



An Informative Poster for Nursing Students about Adult and Elderly Mouth Care

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**An Informative Poster for Nursing Students about Adult and
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Mouth care is a global challenge that show various minor to major effects on people's well-being. From a nursing point-of-view the mouth health and care include understanding about the anatomy, diseases, effects of aging and drugs, as well as equipment and treatments of the mouth. The nursing provides people with information, guidance, encouragement, and help with the actual mouth care.

A constructive developing action model is applied to create nursing students an informative poster about adult and elderly mouth care. Three steps: planning, implementation, and evaluation, are used as the thesis structure. In planning information is gathered, which is then used in the implementation to create the poster. Lastly, the poster is evaluated via a questionnaire and analysis.

The result of this research is two informative posters to provide information of mouth care from adult and elderly point of view including nurse's roles, five most common mouth disease or issue, effects of drugs, and use of care equipment. Questionnaire survey was conducted to evaluate the poster. The findings of the questionnaire suggest that students could need more informative posters and further information about mouth care and especially the different mouth diseases or mouth related issues.

The limitations of generalizability and limited experience of research are overcome by rigorous and reflective process. With respect to the meaningfulness of the mouth care, the findings of the questionnaire suggest that students could need more informative posters and further information about mouth care and especially the different diseases or mouth related issues.

Keywords: mouth care, nursing, oral care, informative poster, educational poster

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1 Introduction

In one of the most widely published research into mouth care, The Global Burden of Disease Study 2017 estimated that oral diseases affect about 3.5 billion people worldwide and that globally estimated 2.3 billion people suffer from caries of permanent teeth and more than 530 million children suffer from caries of primary teeth. (World Health Organization 2022.) The World Health Organization 2022 has stated it is a major burden for both people and societies and that, “most oral health conditions are largely preventable and can be treated in their early stages. This is important to highlight because we have the knowledge and resources to improve and provide good mouth care nowadays globally. However, oral diseases still pose a major health burden for many countries and affect people throughout their lifetime, causing pain, discomfort, disfigurement and even death”. (World Health Organization 2022.)

It is an important practice to keep the mouth clean and healthy by brushing and flossing which help prevent oral diseases. From a nursing perspective, good mouth care and service is essential work as it brings comfort to the patient. Dean (2019, 54) lists common problems with patients who no longer can take good care of themselves, they experience “dry mouth, difficulty speaking, chewing or swallowing, a painful mouth, fungal infections, changes in taste”. These are areas, where the nurses can provide help and guidance (Daly & Smith 2015; Helsingin yliopisto 2022; Royal College of Nursing 2021).

The informative poster is noted to be a good educational tool in providing information (Williams & Cullen 2016; Berry & Houston 1995). Berry and Houston (1995) highlighted several benefits of posters in facilitating learning process and summarized as follow: the poster promotes strongly communication and interaction, engage into critical thinking processes in collaboration with other students, and create positive atmosphere for learning.

The aim of this thesis project is to produce a guiding poster of mouth care for nursing students who are studying in English. The poster will be also used as a supporting teaching during their nursing studies. It is primary meant for Laurea's UAS students who are in nursing degree program. The poster will promote their learning in clinical skills related to basic care of geriatric and adult mouth care in Finland. Main purpose of this thesis is improving students overall understanding of good oral hygiene practices on adult and elderly mouth care. Also, to raise awareness to provide responsible mouth care for nursing students. It's one of the skills nurses must learn for the future health care environment to improve patients' overall health.

2 Theoretical Framework

The theoretical framework used for this thesis is inspired by the main findings of the evidence based ORAL CARE GUIDE for secondary schools, produced by the Finnish Dental Association (2008) and main findings from leading international oral healthcare foundations.

2.1 Mouth anatomy

Mouth, which can be also known as oral cavity, is a hollow opening and starts from the lips and goes deep down to the throat. Oral cavity contains different organs responsible for different function. Mouth anatomy contains lips, mouth cavity, teeth, tongue, cheeks, palates, salivary glands. Mouth is a vital part of digestive system because it receives and prepares food for digestion. Organs like teeth, tongue and salivary gland (figure 1) work together in food ingestion and digestion. Similarly, mouth also plays a vital role in speech production. The movement of tongue, lips and cheeks produces different range of speech. Beside these two major functions, mouth is also a secondary means of breathing other than nasal cavity. (Taylor 2020.)

Oral cavity is divided into two parts: oral vestibule and oral cavity proper. Oral vestibule is surrounded by lips and cheeks externally and teeth and gums internally. Oral cavity proper is surrounded by the roof, floor, and the cheeks. The upper boundary of oral cavity, the roof consists of hard and soft palates. The hard palate is a bony plate which separates the nasal cavity from oral cavity. In the other hand, muscular structure in the roof is soft palate. Cheeks helps to keep the food in between the teeth while chewing and making ready for digestion. The floor part or oral cavity proper consists of tongue, salivary glands and ducts, muscular diaphragm and geniohyoid muscles. (Jones 2020.) Mouth health and general health are directly related to each other as most of the things that can affect our health enters through our mouth. Although different part in mouth anatomy has their own function tongue's muscular and sensory abilities plays an important role. Tongue, a muscular organ in the mouth anatomy, is responsible for sensation, chewing and swallowing foods, and speaking. (Vaskovic 2021.)

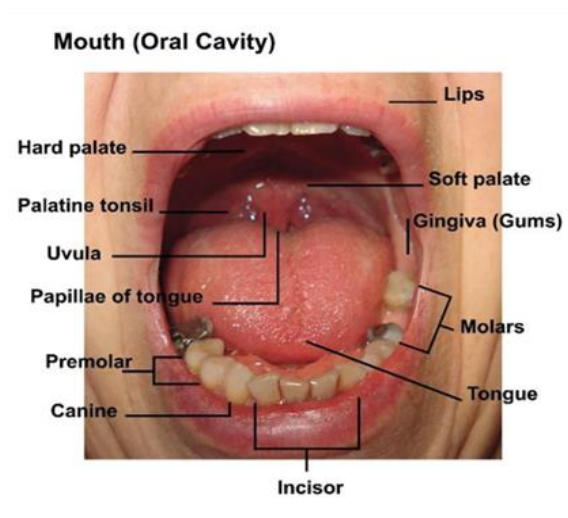


Figure 1: Mouth anatomy (Siira 2022)

2.1.1 Mouth anatomy of aged and changes in anatomy

The oral cavity is not beginning of the digestive tract, but it is also the site of food comminution, mixing, and salivating of food bolus. With aging, changes occur in all oral cavity tissues, resulting in altered shape and function. (Schimmel & Abou-Ayash 2020.)

With increasing age, various changes in mouth anatomy can be seen. Taste sensation in elderly people gradually decreases due to which they find their food not having a strong taste. To increase the taste in their food most of the elderly people prefer adding extra seasoning in their food particularly salt which can be harmful to their health. Or sometimes they prefer to eat hot food which burns their gums and leads to several gum diseases. With the increasing age the quantity of drugs consumption to treat different diseases like high blood pressure, cholesterol, depression, etc. also increases. These kinds of drugs decrease the taste sensation in elderly people. The drugs used results to several disorder like gum diseases, infections, mouth cancer and chronic diseases. It will also decrease the saliva production and make the mouth dry. With aging the teeth becomes weak and starts decaying and losing teeth. Due to weak teeth and losing teeth elder people are not able to chew the food well so, they will not consume the enough nutrition. Similarly, the tissue around the teeth starts to pull back and expose the teeth more than in normal. (Sulyanto 2021.)

The main reason behind a dry mouth can be due to nutritional deficiencies, diseases like Diabetes mellitus, Sjögren's syndrome, Parkinson's disease, or rheumatism, medication, or treatments such as radiation therapy. In the old adults the medication used can cause dry mouth creating problem in chewing, eating and swallowing food. The dryness of the mouth, hyposalivation, is a risk factor behind problems such as oral infections, dental caries, ulcers in

the mucous membrane, and periodontal disease. Dry mouth can be prevented with various ways, brushing teeth twice a day or even more if possible, flossing, using toothpaste with fluoride and visiting the dentist regularly can help to keep mouth healthy. (Frisbee 2021.)

2.1.2 Most common oral diseases

Dental caries means that sugars and acids of the mouth wear out the dental enamel and slowly damages the teeth. The saliva helps to balance the acids within few hours but if more substances are added in the mouth, no precipitation of the minerals can happen to fix the teeth's enamel and fix the damage. The process is categorized into four stages: 1st demineralization where the enamel fades, 2nd the enamel is damaged and a hole forms, 3rd the damage proceeds to the dentine, and 4th where an infection builds up as the hole reaches the pulp inside the tooth. (Suomen Hammaslääkäriliitto 2013a.)

Gum diseases, shows inflammation of the gum and leads to swelling, redness, tenderness, bad breath, and even to bleeding of the infected site. Also, due to periodontitis, the gum may withdraw, and cause tooth become loose, or expose the root of the teeth for infections. Different stages of the periodontal disease are 1st the mildest form called gingivitis showing inflammation, which without treatment in the long run progresses into periodontitis causing falling of the tooth and damage all way up to the dentine. Reasons behind periodontal disease are poor mouth hygiene and care of the mouth, use of drugs, diseases such as diabetes mellitus, stress, immune defiance, unsuitable fillings or bridges, dry mouth, and hormonal changes due to pregnancy or contraceptives. (Suomen Hammaslääkäriliitto 2013b; CDC 2013.)

Oral cancer is a malignant tumour with a high mortality rate that can be detected mostly on the tongue or the mucous membrane. A sign of it can be a colour change in part of the mouth, such as redness or pale spot. Also, signs can be spots with ulcer without healing for more than few weeks or lumps and changes in ability to speak or fitting of the prosthesis. Risk factors for oral cancer are for example drug usage, a spot in the mouth with local cancerous mutation, or receiving UV-radiation on lips. (Suomen Hammaslääkäriliitto 2013c.)

The oral fungal infections can reside in many parts of the mouth, like the mucous membrane, the pulp or the dentine. Those infections can be bacterial, viral, or fungal infections. Reasons behind bacterial infections include the dental caries and periodontitis. The fungal infections are caused by the normal microbiota that inflames due to poor mouth hygiene, diseases such as diabetes mellitus, medication such as continuous corticosteroids or antibiotics, and frail immune system. The fungal infections cause stinging sensation, sore and tender mouth, bad breath, and changes in the mucous membrane color. (Suomen Hammaslääkäriliitto 2013d.)

Oro dental traumas happen due to accidents in everyday life. The trauma affects teeth, gum, or soft tissue of the oral cavity, but also indirectly the quality of life and psychological well-

being. The treatment of oro dental traumas is mostly expensive and complicated due to the fragileness of the oro dental area. Risk factors for the trauma include environmental factors. Due to the age and other health issues such as deterioration of the balance, fragile bones, and poor recovery, prevention and protection against the risks and trauma is emphasized. (Lam 2016; World Health Organization 2022.)

2.1.3 Drugs, tobacco and chew tobacco

According to world health organization nowadays marketing by advertising tobacco, alcohol and food with high sugar has been leading to increase consumption of products that contribute worldwide to oral health condition and as well as other noncommunicable diseases (World Health Organization 2022.) Medline Plus (2019) define the drugs as chemical substances that can affect the body and mind action. The drugs consist of They include prescribed and over-the-counter medicines, other substances like alcohol and illegal remedies. (Medline Plus 2019.)

Regarding oral mouth care drug use and abuse is important to highlight alcoholic cocktails, wines and beer can be extremely acidic. This may cause erosion of the enamel on your teeth, resulting in pain and sensitivity of teeth. Vodka and bourbon are exceptionally high in liquor and may give you dry mouth. Numerous blenders and alcopops are high in sugar. This can cause dental decay or rot. (Oral Health Foundation 2017.)

Illegal drugs such as Methamphetamine and Heroin can likewise make you have a dry mouth. There is a diminished salivation stream in the mouth, this can likewise prompt tooth decay and gum infection. Ecstasy and Cocaine can prompt jaw-g and grinding your teeth together. This can result in broken teeth or a broken tooth, which causes headaches and may require surgery to get new teeth (dental implant) as replacement if teeth are beyond restoring naturally. (Oral Health Foundation 2018.)

Tobacco is a plant grown for its leaves, which are dried and aged prior to being placed in tobacco items such as cigarettes. Tobacco contains nicotine, an ingredient that can cause addiction, which is the reason why so many people who use tobacco think that it is hard to stop using it. There are additionally numerous other possibly harmful synthetic compounds found in tobacco or made by consuming it. (National Institute on Drug Abuse 2021.)

In 2020, 22.3% of the global population used tobacco, 36.7% of all men and 7.8% of the world's women. (World Health Organization 2020) Cigarette smoking harms nearly every organ of the body, causes many diseases, and reduces the health of smokers in general. (CDC 2021.)

In addition to smoking tobacco, one can also chew tobacco or use snus. Smokeless tobacco typically comes in the form of leaves which you place within your cheek and chew inside the mouth. Biting the tobacco delivers the flavours and nicotine which makes your mouth make a great deal of salivation. Users who use these for the most part spit tobacco out after the flavour has decreased or dried up or delivered enough nicotine to the bloodstream. (University of Bath n.d.) Snus is tobacco that comes as a clammy powder, or is gathered in little sacks, and you put it under within your base lip (Oral Health Foundation 2017). Snus is only legally available for purchase in Sweden within the European Union, but personal use of it is not illegal in countries like Finland for example. (University of Bath n.d.)

2.2 Mouthcare for adults and aged

Mouth care is a fundamental aspect of nursing. It is a scientific way to care of mouth and teeth by using antiseptic solution (Mandal n.d.). People both adult and elderly battle from various mouth disease such as gum diseases, toothaches, bad breath and so on. Mouth health is an important factor to do our day-to-day activities and interaction with people. (Mouth care tech n.d.)

Mouth care should be done at morning or evening after meals so, we need to raise awareness about important of oral health amongst people and give them guidance to keep mouth free from harmful bacteria by daily brushing and flossing. Everyone wants a comfortable, clean, moist and infection free mouth, but people are prone to mouth health problems due to poor knowledge. Sometime people are taking care of a mouth in the wrong way knowingly or unknowingly. (Oral Health Foundation b n.d.) According to YLE (2018), a little over fifty percent of males in Finland older than thirty years do daily mouth care twice, whereas the women reach eighty percent in regular teeth care, and younger than thirty years old do substantially less.

Poor oral health may affect systemic condition like aspiration pneumonia, diabetes, cardiovascular disease. People who may need mouth care are ventilated or sedated patients in intensive care units, patient undergoing chemotherapy, radiotherapy on head or neck region and oxygen therapy, elderly people. With the increasing age you need to pay extra attention to your mouth and teeth to protect from any kind of diseases. Dental care for adult and elderly people is pretty much same. Using proper equipment's in a proper way can always help to keep your mouth and teeth free from any kind of diseases. In some cases, if the elderly people are unable to take care of themselves, they need a guidance or help from caregivers or close relatives. Similarly, if elderly people have a dementia or they are unable to use their hands because of some reason than they will also need external help to take care of their dental health. Comparatively elderly people face more dental problems than adult, but this does not mean that adult people always have a healthy tooth. People from every age

group need to pay attention to their dental health as poor dental health always leads to poor health conditions. (Clynes 2012.)

Dental care always starts with properly brushing your teeth twice a day by using a good toothbrush and a toothpaste. The proper brushing includes a circulating motion in 45 degrees between the tooth and gum with a firm pressure. Beside brushing your teeth in the morning and evening, flossing your teeth at least once a day is also important. Most of the experts suggests visiting a dentist once in a six-month period or as per your dental team recommendation. Dentist should be informed about any kinds of medications if you are using any. Along with the counselling from dentist individuals should always avoid using products that can affect your dental health like chewing tobacco and smoking cigarette. Eat balanced diet which includes good amount of nutrition to keep the gums healthy and prevent your teeth from decaying and keep your gums healthy. (Thompson et al. 2020.)

2.2.1 Basic equipment for mouth and dental care

Basic equipment for mouth and dental care includes toothbrush, dental floss, and toothpaste with fluorine. The brushing should minimum two times daily for two minutes. A soft brush is preferred to avoid too strong mechanical wear on enamel and gums. The fluorine in the toothpaste works against dental caries by minimizing the activity of the bacteria causing sugars and acids in the mouth that lead to the dissolution of the enamel on teeth. Also, dental floss should be used daily. Instead of the dental floss can be used different kinds of brushes or sticks that reach in between the teeth. (Suomen Hammaslääkäriliitto 2013e; Ilovesuu a. n.d.)

Bad breath, also called halitosis, can follow due to bacteria on the tongue. The tongue can be cleaned with many ways: by using the soft toothbrush, or with other tools design for the cleaning such as a scraper that's edge gathers the bacteria. (Suomen Hammaslääkäriliitto 2013f.)

Dry mouth can be a continuous state without cure but needs alleviation. Characteristic for dry mouth are delicate, dry and stinging mucous membranes and chapped lips or sores in the mouth. (Siukosaari & Nihtilä 2015.) Dryness can be alleviated by applying for example food oil on the mucous membranes. There are also several types of toothpastes, pastils, xylitol gums, sprays, and mouthwashes that help with the dryness. Furthermore, drinking water and chewing the food carefully help more saliva to form in the mouth. The dryness of the lips can be relieved by using lip balms regularly. (Suomen Hammaslääkäriliitto 2013g.)

In addition to washing the teeth and cleaning between the teeth, also xylitol products can be used to alleviate the acid attack. For example, chewing xylitol gums, sucking pastels, or gargle mouthwash support the mouth's well-being. Some general notes of the use of those

products are that the mouth wash is supposed to be spit out after gargle as those are designed to clean the mouth but does not fit in the GI-track. Each product contains individual instructions for use that should be followed. In cases where teeth are missing or the mouth is especially sore, it is suitable to use soft toothbrush instead of sticks with plastic foam as those possess a risk of loosening and blocking the respiratory tract. (Ilovesuu b. n.d.)



Figure 2: Denture upper bite (BetterBite dental clinic)

Equally to the normal teeth, also the prosthesis should be cared daily. The dentures, figure 2, need daily washing as food gathers to them. In the evening, before going to sleep, the dentures are taken out of mouth and washed with specialized brush. Then they are placed in a box to dry overnight. Once in a week the dentures can be put into water with special cleaning tablets that remove bacteria, bad smell, and dissolve dental plaque. While washing the prosthesis, also mouth should be cleaned for food remains and bacteria. (Suomen Hammaslääkäriliitto 2013h.)

While helping to clean the teeth of other person, there might be need for tools to assist keeping mouth open. The finger can be covered with a silicone cover that keeps the jaw separated while preventing the teeth from damaging and nurse's fingers from getting squashed. (Hampaille.fi 2022.)

Most of the mouth care equipment exists in the grocery stores. The more specialized products such as specialized toothpastes and brushes such as denture brushes, moisturizing sprays, some of the xylitol pastils, and stronger mouthwashes can be found from the pharmacies (Nettiapteekki 2022) or from producers' online stores.

2.2.2 Treatments for common oral diseases

The most common found oral diseases are dental caries, gum disease, inflammations, mouth cancer and others (World Health Organization 2022). In their study of link between drug users and oral health Yazdanian et al. (2020, 15-16) found that it is possible to treat dental caries and periodontal complications among drug users by connecting them with support services like substance treatment programs. Furthermore, they state early screening is important for

detection of finding the number of decayed, missed and filled teeth (DMFT) so that screener can facilitate referral to dentist for oral health services. (Yazdanian et al. 2020.)

Dental caries is one of the most serious diseases of the mouth according to Yazdanian et al. (2020) and can be prevented using prophylactic and protective methods. Also, in their collection of findings found that brushing teeth more than two times a day was significantly associated with lower tooth decay score, compared to daily teeth care. Duodecim (2020) has stated that caries is still one of the most common diseases worldwide and in their independent evidence-based care guide have given the following treatment recommendations:

1. Cleaning of teeth, two times a day (Finnish Dental Association 2013)
2. Use of fluoride toothpaste (Finnish Dental Association 2013)
3. Regular mealtimes and a varied diet
4. Water as a thirst quencher, avoid sugar-containing, acidic and flavoured beverages
5. Design of management measures for elderly caries, plan a design that ensures that teeth and dentures are thoroughly cleaned daily, either independently, guided or assisted
6. Oral hygiene also includes cleaning the spaces between the teeth with individually selected instruments and teaching them how to use them
7. The use of xylitol products (The Finnish Dental Association)
8. Coating, resin-based coating material or hydrophilic glass ionomer on molars

A routine semi-annual or annual check-up with a dentist or dental hygienist for tartar removal (and plaque) is strongly recommended by multiple sources (Duodecimo 2020; Oral Health Foundation a n.d.) for treatment of gum disease. Daily cleaning in morning and night with either a soft brush toothpick or dental floss between teeth is recommended to avoid foods and bacteria to continue growing and risk developing an infection (Koponen 2022).

However, lack of treatment may lead to gum abscesses, and pus may ooze from around the teeth. Over several years, the bone supporting the teeth can be lost. (Oral Health Foundation a n.d.). Oral disease effects many people through their lifetime by causing pain, disfigurement discomfort and in worse scenarios even death. For these scenarios there is usually risk factors with other major noncommunicable diseases (World Health Organization 2022).

According to the Finnish Dental Association, oral cancer is found in many ways, and it is quite diverse so paying attention to details is important when inspecting the inside of a mouth. Most often the cancer manifests as an ulcer that does not heal in a couple of weeks. The ulcer may be asymptomatic which is why patients may not be seeking immediate treatment as they are unaware. The symptoms of oral cancer may also include, a nodule, unsuitable dentures, eating or speech problems. Most causes for oral cancer come from the use of tobacco and alcohol. (Finnish Dental Association 2013.)

If suspecting oral cancer, referral to a dentist is recommended as biopsy sample of tissue is needed to be tested in the laboratory to be sure it is oral cancer if they find cancer tumour cells. Further lab tests may be required to determine which treatment is recommended depending on the severity of oral cancer progression. Oral cancer can be treated with surgery, radiation therapy, chemotherapy, or a combination of these, depending on the type and prevalence of the cancer. (Finnish Dental Association 2013.) The chances of recovery are good if cancer is detected in time. According to the Finnish Dental Association (2013), the smaller the change found in tissue, the better the prognosis for healing.

An oral fungal infection can produce prolonged pain in the oral mucosa if left untreated. A geriatric patient's dentures and prosthesis fit may also degrade. A fungal infection of the mouth that goes untreated for a long time raises the chance of malignant mucosal alterations. (Finnish Dental Association 2013.)

The Finnish Dental Association (2013) recommendations are more focused on preventative actions rather than reactionary. Cleaning your teeth and tongue should be done on a regular basis with your toothbrush or other dental equipment. After each meal, you should try to rinse your mouth with water. (Finnish Dental Association 2013.) This advice is given to patients as reminder when leaving a dental clinic after visit usually (Koponen 2022).

A prosthesis should be kept out of the mouth as much as possible, especially at night, stored in a dry and airy place to ventilate. Dentures should be cleaned daily using warm soapy water and a gentle denture brush or .2 percent chlorhexidine, hypochlorite, or effervescent tablet can be used as a disinfectant. (Finnish Dental Association 2013.) Maintaining a balanced diet consisting of enough protein, vitamins and iron does reduce the risk of developing an oral fungal infection (Koponen 2022). As stated earlier the main category of oral dental trauma is either dental related or jaw related as both deal with the bite. (Finnish Dental Association 2013.)

Dental treatments related to how severe the tooth is damaged. In minor cases a dentist can sand and smooth rough edges on a chipped tooth, to filling missing parts of tooth with dental filler material. If more severed, then rooting or crowning might be needed in minor surgery and in more severe cases if a tooth is deemed unsavable then the tooth is removed, and a

dental implant surgically placed in its place such as a ceramic crown that looks like original tooth. (Finnish Dental Association 2013.)

When treating jaw fractures, they are more severe and diagnosed by doctor or dentist as they require surgery by either temporarily wiring the jaw and either upper or lower teeth together to allow fractures to naturally heal or surgery, “in which case small titanium plates are usually attached to the fracture area.” (Finnish Dental Association 2013.)

2.3 Nurses' roles in mouth care

Registered nurses participate in the mouth care on various levels. The participation is defined by the Finnish health care act (Terveydenhuoltolaki 2010) that states that registered nurses are obliged to maintain and promote “populations safety, health, well-being and ability to work and function” which refers also to the mouth care. Furthermore, Social and Health Ministry (2015) guide mention right for mouth care and support when needed. As Otukoya and Shepherd (2018) note, a proper mouth care affects both the physical as well as mental well-being.

The various levels of the adults and aged mouth care that a registered nurse is part are to providing guidance, support, give actual mouth care, and to provide healthy and suitable nutrition. Guidance can happen for example while receiving guidance or treatment to mouth related health conditions such as diabetes mellitus. Furthermore, people may receive information and support from nurses while having regular health control visits. Also, as person ages, they receive possibly home care or become part of the daily health care services such as nursing homes. There nurses can aid with or provide the actual mouth care. Part of nurse-led mouth care of aged and handicapped is to assess the needed care and specialized mouth care services. (Daly & Smith 2015; Helsingin yliopisto 2022.)

At person's end of life, the nurse may act as an extension of the person's hands and mind. The meaning of the support and guidance increases when the patient's own resources focus on the end of life. The Royal College of Nursing (2021) has produced a guide about mouth care's meaning in the palliative or end-of-life care. There, the nurse's role goes from providing encouragement to decision making about the tools used for the mouth care. Primarily, the patients are encouraged to take care of the mouth themselves. The nurses can support in finding best suitable tools, follow the mouth's condition, and enable contact between dental services. When the whole care moves towards more supported activities, the nurses become part of the actual mouth cleaning. The mouth's follow-up continues as well as documentation of it. This enables the staff to notice any changes on the mouth and seek for best suitable care options for the patient or client. For example, often this could mean taking into account the medications' drying effect and providing patient with moistening or considering the best suitable time for the mouth care activities. Understanding patient's and

client's condition and needs and providing even small help can provide great comfort for the client. (Royal College of Nursing 2021.)

3 Purpose, Aim, and Research Question

The aim of this thesis is to produce a guiding poster for nursing students dealing with oral care. It can be also used in supporting teaching as a tool in their simulations at school or practical placement. The purpose is to raise awareness in nursing students and improve overall understanding of good oral hygiene practices and how to provide responsible mouth care for adults from a nursing perspective. The poster can be used as a supporting teaching.

This thesis will support the learning-, research- and professional skills of all the authors. It will also contribute to the learning of other nursing students at Laurea University of Applied Sciences within oral healthcare.

Research Question:

Can a poster provide effectively mouth health information about adults and aged for nursing students?

4 Method

Kehittämistoiminta, freely translated as Constructive developing action model, derives from the history of research, development, and innovation generation and integration, and can be called also with terms such as developing, innovation or design thinking. The model can be visualized as a triangle, where in the middle exist the TKI-toiminta or research, development, and innovation integration, that form the base for the working life integration and cooperation. In each end of the triangle emerge the actor of the collaboration, either the school providing the education and connections, or the working life with services and products offering the expertise, or the clients sharing their views as users and providing experience expertise. This pictures the basic idea of the constructive developing action model as a collaborative and shared activity. (Salonen et al. 2017.)

The developing model can work in form of positivist, imperative, realistic, pragmatic or constructive tradition out of which the constructivism aims to activity that changes or develops situation or action. The process works in cycles beginning by planning, moving to further planning after implementation and evaluation. On each of the steps takes place reflection, observation and action, and the change is achieved by dialogue and reflection. The constructive developing action works through concepts, aims to create new results or

benefit the target with concrete artefacts and be useful. The creation should be unique and planned with an actor lead open or closed process bound to time and place. Factors that exist in the constructive developing action research, the creators, equipment, community, guidelines, work distribution, and object leading to result, cause conflicts when collaborating and ensure that development is pursued. (Salonen et al. 2017.)

Methods of the thesis include literature search from academic databases and other reliable and relevant information sources, and a Learning by Developing model (LbD) in a form of an informative poster and its evaluation via a questionnaire.

One sub-method for constructive developing action model is a Learning by Developing model by the Finnish university of applied sciences Laurea. It has been created to respond to the growth of the population on that area and to facilitate the process of students joining the working life. The model aims to enhance concrete working life innovations and creativity in collaboration with the student, working life partner and school. By participating in the projects with LbD, the students can be active creators of real products as well as gathering experience of the working life while being supported by the school and its learning environment. The area of expertise where LbD-model is applied can be in the business, healthcare, or IT and communications. (Vyakarnam et al. 2008.)

Learning by Developing includes generic values such as being ethical, creating innovation, being reflective, thinking global and networking. Vyakarnam et al. (2008) find that these values create the core of the project and collaboration as well as strengthen the professionalism. The competence development is begun by identifying an authentic problem to be solved in collaboration with the working life partner. Sometimes the identification is also done in collaboration with the partner. As the partnership is formed, the collaboration generates reciprocal competencies and new skills. The research-oriented approach is enhanced by constant reflection and evaluation of the process, the learning and effectiveness. Those four steps, that work back and forth during the process, lead to creativity, the new knowledge or a product. (Vyakarnam et al. 2008.)

As mentioned, the constructive developing action model forms a cycle that includes steps of planning, piloting, execution, and passing the artefact or information forward. The steps are rarely in reality strictly separated and in actualization can overlap. Here, the process is considered to begin from the planning phase which is followed by piloting and execution as a single step, and lastly followed by forwarding the results as the evaluation of the project.

4.1 Planning

The development process begins from planning where the subject is given reasoning and a need for the project is defined. As noted above, the different phases of the process can

intervene. For example, the following step, the ideation can mix with stating the need. So, the first step of planning is followed by ideation. From the very beginning occur TKI-methods (research, development, and innovation integration). Those methods apply many different tools either from the research methodologies or development and innovation tools that support the integration. Development and innovation tools can be for example SWOT analysis, Learning café, Gantt-chart, workshops et cetera. (Salonen et al. 2017.)

The thesis works in collaboration with university of applied sciences Laurea to provide information about adult and elderly mouth care for nursing students. The Finnish Dental Association, *Hammaslääkäriliitto* (2021) has launched a campaign translated to English as “The Whole Finland Brush campaign 2021”. For the campaign the association and their oral care work business partners have challenged citizens and residents about importance of brushing and reminding the elderly to take care of their oral health through social media and infographics. The opportunity from this for us researchers is to gather and collect very recent evidence based dental practices, as well as content from this campaign such as infographics, that will also be shared and highlighted in the results.

In the planning phase, the aim and objective are defined, and a research question is formed. After those are done, an information gathering begins from academic databases, such as Google Scholar, EBSCO, *Terveysportti*, the Finnish Dental Association website, et cetera to create a solid understanding about the subject: adult and aged mouth care. This information is used as content for the project’s product, the informative poster. Salonen et al. (2017) present different tools to enhance the whole process. In the planning, for example SWOT-analysis and Learning café can be helpful to define the vulnerabilities and assets for the project as well as collecting various ideas everyone has for the project. Learning Café takes place in small scale activity lead by one of the group members and joined by the two other members. In the beginning, the leader holds ideation and creates those ideas further with the first member after which more sessions are held with the leader and other member to more ideation and edits on the already existing information. (Salonen et al. 2017.) Through this is formed the outlines of the theoretical framework. SWOT-analysis is applied to define the subject and further methods to actualize the information distribution. In addition, the academic sources are used to learn about the implementation and evaluation methods of the thesis, the informative poster and a questionnaire.

Thirdly, planning can include organizing responsibility areas between each group member. Salonen et al. (2017) identify responsibilities, actors and materials as parts of planning. A tool to define tasks between group members could be for example Gantt-chart. This chart, table 1, is done during a workshop-kind of meeting together with every group member. The tasks are divided based on each own interest as well as considering the possibilities and strengths.

As the process goes on, the responsibilities evolve and can even change when learning about each other's strengths and challenges.

Table 1: Dividing roles and responsibilities

Group member	Responsibilities
Huda	<ul style="list-style-type: none"> • Base of the thesis • Content • Thesis subject • Aim and purpose • Planning poster • In charge of permission of products • Producing product pictures
Indu	<ul style="list-style-type: none"> • Creating the presentation base • Planning poster • Correcting references • Creating the questionnaire • Producing questionnaire answers into charts on the thesis
Veera	<ul style="list-style-type: none"> • Editing content topics & order • Creating zoom meetings • Planning poster & creating preliminary content (text, layout, producing mouth pictures) • In charge of research permit & contacting Laurea's Opintotoimisto
Together	<ul style="list-style-type: none"> • Writing divided equally throughout the thesis process • Deciding on timetable • Making questions • Adding information to the presentation

4.2 Implementation

The constructive developing action model's planning phase follows by implementation stage. It can include two steps that possibly overlap: actual implementation and realizing an output or a product. The actual implementation process relies on ideation and decision made during the planning phase, but also reflects those. The implementation means for example collecting information. Tools that help the implementation process can be for example workshops but also documentation. Although implementation should come before the realizing of a product, those may overlap when making the product and reflecting on the design. (Salonen et al. 2017.) The product is created in workshops in Zoom-meetings online. The ideation is an open process where each member has equal changes to present their ideas. Those are collected in notes, which are then developed forward.

The form of the new practice, a product or knowledge produced in the project is not defined. As noted, the area of expertise applying the model is wide (Vyakarnam et al. 2008, 18). The product can be anything from service to information and its presentation. Here, the product is information that is provided as an informative poster.

Posters are widely used in the academic community, and most conferences include poster presentations in their program. The poster can contain multiple details, like short text supported by other visual elements like tables, graphs, pictures etcetera. A conference situation provides the participant with change to reach the poster supported by the makers presentation and change for discussion. (New York University 2022.)

Bagger & Kelly (2008) stated in their research within nurse education that by making posters the students have change to evolve their organizing, evaluation, and reflection skills of information and further develop the communication of their own understanding about theoretical knowledge, and that it was an important pedagogical tool that we want to use. In today's digital world the effectiveness of posters as an educational tool cannot be compared with any other sources although it is a traditional method. The content and information in the poster are a very effective way of transferring the knowledge. It is very important to pass healthcare information to the community by health professionals to get the better understanding of the topic. Poster with good content can help viewers to understand the topic much faster and in easier way. Viewers can be motivated to learn more about the topic. Posters can easily transfer difficult messages visually if it is made accordingly and effectively. (Ilic & Rowe 2013.)

The result of this research is also a poster, which will help to transfer the knowledge about mouth care to Laurea's nursing student as well as other health professionals who will read this research work. Poster is used in this research to give a clear result of this research so the viewers can know about the mouth care visually and easier way. Educational poster always

helps to summarize the work and present it to the viewers in the most effective way. Being a traditional tool of education, posters are still used in various academic and professional works. Posters are widely used in health sectors also because they can pass the difficult information in an easy and effective way as general people may not be aware with the terms used by health professionals. (Ilic & Rowe 2013.)

4.2.1 Creating poster

As our target audience is Laurea's nursing students, we chose to follow the official university brand guidelines for presenting a poster using a pre-set poster template with a minor twist. We choose to use Laurea A3 vertical format with the Laurea font and graphics pre-installed. This educational poster serves our informational needs the best as the design, format, font and colours are pre-determined in a template that the students are familiar to seeing. Using existing template from recognized source may increase trust and provide credibility to the poster that may reduce initial doubt as to what the contents are. The choice of using a pre-set template from Laurea is therefore, a conscious decision in planning and design due to the nature of our audience.

The poster creation was begun by ideation session, where was decided what would be placed on page one and what would be on page two. After this one of the groups created a preliminary poster with texts and layout showing possible contents such as texts and created in collaboration with another member the pictures. Creating pictures by ourselves removes the obstacle of using money to buy anything. The preliminary poster phase included group session for commenting on the contents and developing those. The content development continued based on teachers comment from a thesis seminar. The result, appendix 1 and 2, changed subtly based on the comments.

The poster's design bases on features that support the content and provides information in an easy and coherent form. The good poster features consist of the content in a visual form that is easy to follow and coherent. Cartier's (2019) informative poster about good poster features notes important points such as thinking about the focus group and using the visuals to convey the message. Any graphics should be understood both with and without text. Furthermore, presentation order of the content affects both the understanding and remembering the content. Beginning from the topic and introduction, continuing to the methods and data, and ending with the results and conclusion plus references, strengthens comprehension and the message of the poster. Important part of the good poster features is referencing or giving credits and using ethically correct material such as pictures with creative common license. While using visual aids, also text appears in the posters to enhance and expand the subject. When using text, details like colour, text type and size, style and contrast should be considered. The style decisions are made to support the content. (Cartier 2019.)

Williams & Cullen (2016) discuss “visual aesthetics, contextual relevance, and logical sequencing” and their meaning as good poster features. On a poster everything begins from the visual aesthetics that defines whether the content is familiarized with or not. The contextual relevance means that arrangement of the information to highlight the most important information while moving to smaller visibility with more details affects whether the reader decides to familiarize themselves more. The logical sequencing consists of the visual aids supporting the story. As noted, the visuals should convey the content and forward information in a memorable and logical way. (Williams & Cullen 2016.)

A key thought for the poster, was to have two pages, that would be created based on the gathered information about mouth care. The posters focus on providing students with an understanding about mouth anatomy, basic mouth care steps, registered nurse’s role in mouth care, short information about effect of drugs to mouth, and five common mouth issues. On the second page is presented the tools for mouth care including more special equipment for aged mouth care.

Design wise, the visual information is supported by short text, while providing reader with further information about the topics. Using the pre-installed design provided the poster with the university logo in the top right corner and the heading of the poster on the left in big bold Laurea university blue. Below it after a space comes the authors of the posters. A possibility to have a summary or an abstract of the poster in bolded italics and smaller font in a square box was left out to include more information about the wide subject with a more visible design.

The two posters separate in their layout. However, there are similarities that connect them as a one item. Two of them begin with the title of the project and the names of the creators. At the bottom of both pages are the main references of the information. The subheadings are in same Laurea blue and with capital letters to allow eye to focus on short and concise information held within each paragraph texts. However, some of the paragraphs apply also the capital letters when the text is just few words to emphasize the message. The first page (appendix 1) places bigger picture on top to the right to utilize the space more efficiently, and the smaller pictures go linear across the page to enable the text dividing into five paragraphs. On the second page (appendix 2) the pictures as visual elements are placed on the right side to emphasize the movement from the topic and text to the supporting picture. Furthermore, the subjects are gone from more basic knowledge to the more specialized equipment and tools. Similarly, the first page begins by concentrating on more basic knowledge on top and moving to the more specialized information towards the bottom.

4.3 Evaluation

Evaluation follows the implementation and product in the constructive developing action model (Salonen et al. 2017). Also, in the LbD project evaluation is important as noted by Vyakarnam et al. (2008). The project assessment is done via documentation of feedback from the seminars throughout the process as well as by group discussions in workshops. The poster evaluation is done after creation process by a questionnaire.

Depending on the way of approach towards the participant, the questionnaire offers low cost, abrupt, and flexible method. For example, email provides practical way to reach participants. Possible threats for the quality of the questionnaire vary from technological issues to problems in the actual questions. The problems in questions range for instance from misleading wording to incorrect information and unsuitable scales. (Safdar et al. 2016.) The thesis utilizes the electronic ways to reach the participants as well as to collect the data. As mentioned, sending email is cost- and time-efficient. Furthermore, the present Covid-19 virus has moved many studies to take place as distant learning via internet, which may increase the probability of reaching the participants via school email addresses.

The questionnaire design should consider what kind of target group is in question. It is noted that for example in health care sector the questionnaires aim to understand values and phenomenon that can be covered better with the qualitative ways or with mixed method joining the qualitative with quantitative numbers. (Safdar et al. 2016.) Also, Schoonenboom and Johnson (2017) find that using quantitative questions alongside with open-ended questions, as a mixed method provides further and more coherent understanding about the perceptions of the participants.

When creating a quantitative questionnaire, a sampling frame is needed to define the group of participants to whom the survey is aimed at and to whom the questions are designed for. (Curtis, Drennan & Drennan 2013.) The LbD partner for the thesis is Laurea and the target group is Laurea's nursing degree students. Since the poster concentrates on adult and aged mouth care, a suitable place to present the information for the student participants could be in the first year of the studies. At that point the students are learning about basic adult and aged care. Suitable courses could be for example basics of clinical nursing, or health promotion, support for self-management and guidance in nursing, or nursing care of elderly patients (Laurea 2022a). Because the project involves Laurea and its students, a research permission is needed (Laurea 2022b).

Types of questions that can be applied to a questionnaire are demographic/background questions, Likert-scale questions, rating scales, or multiple choices. The background questions portray the group of survey participants. Likert-scale questions reflect the thoughts and experiences of the participants on an agree-disagree-scale. The scale can include yes-no

answers or a wider scale. Using rating scales provide change to evaluate different traits on a numeric scale. Lastly, the multiple choices provide possibility to give more than one option for the variable. (Survey Monkey 2022.) As said, the open-ended questions establish more coherent understanding about phenomena (Schoonenboom & Johnson 2017). The questions should provide participant information about the subject and create an opportunity to say opinion (Saris & Gallhofer 2014).

The chosen questionnaire questions include one background question and six poster related questions (Appendix 4) that aim to measure and analyse the poster's informativeness and validity for nursing students. The background question asking the participant's year of the study aims to provide understanding about possible correlation between the advantage of the studies and relevance of the information on the poster. First of the Likert-scale questions discuss poster's ability to forward the information to the participant visually and content wise. The second Likert-scale measures the poster's meaningfulness by asking how much new information the participants receive from it. Thirdly is measured the poster's ability to support learning. Fourthly, is measured the poster's ability to visually convey the information in a Likert-scale question. The fifth poster-related question is a multiple choice, that defines what else could be shown on the poster and what kind of subjects the participants feel should be shown more. Lastly, the participants are given a chance to further discuss and the poster and their experiences about it by an open-ended question.

The analysis of the questionnaire is done by calculating the numbers of the quantitative questions, making tables and graphics out of the numbers, and cross-tabulating or comparing the information. On the open-ended questions, the analysis is done by finding the existing themes within the answer from which are formed sub- and main topics. Those can be then compared with the numeric information. (Saris & Gallhofer 2014.) The collected information is applied to discuss and develop further the informative poster.

The data is gathered by an email that is forwarded to the chosen group of students by the Laurea Tikkurila's student office. The groups are SNV221NS, SNV220SN, SNV219SN, SHV221KN. The email includes an invitation letter (Appendix 3) as well as a link presenting the poster (Appendix 1, Appendix 2) and the questionnaire questions (Appendix 4). The email shows the invitation letter that explains what the students are about to participate and explains the anonymity: it is protected by not collecting or presenting any personal or contact information. There exist many electronic formats to realize a questionnaire and process automatically the answers into numbers and figures. The google forms is chosen for the project because the writers are familiar with it and able to produce the questionnaire with it. The Google forms provide easy to access layout and processes the collected data into visual figures.

4.3.1 Poster feedback analysis

The poster is developed further by creating a questionnaire for the target group, the nursing students at Laurea university. Those questionnaire questions are analysed, and the feedback is applied to improve the poster and its information.

In order to evaluate the poster, a questionnaire survey was used with seven different questions. Before sending the questionnaire to the participants, a research permit was obtained from Laurea UAS. Later, a questionnaire including a cover letter and poster as a google form link was sent to 96 nursing students in Laurea through email. The response time was from 20.04.2022 - 24.04.2022. Out of 96 students, 10 responses were received, which is relatively low response. The response time could be the reason for low response as well as, questionnaire was sent online which could be another reason. The main aim and purpose of the survey was to get feedback on the poster, how well it described mouth care. The target group were nursing students because respondents can use their education and experience to evaluate the poster.

The Chart 1 below shows the study year of the participants which was the first question in the questionnaire. The background question asking the participant's year of the study aims to provide understanding about possible correlation between the advantage of the studies and relevance of the information on the poster. 40 % of the respondents have studied 3 or more than 3 years of nursing studies in Laurea and 30 % of respondents have studied 2 years. 20 % of respondents were students who studied 1 years of nursing studies in Laurea and 10 % of respondents were students who studied less than a year.

Year of study

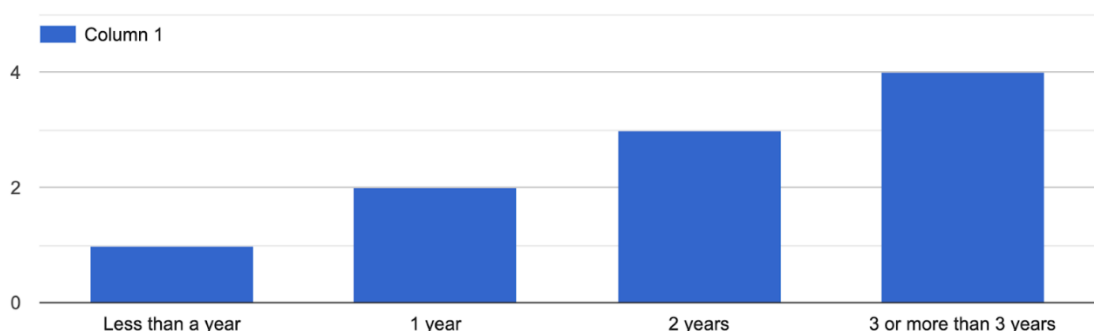


Chart 1: Respondent's year of the study

The second question of the questionnaire was about how easy the poster is to follow (Chart 2). Likert - scale (1-5) was used to evaluate where 1 was easy to follow and 5 was hard to follow. From the responses received, 30 % of respondents thought the poster was very easy to follow while 40 % of the respondents thought it was easy to follow, 20 % of respondents felt the poster neutral and 10 % of respondents felt the poster difficult to follow. None of the respondents felt the poster was very difficult to follow which can also be seen in the chart below. Majority of respondents found the poster was easy or very easy to follow.

Was this poster clear/easy to follow?

10 responses

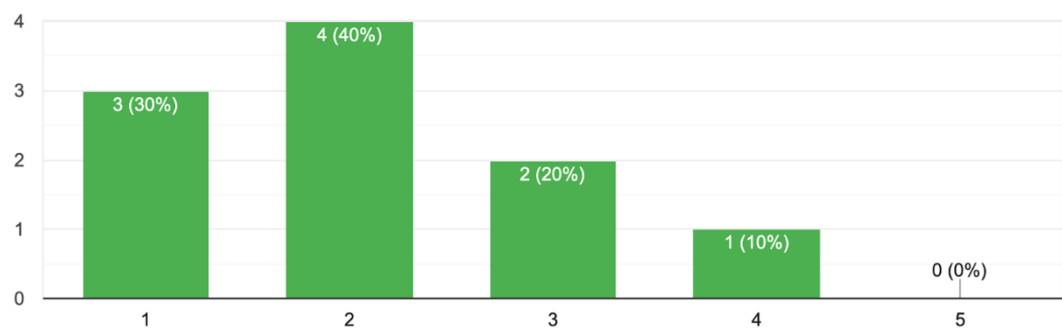


Chart 2: Evaluation on poster's clearliness (Scale: 1=Very clear/very easy, 5=very hard)

The third question asked about the amount of new information provided by the poster about mouth care. In the Chart 3, 10 % respondents believed the poster provided very much new information about mouth care while 50 % learned a lot and 20 % of respondents learned average new information from the poster. There were 10 % of respondents who learned little information and 10 % of the respondents thought the poster provided very little new information about mouth care.

How much new information did you learn about the mouth care from the poster?

10 responses

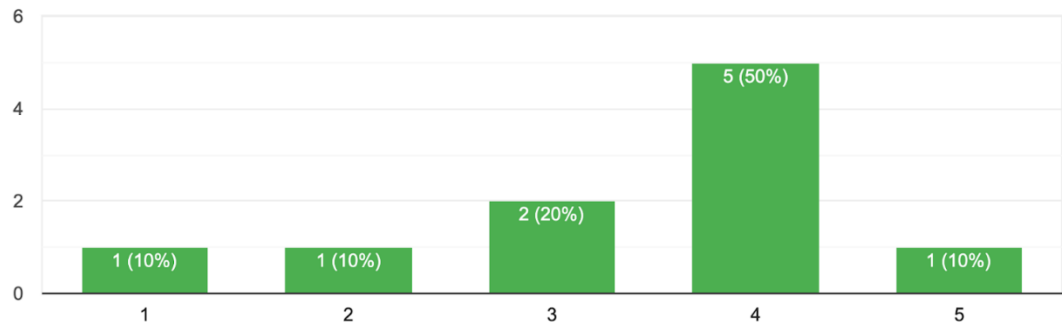


Chart 3: Evaluation on new information (Scale: 1=Very little, 5=Very much)

The fourth question was about how supportive the poster is in your learning, the responses can be seen in the below (Chart 4). 20 % respondents found the poster very much supportive while 30 % found the poster somewhat supportive. Likewise, 20 % of respondents found the poster average supportive. Similarly, 20 % of respondents felt the poster was not much supportive in learning and 10 % of respondents found the poster not at all supportive.

How much this poster would support your learning?

10 responses

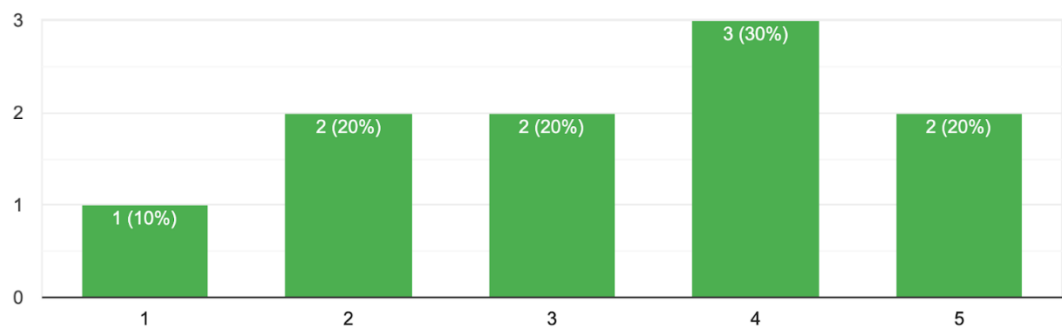


Chart 4: Learning supportive evaluation (Scale: 1=very little, 5=very much)

In the fifth question (Chart 5), respondents were asked about how well did the visual layout of the poster support the information in the poster. In this section, likert scale (1-5) was used to measure where 1 is very weak and 5 is very strong. 20 % respondents found the layout of the poster supports the information very strongly while 50 % of respondents found the layout strongly supports the information. Similarly, 10 % of respondents found the layout supports

the information averagely and 20 % of respondents found the layout less supportive which can also be seen from the chart below.

How well did the visual layout support the information?
10 responses

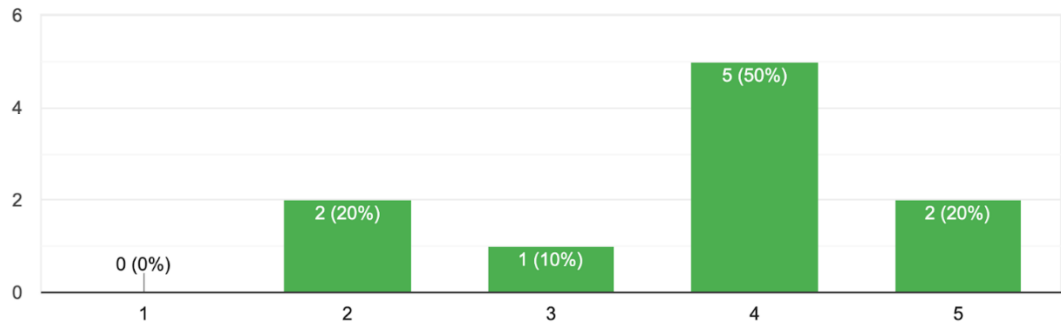


Chart 5: Visual layout evaluation of the poster (Scale: 1=not at all, 5=very well)

The sixth question was a multiple-choice question where respondents can choose a topic on which they want to learn about more. Out of three choices (Chart 6) 60 % of the respondents want to learn more about oral diseases. 30 % of the respondents want to learn more about mouth care equipment and proper guidance while 10 % of respondents want to learn more about mouth care guidance information.

Which of the following would you want to know more?
10 responses

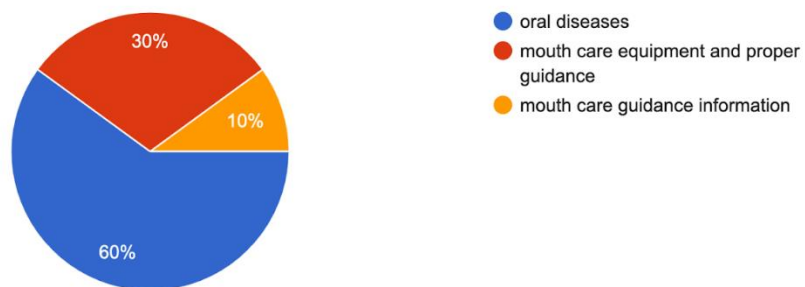


Chart 6: Further research recommendation

Majority percentage of the respondents found the poster easy or very to understand as well as the poster provides new information about mouth care. All the respondents were students

of nursing from Laurea and they found that the poster will also support them in their learning. As the visual display always attracts the viewer's attention similarly, respondents felt the layout of the poster supported the information. Many of the respondents wanted to learn about oral diseases.

Would you introduce or recommend this poster to someone else? If yes, whom?

3 vastausta

yes!

Primary school students

Everybody

Chart 7: Recommending the poster to others

During the process of sending the questionnaires forward a change occurred on the questions. A question number 5 was added to the questionnaire and the earlier planned open-ended question "What do you think is missing or could be done the other way in the poster? (open-ended question)" changed into "7. Would you introduce or recommend this poster to someone else? If yes, whom? (open-ended question)" (Chart 7). Altogether three answers were received for the open-ended question. The answers divided into two groups. Firstly, participants thought that the poster could be suitable for everyone. The second group would recommend the poster for primary school students.

5 Result

The results divide into two groups. First result of the project is the product, the two poster pages about adult and elderly based mouth care and oral health. No changes were made to the final presented educational posters during the process due to time limits. The second part of the thesis, the questionnaire answers discuss the posters' visual and verbal effectiveness. Also, it provides understanding of students' perception about posters' relevance for them. Three themes emerged from the questionnaire: poster's informativeness, the layout, and further recommendations. The small number of answers affects the reliability of this question and leaves room for further inquiries.

We would recommend more quantitative based questionnaire about the nursing perspective about the mouth care from registered nurses with real experience. This thesis work can also be used as a reference in nursing studies if needed. A limitation was that only 10 responses was achieved, so a very small sample size, not enough data to make generalisation findings or analysis to make informative statements. It would be hard to extrapolate findings to bigger

study, but opinion makes this interesting and shows signs that this area is interesting for the target audience.

6 Ethical considerations

Suri (2019) has pointed out three guiding principles for a quality research synthesis which are Informed subjectivity and reflexivity, purposefully informed selective inclusivity and audience-appropriate transparency.

In making ethical decisions we the authors used questioning as a strategic tool in raising awareness and brining up issues to debate such as whether to seek or accept sponsorship from certain dental product brands and manufacturers who wanted to be featured and to be used in product placement in the poster. Whether it would be ethical to blur out logos in images of products such as mouthwash and toothpaste and does the shape and handle of certain dental brushes increase or decrease efficiency, if would not have the permission. To reduce bias and ensure objectivity as advised by TENK (2019) in our thesis we chose not to use sponsored products, mention specific dental clinics or accept financial aid or gifts to promote certain brands, products or services. The decision was made to not focus on any specific item features unless specially found to be evidence based and found published by the independent care recommendations of the Finnish Dental Association by public domain. Reflecting on this decision, this helped us stay focused on health issues and the nurse perspective of oral care and not a dentist or dental hygienist view on oral mouth care, a topic which there is already much research and articles written.

Bryman & Bell (2011) said that an ethical consideration in qualitative method was who we had access to interview or gather data from. Specifically choosing certain people may bias data gathering as responder may want to give easy answers or answers that we as researchers want to hear. For this reason, we use many credible secondary data sources, but we felt there was certain times that could use a primary data perspective. One of the authors family members is the director of a large private dental clinic in Helsinki and was willing to answer questions if we asked. To reduce bias, we did not use this person and when asking a question, it was asked by phone or email by the other unrelated authors. However, we support openness of research data in according with TENK (2019) as data should be considered at the planning of the research and accessible for further evaluation by other researchers, so despite anonymous collecting of data, there is a record of responses that the authors store online in a secure online storage.

The main primary data collecting source therefore will be a questionnaire to be answered by Laurea's nursing students. Questionnaire were sent online to the student affairs office from

where they passed it forward to the nursing groups that teachers had recommended us. We asked them to share the link to the students by their group code, so that we get enough possible data but without anybody being specifically targeted or selected.

The source materials were documented with in-text citations, and the complete list of references was included in the thesis work's references section. The authors created own pictures and secured a right to publish in the poster design pictures which was either from a dental clinic or the Finnish dental association, credit was attributed to source pictures when used. Following ethical guidelines of the university, all research involving university students requires a research permit from Laurea university, which the authors received before handing out the feedback questionnaires to the students. In general, the thesis' fundamental objective in terms of research ethics is to avoid inflicting harm as well as accomplishing good.

Informed consent was important to establish and receive in the beginning of the questionnaire, this means we are asking for permission and respondents willingly share their answers with us after we have shared what the goal of the research is, who we are as researchers and who else may be involved. A risk with conducting this way is that we do not get enough answers or respondents as the responders are they are voluntarily answering, but they can also refuse to participate. We also process data in ethical way and do not collect individual names, emails, names and will not be published to protect individual privacy. (TENK 2019, 9.)

7 Validity and Reliability

The term reliability and validity are used to assess the quality of research. They describe the accuracy with which a method, approach, or test measure something. Validity and reliability should be considered from planning research to writing the result of the research. If the research is constant with the method used to measure, it is reliable. Validity is about accuracy of the measure used in the research. The accuracy with which a method measures what it is supposed to measure is referred to as validity. While reliability is concerned with its consistency. (Khalid n.d.)

Reliability and validity were considered critical during the planning of this study to answer the research question and meet the purpose and goal of this study. Additionally, latest scientific studies that provide reliable evidence has been used in this research. The validity of a research depends on how accurately it measures what it claims, whereas reliability depends on how consistently it measures its subject. Also, high reliability indicates that the measurement is valid. As a result, if a method is unreliable, it is probably not valid, but reliability alone does not guarantee validity. This thesis is highly valid because the results are

consistent with fundamental properties. We are confident the same result can be consistently achieved using the same methods and under the same conditions, supporting the validity of this thesis, Validity may be more challenging to assess than reliability, but it is even more vital. (Nicolas 2021.)

To make our thesis more valid and reliable, we followed Laurea's thesis guidelines during the whole research process. There were various sources available related to our research topic. During the search for sources, each source was critically evaluated and the most useful were only selected based on keywords and research question. Each and all sources were evaluated from different perspectives to find the reliable and valid base for our research. The research results that were published before 2010 were omitted. We included the latest research results to make the thesis work more reliable and valid in current context. To make it more valid and reliable we followed the thesis supervisors' feedbacks and instructions carefully. Also, we did pick good advices for structuring and readability from the other seminar participants. The feedback on the posters from the questionnaire was positive but leaves further development open.

Plagiarism is an important aspect during any research work and sometimes it is also a problem for researchers. Presenting other's work, no matter intentionally or unintentionally without giving credit to the original author is plagiarism. (Helgesson & Eriksson 2014.) All the sources used in our research work are properly referenced to avoid the plagiarism according to Laurea's referencing guidelines. Laurea uses modified version of Harvard standard of referencing. Laurea thesis guidelines was properly followed in this research so, this research work can also be used as a source for future research reference. Pictures and experiences from BetterBite dental clinic were used in this research work, which made the research more reliable. Poster, the result of this research was sent to nursing students from Laurea for the evaluation after obtaining the research permit from Laurea. Ethical considerations were made during poster evaluation, all the information and data received from the poster evaluation were be kept confidential. After feedbacks were collected, poster was evaluated thoroughly.

8 Conclusion

This conclusion will summarize the key findings in relation to the research question and aim and provide the thesis contributions with its limitations and recommendations for further studies. Overall, the thesis discusses adult and elderly mouth health and care, the global challenge that shows in individuals well-being on minor to major scale. Specifically, the nursing aspect is addressed as it contributes to the guidance, encouragement and helping with the actual mouth care.

The thesis aimed to present support for the nursing students' learning about mouth health and care in form of a two informative poster pages. Furthermore, returning to the posters aimed to support students training at school or practical placement. The informativeness and meaningfulness of the posters and mouth health and care knowledge was inquired by creating a questionnaire for the nursing students. Findings of a mixed-method questionnaire for the nursing degree students at Laurea University of Applied Sciences suggest that the posters about adult and elderly mouth care are useful and easy to follow, and a need for further information about the mouth care exists. The findings side with Bagger & Kelly's (2008) thoughts about informative posters as efficient learning tools that enhance the nursing students' assimilation of knowledge. Furthermore, we agree with Ilic & Rowe's (2013) notion of the posters as motivational and facilitative in conveying messages especially in the healthcare context.

Based on the gathered answers mouth health and care's significance is recognized. As such, the posters engage with the Finnish Dental Association's (2008) work to provide the secondary schools with evidence-based information about the mouth health and care.

Main limitations of the thesis consist of the generalizability of the data and the lack of the experience in creating questionnaire and analysis. The low response rate may affect the perception of were the posters visually and verbally efficient as well as what the further recommendations will be about. Similarly, the limited experiences on the questionnaire creation and analysis may have created narrow understanding about the subject or create mislead conclusions. The lack of experience was improved by a rigorous and reflective process including external feedback. All answers, although few, were analysed explicitly. The few answers show for example interest towards information about the mouth related diseases and issues. As a future recommendation, this could be studied more.

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Adults and Aged Mouth Care for Nursing Students

Huda Hussaini-Koponen, Indu Basnet & Veera Siira

WHAT IS MOUTH CARE?

CLEAN MOUTH AND TEETH

TAKE CARE OF MOISTURE AND INFECTIONS

TREAT PLAQUE, TRAUMAS, INFECTIONS, AND ULCERS

SUPPORT HEALTH BY BALANCED DIET, AVOIDING DRUGS,

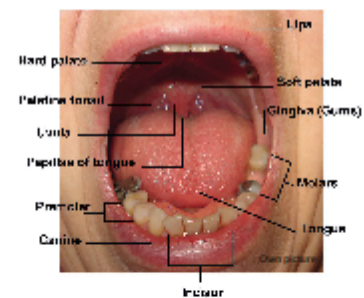
LOOK AFTER PHYSICAL & MENTAL WELL-BEING

MOUTH ANATOMY

Mouth processes the food with teeth, tongue and salivary gland, and transmits the processed food forward in to the digestive system. Mouth is also part of the speech production and can assist in the breathing.

The tongue is one bigger actor in the mouth by being a muscle that tastes things, and participates in chewing, swallowing, and speaking.

Mouth (Oral Cavity)



NURSE'S ROLE

HELP WITH DAILY MOUTH CARE

GUIDE PROPER MOUTH CARE

SUPPORT IN FINDING NEEDED MOUTH CARE SERVICES

ASSIST IN ACCESSING HEALTHY NUTRITION

DRUGS, TOBACCO AND CHEW

TOBACCO

Drugs harm mouth and teeth by strong acidity leading to erosion, by decreasing saliva production causing dry mouth, by exposing teeth to sugars leading to decay and infections, and by exposing mouth to cancerous substances.

5 COMMON MOUTH DISEASE, CONSEQUENCE & SELF-TREATMENT



DENTAL CARRIES

Mouth's acids and sugars dilute dental enamel and leads to holes on teeth.

The dental enamel breaks in 4 steps: on the surface, through the enamel, through the dentin/teeth bone, lastly to the pulp and creates an infection.

Self-treatment is daily teeth washing with fluoride paste.



PERIODONTAL

The untreated gingivitis/gum infection destroys slowly the gum.

The gum gets increasingly irritated, the teeth gets exposed to further damage as the gum vanishes, and in the end the teeth may come off.

Self-treatment is daily mouth care and avoiding drugs like tobacco.



ORAL CANCER

Is a malignant tumor on mouth, mostly on tongue, floor of the mouth, or on gums. Can be f.ex. a 2-week long symptomless ulcer. Connects strongly to drug usage.

Early detection improves the prognosis and decreases mortality rate.

Treatment required diagnosis by doctor (biopsy, clinical examination, blood samples...)



ORAL FUNGAL INFECTIONS

Burning sensation, pain, sensitivity, and bad breath follow due to poor mouth care inflaming a fungus, mostly the normal Candidiasis yeasts.

Untreated infection can cause continuous pain as well as exposes to malignant mutations and can affect the denture's fitting.

Self-treatment: proper daily mouth care. Cleaning mouth with water after eating and avoiding drugs like tobacco. Having a balanced diet.



ORO DENTAL TRAUMAS

The oro dental traumas can be either on jawbone or on the teeth due to several reasons.

Broken bones and dislocations cause pain and need mostly surgery.

As a first-aid with a loose tooth, it can be reconnected within 30 minutes by a careful push. The tooth can be carried f.ex. in milk, or in wet paper. A plastic patch can be also used.



Reference:
Finnish Dentist Association

Adults and Aged Mouth Care for Nursing Students

Huda Hussaini-Koponen, Indu Basnet & Veera Siira



AMMATTIKORKEAKOULU
University of Applied Sciences

BASIC EQUIPMENT

Mouth care should be done daily. **Toothbrushing** with **toothpaste** that contains **fluorine** is recommended to be done in the morning and evening. A **dental floss** can be used to clean the tooth gaps. Mouth care can include also **mouth wash**, that removes bacteria and freshens the mouth, and a **tool** to clean the top of tongue.



DENTURE CARE

Also **dentures** should be cared daily. Dentures can have a special **toothbrush** that is recommended to be used in the evening after taking off the prosthesis. Also mouth should be brushed. The dentures can be cleaned with a **pore tablet** in a cup once a week.



FURTHER EQUIPMENT

A dry mouth can be moisten with **food oil** or **special sprays**. Sometimes assisting with food cleaning requires protection for fingers, such as **silicone covers**, to hold the mouth open.

When mouth is especially sore, it can be cleaned by gently wiping **foldings** or with a **soft toothbrush**.

Using **xylitol products** such as **gums** and **sucking pastels** relieve the dryness of the mouth and decrease the acid attack in the mouth.

A **lip palm** is used to keep the lips moist and intact.



Reference:
Finnish Dentist Association

Appendix 3: Invitation letter



Invitation letter

14.4.2022

Dear participants,

We are Huda Hussaini-Koponen, Indu Basnet and Veera Siira, A bachelor's degree students from Laurea university of applied sciences. As part of our thesis, we have researched adult and elderly mouth care. One of the outcomes of our thesis has been designing an informative poster that will be used as part of the studies in Laurea for degree nursing students.

This is our reason why we invite you to participate in this research study by answering the attached questionnaire. It takes approximately 5 minutes to answer the questionnaire. From answering you will not get any compensation, and there are no risks related to participating in this survey. Names in the questionnaire are not needed. However, all the information of participants is kept confidential. Additionally, an electronic copy of the informative poster with the questionnaire link is attached in the thesis.

We ask you to answer all the questions honestly after reviewing both posters if you chose to participate in this survey. Consequently, participation is voluntary, and you can refuse to participate at any time.

Here we already thank you very much for taking your time to assist us to completing our thesis project. The feedback of yours will provide useful information regarding how to edit the poster and subjects for improving its outlook for better learning.

Research permit to undertake this thesis study was granted by Laurea UAS

Link to questionnaire:

<https://docs.google.com/forms/d/1LT4LQmbzlpDKrGOVHOMKmkkiVBKDsYooVL5sLLHpPSo/edit>

Best regards,

Huda Hussaini-Koponen huda.hussaini-koponen@students.laurea.fi

Indu Basnet indu.basnet@students.laurea.fi

Veera Siira veera.siira@students.laurea.fi

Supervisors,

Sanna Soini sanna.soini@laurea.fi

Riikka Mulder riikka.mulder@laurea.fi

Appendix 4: Questionnaire Questions

1. Year of study (background question)
2. How easy was this poster to follow? (Likert-scale 1-5)
3. How much new information did you learn about the mouth care from the poster? (Likert-scale)
4. How much did the poster support your learning? (Likert-scale)
5. How well did the visual layout support the information? (Likert-scale)
6. Which of the following would you want to know more: a) oral diseases, b) mouth care equipment and proper guidance, c) mouth care guidance information? (Multiple choice)
7. Would you introduce or recommend this poster to someone else? If yes, whom? (open-ended question)

Appendix 5: Research Permit

1.5.2022

Research permit application should contain at least following elements.
If needed, you may give additional information in attachments. Send the application in Word-document -format to Laurea's contact person.

Name: <i>Huda Hussaini-Koponen, Indu Basnet, Veera Siira</i>	
Title: <i>Bachelor of HealthCare</i>	
E-mail: huda.hussaini-koponen@student.laurea.fi ; indu.basnet@student.laurea.fi ; veera.siira@student.laurea.fi	
Date <i>14.4.2022</i>	
[Research, thesis, etc.] Author(s) /investigator(s):	<i>Huda Hussaini-Koponen, Indu Basnet, Veera Siira</i>
Degree programme / college / university:	<i>Degree Programme of Nursing / University of Applied Sciences Laurea</i>
Unit/ department:	<i>Laurea UAS Tikkurila</i>
[Research, thesis, etc.] Instructor(s):	<i>Sanna Soini, Riikka Mulder</i>
Title of the {research, thesis, etc.}:	<i>An informative poster for nursing students about adult and elderly mouth care</i>
Objectives / research problem:	<i>Aim: To produce a guiding poster for nursing students dealing with oral care which can also be used as a supporting teaching.</i> <i>Purpose: Improve overall understanding of good oral hygiene practices for nursing students. Raise awareness to provide responsible mouth care.</i>
Concise definition	Needed information: <i>Laurea student office contact information, the email.</i>

1.5.2022

of what information is needed, the format in which they are needed and how the information is delivered:	<p><i>The invitation letter and questionnaire are passed to the Laurea Tikkurila's student office, who will pass on the request to participate the project (a poster and a questionnaire), and a link to the project. Student groups: SNV221SN, SNV220SN, SNV219SN, SNV221KN.</i></p> <p><i>No contact information is collected or saved for any usage from the participants.</i></p>		
Timetable (in two months accuracy):	<p><i>Receiving research permit asap after getting the thesis plan accepted (date 14th of May 2022). Sending the request of the project & link to the questionnaire for the participants (open during 19th of May 2022 to 24th of May 2022).</i></p>		
Attachments (research plan, questionnaire, framework for theme interview, privacy statement etc.):	<p><i>Thesis plan, poster, questionnaire, invitation letter/privacy statement</i></p>		
Filled by issuer of permit at Laurea	Research permit is granted	Research permit is not granted	
	Grounds		
Name of the issuer of permit: Date:			

Research permit is granted on the condition that applicant complies with legislation when processing and saving personal data. All data is confidential and provided only for purposes of survey/research in question. The applicant is responsible for securing identity and anonymity of persons in data provided. After the survey/research is completed, the applicant is responsible for deleting the data in appropriate manner.

If personal data file is created during the research (Personal Data Act -523/1999- Section 10) then applicant must comply with the provisions of law when processing and protecting of personal information. If necessary, the application must be accompanied by Scientific Research Register Description.

Research permit application 3 (3)

1.5.2022

The applicant is responsible for providing positive decision to a person who will provide information at Laurea. Practical implementation of survey is negotiated at this point.