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# **Oral Care of ICU Patients**

Educational video for nursing students

DEGREE PROGRAMME IN NURSING  
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## Abstract

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Although oral health in ICUs is crucial, it is commonly disregarded in complete therapy. Poor oral hygiene in ICU patients might cause ventilator-associated pneumonia and chronic infections. Breathing oral bacteria might cause serious respiratory difficulties. Systemic inflammation, sepsis, starvation, and dehydration may result from poor dental hygiene. The relevance of oral health on overall health requires intensive care unit (ICU) personnel to prioritize frequent oral exams and evidence-based oral hygiene regimens. This decreases hazards and improves patient outcomes.

This thesis aims to create an educational video for nursing students studying in SAMK about the assessment, intervention, and challenges to oral health care for ICU patients, with the objective of improving nursing student's competence in oral health when taking care of patients in intensive care, demonstrating effective methods and techniques to be used for oral care, and to improve the quality of care for ICU patients. The thesis begins with a thorough evaluation of the existing research on ICU oral care procedures and patient outcomes using databases like "PubMed" and "Google Scholar". Educational film creation will be guided by evidence-based criteria from this evaluation. Next, the thesis involves making an instructional movie that shows common dental care treatments using evidence-based standards.

This thesis was completed using Waterfall methodology for project management. Careful thought helped the thesis attain its aims. Nursing students can learn ICU oral health from the video. I understand my career requires continuing training as I progress. To enhance and extend educational tools, focus on continuous refining and healthcare professional and student input is needed. Maintaining the effect of this thesis and adapting to new research and approaches to improve ICU dental care are future goals.

Keywords: Oral Health, Intensive Care Unit (ICU), Educational video, Nursing students

## ABBREVIATIONS

AACN- American Association of Critical-Care Nurses

FDI- World Dental Federation

HPV-Human papilloma Virus

ICU-Intensive Care Unit

OYS – Oulun Yliopistollinen Sairaala

SAMK-Satakunnan ammattikorkeakoulu / Satakunta University of Applied Sciences

VAP- Ventilator-Associated Pneumonia

WHO- World Health Organization

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## 1 INTRODUCTION

Oral health is a crucial aspect of general well-being for everyone, encompassing the care and upkeep of the mouth, including the gums, teeth, tongue, and facial areas. Highlighting the importance of oral health across many phases of life, emphasizing the need for customized care at each period of an individual's growth. Health indicators such as the capacity to smile, speak, and chew are important benchmarks that indicate the absence of disorders such as gum diseases, mouth ulcers or tooth decay. (Heilmann et al., 2015.)

It's not just about dentistry; mouth health is an important part of overall health, which has effects that go beyond dental (Lee & Somerman, 2018). In order to emphasize the need for a comprehensive concept of oral health, the World Dental Federation (FDI) has brought attention to the deep connection that exists between dental and systemic health (Glick et al., 2016). Oral health conditions are numerous and funneling down to the oral care of Intensive care unit patients, and even more specifying to intubated patients admitted to intensive care, are at more risk of developing bacterial oral health problems, leading to larger scale respiratory problems such as "ventilated pneumonia" due to presence of "oral microbial flora". (Grap & Munro, 2017a.) Oral microbial flora in simpler words can be defined as an organism that is habitant of dental plaque and colonizes itself there complexing the situation leading to larger respiratory problems (Deo & Deshmukh, 2019). Patients' issues in the complex landscape of intensive care are numerous, frequently extending beyond the immediate concerns of their presenting diseases. This is usually true in the case of critical care settings, where an individual is dealing with compromised health and requires specialized attention from a multidisciplinary team. Within this area, even the most basic chores become a difficult burden for patients, which is exacerbated by their reliance on healthcare providers for critical everyday activities. (Bhat et al., 2022.)

Oral health care is often disregarded in the ICU, despite its importance, which may lead to serious repercussions. It is essential to provide education on assessing, treating, and overcoming barriers to oral healthcare for persons in the intensive care unit in order to bridge this knowledge deficiency. (Winning et al., 2021.) Established guidelines have emphasized the need of dental care in avoiding infections, especially in intubated patients, by recommending the use of chlorhexidine gluconate 0.12% (Cruz et al., 2023). Nevertheless, there are ongoing obstacles, such as problems associated with dental hygiene that impact people, impacted by variables such as education, socio-economic disparities, and cultural heritage (Hannan et al., 2021).

The purpose of this project thesis is to create an educational video for nursing students studying in SAMK about the assessment, intervention, and challenges to oral health care for ICU patients. Nursing students who are presently enrolled in nursing programmes at Satakunta University of Applied Sciences are the individuals who are intended to benefit from this educational video. The intended video, appropriate for incorporation into clinical skills training or classroom lectures, is to educate students about prevalent oral health problems experienced by patients in the intensive care unit. The video aims to narrow the educational divide and promote cooperation between nursing and dentistry education by providing effective solutions and preventative strategies. This will eventually improve patient outcomes and encourage a comprehensive approach to patient care among nursing students. The AI based program named Grammarly has been used in this thesis. The program helps to enhance academic writing and provides suggestions for improvement of grammar of the sentences.

## 2 THEORETICAL BACKGROUND

### 2.1 Importance of Oral Health

#### 2.1.1 Oral health

When it comes to core tasks like eating, breathing, and speaking, oral health, which encompasses the state of the mouth, teeth, and orofacial tissues, is very necessary (WHO, 2023). Oral health is recognized by the World Health Organization (WHO) as an essential component of overall health, with an expanded range of consequences for psychological and social well-being as well as involvement in society (YactayoAlbuquerque et al., 2021). The multidimensional character of oral health encompasses not only the absence of illness but also factors such as the capacity to perform without experiencing pain or discomfort, as well as the ability to convey one's emotions (Glick et al., 2016). A modern view of oral health emphasizes not only the absence of illness but also the condition of total well-being in the craniofacial complex. This is indicative of the evolution of the definition of oral health throughout various historical periods. One of the most important factors in forming this concept is the description provided by the World Health Organization (WHO), which describes oral health as a condition in which persons are able to execute fundamental duties with confidence, free from pain, discomfort, and illness. (WHO, 2022.)

As in September 2016 the FDI convention came up with a revised definition of oral health that has been adopted, which lays considerable importance on five fundamental elements that jointly impact an individual's oral well-being. The notion of oral health today includes five dimensions that influence an individual's oral health. This includes "genetic predisposition", "social environment", "physical environment", "health behaviors", and "care access". This modern concept emphasizes the complex interaction of oral health elements beyond clinical concerns. Genetic predisposition emphasizes the importance of genetics in oral health outcomes. Social and environmental variables may

affect oral health beyond individual behaviors, as seen in the social and physical environments.(Glick, Williams, 2016.) Health behaviors, a crucial category, include individual decisions and habits that directly affect dental health, emphasizing good lifestyle choices and prevention. Access to care, the third area, emphasizes the importance of healthcare accessibility in maintaining and enhancing oral health by guaranteeing timely and adequate treatment. The new idea of oral health highlights its unique diversity. Age, culture, money, personal experiences, expectations, and flexibility affect this complexity. These different factors emphasize the necessity for patient-centered dental health treatment. Age related factors, cultural differences, economic inequalities, and individual adaptability emphasize the need for personalized interventions. This updated definition represents a paradigm change towards a more complete and personalized view of oral health, recognizing its dynamic character and the many elements that affect overall wellbeing. (Lamster, 2016.) The oral health of an individual is an essential component of their total wellbeing, and it has significant repercussions for both their physical health and the psychosocial parts of their lives. On the basis of scientific data, the interconnection of oral health with systemic disorders is supported. This evidence highlights the links between chronic periodontal diseases and illnesses like cardiovascular diseases and diabetes. (Tonetti et al., 2017.) When it comes to psychological and social well-being, dental health is far more important than physical health. One's self-esteem and confidence may be positively impacted by a grin that is both healthy and beautiful, which in turn has an effect on social relationships. (Settineri et al., 2017.)

Putting one's dental health at risk might result in significant financial losses. There is a major contribution to the total economic effect to be made by the expenditures involved with the treatment of advanced dental illnesses as well as the individual expenses required for oral healthcare. (Peres et al., 2019.) For the purpose of avoiding common oral illnesses such as dental caries and periodontal disorders, it is essential to engage in preventative oral care practices. These practices include scheduling frequent dental checkups and practicing efficient oral hygiene technique. (Jain Gabar, 2023.) Good dental health



improves the quality of life by allowing people to eat a wide variety of foods, talk without difficulty, and smile with self-assurance. This has a good impact on feelings of fulfilment and contributes to the development of healthy behaviors. (Spanemberg et al., 2019.)

Establishing healthy oral hygiene routines at a young age has a significant and long-lasting effect on the trajectory of one's oral health. It is more probable that children who acquire and practice excellent oral hygiene will retain these practices into maturity hence minimizing the risk of oral illness throughout their whole lives from childhood to adulthood. (Drummond et al., 2013.) In conclusion, to acknowledge the significance of oral health, it is necessary to comprehend the systemic linkage that it has, the function that it plays in psychological well-being and the economically significant ramifications of neglect. Not only do people contribute to their oral wellbeing by making oral health a priority via preventative measures and regular treatment, but they also enhance their general wellbeing and quality of life by participating in these activities.

### 2.1.2 Oral Health diseases

Several diseases put off this delicate balance, which is a problem because mouth health is a complex area that is important for overall health. When it comes to these, gum disease, which includes disorders including gingivitis and periodontitis, is one of the most common causes of damage to the tissues that support teeth. (Barranca-Enríquez & Romo-González, 2022.) It is also possible for the oral cavity to be affected by dental caries, which are more frequently referred to as cavities. Cavities are characterized by the demineralization of tooth enamel as a result of bacterial activity. (Zhu et al., 2023.) Furthermore, the daunting prevalence of oral cancer is a cause for grave worry. Oral cancer refers to tumors that affect tissues such as lips, mouth, and throat. Tobacco use, excessive alcohol use, and infection with the Human papillomavirus (HPV) are recognized as risk factors for oral cancer. (Irani, 2020.) The complex nature of oral health is shown by the fact that each of these oral disorders requires individualized methods to both prevention and

treatment. Oral cancer, dental caries, and gum disease are the terms that may be used to describe the disorders. Each of these diseases has a unique influence on oral and general health.

Dental decay is universal and has affected individuals globally (Rathee & Sapra, 2023a). Demineralization of tooth enamel is its characteristic. Untreated dental issues might cause cavities. Chemico-parasitic Mutans streptococci, *Candida albicans*, lactobacilli, etc. cause it. (Malcangi et al., 2023.) Risk factors for dental caries differ as nutrition, structural sensitivity, and fluoride deficit contribute to it (Farah et al., 2023). Carbohydrate fermentation like sugar causes cavities. Dental hygiene and neglect may increase caries risk. Caries damages teeth and gums. (Feldens et al., 2018.) Caries develops when dental bacteria, acids, and carbohydrates erode enamel. This interaction may have caused cavities. Mutans streptococci swiftly ferment carbohydrates and generate tooth-damaging acids. This boosts contributions. White spots may produce abscesses, necrosis, and cavities. Dental caries starts with white spots. Untreated dental caries may impact weight, development, and life. (Rathee & Sapra, 2023b.) Dental caries prevention must address causes and prevention. Fluoride inhibits demineralization and strengthens enamel. Fluoride toothpaste and items may assist. Skipping sweets and eating cheese decreases cancer. Oral health requires cleaning. Checkups, flossing, and fluoride toothpaste constitute dental care. (Sicca et al., 2016.)

Common gum and periodontal disorders damage gums and tooth-encircling tissues. These are periodontal disorders. Gum disorders are also termed periodontal issues. Periodontitis and gingivitis are connected. (Dubey & Mittal, 2020.) Many factors may cause gum disease. Lack of brushing and flossing creates the condition. Research reveals that smoking and tobacco use increase periodontal disease risk. Diabetes may aggravate gum disease. (Kinane et al., 2017.) Bacterial plaque on teeth and gums causes periodontal disease. Plaque in the gums causes gingivitis. Gingivitis may progress to periodontitis, which damages tooth bone, if untreated. Periodontal disease causes red, swollen gums, bleeding while brushing or flossing, and tooth movement

in severe instances. A comprehensive gum disease preventive strategy includes causes and prevention. Plaque prevention requires proper oral hygiene. Brush and floss regularly using fluoride toothpaste. Regular dental visits identify and treat tooth concerns early. Smoking cessation and lifestyle improvements may considerably lower gum disease risk. (Mann et al., 2020.) Overall, gum issues are harmful to oral health and need aggressive treatment. Avoid gum infections by addressing risk factors including poor dental hygiene and medical conditions. Gums need regular brushing, flossing, and mouthwash. Regular examinations and cleanings prevent and cure gum disease. Following these strategies may lessen gum disease's impact on oral health. Any oral health issue requires preventive. This means communities should promote gum health.

Uncontrolled cell growth in the lips, tongue, cheeks, and throat causes oral cancer. To treat this potentially fatal sickness, one must identify risk factors, early indications, and prevention measures. (Goodger & Odell, 2021.) Multiple risk factors may cause oral cancer. Smoking and smokeless tobacco use greatly raises oral cancer risk. This risk increases with tobacco and alcohol, particularly heavy alcohol use. (Sankaranarayanan et al., 2015.) linked HPV to oropharynx tumors. Tobacco and alcohol use may create genetic changes that promote uncontrolled cell growth and oral cancer. Early mouth sores and red or white patches may appear. Some people experience swallowing issues and voice alterations. The sickness may impact speech and chewing due to oral tissue abnormalities. (Mishra et al., 2020.) A thorough approach to controllable risk factors and early detection may prevent oral cancer. To avoid oral cancer, quit smoking and drink less. (Sankaranarayanan et al., 2015.) Finally, oral cancer is a major health risk. Understanding modifiable risk factors, changing lifestyles, and getting regular dental care are essential for early oral cancer identification. Education, public awareness, and integrated healthcare minimize mouth cancer incidence and death. Stressing cooperation on this health issue is vital.

## 2.2 Oral care in ICU

ICU stands for intensive care unit, which is another name for critical care units. These units are specialized wards in hospitals that are designed to provide patients suffering from acute and vital diseases with extensive and continuous medical treatment. The intensive care units in today's health care systems play a significant role in providing specialized treatment for patients suffering from illnesses presenting a substantial risk to their lives. (Marshall et al., 2017.) One crucial aspect of intensive care units (ICUs) is their ability to manage intricate medical cases that necessitate ongoing observation and prompt intervention. Patients experiencing severe respiratory distress, multiple organ failure, or post-surgical complications frequently find solace in the specialized care offered within intensive care units (ICUs). The diligent observation of essential indicators, such as the pulse, blood pressure, and oxygen saturation, enables healthcare providers to promptly identify any decline in a patient's state and implement suitable interventions. (Verdonk et al., 2021.) ICU are units that take care of patients that are critically ill. ICU patients are individuals who necessitate highly specialized and immediate medical attention owing to severe illnesses, life-threatening injuries, or complex medical conditions, dear. The patients frequently find themselves in a critical state, and the main objective of intensive care unit (ICU) care is to offer thorough monitoring, assistance, and medical interventions to stabilize their condition and promote recuperation. (Jackson & Cairns, 2021.)

### 2.2.1 Most common Oral health problems in ICU patients

Ensuring the utmost oral health is of utmost importance in maintaining overall wellbeing, especially for patients in intensive care units (ICUs). The distinct challenges experienced by patients in the ICU, such as prolonged intubation, weakened immune systems, and the use of different medications, frequently lead to a range of oral health concerns. As we delve deeper into the realm of scientific studies, we are increasingly recognizing the intricate link between oral health and overall well-being. Therefore, it is crucial to pay special attention to the unique oral care requirements of individuals undergoing critical

medical interventions. Knowing and treating these issues allows healthcare practitioners to enhance oral health and offer complete critical care. Health outcomes may be affected by oral health in the ICU, emphasizing the need of dental concerns in holistic treatment of critically sick patients. (Miranda et al., 2016.) The prevalence of oral health issues is observed in patients that are being treated in the intensive care unit (ICU), and these concerns can have notable implications for overall health and recovery. In the intensive care unit, we often come across various following oral health issues that are frequently observed in patients.

1. Ventilator-Associated Pneumonia (VAP) is a frequently encountered oral health issue among patients in the intensive care unit (ICU). The endotracheal tube utilized for mechanical ventilation has the potential to act as a conduit for bacteria to infiltrate the lungs, thereby resulting in respiratory infections. Inadequate oral hygiene practices and the build-up of dental plaque can increase the likelihood of developing Ventilator-Associated Pneumonia (VAP). (Lefebvre et al., 2023a.)
2. Oral mucositis is a condition that can affect patients in the ICU, particularly those who are receiving chemotherapy or have weakened immune systems. The condition you are experiencing involves inflammation and ulceration of the oral mucosa, which can result in significant pain and discomfort. Factors such as prolonged intubation, use of medications, and systemic illnesses can exacerbate the condition. (Colella et al., 2023.)
3. Xerostomia, also known as dry mouth, is a frequently observed oral health concern among patients in the intensive care unit (ICU). Factors such as medications, dehydration, and critical illness might cause a decrease in the amount of saliva that is produced. Xerostomia, or dry mouth, can cause oral discomfort and raise the likelihood of dental caries and oral infections. (Du & Zhou, 2023.)
4. Gingivitis and periodontitis can arise due to inadequate oral hygiene practices and systemic conditions in patients in the ICU. These inflammatory conditions, known as periodontal diseases, can have an impact on the gums and the structures that support the teeth. This can result

in symptoms such as bleeding, swelling, and in some cases, even tooth loss. (Lim et al., 2020.)

5. Dental erosion can be observed in patients who became hospitalized to the Intensive Care Unit (ICU) as a result of various factors, including acid reflux, medications, and changes in oral pH. Dental erosion is a condition where there is a gradual loss of tooth structure, which can result in heightened sensitivity and an elevated susceptibility to dental caries. (Schenkel et al., 2022.)

Ensuring optimal oral health in patients admitted to the intensive care unit is of utmost importance in providing comprehensive patient care. Interventions such as implementing regular oral hygiene care, ensuring proper moisture maintenance for the oral mucosa, and fostering collaboration between the dental and ICU teams can effectively address these concerns and enhance the overall well-being of patients in critical care settings.(Khasanah et al., 2019.)

### 2.2.2 VAP in intubated patient

Patients who are undergoing mechanical ventilation via an endotracheal or tracheostomy tube are at risk for developing a kind of lung infection known as ventilator-associated pneumonia (VAP). Under normal circumstances, this syndrome manifests itself at least forty-eight hours after the beginning of mechanical ventilation. As a result of the fact that it may result in increased morbidity, mortality, and expenditures associated with healthcare, VAP is a major problem in healthcare settings. (Kalanuria et al., 2014.) The development of VAP is influenced by a number of different circumstances. The major cause is the introduction of germs into the lower respiratory system, which often occurs as a result of the invasion of the endotracheal tube or the aspiration of contaminated secretions. *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* are examples of common bacteria that are linked with ventilator-associated pneumonia (VAP). (Sanjay Sethi, 2022.) Several risk factors, such as extended mechanical ventilation, immunosuppression,

malnutrition, and underlying respiratory diseases, all contribute to an increased possibility of developing ventilator-associated pneumonia (VAP). Additional factors that contribute to the risk of ventilator-associated pneumonia (VAP) include the use of antibiotics with a wide range of activity, stomach colonization, and insufficient hand hygiene. (Lefebvre et al., 2023b.) Utilizing an evidence-based set of practices is necessary to reduce complications associated with Ventilator-Associated Pneumonia (VAP). Some of these measures include raising the head of the bed to an angle of 30 to 45 degrees to reduce the risk of aspiration, ensuring regular dental care to minimize bacterial colonization, and using sedation techniques to decrease the duration of mechanical respiration. Furthermore, healthcare providers must strictly follow rigorous hand hygiene protocols and regularly assess the need of ongoing mechanical ventilation to minimize the duration of patient intubation. The selection and management of endotracheal tubes have a crucial role in preventing ventilator-associated pneumonia (VAP). Both the removal of secretions below the vocal cords and the use of specialist tubes inserted into the windpipe to reduce the formation of bacterial growth have the potential to be effective preventive measures. Furthermore, healthcare organizations may use monitoring and feedback systems to oversee and improve adherence to rules aimed at preventing ventilator-associated pneumonia in patients. (Boltey et al., 2017.) Intubated patients are at risk of ventilator-associated pneumonia, which increases mortality. Evidence-based prevention, careful monitoring, and healthcare professional education are needed to combat VAP. Healthcare institutions may considerably decrease VAP and enhance patient outcomes by focusing on risk factors and implementing preventative measures. (Sanjay Sethi, 2022.)

### 2.2.3 ICU patient's Oral care Guidelines

Administering oral hygiene is an essential intervention for patients who are acutely ill and staying in the hospital. It helps to improve their comfort, decrease dental plaque, reduce inflammation in the mouth, and promote overall oral health. This guideline is based on evidence from various studies, notably

those outlined in the "Advanced Critical Care Journal", which is a publication of American Association of Critical-Care Nurses (AACN) organization. As a nurse, it is important to rely on credible sources and research to inform our practice and provide the best care for our patients. (Grap & Munro, 2017.)

Anticipated Nursing Protocols mentioned in the journal.

- When it comes to tooth brushing, it is important to remember to brush your teeth, gums, and tongue at least twice a day. It is recommended to use a toothbrush with a soft, compact head, whether it is a pediatric or adult toothbrush.
- Ensured administer of oral moisturizing to the oral mucosa and lips at regular intervals of 2 to 4 hours.
- Chlorhexidine Oral Rinse is a beneficial solution that can be utilized by intubated patients to help minimize the potential occurrence of Ventilator Associated Pneumonia (VAP). It is recommended to incorporate this oral rinse into your daily routine, ensuring that it is used twice a day.
- For non-intubated patients, it is currently not recommended to routinely utilize oral chlorhexidine gluconate (0.12%). (Grap & Munro, 2017b.)

Whilst the above provided is guidelines approved by American Association of Critical-Care Nurses (AACN), published in the journal. AACN is a non-profit organization that encourages greatness and new ideas in critical care through teaching, study, and support for nursing.(Critical Care Nurse | American Association of Critical-Care Nurses, 2023.)

According to the information provided below, Oulu Hospital (OYS) has a care regimen for patients who are intubated. When it comes to oral care for intubated patients in intensive care units, Finland does not have any established guidelines. As a result, several medical organizations around the nation have developed their own protocols, which are to be used inside their respective organization's premises. The protocol that is being discussed is a picture that has the protocol written in the "Finnish" language. (Jansson & Ala-Kokko, 2015.) The translated text (the original is written in Finnish, and you have translated it freely without any professional language checking) looks like the following:



Table 1: Oral Care protocol of Intubated patients from Oulun yliopistollinen sairaala. (Jansson & Ala-Kokko, 2015.)

<b>8:00 to 10:00</b>	<b>12:00 to 14:00</b>	<b>16:00 to 18:00</b>	<b>20:00 to 22:00</b>
Check the cuff pressure for 20-30 cmH <sub>2</sub> O.	Check the cuff pressure for 20-30 cmH <sub>2</sub> O.	Check the cuff pressure for 20-30 cmH <sub>2</sub> O.	Check the cuff pressure for 20-30 cmH <sub>2</sub> O.
Keep the posture 30–45° raised.	Keep the posture 30–45° raised.	Keep the posture 30–45° raised.	Keep the posture 30–45° raised.
Prioritize patient, environmental, and healthcare provider safety.	Prioritize patient, environmental, and healthcare provider safety.	Prioritize patient, environmental, and healthcare provider safety.	Prioritize patient, environmental, and healthcare provider safety.
Limit suction force to 10 kilopascals	Limit suction force to 10 kilopascals.	Limit suction force to 10 kilopascals.	Limit suction force to 10 kilopascals.
Eliminate saliva and throat secretions.	Eliminate saliva and throat secretions.	Eliminate saliva and throat secretions.	Eliminate saliva and throat secretions.
Clean the teeth, mucous membranes, tongue, and intubation tube surface.	Use cotton swabs and foam sticks to clean the mouth.	Use cotton swabs and foam sticks to clean the mouth.	Clean the teeth, mucous membranes, tongue, and intubation tube surface.
Flush the mouth with a 15ml 0.2% chlorhexidine solution.	Flush the mouth with a 15ml 0.2% chlorhexidine solution.	Flush the mouth with a 15ml 0.2% chlorhexidine solution.	Flush the mouth with a 15ml 0.2% chlorhexidine solution.
Hydrate the patient's oral cavity and provide lip balm.	Hydrate the patient's oral cavity and provide lip balm.	Hydrate the patient's oral cavity and provide lip balm.	Hydrate the patient's oral cavity and provide lip balm.

Frequent evaluation of the oral condition is crucial for achieving the highest level of patient care. Regularly assessing the condition of the oral cavity is crucial, and if needed, modifying the positioning of the intubation tube is important to improve comfort and minimize difficulties. Being watchful and alert is crucial, and any changes in oral health or problems should be immediately reported to the healthcare personnel. Prompt notice enables quick intervention and guarantees that necessary actions are performed to tackle any arising problems, therefore promoting the overall welfare of the patient. (Jansson & Ala-Kokko, 2015.)

### 2.3 Educational video

Educational videos are crucial tools in higher education, particularly in biology classrooms, providing a visual medium to communicate intricate topics. In order to enhance their efficiency, teachers must take into account cognitive load, prioritizing techniques such as signaling and segmenting, and ensuring that the mode of instruction matches the topic being taught. Furthermore, it is of utmost importance to sustain student interest, which may be accomplished by using succinct films, employing conversational narration, and ensuring relevancy to the course setting. The amalgamation of these aspects produces a very influential educational instrument. (Brame, 2016.)

The integration of instructional films into active learning methodologies amplifies their effectiveness. Embedded questions and interactive controls enhance the learning experience by promoting active engagement and self-regulation, so transforming passive watching into an immersive and participatory process. By including videos into comprehensive assignments, educators enhance the significance of the content, promoting a comprehensive method of acquiring information. The combination of attention to cognitive load and active involvement guarantees that instructional films are very effective tools for learning in biology courses. (Brame, 2016.)

### 3 PURPOSE AND OBJECTIVE OF THE PROJECT

The purpose of this project thesis is to create an educational video for nursing students about the assessment, intervention, and challenges to oral health care for ICU patients.

The objective of this thesis are:

- Improve Nursing student's competence of oral health when taking care of patients in intensive care, demonstrating effective methods and techniques to be used for oral care,
- To improve the quality of care for ICU patients.

The project task for the thesis can be particularly outlined as

- Finding a relevant literature basis.
- Prepare script for the video.
- Video shooting and editing

### 4 PROJECT IMPLEMENTATION

#### 4.1 Target Group

The client for this thesis is SAMK, whilst the target group of this thesis are nursing students who are studying nursing at Satakunta University of Applied Sciences. Sharing videos with nursing students is a good method to educate the next generation of healthcare professionals about the significance of oral health care in the ICU. These are the major demographics for whom the video is intended to be instructive and relevant. The target group of nursing students was chosen strategically in order to address their unique educational needs and improve their awareness of good dental health care practices in the setting of intensive care units (ICUs). Given that nursing students are in the process of obtaining critical skills and information for their future careers in healthcare, the instructional video is a helpful resource to support their curriculum. The video seeks to contribute to nursing students' overall competency

in providing quality care to ICU patients by adapting the content to match their learning objectives at SAMK. This customized approach guarantees that the educational content is aligned with the academic context of the nursing programme at SAMK and has the greatest impact on the intended audience's learning results.

## 4.2 Methodology

Especially in the fields of project development, the Waterfall technique is a systematic approach to project management that serves as a framework for dealing with projects. This approach divides the project into discrete stages, each of which is comprised of activities and processes that are predetermined, so establishing a progression of tasks in sequential order. (Andersen, 2023.) The project methodology consists of 5 stages, listed out as Requirements, Design, Implementation, Testing and Maintenance (Laoyan, 2022).

For the purpose of the thesis, I used the waterfall technique, which required me to do particular duties throughout each step. The Waterfall model, a groundbreaking way to manage projects, is similar to methods used in other fields. The unique thing about it is that it breaks a project into set stages, with each stage building on the research and results of the previous stage:

1. Requirements: The focus is to analyze the needs in a broad way. A key part is detailed paperwork that lists all the features and functions that should be in the end of project. The goal of this phase is to make sure that the author knew exactly what the project was meant to do.
2. Design: The goal of this phase was choosing the right tools and carefully planning the project as a whole. This includes laying out the design, how the project will move, and how the different parts will work together. The results of this step are used as a guide for the next stages.
3. Implementation: The goal of this phase was fixing problems that have been found, making answers better, and turning an idea for a plan into a project. Using the background and plans made in the design phase,

developers work on putting each part of the project that was described in the needs phase into action.

4. Testing: In the Testing process, which is an important step, the features and components that have been applied are carefully looked over. This includes using different testing methods to find problems and fix them.
5. Maintenance: The project provided to the client in this phase. This phase involves the release of the product for the end-users and following a focus on smooth transition from development to real world utilization. (Thesing et al., 2021.)

#### 4.3 The stages of the project, timetable

The project proceeds in five stages, beginning with the identification and familiarization stage, in which research databases and articles are reviewed to gain a thorough grasp of the chosen topic. The stage lays the framework for Stage 2, which is distinguished by thorough planning, information gathering, screenplay writing, and video preparation, Stage 3 entails the practical execution of theoretical parts, including video filming and editing, according to a well-structured strategy. The following stage is the climax of efforts, with Stage 4 encompassing the creation of the final film and the preparation of the thesis report. Stage 5 concludes with a comprehensive examination of the video's content and a presentation of the finalized teaching material. This process guarantees that the education video on oral health care for ICU patients is developed methodically and comprehensively.

Table 2: Timetable of the project according to the Waterfall Methodology

Waterfall model Stages	Task	Date
Requirements	Identify and Familiarization with the topic like research database and articles	06.01.2023-30.05.2023
Design	Planning and collecting all the information, making a script, and preparing for the video.	01.06.2023-30.09.2023
Implementation	Implementation for the theory and script part as a pathway to our video like as video shoot, editing part.	01.10.2023-30.10.2023
Testing	Final video. Put together the final video and finish the report on the thesis.	01.11.2023-30.11.2023
Maintenance	Review and present the video.	22.12.2023

#### 4.3.1 Requirements (Phase1)

I was able to build a clear grasp of the target audience during the requirements phase by identifying precise objectives and purposes for the educational video. This included taking into account the degrees of language literacy and the level of knowledge of medical terms. This preliminary effort served as a strong foundation upon which the remaining elements of the technique could be built. The requirement phase started with lectures, familiarization of various types of Theseus, and with focus on project thesis.

#### 4.3.2 Design (Phase 2)

Proceeding to the design phase, I diligently formulated the project planning, did comprehensive literature research, and crafted a manuscript. The screenplay was meticulously composed to ensure clarity and brevity, and materials were meticulously arranged for the video production. For the purpose of carrying out this project, my research technique consisted of completing an exhaustive review of the literature about oral health in the intensive care unit (ICU), with a specific emphasis on nursing students, as well as the production

of educational video material. With the ultimate objective of improving the quality of care provided to patients, the main objective was to improve nursing students' understanding of oral health care practices that are used inside the intensive care unit (ICU). I performed searches across acknowledged databases such as PubMed, Google Scholar, Crossref, ResearchGate, and ScienceDirect in order to guarantee that the current knowledge base would be thoroughly examined. I made a deliberate choice of a group of keywords to narrow the scope of the search and get a better understanding of the aspects of the topic. Oral health, intensive care unit, nursing student, educational video, were some of the keywords that were included in this list. I used a combination of Keyword mentioned as “oral health” AND “ICU”, “nursing student” AND “educational video”, “oral health” AND “oral diseases”, “ICU” AND “oral diseases” and “educational video” AND “learning”. Through the use of these reliable databases and a set of keywords that I had carefully selected, I was able to guarantee a comprehensive and varied collection of evidence (APPENDIX 1). The use of this technique makes it easier to provide instructional content that is not only based on previously published works but also specifically crafted to meet the needs of nursing students in the context of oral health care inside the intensive care unit (ICU). Incorporating search phrases that range from oral health issues to instructional approaches and intensive care unit practices, the material that has been synthesized from various sources will eventually lead to the development of a teaching resource that is more effective and focused. The review further was divided into inclusion and exclusion criteria which is mentioned in the table below.

Table 3: Inclusion and Exclusion criteria for Literature retrieval process

INCLUSION CRITERIA	EXCLUSION CRITERIA
Articles in English and Finnish	Articles in other Languages
Peer-reviewed article	Non-peer-reviewed article
Free to use	Cost burden or requires fees
Published time frame within 10 years	Published before 10 years' time frame
Related to healthcare and /or nursing	Information not related to healthcare

This comprehensive approach sought to guarantee a meticulous analysis of the current body of research about the relationship between oral health and the ICU environment, specifically focusing on the field of nursing education. The employment of several databases facilitated the consideration of a wide range of sources, while the precise search keywords focused on material that was relevant to the study questions and goals. The procedure of collecting literature formed the basis for the following analysis and synthesis of results in the thesis. The manuscript developed has been mentioned in the appendix (APPENDIX 2).

#### 4.3.3 Implementation (Phase3)

During the implementation phase, I collected and documented essential images and audio components for the video, and then edited the information to guarantee a coherent and captivating storyline. An appealing video was diligently developed at SAMK, showcasing a diverse array of carefully curated clips to effectively convey a compelling narrative. The production followed a meticulously organized manuscript, ensuring a seamless flow and maintaining utmost relevance. With the assistance of Adobe Premiere Pro, the footage received meticulous editing, skillfully incorporating subtitles, and enhancing the auditory experience by adding essential audio elements. The post-production process demonstrated a harmonious fusion of artistic ingenuity and proficient technical skills, culminating in a refined and captivating end product. Notably, a compassionate carer played a vital role in the video's realization, dedicating their time and effort. The user's invaluable participation has been duly acknowledged, recognizing their significant role in bringing the project to fruition, as a nurse, I appreciate their valuable contribution. The completed video serves as a testament to the collective efforts, highlighting the dedication to producing high-quality content at SAMK.

#### 4.3.4 Testing (Phase4)

Throughout the testing process, I used meticulous precautions to guarantee the dependability and efficacy of the technique. I intensively sought instruction and support from both my supervising teacher and another ICU nursing



specialist to strengthen the thoroughness of the testing procedure. Teacher's advice was very important in evaluating the video's clarity and overall effectiveness. In the future, it might be advantageous to contemplate the adoption of continuous testing regimens, maybe including a wider demographic or soliciting input from supplementary healthcare practitioners. This technique has the potential to provide a more thorough assessment and aid in improving educational resources for future use.

#### 4.3.5 Maintenance (Phase5)

Ultimately, during the maintenance phase, I carried out continuous monitoring to evaluate the lasting efficacy of the video in encouraging dental hygiene. To get the best outcomes in maintaining oral hygiene, it is essential for the receiver of the instructional video to actively participate and interact with the offered material and, observe the movie with focused attention and integrate the recommended strategies into practical dental care regimen. Consistent evaluation of dental well-being and guidelines, active engagement with the training materials, nursing students will be able to establish and maintain a clean and healthy oral environment.

The completion of each stage within its designated time span is carefully outlined in the table below, providing specific time periods during which each stage occurred. The activities performed during these stages have been meticulously outlined, offering a thorough breakdown of when and which tasks were carried out in the advancement of the project. The purpose of this structured elaboration is to provide a comprehensive understanding of the sequential development and execution of the video production process. As a nurse, I am here to assist you in gaining this knowledge.

## 5 EVALUATION

### 5.1 Evaluation of the project and product

For the assessment of my thesis research, I actively sought and received important input from my supervising instructor at SAMK. In order to optimize the progress of my project, I extensively researched and used a range of resources. Crucial recommendations, research studies, and instructional materials were offered by esteemed dental organizations such as the Finnish Dental Association (Suomen Hammaslääkäriliitto). Academic publications, which may be accessed via platforms such as Google Scholar, provide peer-reviewed studies on solutions and obstacles related to oral health care for patients in the intensive care unit (ICU). Furthermore, internet resources provided by esteemed organizations like the National Institute of Dental and Craniofacial Research and the World Health Organization were found to be invaluable repositories of knowledge. I used SAMK's simulation rooms well, devising actual situations for the movie that were placed in a recognizable office environment.

Within the scope of my project management, I extensively explored the concepts of risk assessment and management. Given the possibility of prejudice in educational and scientific pursuits, I placed a high importance on maintaining impartiality and neutrality. Thorough preparation was crucial for the video production, taking into account elements such as time, financing, and equipment. I demonstrated my dedication to excellence by meticulously comparing the outcomes attained with the predetermined objectives. I acknowledge the crucial significance of precise information in instructional materials, guaranteeing thorough research and dependence on reputable sources. The core focus of my work revolved on ethical issues, such as obtaining informed consent and demonstrating respect for autonomy. These principles were in accordance with the rules set out by the National Board on Research Integrity. (National Board on Research Integrity TENK, 2023.)

The risk analysis of the project has been created with the help of SWOT analysis chart. I was able to identify the strengths, weaknesses, opportunities, and

threats of my project. The positive factors of both internal and external factors were considered and used, whilst the negative factors of both internal and external factors were analyzed and avoided as much of it was possible. (Mercieca et al., 2019.)



Figure1: SWOT analysis template developed in (Home - Canva, 2023).

## 5.2. Achievement of the objectives and development of professionals' skills

The major purpose of the thesis to create an educational video for nursing students about the assessment, intervention, and challenges to oral health care for ICU patients and the objective was to, Improve Nursing student's competence of oral health when taking care of patients in intensive care, demonstrating effective methods and techniques to be used for oral care, and improve the quality of care for ICU patients. This objective was accomplished by means of a methodical procedure that included doing significant study in order to develop a solid foundation in literature. The synthesis of this body of material served as the basis for the construction of a thorough screenplay for an instructional film that was intended to bridge the gap between academic understanding and practical application. By ensuring that the video filming and editing processes were successfully completed, a useful resource was

created for nursing students. This resource contributed to the nursing students' ability to provide high-quality oral care to critical care unit patients, which ultimately led to an improvement in the overall quality of patient care in intensive care settings.

During the course of the thesis project, the development of essential professional abilities occurred concurrently with the accomplishment of the project's goals. My research abilities were improved as a result of the complete literature review and synthesis, which helped me develop the capacity to explore and extract information from any number of different sources. The process of writing the screenplay for the instructional film helped me improve my communication skills since it required me to translate difficult healthcare topics into a manner that was understandable and easy to understand. My ability to effectively coordinate a variety of variables to provide a high-quality result was encouraged by the process of video filming and editing, which not only required me to have technical expertise but also helped me develop abilities in project management. My competencies in research, communication, and project management have been strengthened as a result of these experiences together. These are essential assets for continuing progress in the healthcare profession as well as successful cooperation with teams that include members from a variety of disciplines.

## 5.2 Ethical considerations

In this thesis project, I have prioritized ethical values across all phases, from data collection to publication. To inform ethical framework, extensively studied various materials on ethical theory, with a particular focus on the guidelines provided by the Finnish National Board on Research Integrity TENK. Drawing inspiration from SAMK's commitment to ethical research practices, a designated research integrity advisor to guide through ethical considerations. This proactive approach aims to prevent any unintended lapses in research integrity, ensuring that the project aligns consistently with established ethical guidelines. (National Board on Research Integrity TENK, 2023b.)

Ethical considerations for this project are mentioned as follows:

- **Respect for autonomy:** I have found a volunteer, who is willingly agreeing to participate in my video development directly or indirectly un-stated. Hence the autonomy of that individual will be respected.
- **Non-maleficence:** I made sure to take necessary measures to minimize any potential harm to our participants. Ensuring that the assessment of oral health was conducted in a safe and non-invasive manner was part of our responsibility.
- **Justice:** It was made sure that the information in the video was accessible and relevant to all viewers, regardless of their background or demographic. The potential impact of the video on various populations was taken into account, and information was presented in a just and impartial manner.
- **Respect: Privacy** was prioritized, and measures were implemented to safeguard the confidentiality of volunteers. As a nurse, it was important to obtain the consent of the individuals to be featured in the video. Additionally, it was crucial to prioritize their privacy by refraining from sharing any personal information or identifying details without their explicit consent. (Pugh, 2020.)
- **Reliability:** The precise standardization of video quality and rigorous training based on considerable research represent ethical development approaches in this thesis. The extensive documentation in the appendix shows a dedication to creating a product with lasting value, boosting the work's reputation.
- **Accountability:** Authoritarian responsibility has guided the initiative from its start. From project beginning to agreement completion, including SAMK's research authorization, to product copyright transfer to SAMK, this devotion is clear. This comprehensive approach increases authenticity and author and developer responsibility throughout the project. (National Board on Research Integrity TENK, 2023.)

### 5.3 Discussion

Taking on this endeavor represents a notable advancement in the study of the intricate connection between education and healthcare. Its objective is to create an educational video focused on oral healthcare specifically designed for patients in critical care units. Moreover, the research delves into the broader framework of enhancing patient outcomes in critical care environments, beyond the particular achievements of each person. The meticulous planning, research, and cooperation involved in the project have not only contributed to my professional growth, but have also emphasized the significant intersection of theory, practice, and ethical considerations in healthcare initiatives.

The significance of this endeavor lies not only in the educational video that was produced, but also in the revelations that were uncovered over the course of its execution. After conducting a thorough literature analysis and outlining the issues, evidence-based best practices were identified. These practices revealed previously unknown prospects for enhancing oral health in patients in the critical care unit. The video aims to function as a comprehensive manual for nursing students, addressing a crucial aspect of patient care that is sometimes overlooked. As we consider the future, the impact of this effort will extend beyond the limits of its current activity. It is advised that future efforts focus on broadening the transmission of the training material in order to ensure that it is available to healthcare professionals and institutions. The iterative structure of the project highlights the need of constantly adjusting to new situations, being open to user feedback, and harmonizing with the evolving healthcare practices.

This initiative is more than just a personal achievement; it is a valuable addition to the ongoing endeavors aimed at improving patient care in critical care units. Ultimately, this effort represents more than just a personal victory. This journey has included the exploration of novel concepts, collaboration with peers, and a steadfast dedication to maintaining moral principles. This programme symbolizes the ever-changing character of healthcare education and the continuous quest for exceptional patient care, both of which persist despite the steady evolution of healthcare.

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## APPENDIX 1: LITERATURE RETRIEVAL

Database	Keyword / Search Word	Results	Chosen result
Pubmed	Oral health definition Filter-Year range 10years, Medical journals, Peer reviewed	257	3
Google scholar	Oral health definition Filter- Year range 10 years, medical journals, Peer reviewed	315	2
Pubmed	Oral Health Importance Filter- Year range 10 years, medical journals, Peer reviewed	200	3
Science Direct	Oral Health Importance Filter- Year range 10 years, medical journals, Peer reviewed	152	1
Google scholar	Oral Health importance Filter- Year range 10 years, medical journals, Peer reviewed	201	3
Cross ref	Oral health diseases (Cavity, oral cancer, gum diseases) Filter- Year range 10 years, medical journals, Peer reviewed	21	1
Pub Med	Oral health diseases (Cavity, oral cancer, gum diseases) Filter- Year range 10 years, medical journals, Peer reviewed	200	4

Google scholar	Oral health diseases (Cavity, oral cancer, gum diseases) Filter- Year range 10 years, medical journals, Peer reviewed	235	2
Research gate	Oral health diseases (Cavity, oral cancer, gum diseases) Filter- Year range 10 years, medical journals, Peer reviewed	168	3
Google Scholar	“ICU” AND “ICU patients” Filter- Year range 10 years, medical journals, Peer reviewed	72	1
Pub Med	“ICU” AND “ICU patients” Filter- Year range 10 years, medical journals, Peer reviewed	81	1
Pub Med	ICU and its Importance Filter- Year range 10 years, medical journals, Peer reviewed	61	1
Google Scholar	ICU and its Importance Filter- Year range 10 years, medical journals, Peer reviewed	109	1
Pub Med	Oral diseases in ICU patients Filter- Year range 10 years, medical journals, Peer reviewed	115	1
Google Scholar	Oral diseases in ICU patients Filter- Year range 10 years, medical journals, Peer reviewed	146	4
Google Scholar	Ventilation associated Pneumonia. Filter- Year range 10 years, medical journals, Peer reviewed	122	2

Pub Med	Ventilation associated Pneumonia. Filter- Year range 10 years, medical journals, Peer reviewed	91	2
Pub Med	Educational video as learning tool Filter- Year range 10 years, medical journals, Peer reviewed	46	1

## APPENDIX 2 : MANUSCRIPT

**Title:** "Comprehensive Oral Care ICU patients - A Guide for Nursing Students"

**Progression:** The video has been planned to be shot at the simulation room of our university. The permission will be in progression after the approval of proposal.

### INTRODUCTION OF ICU

**Narrator (N):** Welcome to our educational video on providing comprehensive oral care for patients in the Intensive Care Unit (ICU). Proper oral care is crucial in maintaining the overall health and well-being of patients. In this video, we will explore the importance of oral care, the unique challenges faced in the ICU setting, and practical steps that nursing students can take to ensure the oral health of their patients.

**IMPORTANCE OF ORAL CARE (N):** Proper oral care in the ICU is vital for several reasons. Patients in the ICU are at a higher risk of developing oral health problems due to prolonged intubation, reduced mobility, and compromised immune systems. Neglecting oral care can lead to infections, discomfort, and complications that can affect the patient's overall recovery. Discussing on the other hand, patients in ICU have various causes of being in intensive care, whilst one factor could be use of "ventilator", and the other could be "sedation" and "weakness". Such factors have a huge impact on a patient's ability to manage self-hygiene and dependency on the nursing professionals.

**FACTORS TO CONSIDER (N):** Let's discuss some key factors to consider when providing oral care for ICU patients:

1. **Risk Assessment:** Assess the patient's risk for oral health issues, considering factors like intubation, medication use, and underlying medical conditions.
2. **Infection Control:** Strictly adhere to infection control protocols, including proper hand hygiene and personal protective equipment (PPE).



3. **Mobility and Positioning:** Adapt oral care techniques to the patient's position and mobility limitations. Use pillows or positioning aids when necessary.
4. **Equipment and Supplies:** Gather the necessary supplies, such as a soft toothbrush, oral swabs, and saline solution.
5. **Communication:** Ensure clear and respectful communication with the patient and their family to obtain their preferences and consent for oral care.

**STEP-BY-STEP ORAL CARE (N):** Now, let's go through a step-by-step guide to providing oral care for ICU patients:

1. **Hand Hygiene:** Start by performing thorough hand hygiene and doing appropriate PPE.
2. **Patient Assessment:** Assess the patient's oral health and any specific concerns or discomfort they may have.
3. **Collection of necessary materials:** 1 damp cloth, 1 unit dose bottle of 0.12% CHG Oral Rinse, 1 suction toothbrush package, 2 suction oral swab package, 1 oropharyngeal suction catheter.
4. **Positioning:** Ensure the patient is in a comfortable and safe position for oral care. Raise the head of the bed if possible.
5. **Lip and Mouth Care:** Gently clean the patient's lips with a soft, damp cloth. Apply a moisture barrier to the lips if needed to prevent dryness and cracking.
6. **Oral Hygiene:** Use the soft suction toothbrush by dipping in the oral rinse solution to clean the patient's gums, and teeth cavity.
7. **Oral swab:** Dip the untreated Swab in the oral rinse and swab the patient's mouth.
8. **Suction:** Attach suction catheter to suction device to remove excess secretions from the mouth and throat.
9. Repeat the process as much is required.
10. Remember to moisturize your lips.
11. **Documentation:** Accurately document the oral care provided, including any abnormalities or patient preferences.

12. Comfort and Communication: Throughout the process, maintain open communication with the patient, offering comfort and reassurance (Basic Principles of Mouth Care for Unconscious Patient, n.d.).

**CONCLUSION (N):** Providing proper oral care for ICU patients is an essential aspect of nursing care. It helps prevent complications, maintains patient comfort, and promotes overall well-being. As nursing students, it's crucial to be thorough, empathetic, and vigilant when it comes to oral care in the ICU. By following the guidelines and steps outlined in this video, you'll contribute to better patient outcomes and a higher standard of care in the ICU. (Winning et al., 2021.)