THE ROLE OF ORAL HYGIENE IN THE PREVENTION OF NON-VENTILATOR ASSOCIATED HEALTH-CARE ACQUIRED PNEUMONIA

by

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DNP Project Approval Form

This is to certify that Catherine Yuen

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successfully disseminated their project entitled:
The Role of Oral Hygiene in the Prevention of Non-Ventilator Associated Health-Care Acquired Pneumonia

on April 24, 2020

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Abstract

**Background and Significance:** Patients who develop HAP are at increased risk for mortality, longer hospital stays, and stays in the intensive care unit (ICU). However, oral hygiene is often overlooked in non-ventilated patients due to patient noncompliance, challenges on acute-medicine units, nursing staff shortages, and lack of oral care policies in non-ICU settings.

**Purpose and Objectives:** Currently, there are no standard oral care policies in non-ventilated patients, but HAP is still problematic in this patient population. Therefore, the purpose of this project is to design an educational workshop for nursing staff highlighting the importance of oral hygiene.

**Theoretical Framework:** Benner’s theory, From Novice to Expert, explains how nursing proficiency improves through education and experience in practical situations. Similarly, this project’s goal to increase nursing knowledge and expertise.

**Methods and Design:** This project is designed to outline the in-service educational session, as well as an outline of the pre- and post-intervention survey.

**Protection of Human Rights and Ethical Considerations:** The design of the project includes obtaining nursing consent prior to implementation.

**Results:** Future recommendations include utilizing the outline to develop an on-site research project to determine whether the in-service session will improve nursing staff provision and documentation of oral hygiene in non-ventilated adult patients in acute settings.

*Keywords:* non-ventilator OR non-ICU AND oral hygiene AND pneumonia
Acknowledgments

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Next, I would like to thank my mother. You are the strongest individual I know, and I would not be where I am today without you. I am exceedingly thankful for the amount of sacrifice and love you have given me.

I would also like to thank my husband for his endless support throughout these last few years. You have been my rock, and have always encouraged me to get back up when I fell down. Thank you for always being by my side, even during the toughest times.
The Role of Oral Hygiene in the Prevention of Non-Ventilator Associated Health-Care Acquired Pneumonia

Hospital-acquired pneumonia (HAP) is the most common acquired infection in acute care hospitals (McNally et al., 2018). It is defined as the development of pneumonia after a 48 hour or longer hospital admission with the absence of the infection during time of admission (Shebl & Gulick, 2019). Studies have shown that proper oral care has significant impact on reducing respiratory infections such as HAP and ventilator-associated pneumonia, also known as VAP (Passaro et al., 2016). It has been known that without proper oral hygiene, bacteria that remain in the oral cavity become more pathogenic over time and can cause serious complications (Jenson et al., 2018). However, oral hygiene is often neglected in acute care settings due to barriers such as lack of time, limited resources, and staff shortages (Jenson et al., 2018).

Although oral hygiene is necessary for all patients, there are certain patient populations that are at a higher risk for HAP (Jenson et al., 2018). This includes patients that are postoperative, have recently been extubated, those staying on progressive care units, and patients with dysphagia (Jenson et al., 2018). Current recommendations in non-intensive care unit (ICU) settings include the provision of oral care at least 2 times per day (McNally et al., 2018). However, there are no clear guidelines or protocols on oral hygiene in prevention of non-ventilator (NV)-HAP in non-ICU settings.

Background & Significance

Patients who develop HAP are at increased risk for mortality, longer hospital stays, and more likely to require stays in the ICU (Passaro et al., 2016). Because HAP is a preventable infection, the Center for Medicare and Medicaid Services (CMS) no longer reimburses hospitals for treatment of non-VAP (McNally et al., 2018). Subsequently, during 2009-2011 in the United
States, the total cost for non-ventilator associated healthcare-acquired pneumonia (NV-HAP) was approximately $156 million (Giuliano et al., 2018). Even a 50% reduction in pneumonia cases per year can cause a potential savings of $15 million annually (McNally et al., 2018). The economic burden of NV-HAP can be improved by simple techniques such as maintenance of oral hygiene in hospitals (McNally et al., 2018). Although extensive studies focus on reducing VAP with aggressive oral care, there is a lack of evidence to support oral care guidelines in non-ventilated, non-intensive care unit patients (McNally et al., 2018).

Although there are currently no standard oral hygiene guidelines in non-ventilated patients, HAP is still problematic in non-ICU settings (McNally et al., 2018). There is a gap in literature regarding oral hygiene in non-ventilated patients in acute settings due to small sample sizes, noncompliance from staff and patients, and challenges on acute-medicine units secondary to nursing staff shortages (McNally et al., 2018). Therefore, further research and increased awareness of NV-HAP in acute care hospital settings is needed to prevent NV-HAP rates in adult patients.

**Purpose, Aims & Objectives**

A policy for management of oral health with the Q Care Oral Cleaning System in intubated patients and those with tracheostomies exists in the proposed project site, but there is no standardized policy for oral care in non-ventilated, non-ICU patients (NYU Langone Health, 2019). This Doctor of Nursing Practice (DNP) project was designed to develop an evidence-based PowerPoint presentation for an educational workshop with a pre and posttest survey and a protocol guideline for nurses working in the project site acute medicine unit on the role of oral hygiene in preventing health-acquired pneumonia among non-ventilator patients in non-ICU settings. Future implications include implementation of the educational workshop in the clinical
setting that focuses on the importance of providing oral care in non-ventilated adult patients on an acute medicine unit.

This project aimed to highlight the importance of education in hopes to increase nursing frequency in providing oral care to patients, with overall goals to achieve reduced incidences of NV-HAP. Reducing rates of NV-HAP can cause a significant decrease in mortality rates, reduce hospital length of stay, and decrease the financial burden of NV-HAP (Passaro et al., 2016).

**APN Contributions to Scholarship and Practice**

Advanced practice nursing entails applying best practice to achieve positive patient outcomes (American Nurses Association [ANA], 2019). It is also a profession that helps drive practice changes through policy development with an overall goal of improving the quality of healthcare (ANA, 2019). Advanced practice nurses are also responsible for carrying out the roles of educators and supporters to the interdisciplinary team (ANA, 2019). This Doctor of Nursing practice (DNP) project contributes to scholarship and practice through policy development, educating staff nurses, and enhancing the patient care experience.

**DNP Essentials**

This DNP project aims to fulfill the DNP Essential of clinical scholarship and analytical methods of evidence-based practice through the design of an educational intervention to translate research into practice (American Association of Colleges of Nursing [AACN], 2006). Policy development is also part of the DNP Essential of health care policy for advocacy in health care (AACN, 2006). This project advocates for those at risk for HAP and address the gaps present in current literature. It also entails educating nurses to achieve positive health outcomes.
Theoretical Framework

Benner’s theory, From Novice to Expert, was the framework that guided this DNP project. This theory describes how the ongoing changes and advancements in healthcare necessitate an increased need for experienced nursing staff (Benner, 1982). Prior to the development of this model, most formal models of nursing have not described the transition of novice nurses to expert nurses (Benner, 1982). Benner created From Novice to Expert based on The Dreyfus Model of Skill Acquisition. The model consists of five levels of expertise in context to nursing development (Benner, 1982).

The first level, novice, consists of beginners with no experience and thus they lack the ability to use judgment in decision making (Benner, 1982). Additionally, novice level nurses are unable to prioritize tasks, since they lack knowledge on what they are expected to perform (Benner, 1982). In this level, novice nurses do not have experience in clinical settings and therefore, there is a deficiency in insight in patient care (Benner, 1982). Level II is the advanced beginner, which are those nurses who have past experience of the situation, but with guidance from a mentor (Benner, 1982). In this level, advanced beginners are still lacking prioritization skills and critical thinking skills (Benner, 1982). Advanced beginners focus on rules and regulations and still require practice on certain tasks (Benner, 1982). Level III are nurses who are competent, which include nurses who have 2-3 years of experience and are able to formulate a logical plan for their day (Benner, 1982). Nurses in this level are able to time manage and prioritize tasks competently (Benner, 1982). Although this level is considered satisfactory, the competent nurse still lacks proficiency, speed, and flexibility (Benner, 1982). Level IV are proficient nurses who are able to think critically and be quicker in decision-making in situations where immediate response is needed (Benner, 1982). However, the proficient nurse still requires
principles and guidelines to formulate a plan (Benner, 1982). Lastly, level V are expert nurses who no longer require guidelines or rules to respond to a situation (Benner, 1982). Expert nurses have gained intuition and problem-solving skills through years and years of experience (Benner, 1982). Expert level nurses also possess a deep understanding of the situation, and mostly rely on instinct rather than guidelines (Benner, 1982).

Benner suggested that experience is not simply defined as the amount of time spent working in the clinical setting, it also accounts for encountering numerous practical situations where one’s skills are refined (Benner, 1982). Experience is how nurses are able to transition from novice to expert level (Benner, 1982). This theory fits the aims and objectives of this DNP project, where there is a shared goal to increase nursing knowledge and expertise and in turn, increase quality of care. This DNP project presents an evidence-based PowerPoint presentation for an educational workshop with a pre and posttest survey and a protocol guideline for nurses working in the project site acute medicine unit on the role of oral hygiene in preventing health-acquired pneumonia among non-ventilator patients in non-ICU settings. The workshop was developed to evaluate if advanced beginner and competent nurses grasp understanding of how oral hygiene among non-ventilator patients in non-ICU settings can prevent health-care acquired pneumonia and promote health and healing. Oral hygiene may be a simple task to perform, but understanding its importance is what will allow a nurse to transition to a higher level of expertise, according to Benner’s model (Benner, 1982).

Literature Review

A literature search was conducted on CINAHL, PubMed, and Medline. Search words included, oral hygiene, non-ventilator, hospital, non-ICU, and/or pneumonia. Inclusion criteria were articles with publishing dates less than 5 years old, articles focused on non-ICU settings,
adult patients, and non-ventilator dependent patients. Exclusion criteria included articles older than 5 years, articles focused on ICU settings, non-adult patients, and patients on ventilators. See Appendix A for the literature review matrix.

In a systematic review conducted by Kaneoka et al. (2015), there was a significant decrease in non-ventilator associated pneumonia (non-VAP) when nursing home patients were provided topical chlorhexidine or mechanical (toothbrush) oral cleaning. Kaneoka et al. (2015) focused on 5 studies, 3 of the studies examining interventions of mechanical oral cleaning in nursing home residents. These 3 studies found significant evidence that routine mechanical oral care in adjunct with professional oral hygiene is effective in reducing the risk for pneumonia (Kaneoka et al., 2015). The other 2 randomized controlled trials (RCT) provided evidence that mechanical oral care reduced the risk of fatal pneumonia, or death due to pneumonia (Kaneoka et al., 2015). However, these studies were conducted in nursing homes, and there remains a gap in knowledge on whether oral care reduces non-VAP in hospitals and long-term care facilities (Kaneoka et al., 2015).

McNally et al. (2018) conducted a nonrandomized controlled clinical trial in non-intensive care units to examine the results of an oral care protocol in NV-HAP rates. In this study, the authors created a structured toothbrushing program, where nursing staff were instructed to provide oral care three times per day, utilizing either SAGE Toothette Suction Toothbrush Kits or regular hospital-issued toothpaste and toothbrushes in non-ventilated adult patients (McNally et al., 2018). The authors concluded that an aggressive structured toothbrushing oral care program has potential to reduce NV-HAP in non-ICU patients, but due to noncompliance with 3 times per day oral care by nursing staff (the average actual toothbrushing recorded was 1.6 times per day), there has been a lack of evidence that this protocol can reduce
NV-HAP (McNally et al., 2018). Consequently, the need for compliance tracking, a stronger interdisciplinary team approach, intensive staff education and re-enforcement, competency requirements, and required oral care documentation are recommended (McNally et al., 2018).

A narrative review by Passaro et al., (2016) also suggested that there is a gap in literature regarding standard oral care guidelines to reduce HAP rates in non-ventilated adult patients. The authors conducted a literature review and found a reduction in HAP associated with oral care, but the range of interventions performed are very broad, and thus creation of a standardized protocol is difficult (Passaro et al., 2016). Further studies are needed that focus on specific oral care techniques (Passaro et al., 2016).

In a study by Jenson, Maddux, and Waldo (2018), the authors conducted a pre- and post-interventional study to determine if the implementation of an oral care protocol would impact the frequency of oral care in non-ventilated patients and those without a tracheostomy. The pre-intervention data was collected through retrospective chart reviews (Jenson et al., 2018). The intervention included an hour-long educational session by a clinical nurse specialist (CNS) that explained the importance of oral hygiene in reduction of NV-HAP rates (Jenson, Maddux, & Waldo, 2018). The sample population completed a questionnaire regarding knowledge and barriers to oral care (Jenson et al., 2018). The authors found a significant improvement in documentation between weeks 5 and 7 (p=0.000), and between weeks 5 (p=0.000) and 9 (p=0.000), but not between weeks 7 and 9 (Jenson et al., 2018). However, there was no significant increase in staff education on the importance of oral hygiene to prevent pneumonia post-intervention (Jenson et al., 2018). The authors recommend that further research include a large sample study and higher-risk population groups, such as patients with dysphagia, feeding tubes, NPO status, and those recently extubated (Jenson et al., 2018).
In a single arm intervention study by Munro and Baker (2018), the authors tested the effects of a twice daily oral care protocol on NV-HAP rates. This study was conducted in various non-ICU settings, such as community-based outpatient clinics, community living centers, and domiciliary residential rehabilitation areas (Munro & Baker, 2018). The study concluded that a twice daily oral care protocol reduced the incidence of NV-HAP by 92% in one year (Munro & Baker, 2018). However, this study did not focus on acute inpatient hospital settings.

Nursing documentation regarding measures to prevent NV-HAP are lacking, as discussed in an article by Tesoro, Peyser, and Villarente (2018). In this article, the authors conducted a descriptive, observational, and retrospective chart review to analyze nursing care associated with pneumonia rates in Montefiore Hospital Centers (Tesoro et al., 2018). In this article, the authors found that only 3.9% of patients received documented oral care at least 4 times per day (Tesoro et al., 2018). Barriers addressed include lack of staffing, time, and low recognition of its value in regards to other tasks (Tesoro et al., 2018). Thus, other methods to improve nursing documentation and oral hygiene activities should be analyzed in future studies.

Another article written by dental hygienists also discuss the importance of oral care in prevention of bacterial disease (Kanzigg & Hunt, 2016). In this literature review, the authors analyze the relationship between oral hygiene and incidences of HAP in adult nursing-home patients (Kanzigg & Hunt, 2016). Like the other studies, the authors found a positive correlation between lack of oral hygiene and incidences of HAP (Kanzigg & Hunt, 2016). However, medical staff lack the knowledge of the importance of oral care, which poses as a barrier (Kanzigg & Hunt, 2016). Another barrier addressed in this article was the compliance by the elderly patients to perform oral care for themselves (Kanzigg & Hunt, 2016). The authors recommended an in-
service for elderly patients on the importance for self-care to potentially decrease the incidence of HAP (Kanzigg & Hunt, 2016).

Hagedorn Wonder, Martin, and Jackson (2017) conducted a 13-article critical appraisal with aims of assessing nursing and nursing assistant staff knowledge, attitude, and practices on oral hygiene in patients. In this study, they also hoped to develop a policy based on evidence-based practice guidelines, and promote education to nursing and nursing assistant staff on oral hygiene (Hagedorn Wonder et al., 2017). Barriers to oral care addressed in articles and in the study itself included nursing’s lack of sense of responsibility in performing oral care to patients (Hagedorn Wonder et al., 2017). Most nurses believed it was the nursing assistants’ responsibility to carry out the task of oral hygiene, but nursing assistants reported that nurses rarely delegated this task, or followed up with them on oral care (Hagedorn Wonder et al., 2017). Thus, this has become a missed opportunity, so the authors developed competencies on oral care to increase staff knowledge and communication (Hagedorn Wonder et al., 2017).

Furthermore, a literature review conducted by Mitchell et al (2019) studied 15 articles that focused on oral hygiene and other strategies to prevent NV-HAP. This article differed from the other literature reviews mentioned in that it included articles with both professional and non-professional oral care techniques (Mitchell et al., 2019). Professional oral care was done by a dentist or hygienist, while non-professional care included interventions using antiseptic oral kits or toothpaste with sodium bicarbonate conducted by non-dental professionals (Mitchell et al., 2019). 2 of the 4 studies concluded an association with a decrease in NV-HAP in those who received professional oral care regularly (Mitchell et al., 2019). However, all articles were similar in that it identified oral care as the most common preventive strategy used for NV-HAP.
ORAL HYGIENE NON-VENTILATOR PNEUMONIA PREVENTION

(Mitchell et al., 2019). Further research is indicated to determine which oral care agent is ideal to prevent NV-HAP (Mitchell et al., 2019).

A quasi-experimental pretest-posttest project analyzed methods of oral care for both ventilator-dependent and non-ventilated patients, but non-ventilator-dependent oral care techniques were focused on for this DNP capstone project (Warren et al., 2019). The quality improvement project consisted of hosting educational sessions for 1,131 clinical nurses and analyzing EHR documentation of oral care (Warren et al., 2019). The education sheet provided to nurses described the importance of conducting oral hygiene at least 4 to 6 times daily to prevent pneumonia (Warren et al., 2019). As a result, the rate of NV-HAP decreased by 50%, and an estimated of 16 deaths was avoided (Warren et al., 2019). Additionally, approximately $1.04 million in healthcare costs was saved over a 7-month period (Warren et al., 2019). This article suggests that an evidence-based oral care protocol can play a role in reducing the rates of NV-HAP and increase patient outcomes (Warren et al., 2019).

Methodology

Project Design

This DNP project was designed to present an evidence-based PowerPoint presentation for an educational workshop with a pre and posttest survey and a protocol guideline for nurses working in the project site acute medicine unit regarding the role of oral hygiene in preventing health-acquired pneumonia among non-ventilator patients in non-ICU settings. The presentation was designed to guide future educational opportunities on the clinical campus which could not take place at the time of this DNP project in light of the COVID-19 pandemic. The educational workshop presents the importance of providing oral care to prevent non-ventilator associated pneumonia in adult patients and highlights current gaps in knowledge on oral care protocols in
non-ventilated adult patients as well as how current protocols for VAP can be practiced for high-risk non-ventilated adult patients (Appendix B). Additionally, the workshop introduces current facts about hospital-acquired pneumonia, including the definition and common pathogens that cause HAP, and presents the negative effects of NV-HAP, such as increased risk of mortality, higher incidences of ICU admission, and increased financial burden (Kanzigg & Hunt, 2016). Based on current data, people at risk for NV-HAP include those with arthritis, heart disease, diabetes, emphysema, hepatitis B, obesity, HIV, organ transplant recipients, and those on certain medications like steroids or antihistamines (Centers for Disease Control [CDC], 2016). The elderly population is also at increased risk due to decreased salivary flow, weaker cough reflexes, dysphagia, and lack of dexterity to perform adequate oral hygiene (Kanzigg & Hunt, 2016).

Methods of preventing NV-HAP, barriers to oral care provision, and nursing staff documentation is also presented.

Finally, current practice techniques are addressed in the presentation, such as the Q Care Oral Cleaning Policy currently implemented at the project site (Ellucid, 2015). The workshop addresses that although this policy exists, there are no policies on required documentation for non-ventilated adult patients (Ellucid, 2015).

Learning objectives for the educational workshop include understanding the importance of NV-HAP, evaluating current barriers to oral care provision and documentation, and recognizing implications for future research. Protection of human rights and ethical considerations were addressed in the introduction of the workshop session.

A proposed oral hygiene protocol (Appendix E) was drafted in the workshop, which was adapted from the NYU Langone Health policy for intubated and trached patients (Ellucid, 2015). The protocol includes an Oral Assessment Tool Scoring System based on the integrity of the
patients’ teeth, lips, tongue, oral mucosa, and saliva (Ellucid, 2015). Recommendations on frequency of oral care interventions are provided based on the total score (Ellucid, 2015). Lastly, the protocol describes aspects on documentation which should be carried out per shift, at minimum. Visual representation of the proposed protocol was included in the slideshow for clarity. The Oral Assessment Tool and Oral Cleansing Recommendations were demonstrated in chart format.

The pretest survey (Appendix D) was created based on eleven questions adapted from Quinn and Baker’s (2015) survey. The pretest survey serves to assess nursing experience, attitude, knowledge, and frequency of oral care and documentation. The pretest survey also includes the Professional Quality of Life Scale (ProQOL) to analyze nursing burnout (Hudnall Stamm, 2009). Nursing burnout negatively impacts the health of patients and often poses as a barrier to oral hygiene (Hoben et al., 2016). The pretest survey also includes an opportunity for nurses to identify their own barriers to performing oral hygiene for patients.

The posttest survey (Appendix E) was created to re-evaluate nursing attitudes and knowledge on the importance of oral care after educational workshop. It consists of the same knowledge-based questions in the pretest to determine the efficacy of the workshop on providing education. It was also created to reassess changes in attitude and thoughts on oral hygiene post-workshop.

Protection of Human Rights/Ethical Considerations

No participant data or patient information was collected for this project. Protection of human rights and ethical considerations were addressed in the introduction of the workshop session. The workshop includes a PowerPoint slide describing how future on-site research opportunities should include a pre-intervention written consent form for participants.
Conclusion

DNP Outcomes

The outcomes of this DNP project include policy development and implementation of evidence-based practice to achieve improved quality of care. Interprofessional collaboration was also utilized in order to empower nursing staff confidence and education. Its plans can be utilized for future projects and research opportunities.

Future Implications

In the future, this project can include a pre- and post-intervention survey to assess whether this educational workshop will improve nursing staff provision and documentation on oral hygiene in the targeted population. The pre-intervention survey can also include the ProQOL Scale which assesses nursing burnout, since this is a factor that directly affects delivery of nursing care (Hudnall Stamm, 2009). The pre- and post-intervention survey can also evaluate the proposed oral hygiene protocol in the said population. Nursing staff evaluation of the oral care protocol can identify areas of improvement.

Additionally, compliance tracking for documentation of oral care can be measured pre- and post-intervention through chart reviews. Chart reviews and audits can determine whether nursing staff improve on their oral care documentation after attending the educational workshop. With the lack of existing oral hygiene policies for non-ventilated adults in most hospitals, this project can become the development of a standard protocol on a system level.

Additionally, the format of this project can be adapted for non-hospital settings, such as nursing homes or long-term care facilities. With the gap in knowledge extending to nursing homes, this project poses as an opportunity for research in this particular setting as well (Kaneoka et al., 2015).
**Project Deliverables**

This project’s goal was to increase nursing staff education and awareness on oral hygiene. It also raised awareness on the current gap in knowledge on standard oral care guidelines. Project deliverables also include adaptation of NYU Langone’s current protocol for ventilated patients to be implemented for non-ventilated, non-ICU adult patients as well. Expansion of the protocol for this population group advocates for non-ventilated patients who are at high risk for NV-HAP. This policy can also be adapted for use on a higher level and in different hospital settings.
References


http://web.a.ebscohost.com.ezproxy.med.nyu.edu/ehost/pdfviewer/pdfviewer?vid=1&sid=46c79bf4-b3f6-4739-a6e1-6eb5b1b7aabb%40sessionmgr4008.


## Appendix A

### Literature Review Matrix

<table>
<thead>
<tr>
<th>Article Citation</th>
<th>Type of Study</th>
<th>Method, description, &amp; tools</th>
<th>Results &amp; key findings</th>
<th>Relevance to proposed project</th>
</tr>
</thead>
<tbody>
<tr>
<td>McNally et al., (2018)</td>
<td>Non-randomized controlled clinical trial</td>
<td>2,890 patients in non-ICU units were studied (experimental group n=1,403, control n=1,487). Implementation of a 3 times per day toothbrushing protocol was experimented, whether it be patient's own toothbrushes or SAGE oral care kits. Control group was standard 2 times per day daily care.</td>
<td>Compliance with toothbrushing 3 times per day was not followed, and thus the average times of oral hygiene was provided 1.6 times per day. However, a second analysis was performed in which pneumonia rates were significantly lower in patients who received more frequent oral care.</td>
<td>There are currently no formal nursing guidelines for oral care in the non-ICU setting. Mandatory compliance should be tracked via nursing documentation.</td>
</tr>
<tr>
<td>Jenson et al., (2018)</td>
<td>Pre- and post-interventional study</td>
<td>A pre-post design was used. Retrospective chart review was used to determine the frequency of oral care pre-intervention, and weeks 5, 7, and 9 following intervention. N=23 pre-intervention, N=16 post-intervention.</td>
<td>There was a significant improvement in documentation between weeks 5 and 7 (p=0.000), and between weeks 5 (p=0.000) and 9 (p=0.000), but not between weeks 7 and 9. However, there was no significant increase in staff education on the importance of oral hygiene to prevent pneumonia.</td>
<td>Future studies should include the assessment of different methods of teaching. Future studies should also include higher-risk non-ventilated patients, such as those with dysphagia, post-extubation, NPO, and receiving tube-feedings.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Research Design</td>
<td>Study Description</td>
<td>Findings</td>
<td>Notes</td>
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<tr>
<td>Keneoka et al., (2015)</td>
<td>Systematic review and meta-analysis</td>
<td>5 studies: 2 trials assessing chlorhexidine, 3 studies examined mechanical oral cleaning</td>
<td>Oral care interventions were associated with a significant risk reduction for developing non-VAP. Mechanical oral care significantly reduced non-VAP. Chlorhexidine</td>
<td>There is a gap in knowledge for the effects of oral care in hospitals and long-term care facilities.</td>
</tr>
<tr>
<td>Passaro et al., (2016)</td>
<td>Narrative review</td>
<td>A literature search utilizing Medline was conducted to determine the overview of current standards for the prevention of HAP in non-ventilated adult patients.</td>
<td>No specific recommendations for NV-HAP prevention is available. Early mobilization, dysphagia treatment, and standard precautions are associated with reduced HAP cases. The impact of bed position and stress bleeding prophylaxis remains uncertain.</td>
<td>There is a gap in literature regarding standard oral care guidelines to reduce HAP rates in non-ventilated adult patients.</td>
</tr>
<tr>
<td>Munro &amp; Baker, (2018)</td>
<td>Single arm interventional study</td>
<td>Single arm intervention study which included a twice daily oral care protocol. Retrospective study of 14,396 patient days (2002-2012) that determined the pre-intervention levels of nursing care provided, and the overall disease prevalence.</td>
<td>Twice daily oral care protocol reduced the incidence of NV-HAP by 92% in one year</td>
<td>Barrier: (1) the perception that oral care is an optional daily care activity for patient's comfort, (2) hospitals supply inadequate, poorly designed oral care materials, and (3) hospitals are not required to monitor the incidence of NV-HAP.</td>
</tr>
<tr>
<td>Authors</td>
<td>Study Type</td>
<td>Methods</td>
<td>Results</td>
<td>Recommendations</td>
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<tr>
<td>--------------------</td>
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<tr>
<td>Tesoro et al., (2018)</td>
<td>Descriptive, observational, and retrospective chart review</td>
<td>Chart reviews were conducted to analyze diagnoses of pneumonia and associated nursing care performed 24 hours before the pneumonia diagnosis. Nursing care included oral care, HOB 30-40 elevation, out of bed activity, incentive spirometer use, and coughing and deep breathing techniques.</td>
<td>Nursing documentation is lacking in activities to reduce NV-HAP. Oral care is mainly patient comfort-drive rather than to prevent NV-HAP. Only 3.9% of patients received documented oral care at least 4 times per day. This can be due to lack of staffing, time, or low recognition of its value.</td>
<td>Quality improvement initiatives are needed regarding strategies to reduce NV-HAP.</td>
</tr>
<tr>
<td>Kanzigg &amp; Hunt, (2016)</td>
<td>Literature review</td>
<td>Literature review was conducted to analyze the relationship between oral health care practices and healthcare-acquired pneumonia in elderly adults.</td>
<td>There is a positive correlation between lack of oral hygiene and incidences of HAP. However, there is a lack of applied knowledge by the medical personnel and compliance by the elderly patients to perform oral care.</td>
<td>In-service training should be conducted to elderly patients and healthcare providers.</td>
</tr>
<tr>
<td>Hagedorn et al., (2017)</td>
<td>Literature review</td>
<td>13 relevant articles were critically appraised with goals of assessing oral care knowledge, attitudes, and practices of RNs and nursing assistants for non-ventilated patients. After the literature review, a policy was developed which included a 15-minute in-service on importance of oral hygiene, and inclusion of the topic into new-hire requirements.</td>
<td>RNs and nursing assistants were educated on importance of oral care, and it was integrated into competencies so that leaders were able to evaluate attitudes and practices of oral care. The policy that was enforced increased nursing documentation on oral care.</td>
<td>Oral care should be included in required nursing and nursing assistant competencies to increase compliance with current evidence-based guidelines.</td>
</tr>
<tr>
<td>Study</td>
<td>Design/Methodology</td>
<td>Participants</td>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Warren et al.,</td>
<td>Quasi-experimental</td>
<td>1,131 nurses</td>
<td>There was a significant improvement in pneumonia outcomes from oral care</td>
<td></td>
</tr>
<tr>
<td>(2019)</td>
<td>pretest-posttest</td>
<td></td>
<td>. Patient chart reviews were conducted to measure the changes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Subsequently, there was a reduction in hospital length of stays, patient mortality, and hospital costs.</td>
<td></td>
</tr>
</tbody>
</table>

This project highlights the importance of nurse-driven protocols in inpatient settings to reduce the rate of NV-HAP. Tracking and reviewing the provision of oral hygiene has increased patient safety outcomes.

<table>
<thead>
<tr>
<th>Study</th>
<th>Design/Methodology</th>
<th>Participants</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michell et al.,</td>
<td>Literature review</td>
<td>15 articles</td>
<td>A commonality between these articles was providing oral care reduces rates of NV-HAP.</td>
</tr>
<tr>
<td>(2019)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Further research in inpatient settings need to be examined on oral hygiene's relation to NV-HAP. A larger sample size is also needed for such studies.
Appendix B

Workshop Outline

Learning Objectives
- To understand the importance of providing oral hygiene in non-ventilated adult patients at risk for NV-HAP
- To evaluate current barriers to oral care provision and documentation
- Recognize implications for future research

Introduction
Hospital Acquired Pneumonia
- HAP = lower respiratory tract infection that develops after 48 hours of hospitalization (Sethi, 2019)
- Commonly caused by micro-aspiration of bacteria in the oral cavity (Sethi, 2019)

Protection of Human Rights and Ethical Considerations
- Pre-Intervention Written Consent
- Patient and participant confidentiality will be maintained
**Hospital Acquired Pneumonia**

- Common Pathogens
  - Pseudomonas aeruginosa
  - Methicillin-sensitive Staphylococcus aureus
  - Methicillin-resistant Staphylococcus aureus
  - Klebsiella pneumoniae
  - Escherichia coli

**Current Practice**

- Literature suggests a strong correlation between poor oral care and pneumonia
- Most literature focuses on VAP, or patients in ICU settings
- Lack of current protocols for non-ventilated, adult patients on acute care units
- Q Care Oral Cleaning Policy for intubated patients and those with tracheostomies implemented in NYU Langone Health
- No policy for required documentation of oral care currently exists in NYU Langone Health

**Who Is At Risk?**

- People at risk for NV-HAP include patients with arthritis, heart disease, stroke, diabetes, emphysema, hepatitis B, obesity, HIV, organ transplant recipients, and patients on certain medications like steroids or antihistamines (CDC, 2016)
- The elderly are at increased risk of pneumonia due to decreased salivary flow, weaker cough reflex, dysphagia, and lack of dexterity to perform oral hygiene adequately (Kanzigg & Hunt, 2016)

**Background & Significance**

- Patient harm:
  - Longer hospital stays and increased readmission rates in 30 days
  - Higher incidences of ICU admission
  - Increased risk of mortality
  - Leading cause of death from infection in patients aged 65 years and older
- Financial burden:
  - No reimbursement from Center for Medicare and Medicaid Services (CMS)
  - $6.5 billion annually on healthcare dollars to treat pneumonia
- Gap in literature:
  - Lack of studies to support oral care guidelines in non-ventilated, non-ICU patients
  - (Passero et al., 2016)
Risk Factors
- Age 70+
- High gastric pH
- Functional debilitation - ↓ cough reflex
- Poor oral hygiene

Barriers
- Lack of time
- Limited resources
- Staffing ratios
- Low recognition of the value of care in regards to other tasks
- Lack of awareness of oral hygiene's importance to health and wellbeing
- Patient noncompliance
- Lack of delegation to appropriate staff members such as nursing aides, patient care technicians, family members etc.

How To Prevent Non-Ventilator Associated Hospital-Acquired Pneumonia
- Daily oral care reduces the amount of bacteria in the oral cavity, and subsequently reduces the risk of infections (Jenson et al., 2018)
- Oral care should also be provided after meals, and at bedtime (Muller, 2015)
- Hand hygiene, prevention of dysphagia, early mobilization, and proper bed positioning are also techniques to prevent non-ventilator hospital-acquired pneumonia (Passaro et al., 2016)

Proposed Oral Hygiene Protocol
Purpose:
1. To provide evidence-based guidelines for nursing staff in providing oral care to non-ventilator dependent, non-trauma adults
2. To reduce the amount of pathogenic colonization in the oral cavity
3. To reduce the risk of hospital-acquired pneumonia in adult patients
4. To promote patient comfort

Patient Assessment:
For patients on acute medicine units:

Step 1: Conduct a thorough oral and dental assessment/evaluation on admission and every shift (twice daily – morning and evening) with the Oral Assessment Tool on EPIC charting system.

Step 2: Total the scores (0-4) from the Oral Assessment Tool based on integrity of:
- Teeth
- Lips
- Tongue
- Oral Mucosa
- Sialina

Score for Oral Dysfunction

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>No intact mucosa</td>
</tr>
<tr>
<td>3</td>
<td>Mild abrasion</td>
</tr>
<tr>
<td>4</td>
<td>Severe abrasion</td>
</tr>
</tbody>
</table>


Step 3: Using the total score, establish the Oral Cleansing Recommendations using the table:


Oral Assessment Tool

<table>
<thead>
<tr>
<th>Name</th>
<th>Sore</th>
<th>Teeth</th>
<th>Lips</th>
<th>Tongue</th>
<th>Oral Mucosa</th>
<th>Sialina</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Documentation

• Document all aspects of oral care in the electronic medical record
  • Oral care assessment on admission and every shift (q12h)
  • Oral care provided
    • Frequency based on Oral Cleansing Recommendations
  • Patient and family education
  • Patient tolerance

Pre-Test Survey

• Purpose:
  • Assess nursing staff experience level
  • Nursing burnout (ProQOL Scale)
  • Analyze current knowledge on NV-HAP and oral hygiene recommendations
  • Evaluate frequency of oral care provision to patients and documentation
  • Determine current barriers identified by nursing staff
  • Examine the value of oral hygiene in perspective of nursing staff

Professional Quality of Life Scale (ProQOL)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ProQOL Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health</td>
<td>0.5</td>
</tr>
<tr>
<td>Psychosocial Health</td>
<td>0.8</td>
</tr>
<tr>
<td>Emotional Health</td>
<td>0.6</td>
</tr>
<tr>
<td>Psychological Health</td>
<td>0.7</td>
</tr>
<tr>
<td>Social Health</td>
<td>0.5</td>
</tr>
<tr>
<td>ProQOL Total Score</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Post-Test Survey

• Purpose:
  • Reevaluate knowledge on NV-HAP and oral hygiene recommendations post-workshop
  • Reassess whether participant plans on increasing provision of oral care to patients and documentation
  • Identify intended compliance level with proposed oral hygiene protocol
  • Re-examine the nurses’ perspectives on the importance of oral care
  • Determine nursing staff thoughts and input on the workshop
References


References Cont.


References Cont.


Appendix C

Proposed Policy

Oral Hygiene Protocol for Non-Ventilated Adult Patients

Purpose:

1. To provide evidence-based guidelines for nursing staff in providing oral care to non-ventilator dependent, non-trached adult patients.

2. To reduce the amount of pathogenic colonization in the oral cavity.

3. To reduce the risk of hospital-acquired pneumonia in adult patients.

4. To promote patient comfort.

Patient Assessment:

For patients on acute medicine units:

1. Conduct a thorough oral and dental assessment/evaluation on admission and every shift (twice daily – morning and evening) with the Oral Assessment Tool on EPIC.
| Rating       | Teeth                                | Lips                          | Tongue                        | Oral Mucosa                      | Saliva                  |
|--------------|--------------------------------------|-----|----------------|-----------------------------|-----------------------------|------------------------|
| Grade 1 (none) | Clean, no debris                     | Smooth, pink, moist, intact   | Smooth, pink, moist, intact   | Smooth, pink, moist, intact   | Thin, watery, plentiful |
| Grade 2 (mild) | Minimal debris (between teeth)       | Dry, wrinkled, cracked; some reddened areas | Dry, slightly reddened areas, prominent papillae at base | Pale, slightly dry, few isolated lesions, blisters or reddened areas | Increased              |
| Grade 3 (moderate) | Moderate debris (visible on enamel) | Dry and slightly swollen, isolated blisters, inflammatory line of demarcation | Dry and slightly swollen, generalized redness, papillae prominent at base and tip, isolated lesions or blisters | Dry and slightly swollen, generalized redness, few isolated lesions, blisters, or reddened areas | Scanty, thicker than usual |
| Grade 4 (severe) | Covered with debris                  | Extremely dry and edematous, entire mucosa red and inflamed, multiple ulcerations | Extremely dry and edematous, thick and inflamed, tip very red with coating, multiple blisters/ulcers | Extremely dry and edematous, generalized redness and inflammation, multiple confluent ulcers | Thick, viscid, mucoid |

2. Total the Score for Oral Dysfunction using the Grades and total the number.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>No observed dysfunction</td>
</tr>
<tr>
<td>6-10</td>
<td>Mild dysfunction</td>
</tr>
<tr>
<td>11-20</td>
<td>Moderate to severe dysfunction</td>
</tr>
</tbody>
</table>

3. Using the total score, establish the Oral Cleansing Recommendations using the table:

<table>
<thead>
<tr>
<th>Score of 1-5</th>
<th>Score of 6-10</th>
<th>Score of 11-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perform oral assessment on admission and once per shift, every 12 hours.</td>
<td>1. Perform oral assessment on admission and once per shift, every 12 hrs.</td>
<td>1. Perform oral assessment on admission and 3 times daily.</td>
</tr>
</tbody>
</table>
### ORAL HYGIENE NON-VENTILATOR PNEUMONIA PREVENTION

| 2. Remove and brush dentures 2 times daily or after meals. (same time as oral care). Remove at bedtime |
| 3. Perform oral interventions 2-3 times daily (after meals and at bedtime) |
| 4. Use soft toothbrush or toothpaste to clean teeth, gums, tongue and entire oral mucosa. |
| 5. Rinse with non alcohol mouthwash, antiseptic oral rinse or water. |
| 6. Apply Mouth Moisturizer to lips and oral mucosa to lubricate and moisturize (after oral care and as needed). |
| 2. Remove and brush dentures 2 times daily or after meals. (same times as oral care). Leave out if irritating. |
| 3. Perform oral intervention 6 times daily. |
| 4. Use soft toothbrush and toothpaste to clean teeth, gums, tongue and entire oral mucosa. If painful or risk of bleeding, use Toothette plus swabs. |
| 5. Rinse with non alcohol mouthwash, antiseptic oral rinse or water. |
| 6. Apply Mouth Moisturizer to lips and oral mucosa to lubricate and moisturize (frequently; after oral care and 4 times daily minimum). |
| 2. Remove dentures (and leave out). |
| 3. Perform oral intervention 10 times daily. |
| 4. Use of Toothette Plus Swabs and toothpaste to clean teeth, gums, tongue and entire oral mucosa. For patients requiring suction, use Suction Swabs or suction brushes. |
| 5. Rinse with non alcohol mouthwash, antiseptic oral rinse or water. |
| 6. Apply Mouth Moisturizer to lips and oral mucosa to lubricate and moisturize (every 1 to 2 hours; after oral care and as needed). |

### Documentation:


   A. Oral care assessment

   B. Oral care given.

   C. Outcomes with oral care practices. Patient and family education Patient tolerance to suctioning.

   D. Oropharynx assessment every eight hours

   E. Oral hygiene” procedure every four (4) hours and prn.
Appendix D

Pretest Survey

1. How long have you been a nurse?
   a. <1 year
   b. 1-3 years
   c. 3-5 years
   d. >5 years

2. How many patients on average do you care for on a regular day?
   a. 1-2
   b. 3
   c. 4
   d. 5
   e. >5

3. What is your knowledge of oral hygiene in relation to NV-HAP?
   a. I did not know oral care can prevent NV-HAP
   b. I knew oral care can prevent VAP, but not NV-HAP
   c. I knew oral care can prevent both VAP and NV-HAP

4. What type of hospital-acquired infection (HAI) is the most common?
   a. Central-line associated bloodstream infections (CLABSI)
   b. Catheter-associated urinary tract infections (CAUTI)
   c. Ventilator-associated pneumonia (VAP)
   d. Non-ventilator associated hospital-acquired pneumonia (NV-HAP)
5. Which statement is true regarding NV-HAP?
   a. It increases the risk for readmission within 30 days.
   b. It has not been found on pediatric units.
   c. It has no effect on hospitalization costs.
   d. It does not occur in maternity patients.

6. When should oral care be completed for a patient who isn’t eating?
   a. Morning, mid-day, evening, and bedtime
   b. Morning, mid-day, and evening
   c. Morning and mid-day
   d. Morning

7. How frequently do you provide oral care on patients dependent with ADLs that are not ventilated?
   a. Never
   b. Once per shift
   c. Twice per shift
   d. Three times per shift
   e. More than 3 times per shift

8. How frequently do you encourage patients independent with ADLs to perform oral care?
   a. Never
   b. Once per shift
   c. Twice per shift
   d. Three times per shift
   e. More than 3 times per shift
9. How likely are you to document providing oral care after delivering it to patients?
   a. Not likely at all
   b. Somewhat likely
   c. Most likely
   d. Always

10. What barriers do you experience that prevent you from providing adequate oral care to patients?
    a. Equipment
    b. Time
    c. Patient consent/compliance
    d. Others ________

11. How important do you think oral care is for adult non-ventilated patients?
    a. Not important at all
    b. Somewhat important
    c. Very important

Professional Quality of Life Scale (ProQOL)

When you [help] people you have direct contact with their lives. As you may have found, your compassion for those you [help] can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a [helper]. Consider each of the following questions about you and your current work situation. Select the number that honestly reflects how frequently you experienced these things in the last 30 days.

<table>
<thead>
<tr>
<th>1=Never</th>
<th>2=Rarely</th>
<th>3=Sometimes</th>
<th>4=Often</th>
<th>5=Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am happy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I am preoccupied with more than one person I [help].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I get satisfaction from being able to [help] people.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. I feel connected to others.</td>
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<tr>
<td>5. I jump or am startled by unexpected sounds.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I feel invigorated after working with those I [help].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I find it difficult to separate my personal life from my life as a [helper].</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8. I am not as productive at work because I am losing sleep over traumatic experiences of a person I [help].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I think that I might have been affected by the traumatic stress of those I [help].</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. I feel trapped by my job as a [helper].</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. Because of my [helping], I have felt &quot;on edge&quot; about various things.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. I like my work as a [helper].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I feel depressed because of the traumatic experiences of the people I [help].</td>
<td></td>
<td></td>
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<tr>
<td>14. I feel as though I am experiencing the trauma of someone I have [helped].</td>
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<tr>
<td>15. I have beliefs that sustain me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. I am pleased with how I am able to keep up with [helping] techniques and protocols.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I am the person I always wanted to be.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. My work makes me feel satisfied.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19. I feel worn out because of my work as a [helper].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. I have happy thoughts and feelings about those I [help] and how I could help them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. I believe I can make a difference through my work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I avoid certain activities or situations because they remind me of frightening experiences of the people I [help].</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I am proud of what I can do to [help].</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>25. As a result of my [helping], I have intrusive, frightening thoughts.</td>
<td></td>
<td></td>
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<tr>
<td>26. I feel &quot;bogged down&quot; by the system.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>27. I have thoughts that I am a &quot;success&quot; as a [helper].</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>28. I can't recall important parts of my work with trauma victims.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. I am a very caring person.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I am happy that I chose to do this work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Appendix E

Posttest Survey

1. How often do you intend on performing oral care in adult patients at risk for HAP?
   a. Never
   b. Once per shift
   c. Twice per shift
   d. Three times per shift
   e. More than 3 times per shift

2. How likely are you to document providing oral care after delivering it to patients at risk for HAP?
   a. Not likely at all
   b. Somewhat likely
   c. Most likely
   d. Always

3. What type of hospital-acquired infection (HAI) is the most common?
   a. Central-line associated bloodstream infections (CLABSI)
   b. Catheter-associated urinary tract infections (CAUTI)
   c. Ventilator-associated pneumonia (VAP)
   d. Non-ventilator associated hospital-acquired pneumonia (NV-HAP)

4. Which statement is true regarding NV-HAP?
   a. It increases the risk for readmission within 30 days.
   b. It has not been found on pediatric units.
c. It has no effect on hospitalization costs.

d. It does not occur in maternity patients.

5. When should oral care be completed for a patient who isn’t eating?

   a. Morning, mid-day, evening, and bedtime
   
   b. Morning, mid-day, and evening
   
   c. Morning and mid-day
   
   d. Morning

6. How likely are you to comply with this oral care policy if implemented on your unit?

   a. Not likely at all
   
   b. Somewhat likely
   
   c. Most likely
   
   d. Always

7. After the workshop, how important do you rank oral care is for adult patients now?

   a. Not important at all
   
   b. Somewhat important
   
   c. Very important

8. Did this workshop provide useful information regarding the importance of oral care?

   a. Yes
   
   b. Somewhat
   
   c. No