ORAL HEALTH CARE PERFORMANCE FOR INPATIENTS AMONG NURSES AT HANOI CITY HOSPITALS, VIETNAM

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Thesis
entitled

FACTORS RELATED TO THE CONTRACEPTIVE USE AMONG MARRIED MIGRANT WOMEN OF REPRODUCTIVE AGE IN MAESOT, TAK PROVINCE, THAILAND

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ABSTRACT

Poor oral health care increase severity of systemic related diseases. Oral health care performance (OHC) for inpatient by nurses was not well practiced at hospitals in Hanoi. A cross sectional survey was conducted to assess the OHC performance for inpatients and its related factors among 300 nurses at Surgery, Obstetric, Diabetes and Cardio-Vascular wards, in seven purposively selected hospitals in Hanoi, Vietnam during January 2008.

The OHC performance was based on ten criteria such as assisting patients to brush their teeth; encouraging/supervising patient's self-care, help brushing their teeth or instruction to patient to clean their own denture, ect. It was found that type of clinical ward was statistically significantly associated with OHC performance (χ^2 = 18.96; p= 0.004). Attitude on OHC, training during college time, supervision on OHC were statistically significantly associated with increased in OHC performance (χ^2 = 10.41; p=0.034); (χ^2 = 16.09; p<0.001) and (χ^2 =25.40; p<0.001) respectively. Training during working time, patient workload were statistically significant associated with decreased in OHC performance (χ^2 = 8.155; p=0.017 and χ^2 = 7.073; p=0.029) respectively.

Result from logistic regression model showed that OHC performance was best predicted by supervision on OHC (β= 1.24; OR=3.8; 95%CI: 1.6-6.6). On the contrary, patient workload was inversely associated with OHC performance (β= -0.71; OR=0.52; 95%CI: 0.3-0.9).

It was concluded that the OHC performance needs to be improved through continuing education on oral health care, more regular supervision and provision of oral health care regulation at hospital level. It was suggested that the hospitals should facilitate working condition, instrumentation and training programs supporting for nursing oral care.

KEY WORDS: ORAL HEALTH CARE PERFORMANCE/ INPATIENTS/
HANOI/VIETNAM

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LIST OF ABBREVIATIONS

WHO	:	World Health Organization
WHA	:	World Health Assembly
ICU	:	Intensive Care Unit
VAP	:	Ventilator associated Pneumonia
CVD	:	Cardio vascular diseases
CRP	:	C-reactive protein
LPS	:	Lipopolysacharide
OHC	:	Oral Health Care
MOH	:	Ministry of Health

CHAPTER 1
INTRODUCTION

1.1 Rationale and justification of the study

Oral diseases, such as dental caries and periodontal diseases are most common chronic infectious diseases. Most caries and periodontal diseases are preventable, as recommended by resolution WHA 53.17 of the Fifty-third World Health Assembly in 2000 (1). However, the consequences of oral diseases are not only affected to oral cavity, but also to other systemic diseases such as diabetes, cardio-vascular diseases, or respiratory diseases, preterm and low birth weight (2).

There are several bacterial strains in normal flora of the oral cavity. Most of them are pathogens. Bacteria exist mainly inside the dental plaque and dental calculus and on the surface of soft tissue. Dental plaque was formed from mixture of food, saliva and other organic compounds inside oral cavity and it is the main cause of oral diseases (3, 4).

1.1.1 Etiology of Dental caries

Dental caries is a multi factorial nature of disease and resulted from dental plaque, diet and tooth itself. The cycle of disease was presented in 1960 as a model of overlapping circles with three major factors: dental plaque, bacteria, and sugar consumption. The causal model of caries has been evolved with other risk factors such as time, fluoride, saliva, and lack of clinical dental care (5).

Streptococcus mutant is bacterial micro organs grown in dental plaque, which is predominant causing dental caries. Due to the accumulation of acid produced by streptococcus mutant, resulting in lower pH level in saliva, causing demineralization of the enamel, therefore causing dental caries.

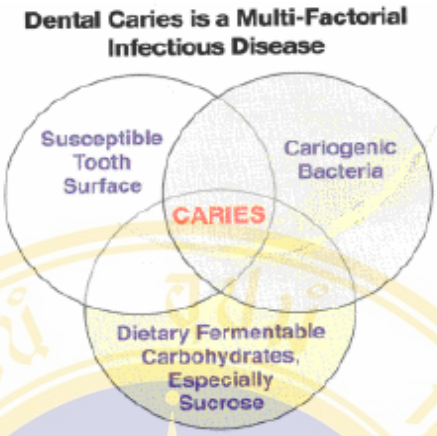

Figure 1 Dental Caries Circles

Enamel mainly consists of calcium phosphate in the form of pyramid, which is demineralized when the pH level of environment is lowered by organic acids and pyramid structure will be destroyed leading to dental caries. The bacteria will continue to produce acid and then destroy the dentin and further penetrate the dental pulp leading to pulpal infection and this will lead to dangerous infection transmitted to other organs in the body through the circulatory system of dental pulp.

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1.1.2 Etiology of periodontal diseases

Periodontal disease is chronic infectious diseases due to accumulation of dental plaque that come from poor oral and dental hygiene condition. If calculus is located at cervical area and under the gum, it would lead to creating periodontal pocket, which lead to the destination of destroying of periodontal ligament and supporting tissue. Therefore the tooth will be mobilized and eventually lost. This infection also lead to infection of other organs and may leading to other systemic diseases such as cardio-vascular related conditions (6).

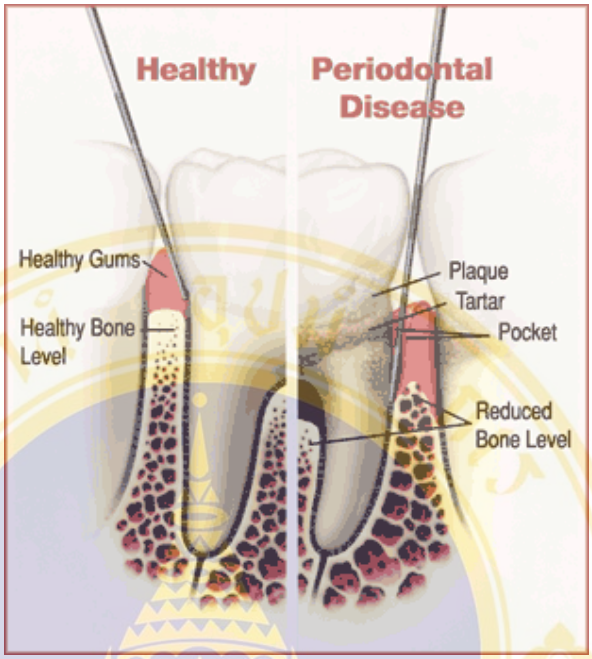

Figure 2 Diagram of periodontal disease

Gingivitis and periodontitis are usually initiated in the space room between two teeth due to calculus or plaque deposition. If dental plaque is removed regularly everyday by brushing and flossing, the risk of disease will be minimized (6).

1.1.3 Oral Health Situation in the World

In the developed countries, even great progress has been made over last 30 years for control of dental caries and periodontal diseases, the rate of dental caries is about 50% in children. About 20% is in high risk group which have more than 4 teeth affected.

In developing countries, most people have 5 or 6 tooth decayed, however almost of their dentition remain until old age. However, the oral disease has been on the increasing trend, this is due to changes in dietary and other food habits, and often linked with migration to urban area (7).

1.1.4 Oral Health Situation in Vietnam

In Vietnam, according to the recent report of National Oral Health Survey in Vietnam in 2001 (8), the prevalence of dental caries in community was about 90% of total population. Prevalence of periodontal diseases was also around 90%. Major cause of high prevalence of common oral diseases in Vietnam included low level of fluoride in water and lack of oral health care service (8, 9).

Table 1 Prevalence of Oral Disease in Vietnam, 2001

Age	Prevalence of dental caries	Prevalence of periodontal diseases
12	57 %	95%
15	60%	95.6%
35-44	72%	99.26 %

1.1.5 Oral health - general health relationship

There are proven evidences that oral health has been closely related to general health. Severe periodontal disease, for example, had been found to be associated with diabetes. There were several study demonstrated the link between oral and systemic diseases such as cardio-vascular diseases, diabetes, pneumonia, and preterm-low birth weight (10).

The mouth, the lungs, intestines, and genitourinary tract are potential entry sites of bacteria may gain access to the body. Several systemic diseases can result from infectious oral microbes, especially in patients with immunological and nutritional deficiencies, where oral microbes are penetrated systemic access. Therefore, the control of existing oral infections is clearly of great importance and a necessary precaution to prevent systemic complications.

1.1.6 Oral Health Care protocol among nurse

Oral health care protocols among nurses for inpatients are mainly based on the daily removal of bacterial plaque from teeth or prostheses or both, in addition to cleaning of oral mucosa, and continual oral rehydration (11). These practices can be facilitated by using of electric toothbrushes and mouth rinsing products such as chlorhexidine mouth wash, fluoride toothpastes, and rinses or gels for dry mouth. This type of protocol should include collaboration with dental professionals in order to provide the nursing staffs a continuous training program on OHC issues (12).

1.1.7 Holistic Patient Care in Vietnam

In Vietnam, the Ministry of Health promulgated Hospital Regulation in 1997, which was oriented to holistic health care. This also included oral health care by physician, nurses and other health personnel. After ten years of implementation, the quality of nursing service was improved. At hospital level, due to different reasons this regulation was not issued clearly as for job description of nurses. Therefore, oral health care for patients has been mainly implemented by individual care or assistance from care giver (13).

The proportion of nurse per population in Vietnam in 2006 was about 6.27 nurse/10,000 population (14). Compare with European countries this proportion is about 60.2/10000 population (15).

Most Vietnamese hospitals are facing with problem of patient overload, which has been a challenge on quality of care for patients as well as hospital service. The ratio of nurse and patients was one nurse per 10 patients, this was low for surgical department. In some specific clinical ward, one nurse is responsible for 20 to 30 patients, especially at night time. There were 3740 hospital beds for all of hospital under Hanoi Health Department. It means that one nurse will be responsible for more than 2 patient’s bed (16).

- Nursing Oral Care for inpatient among nurses in Vietnam

In general, the nursing oral care for inpatients among nurses in Vietnam was inadequate. Despite the regulation has been issued by MOH on holistic care in hospital since 1997, there was not adequate rule and guidelines on OHC for inpatients. This situation exists from long history ago with perception that oral care was responsible of dentist or oral health professionals only.

- Training and Education of Nursing Oral Care in Vietnam

In Vietnam, the system of Nursing Colleges provided training curriculum for nursing students in oral health care including:

- Anatomy of Odonto-Maxillofacial system
- Periodontal diseases and Dental caries
- Pulpitis/ Root canal infection
- Extraction and post operative care
- Maxillo-facial trauma care

During the study course, students had 15 hours of lecture and 20 hours of practice in ward. Students would be exposed to daily nursing care for patient including oral health care in hospitals. Total course was about 4 weeks including practice in hospitals (17).

In Vietnam, there was not yet any study about the oral health care performance for inpatient among nurses. As above mentioned, the oral health care has been one of the components in holistic patient care regulation of the Ministry of Health since 1997. In fact, the implementation has not been adequate. The aim of this study was to conduct a survey on oral health care performance for inpatients among nurses at hospitals in Hanoi city and to identify the factors related with oral care for patients of nurse. The contribution of this study was to find the solution and policy that encourage provision of oral health care for inpatients as an essential part of holistic care, and further to recommend for the supplementation of training curriculum in nursing college.

1.2 Research question :

1.2.1 What is the characteristic of oral health care performance for inpatients among nurses at hospitals in Hanoi city, Vietnam?

1.2.2. What are the factors related to oral health care performance for inpatients among nurses at hospitals in Hanoi city, Vietnam?

1.3 General objectives :

To study oral health care performance for inpatients and its related factors among nurses at hospitals in Hanoi city, Vietnam.

1.4 Specific objectives:

1.4.1 To assess the oral health care performance for inpatients among nurses at hospitals in Hanoi city.

1.4.2 To identify factors namely

- Socio-demographic characteristics of nurses including age, gender, clinical ward, working duration
- Predisposing factors including: knowledge about oral health care issues, attitude toward oral health care
- Enabling factors including: training background on oral health care, skills of oral health care for patients
- Reinforcing factors including: patient workload, supervision on oral health care

1.4.3 To determine the relationship between oral health care performance of nurses at Hanoi city hospitals and related factors named predisposing, enabling and reinforcing factors.

1.5 Conceptual Frame Work

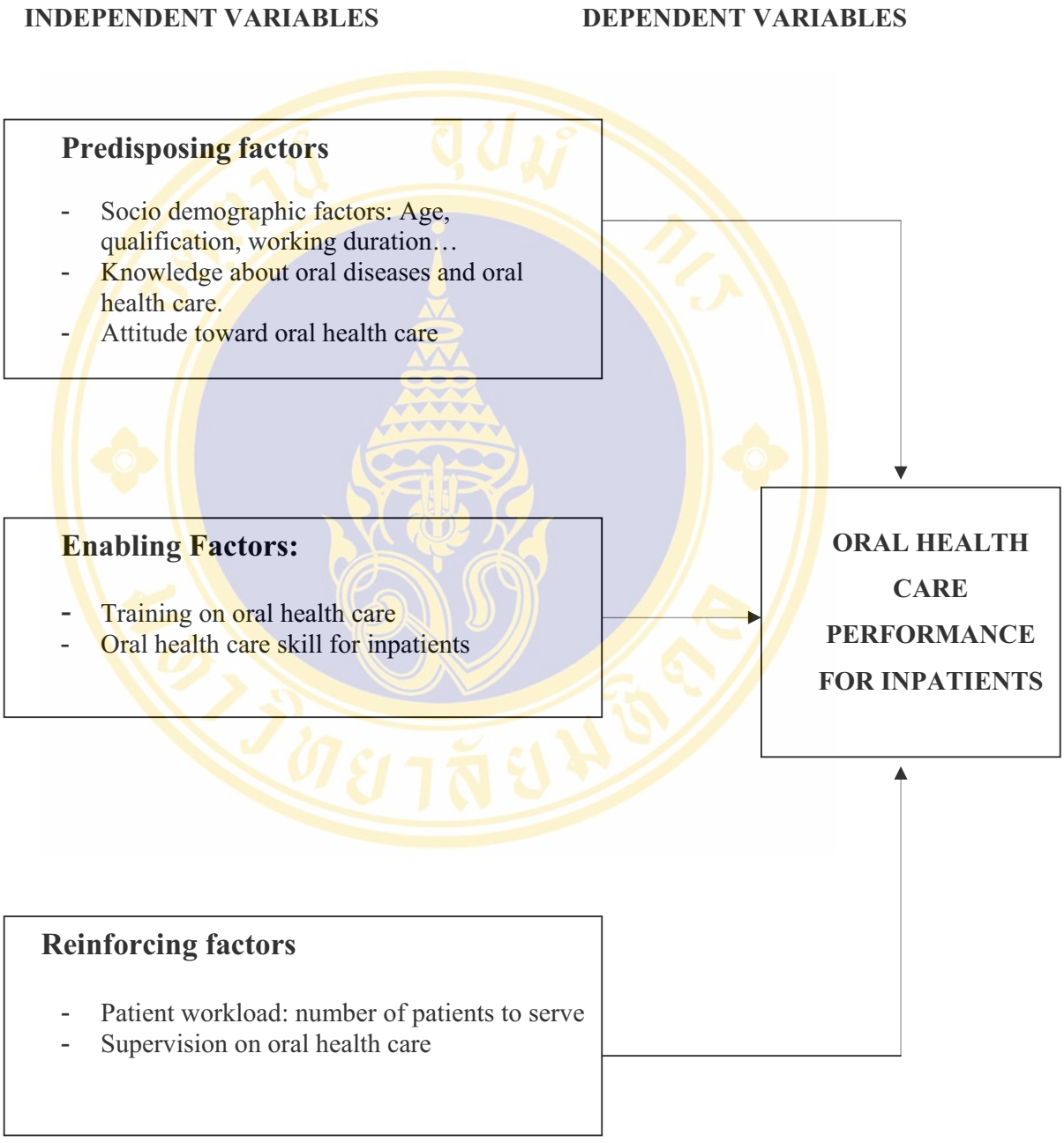

Figure 3 Conceptual framework

1.6. Operational definition of studied variables

1.6.1 Independent variable

a. Predisposing factors

Socio-demographic factors as follows:

- Qualification was defined as respondent's level of training including certificate and bachelor degree, or some other specified degree.

- Type of clinical wards of this study included Surgery, Obstetrics, Cardio-vascular and Diabetes Wards.

- Duration of working was defined as number of working years of a nurse in the selected clinical ward.

Knowledge about oral diseases and oral health care

In this study knowledge focused on causes and symptoms of common oral diseases as dental caries, periodontal diseases and prevention of oral diseases, and oral health care for inpatients with systemic diseases.

Attitude toward oral health care and oral hygiene practice

In this study, it referred to the opinions of nurses toward the importance of oral health care and its prevention among patients with regard to systemic diseases.

b. Enabling factors

- Training background on oral health care:

In this study, it referred to the respondent's background on oral health care training during college year or while working, or other training activities that they have participated.

- Oral health care skills:

This referred to oral care practice skills for inpatients included skills on oral hygiene practice and denture hygiene care for inpatients.

c. Reinforcing factors

- **Patient workload**: number of inpatients that one nurse had to be in daily charge on clinical ward.
- **Supervision on oral health care** referred to the involvement of hospital dentist on oral health care on the patients in the wards. It was also considered as the involvement of Chief of Nurse or Physician in oral health care supervision.

1.6.2 Dependent variable

- Oral health care performance for functionally dependent inpatients: in this case patients can do oral hygiene in bed and they need partial assistance from the other to brush their teeth or mouth rinse. These activities include assistances for patients to brush their teeth, to rinse their mouth and clean the denture for patients
- Oral health care performance for functionally independent inpatients: this was the condition that patients can practice each own oral hygiene care. The nurse would monitor and encourage patients to practice oral hygiene by themselves.

1.7 Limitation of the study

This study was focused only on nurses at Surgery, Obstetric, Cardiovascular and Diabetes ward. The result was only representative for nurses at selected clinical wards. It may not well be represented for entire nursing professionals in Hanoi city hospitals. Further more, almost hospital involved in this study were in central and provincial level, the patient workload in hospital was very high, therefore the answer sheet by self-administered questionnaire might not be fulfilled and the data collected may receive missing values or incorrect answers due to the limitation of time of respondents in answer questionnaire.

Some other clinical wards such as respiratory, oncology, gerontology wards were not investigated adequately. Therefore this result might not be generalized.

CHAPTER 2
LITERATURE REVIEW

In this chapter, the author introduced the background and updated information on oral health care performance for patients in hospital; relationship between oral diseases and systemic diseases; theoretical framework applied in this study and critical review of previous related studies.

2.1 Over view of oral health care

Oral health care was not adequately considered in most protocols on personal hygiene and general health for patients in hospitals, long-term care units with nursing care but no complex medical facilities, and it was poorly addressed by health policies aimed at the community. Oral health, although rarely life-threatening, played an essential role in the quality of life, management of medical problems, nutrition, and social interaction of the elderly. However, there appears to have been no improvement over the past few years in the oral health status of patients, especially among those at high risk for oral disease. These high-risk groups include elderly people, patients with diabetes, cardio-vascular diseases and pregnancy women in institutions or who were functionally dependent for activities of daily living. Briefly, they were characterized by poor tooth and prosthesis hygiene; presence of few functional teeth; edentulous mouths; and dry mouth, which could severely impair well-being. There was firm evidence of the oral etiology of some respiratory and cardiovascular diseases.

There was consensus that any oral hygiene technique, procedure, or set of guidelines must focus on the removal of bacterial gram-negative germs. However, dental researchers were still debating the ideal oral health care system and equipment and the optimal frequency of applications, as well as who should be responsible for oral health. Interestingly, most articles on strategies and guidelines for good oral hygiene practices have appeared in the nursing and critical care literature, although

little was known about the influence of these publications on the behavior of caregivers. However, the design of action strategies and guidelines should follow an audit of the center, including the collection and analysis of relevant characteristics of residents or patients, such as their conscious or unconscious state, the presence of nasogastric tubes, or the need for mechanical ventilation. The study also included an assessment of the facilities at the center and of the training and degree of cooperation of the nursing staffs (11).

2.1.1 Nursing oral health care

According to Orem's nursing theory, nursing care for inpatients includes nutrition care, body hygiene care and other vital signs monitoring (18). Regarding the holistic patient care regulation by MOH in 1997, the scope of nursing care in hospital must cover physical, social, spirit and essential medical care, in which oral health care is a necessary component of nursing care.

The oral cavity is not separate from the rest of the body so that oral bacteria could contribute to declining general health of the body. The oral health care includes professional oral care in treatment of diseases and other preventive action to avoid oral diseases and its effect to general health.

Most of the evidence related to dental caries prevention and control of periodontal diseases. Those diseases could be prevented by good personal oral hygiene practices, including brushing and flossing which were important also to the control of advanced periodontal lesions. Community water fluoridation was effective in preventing dental caries in both children and adults. Professional and individual measures, including the use of fluoride mouth rinses, gels, toothpastes and the application of dental sealants were additional means of preventing dental caries.

Individuals could take actions for themselves and for persons under their care, to prevent disease and maintain health. By appropriate diet and nutrition, primary prevention of many oral, dental and craniofacial diseases can be achieved. Lifestyle behavior that affects general health such as tobacco use, excessive alcohol

consumption and poor dietary choices affect oral and craniofacial health as well. These individual behaviors were associated with increased risk of craniofacial birth defects, oral and pharyngeal cancers, periodontal disease, dental caries, oral candidiasis and other oral conditions.

The impact of oral diseases were painful, suffering, impaired function and reduced quality of life. Treatment was estimated to account for between 5-10% of health care costs in industrialized countries, and was beyond the resources of many developing countries (19).

Oral health care performance for inpatient depended on the situation of the patients. In case patients can do by themselves, they need the guideline or remind from nurses or caregivers. In case patient can not do by themselves, nurses and caregiver would be responsible to do oral hygiene for patients. The oral cavity must be cleaned and dried after meal and before sleeping at night time. According to the Ministry of health of Vietnam, the critical levels of patient care were classified by three levels:

- Level 1: Patient are unable to do individual oral hygiene care due to serious illness, nurses are responsible to do it for patients.
- Level 2: Patient can do individual hygiene with limitation of movement, so they need the assistance from nurses and caregiver to do it.
- Level 3: Patient can do individual hygiene by themselves, so they need the guideline and remind from nurses or caregivers (20).

2.1.2 Oral health care protocol by nurses.

Oral health protocols are mainly based on the daily removal of bacterial plaque from teeth or prostheses, cleaning of oral mucosa, and continual oral hydration. These practices are facilitated by the use of toothbrushes and products such as chlorhexidine, fluoride toothpastes, and rinses or gels for dry mouth. This type of protocol should include regular collaboration with dental professionals and provide a program of continuous training for nursing staff on oral health issues (11).

2.1.3 Instrument for nursing oral health care

In clinical practice, instrument for OHC performance included (21):

1. Toothbrush: should be included both adult and children size, the soft-bristled is recommended in order to reach the posterior aspect of the patient's mouth.

2. Cotton/foam stick: Other tools commonly available for mouth care include cotton and foam swab both of which have been reported to have very little plaque delibriding ability. Although, in practical the toothbrush has been demonstrated to be more effective than cotton/foam swabs in removing debris and plaque

3. Toothpaste: toothpaste is not considered crucial for plaque elimination, the effect of fluoridation has been considered essential in prevention of dental caries.

4. Mouth rinse: This item should include chlorhexidine 0.1-0.2% is most effective anti plaque agent. **Chlorhexidine** works by binding to negatively charged sites on tooth enamel and mucosal cells. This action result in a reduction of microbial adherence to the tooth and mucosal cells. *Hydrogen peroxide 1%* has been used for more than 70 years as mouth rinse and it is still used both professional dental and self-administered hygiene care. **Sodium Chloride,** there is some evidence that the use of sodium chloride mouth rinses can promote healing of oral mucosal lesions. This product is still widely used in clinical practice in Vietnam. *Water,* to provide moisture to and remove debris from, the oral cavity of intensive care patients may be underestimated. Water, a safe, ubiquitous solution can be used in combination with a small, soft-bristled toothbrush to clean the teeth and gums. **Povidone-iodine:** This solution has been used for many years in general wound care including post-operative wounds of the oral cavity.

5. Tongue brush: This item is also recommended to apply for inpatient and it is more convenience with functionally independent patients. In that case, patients can practice by themselves and the effective of this instrument is to minimize of microbial flora in side oral cavity.

2.2 Systemic effect of oral diseases

Periodontal diseases were groups of condition in which inflammation and destruction of the attachment apparatus of the teeth (mobility of the teeth, gum bleeding, and gum inflammation). Factors that place on individuals at high risk of periodontitis may also place them at high risk for systemic diseases such as cardiovascular disease. Tobacco smoking, stress and aging were common risk factors for both periodontitis and systemic disease. Studies have demonstrated that genetic factors shared by periodontitis, cardiovascular disease and preterm labor are common.

From the available literature it appeared that total numbers of leukocytes and plasma levels of C-reactive protein (CRP) were consistently higher in periodontitis patients compared to healthy controls. Red blood cells count and levels of the hemoglobin were lower in periodontitis and there was a trend towards anemia of chronic disease. Periodontitis was associated with cardiovascular diseases.

2.2.1 Oral diseases and Pneumonia

Pneumonia can result from anaerobic bacteria and dental plaque seems to be a logical source of these bacteria, especially in patients with periodontal disease. Such patients harbor a large number of subgingival bacteria, particularly anaerobic species.

The oropharynx of a healthy person is a microbially rich environment. Streptococcus salivarius, a viridans streptococcus that is one of the first organisms to colonize the oropharynx, can be isolated from the oropharyngeal cavity of infants as soon as 18 hours after birth. A healthy person’s oral flora remains stable over time. However, within 48 hours of admission to a hospital, the composition of the oropharyngeal flora of critically ill patients undergoes a change from the usual predominance of gram-positive streptococci and dental pathogens to predominantly gram-negative organisms, constituting the more virulent flora, including pathogens that may cause pneumonia (22).

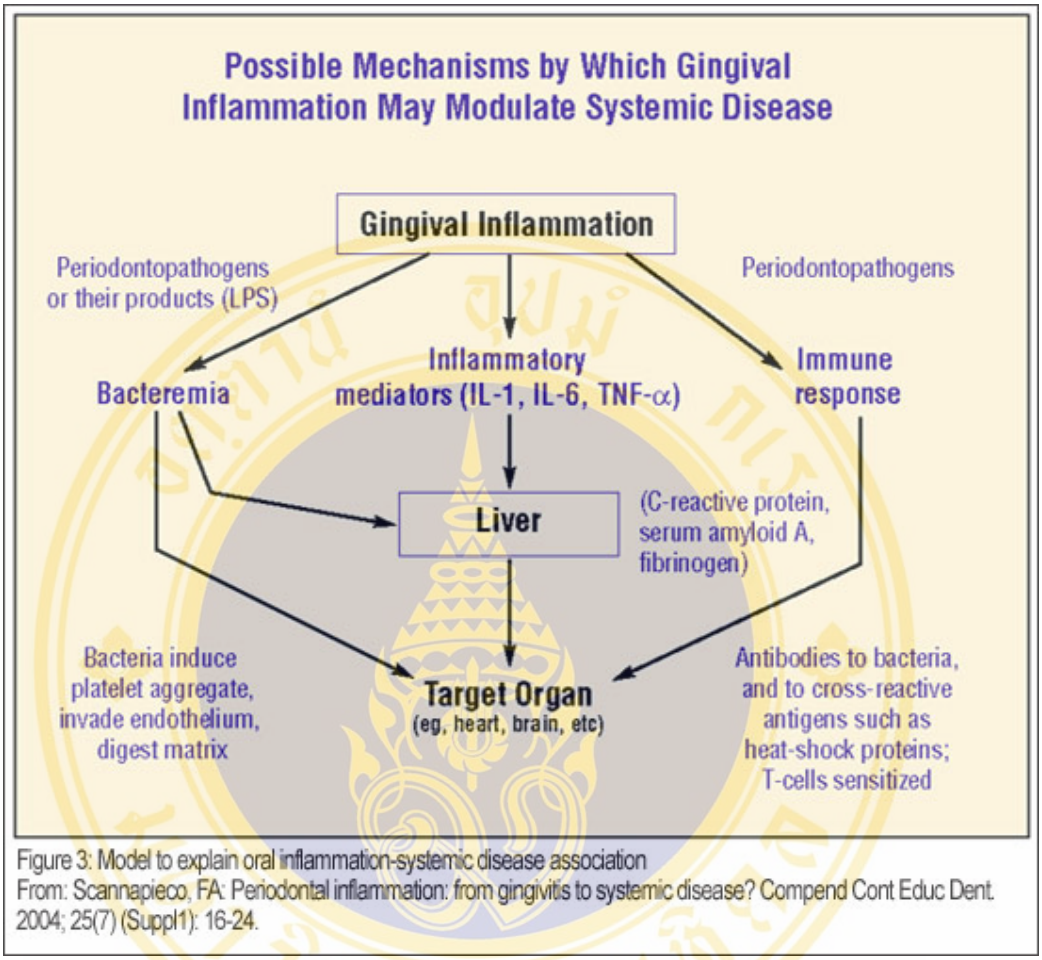

Figure 4 Mechanism of gingival inflammation-systemic disease association

2.2.2 Oral diseases and diabetes

Periodontal disease often coexists with severe diabetes mellitus. Severe periodontal disease increases the severity of diabetes mellitus and complicates metabolic control. An infection-mediated upregulation cycle of cytokine synthesis & secretion by chronic stimulus from LPS and products of periodentopathic organisms may amplify the magnitude of advanced glycation end product medicated cytokine response in diabetes mellitus. Cytokine upregulation explains the increase in tissue destruction seen in diabetic periodontitis and how periodontal infection may complicate the severity of diabetes and the degree of metabolic control (10).

If a patient has been diagnosed with diabetes, it is expected to have problems related to eyes, nerves, kidneys and heart, as well as other parts of the body. Diabetes could lower the immune response and slow down the healing process. The most common oral health problems associated with diabetes are tooth decay; periodontal (gum) disease; salivary gland dysfunction fungal infections; lichen planus and lichenoid reactions (inflammatory skin disease); infection and delayed healing; taste impairment.

When diabetes is not controlled properly, high glucose levels in saliva may help bacteria thrive. Brushing teeth twice a day with fluoride toothpaste and leaning once a day between teeth with floss or an interdental cleaner helps remove decay-causing plaque. Plaque that is not removed can eventually harden (calcify) into calculus, or tartar. When tartar collects above the gumline, it becomes more difficult to thoroughly brush and clean between teeth. This can create conditions that lead to chronic inflammation and infection in the mouth.

Periodontal diseases are infections of the gum and it is the alveolar bone that holds the teeth in place. Periodontal disease often is linked to the control of diabetes. For example, patients with inadequate blood sugar control appear to develop periodontal disease more often and more severely, and they lose more teeth than do people who have good control of their diabetes. Signs and symptoms of periodontal diseases are as follows:

- red, swollen or tender gums;
- gums that have pulled away from the teeth;
- pus between the teeth and gums when the gums are pressed;
- persistent bad breath or bad taste in the mouth;

In patients with seriously ill or limitation of moving, if oral health care or daily oral hygiene practice is inadequate the other infection may occur such as fungal infection. Oral candidiasis, a fungal infection in the mouth, appears to occur more frequently among people with diabetes, including those who wear dentures. If patients smoke and have high blood glucose levels or often are required to take antibiotics,

they are more likely to have a problem with fungal infections in the mouth. Diminished salivary flow and an increase in salivary glucose levels create an attractive environment for fungal infections such as thrush. Thrush produces white (or sometimes red) patches in the mouth that may be sore or may become ulcers (23).

2.2.3 Oral diseases and cardio-vascular diseases (CVD)

Periodontal disease is initiated by the exposure of the periodontium to dental plaque, biofilms that accumulate on the teeth to form bacterial masses. Periodontal destruction results from the action of various toxic products released from pathogenic subgingival plaque bacteria, as well as from the hosts inflammatory responses elicited against plaque bacteria and their products (24).

- Risk factors for CVD and periodontal diseases

Those suffering from CVD have worse periodontal conditions than healthy individual. Also, patients with periodontal disease seem to have a higher risk of developing CVD. Both CVD and periodontal disease share some common risk factors such as diabetes, smoking, low socio-economic status and stress, which could mean that they only are related as to the underlying cause. However, it has been proposed that periodontitis could act as a risk factor itself, contributing to the development of atherosclerosis.

The first carefully planed case-control studies focusing on the association on periodontitis and CVD were performed in Finland in the late 1980´s. Today several epidemiologic studies in North and South America and in Europe suggest a correlation between periodontitis and CVD. Number of missing teeth, alveolar bone loss and different oral health indices have been related to prevalence of ischemic heart disease, when controlled for age, hypertension, geographic area, education and smoking.

Mechanisms behind the association are not known, however potential pathogenic mechanisms are under investigation. Most theories are based on the fact that the process of atherosclerosis in addition to genetic and dietary influence is

affected by bacteria, bacterial products or by additional inflammation. Periodontitis is a chronic inflammatory disease, which can result in increased levels of certain serological risk-markers for atherosclerosis as for example C-reactive protein, leukocytes, certain cytokines, the lipid profile and fibrinogen. This increases the risk of thrombocytes to coagulate and create atheromatous plaque. Improvements in these risk-markers have been observed in some interventional studies as the result of periodontal treatment.

The prevalence of CVD seems to be highest in those individuals whom periodontitis coexist with elevated CRP levels. This may indicate that periodontitis is a risk factor in individuals who react to the infection with a systemic inflammatory and immune response, which may be due to genetic reasons. Further research however is needed to determine the biological and actual linkage between two of the most frequently occurring diseases (25).

2.2.4 Oral diseases and Preterm and low birth weight

Changes in hormone levels during pregnancy promote an inflammation termed as pregnancy gingivitis. Oral infections seem to increase the risk for or contribute to low birth weight in newborns. A gram negative infection, periodontal disease may have the potential to affect pregnancy outcome. During pregnancy, the ratio of anaerobic gram negative to aerobic bacteria increases in dental plaque in the second trimester. The gram negative bacteria associated with progressive disease can produce a variety of bioactive molecules that can directly affect the host. One microbial component, LPS (lipopolysaccharide), can activate macrophages and other cells to synthesis and secrete a wide array of molecules, including the cytokines, TNF- , IL1, and PGE2. If they escape into the general circulation and cross the placental barrier, they could augment the physiologic levels of PGE2 and TNF- in the amniotic fluid and induce premature labor. The periodontitis may be marker for preterm delivery susceptibility as well as potential risk factor (10).

2.3 Theoretical Framework

The PRECEDE-PROCEED model provides a comprehensive structure for assessing health and quality-of-life needs and for designing, implementing, and evaluating health promotion and other public health programs to meet those needs. PRECEDE (*P*redisposing, *R*einforcing, and *E*nabling *C*onstructs in *E*ducational *D*iagnosis and *E*valuation) outlines a diagnostic planning process to assist in the development of targeted and focused public health programs. PROCEED (*P*olicy, *R*egulatory, and *O*rganizational *C*onstructs in *E*ducational and *E*nvironmental *D*evelopment) guides the implementation and evaluation of the programs designed using PRECEDE (3).

PRECEDE consists of five steps or phases (see Figure 5). Phase one involves determining the quality of life or social problems and needs of a given population. Phase two consists of identifying the health determinants of these problems and needs. Phase three involves analyzing the behavioral and environmental determinants of the health problems. In phase four, the factors that predispose to, reinforce, and enable the behaviors and lifestyles are identified. Phase five involves ascertaining which health promotion, health education and/or policy-related interventions would best be suited to encouraging the desired changes in the behaviors or environments and in the factors that support those behaviors and environments.

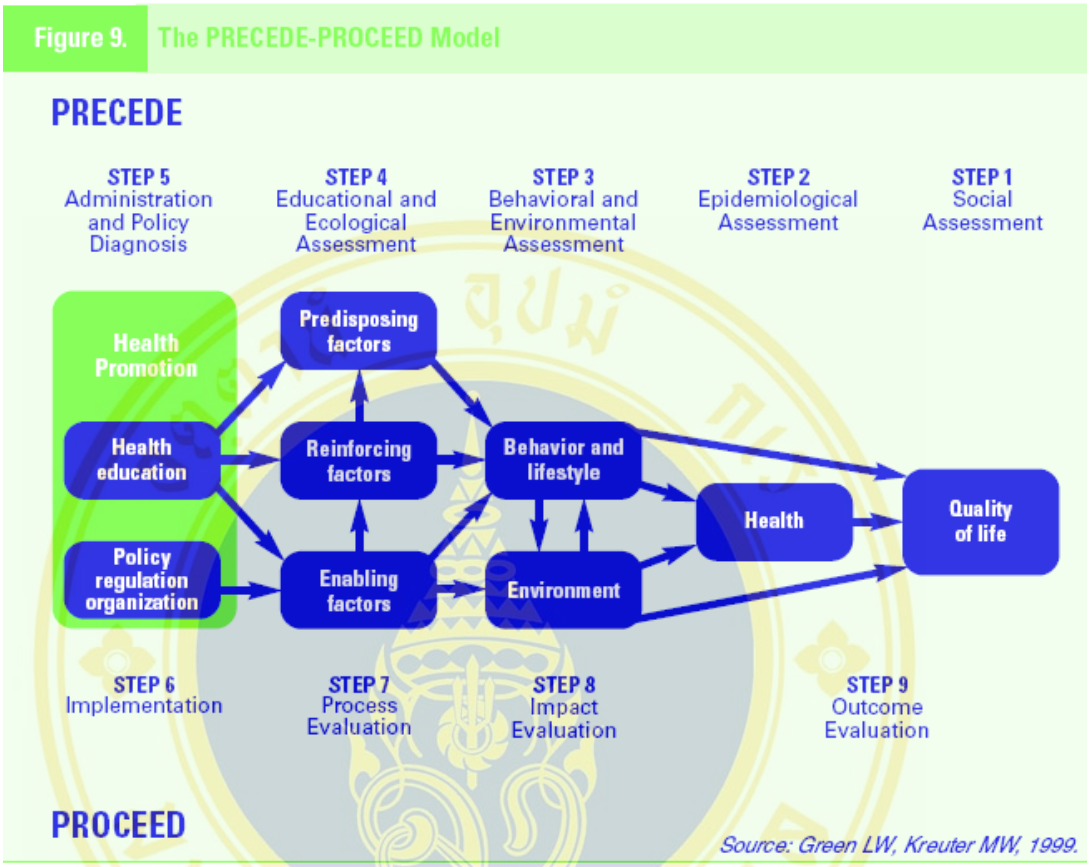

Figure 5 PREDEDE/PROCEED Model

In actual practice, PRECEDE and PROCEED function in a continuous cycle. Information gathered in PRECEDE guides the development of program goals and objectives in the implementation phase of PROCEED. This same information also provides the criteria against which the success of the program is measured in the evaluation phase of PROCEED. In turn, the data gathered in the implementation and evaluation phases of PROCEED clarify the relationships examined in PRECEDE between the health or quality-of-life outcomes, the behaviors and environments that influence them, and the factors that lead to the desired behavioral and environmental changes. These data also suggest how programs may be modified to more closely reach their goals and targets.

PRECEDE-PROCEED are a planning model, not a theory. It does not predict or explain factors linked to the outcomes of interest, but offers a framework for identifying intervention strategies to address these factors. Developed by Green, Kreuter, and associates, PRECEDE-PROCEED provide a road map for designing health education and health promotion programs. It guides planners through a process that starts with desired outcomes and works backwards to identify a mix of strategies for achieving objectives. Among the contributions of the PRECEDE-PROCEED model is that it has encouraged and facilitated more systematic and comprehensive planning of public health programs. Sometimes practitioners and researchers attempt to address a specific health or quality-of-life issue in a particular group of people without knowing whether those people consider the issue to be important.

2.4 Application of PRECEDE Model to the present study

In this study, researcher apply the PRECEDE model on the basis of the National program on patient holistic care, which was issued by the Ministry of Health in 1997, with 10 years of program operations. The goal of holistic patient care program was to improve the quality of medical service in generally and the quality of hospital service in particularly. The application of PRECEDE in this research was based on the factors listed at behavioral and educational assessment phases.

According to the theory frame the National program on holistic care was considered as a policy factor which is directly connected to Health Education and Reinforcing factor. The variables of this study were modified from step 3 (behavioral and environmental assessment) and step 4 (education and ecological assessment) of the theory frame for the construction of conceptual framework.

- **Predisposing factors** were referred to knowledge, attitudes and commitment to prevention practice. Among the nurses, their knowledge about oral health care and oral diseases is a basic factor support to oral health care performance for patients. Attitude and commitment to prevention practice were related to the willing to perform of oral health care for patients. These were factors inside the person and it was formulated during education and training process.

- **Enabling factors** are referred to availability of training background on oral health care of nurses during their study time and their working duration. The other important factors were oral health care skills, which were defined as oral hygiene practice skills of nurse for patient.

- **Reinforcing factors** were referred to patient workload means the number of patients that a nurse has to be responsible for a working day, and supervision on oral health care was defined as supervision on nursing oral care from dentist, chief of nursing or physician.

2.5 Related studies

A research carried out by Hilary Southern, Ireland in 2006 named “oral care in cancer nursing” found that the knowledge and education on oral health among cancer nurses. The data indicated that respondents had not had substantial nurse oral care education during pre-registration education, and their knowledge on oral health status, sign and symptoms of abnormalities was inadequate. Nurses placed a high degree of priority on oral care for patients with cancer. 45.8% cancer nurses received theoretical and clinical education in oral care during their general nurse education. 11.0% nurse attended a continuing education on oral care within past year and received supports from hospital dentists for patient undergoing cancer treatment. Age also influence to providing of oral hygiene information to patients. There were statistically significant main effect for age (p-value = 0.043), it is indicated that nurse at the age group 24-28 had higher mean score than group at 33 years. The result showed that nurse who always informed patient about oral hygiene were significantly younger and had greater total self-rated knowledge score than those who did not provide information (26). It is suggested that nurse require more education if they are to manage the oral care of patients with cancer effectively, and further research is needed into the actual practice of oral care for patients with cancers.

A research developed by Inger Wardth, Sweden in 1997 reported that oral health care assistance is viewed as more disagreeable than other nursing activities. 22.9% consider tooth brushing is most undesirable activity. The attitude toward oral health care among registered nurses is much more positive than other group. Oral health care is consider as disagreeable than other nursing activities (27).

Another research carried out by Jose Antonio Gil-Montoya in Spain in 2006 reported that oral health care is not adequately performed for elderly long-stay patients and care giver should receive adequate training to perform the oral hygiene practice set out by the protocol. It is reported that 23.6% of nursing staff practiced tooth brush, 20% practice prosthesis brushing, 52.7% practice prosthesis rinsing, 61.8% administered oral mouthwash, 61.8% cleaning mouth with gauze, 41% encouraging/supervising tooth brush and 9.1% do nothing (11).

A study carried out by Belal Hijji in Acute Care Hospital, UAE in 2003 reported that there were 37.8% of nurses involved in tooth brush for inpatients (28).

The result from research by Mary Jo Grap et al in Virginia, US in 2003 has shown that 75% of nurse at ICU, Neuro Science, Surgical trauma had provided oral care for patients 2-3 times a day in a large academic medical center. 76% had provide mouthwash, and 81% provided tooth brushing for patients (29).

Result from research of Jenifer L.Cohn in Indiana, US in 2005 indicated that 65% of nurse provided mouthwash for patients and 100% of nurse provide tooth brush for patients in Midwestern metropolitan tertiary hospital (30).

Research by Itaba Reiko in Tokyo, Japan showed that 66% nurses provide oral care, 30% nurse performed less frequency. This study describe the frequency and time of oral nursing care for inpatients in hospitals (31).

Table 2 Summary of previous related study

Author/Year and Place of study	Design	Key variable	Major findings
Hilary Southern 2006, Ireland	Cross sectional	Independent variable	45.8% cancer nurses received theoretical and clinical education in oral care during their general nurse education. 11.0% nurse attended a continuing education on oral care within past year. (n=72)
Inger Wardh 1997, Sweden	Cross sectional	Independent variable	Oral health care assistance is viewed as more disagreeable than other nursing activities. 22.9% consider tooth brushing is most undesirable.(n=398)
Jose Antonio Gil-Montoya. 2006, Spain	Cross sectional	Dependent Variable	23.6% of nursing staff practiced tooth brush, 20% practice prosthesis brushing, 52.7% practice prosthesis rinsing (n=55).
Belal Hijji, 2003, UAE	Cross sectional	Dependent variable	37.8 % of nurses involved in tooth brushing for inpatients (n=58).
Mary Jo Grap 2003, US	Cross sectional	Dependent variable	75% of nurse had provided oral care for patients 2-3 times a day. 76% had provide mouthwash, and 81% provided tooth brushing for patients (n=170)
Jenifer L.Cohn, 2005, US	Cross sectional	Dependent variable	65% of nurse provided mouthwash for patients and 100% of nurse provide tooth brush for patients (n=65).
Itaba Reiko, Japan, 2005	Cross sectional	Dependent variable	66% nurses provide oral care, 30% nurse less frequency (n=160)

Summary of Previous related study

As above mentioned, the previous studies almost focused on specific clinical wards for interview. The cancer, elderly patients, ICU wards were already employed and self-questionnaire was applied in research. However, the sample size selected was too limited; therefore the result may not have significant statistic meaning. The result also not mentioned to all aspect of oral care performance, this might be due to the limitation of time.

In Vietnam, there were several surveys on evaluation of nursing care practice in hospital over the past years in order to improve the quality of nursing care. In fact, there was not any survey on nursing oral health care performance for inpatients. This was the first study on oral health care performance among nurses in Hanoi city. The aim of this study was to conduct a survey on oral health care performance by nurse, in which the oral health care performance would be evaluated in both permanent dentition and denture care. It would also describe the oral health care for dependent patients and independent patients. The study would open new approach in evaluation of nursing performance and also be applied in other evaluation studies.

The result of this study would contribute to enhancement on measure of quality for patient holistic care. In oral health care professional, the promotion of oral health care in hospital should be carried out with approach of primary health care. The education on prevention of diseases for patients would be more effective and low cost measure and contribute to decrease in burden of disease for both oral health professional and other related medical professionals.

CHAPTER 3
METHODOLOGY

3.1 Research Design

This was a cross-sectional survey study in which the data were collected by self-administered questionnaire.

3.2 Study Population

Populations in this study were nurses who were working in Hanoi city hospitals. The criteria of selection sample were nurses who were serving for Surgery, Obstetric, Diabetes and Cardiovascular wards at Hanoi city hospitals. Nurses who were working in administrative section, Intensive or Emergency cares were excluded in this study.

3.3 Sample size

The total required sample size in this study was calculated by the following formula:

$$\mathbf{N} = \frac{Z^2_{\alpha/2} \times p \times q}{d^2} = \frac{1.96^2 \times 0.75 \times 0.25}{0.05^2} = 288$$

n = sample size

Z = Reliability coefficient, level of statistical significance = 0.05; Z =1.96 (Set at 95% Confidence Interval)

p = anticipated proportion of nurses who practice oral health care daily for patients Assumed that p = 0.75

q = 1 – p = 0.25

d = absolute precision in this study was set at 0.05

3.4 Place of study

Hanoi is capital city of Vietnam and it is located in the North Vietnam on the Red River Delta. There are 50 hospitals including provincial and central level hospitals. Additionally, 18 hospitals were under Hanoi Health Departments, 32 hospitals were under the Ministry of Health located in Hanoi city. There were 1500 nurses belonged to Hanoi Health Departments and 90% of them were graduated at secondary level. Only few of them were graduated at bachelor or college degree in nursing.

3.5 Sampling technique

From the hospital list provided by Hanoi Health Department, seven hospitals were selected by purposive sampling technique with total 300 nurses. The hospitals were selected on the availability of the clinical ward including Obstetric, Surgery, Cardio-vascular and Diabetes wards. The list of selected hospitals was as follows:

Table 3 Distribution of nurses at the hospitals in Hanoi city

No	Hospital	Surgery Ward	Obstetric Ward	Cardio-vascular Ward	Diabetes Ward	Total by hospital
1	**Bach Mai Hospital**			20	15	35
2	**Friendship Hospital**			19		19
3	**National Endocrine Hospital**				40	40
4	**Saint Paul Hospital**	65				65
5	**Thanh Nhan Hospital**	15	15	12	10	52
6	**Hanoi Obstetric Hosp**		65			65
7	**Hanoi Heart Hospital**			24		24
	Total	80	80	75	65	300

Total number of respondents was 300 nurses. There were 4 hospitals belonging to Hanoi Health Departments and the other 3 hospitals belonged to the Ministry of Health located in Hanoi city. Based on the structure of hospital and the purpose of study, the clinical wards were considered to be target population of this study. Selection criteria for nurse were described as the nurses who were doing clinical service for inpatient in the selected wards. The clinical wards involved in this study included Surgery, Obstetric, Cardio-vascular and Diabetes wards. The other non related nurses who were working in ICU, emergencies, administrative or other clinical service units were not recruited in this study.

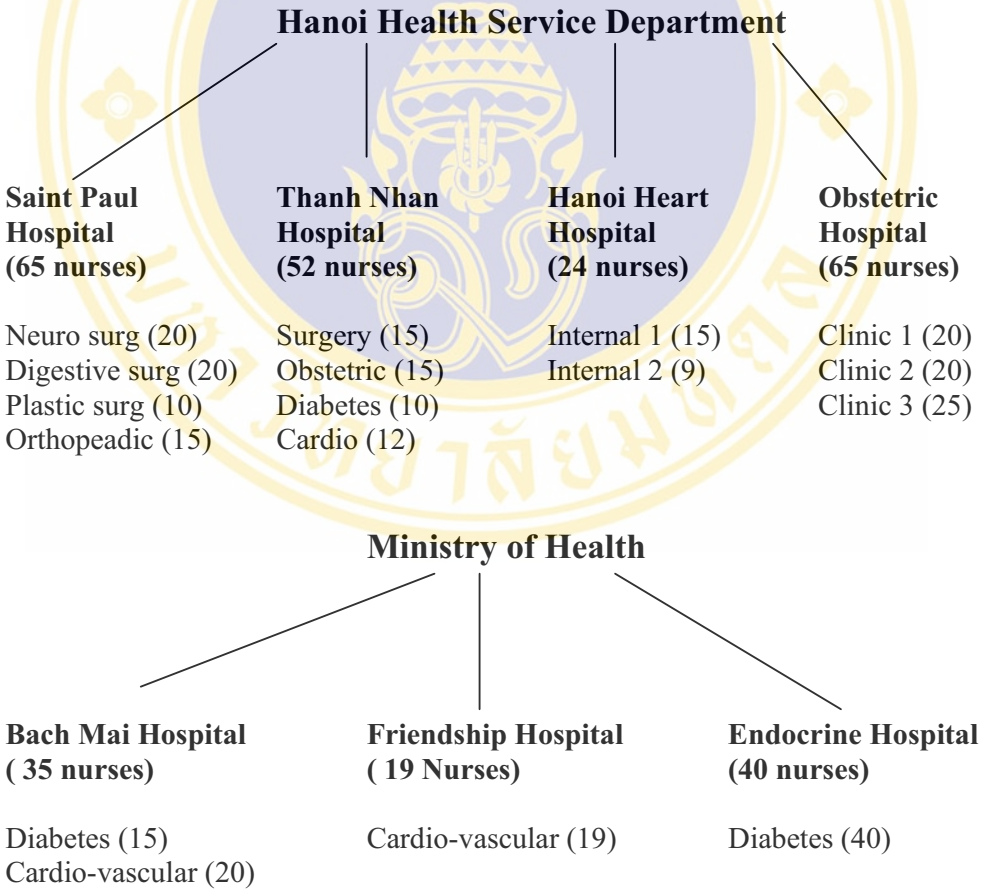

Figure 6 Sampling Scheme

3.6 Research instrument for data collection

3.6.1 Research instrument

Data was collected by self-administered questionnaire for individual answer. The content of the questionnaire was comprised of 8 parts.

Part 1: The first part of questionnaire was socio- demographic characteristics including:

- Age: was calculated by years.
- Gender: was defined as male or female.

  Working duration: referred to the number of working year of the nurse
- Clinical wards: Surgery, Diabetes, Cardio vascular, Obstetric ward.

Part 2: Knowledge on oral diseases

The respondent were asked fifteen questions about their knowledge about oral diseases, systemic diseases related to oral diseases, and oral health care for patients. One score was given to correct answer and the zero for other incorrect answers. The total score for knowledge was classified into 3 groups namely good, moderate and poor based on Benjamin Bloom evaluation scale (32):

- Good: >80% of total knowledge scores
- Moderate: 61 - 80 % of total knowledge scores
- Poor: ≤ 60 % of total knowledge scores

Part 3: Attitude toward oral health care

The respondents were also asked fifteen questions about attitudes towards performing oral health care activities for inpatients, which was prepared on the basis of Likert scales ranging from strongly agree to strongly disagree by the following criteria to give score (33):

- Strongly agree (SA) = 5
- Agree (A) = 4

- Not sure (NS) = 3
- Disagree (D) = 2
- Strongly disagree (SD) = 1

With a total score of 75, the attitude scores were computed for the means and categorized to positive, neutral and negative by Tertile cut-off point due to assumption that the distribution of attitude scores were not normal distribution.

Good attitude: ≥ T2 (greater and equal than second tertile)

Moderate attitude: > T1, < T2 (second tertile)

Poor attitude: ≤ T1 (equal or less than second tertile)

Part 4: Training background on oral health care issues

The respondents were asked by five questions about training on oral health care including their study in college and on the job training. For each question, the answers were categorized by number one for “yes” answer and two for “no” answer.

Part 5: Oral health care skills

The respondents were asked five questions about skills on oral health care for inpatients including oral hygiene care for oral cavity and denture if applicable. For each question, the answers were categorized by number one for “yes” answer and two for “no” answer.

Part 6: Patient workload

This question was to find out how many patients that a nurse had to be responsible for daily. The result shown by mean, SD and categorized in 2 groups as high and low workload based on the nature of data.

Part 7: Supervision on oral health care

The respondents were asked about the supervision on nursing oral care from their chief of nurse or hospital dentist, physician. The result was described in the frequency of person who supervises the activities of nurses in clinical ward.

Part 8: Oral health care performance for inpatients included two components

1) **Oral health care for functionally dependent patients:**

The inpatients were under some limitation that they could not serve for them selves and they needed partial assistance from nurse to practice individual oral hygiene care. The activities were described by five criteria according to the effectiveness of oral health care for patients and score was given as follows:

- After each meal 4 scores
- In the morning and evening before sleep 3 scores
- Evening before sleep only 2 scores
- Morning only 1 scores
- Never 0 score

2) **Oral health care for functionally independent patients:**

The inpatients were seemed as normal and they can serve by themselves in practice individual oral hygiene care. So they need the supervision/ encourage and instruction from nurse to practice correctly in term of time and practice skill. The activities were described by five criteria according to the frequency of activities that a nurse provided to inpatients and scores were given as follows:

- Regularly during everyday : 4 scores
- Sometime or upon patients meeting: 3 scores
- At least one time per admission: 2 scores
- Upon requested by chief of nurse: 1 scores
- Never: 0 scores

The maximum total score of the two groups was 40 and the result of performance score was calculated and categorized by three groups by Tertile cut-off point due to assumption that the distribution of performance score in not normal distribution:

Good Performance: > T2 (greater than second tertile)

Moderate Performance: $\geq$ T1 $\leq$ T2 (second tertile)

Poor Performance: < T1 (less than second tertile)

3.6.2 Pretest:

The questionnaire was translated into Vietnamese language. Pretest was conducted in Dong da hospital, Hanoi. Total 30 respondents including 20 nurses at internal clinic and 10 nurses at surgery clinic were selected for pre-test. KR20 was 0.55 for knowledge questions and Cronbach Alpha was 0.48 for attitude questions by MINITAB software. Questionnaire was revised upon having result of pre-test in order to make questions more clear and understandable for respondents. Some questions at knowledge part and attitude part were simplified for the respondents.

3.7 Data collection process

Data collection of this study was conducted by using self administered questionnaire. There were several basic steps as the followings:

- Contact the leader of Hanoi Health Department and meeting with Chief of Nursing Division to present research proposal and the purpose of this study.

- Discuss about the organization of each hospital and number of nurse in related clinical wards, which were selected for this study. To contact with hospitals to ask for their cooperation.

- Chief of nurse of all 7 hospitals and some chiefs of nurses of clinical wards were invited for training. The research coordinator were trained basically on the orientation of the study; explanation of the content of questionnaire; technique of filling in the questionnaire according to its context and sequences.

- In order to avoid bias, seven hospital chiefs of nurse were invited from selected hospitals for training on over all objectives as well as methodology of the study, in order to standardize the research protocol. The data collection process was informed to ensure the optimal result of survey.

- Respondents were supervised to fill in the questionnaire in their clinical wards by hospital chief of nurse and all answer sheets were checked by the research coordinator before leaving.

3.8 Data analysis procedure and statistical method

Data were entered by Epidata version 3.0 then it was cleaned, coded and analyzed by MINITAB 13 software included 2 parts as follows:

Part 1: Descriptive Statistical Analysis

Descriptive statistics such as frequency, mean, standard deviation, median and percentage were used to describe the distribution of dependent and independent variables

1. Socio-demographic characteristics: age, gender, education, place of working duration.
2. Knowledge about oral diseases and oral healthcare for inpatients
3. Attitude toward oral health care
4. Training background on oral health care
5. Oral health care skills for patients
6. Patients work load
7. Supervision from hospital dentist
8. Oral health care performance for inpatients

Part 2: Inferential Statistical Analysis

Pearson Chi-square test was performed to explore the association between categorized level of OHC performance and independent categorical variables namely socio-demographic characteristic, knowledge, attitude; training and skills on oral health care; patient workload and supervision on oral health care with critical significant level was set at $\alpha = 0.05$. Spearman Rank Correlation analysis was employed to determine the significant correlation between continuous variables (34).

Multivariate regression analysis was employed to identify the explanatory variables that describe the change in OHC among nurses. Statistics were two-tailed tests and set at 5% level of significance.

CHAPTER 4
RESULTS

Oral health care performance for inpatients among nurses who were working at Hanoi city hospitals was studied in January, 2008 in Hanoi, Vietnam. Self-administered questionnaires were answered by 300 nurses of 7 hospitals in Hanoi city, Vietnam. The responses to these questionnaires were completed in January 2008. The findings of this study were presented in two parts: part one was the description of the respondent's characteristics; part two was the inferential statistic analysis to determine the association between oral health care performance for inpatients among nurses and its related factors. The level of statistical significance was set at $\alpha = 0.05$.

1) Descriptive Statistical Analysis

Section 1: Socio-demographic characteristics of respondents
Section 2: Knowledge about oral diseases and oral health care
Section 3: Attitude toward oral health care
Section 4: Training background on oral health care
Section 5: Oral health care skills for inpatients
Section 6: Patient workload
Section 7: Supervision on oral health care
Section 8: OHC performance for inpatients among nurses

2) Inferential Statistical Analysis

Section 9: Association between dependent and independent variables.
Section 10: To predict dependent variable by independent variables. Multiple logistic regressions were employed to detect the strength of relationship between oral health care performance among nurses and its related factors. Statistic tests were two-tailed test and set at 5% level of significance.

Part one: Descriptive Statistical Analysis

4.1 Socio-demographic characteristics of respondents

The age of respondents ranged from 21 to 55 years old with mean age of 33.3. Among these, 51% were concentrated in the age group under 30 years of age and 49% were at the group over 30 years of age.

The majority 91.3% of the respondents were female. This is a specific characteristic of this job; it was acquired by female than male.

Regarding level of graduation showed that the majority 96.67% of respondents completed secondary level. Only 1.33% was college level and 2.0% were graduated bachelor degree. None of them were at preliminary educational level.

Types of clinical wards indicated that 26.67% of respondent were at Surgery ward, 26.67% of respondent were at Obstetric ward, 21.67% of respondent was at Diabetes ward and 25.0% of respondent was at Cardio-vascular ward. Surgical wards included Surgery and Obstetric ward comprised 53.4% (160) nurses; Internal wards included Diabetes and Cardio-vascular ward comprised 46.6% (140) nurses

Concerning to working experience, there were 48.67% of total nurses had less than 5 years of experience. The nurses who had 6 to 15 years of working were counted for 23.33%. The senior nurses had more than 15 years of experience were counted for 28.0%. The mean of working duration was 10.02 years, the shortest duration was 0.5 year and the longest working duration was 33 years.

Table 4 Frequency and percentages of respondents by socio-demographic characteristics.

Characteristics	Number (n=300)	Percentage %
Age (years)		
20 - 29 years old	153	51.0
30 - 39 years old	58	19.3
40 - 55 years old	59	29.7
Means = 33.3 SD = 9.7	Min = 21 Max = 55	
Gender		
Male	26	8.7
Female	274	91.3
Level of graduation		
Secondary level	290	96.7
College level	4	1.3
Bachelor level	6	2.0
Clinical wards		
Surgery	80	26.7
Obstetric	80	26.7
Diabetes	65	21.6
Cardio-vascular	75	25.0
Working duration (years)		
0 - 5 years	146	48.7
6 - 15 years	70	23.3
16 - 25 years	47	15.7
26 – 35 years	37	12.3
Means = 10.02 SD = 9.65	Min = 0.5	Max = 33

4.2 Knowledge about oral diseases and oral health care

As shown in the table 5, there were 15 oral health knowledge related issues such as type of oral hygiene care, oral diseases, ect. The number and percentage of those who answers each question correctly ranged from 99% highest to 25% (lowest) of nurses. In the question 1 there were 99.6% (299) correct answers, while question 15 asking about the minimum frequency of oral health care practice for patient, there was only 25% (75) correct. More than 60% of nurses could respond at least 13 out 15 questions correctly.

Table 5 Frequency and percentage of nurse by their knowledge about oral diseases and oral health care

Knowledge	Number of correct answer	Percentage (%)
1. Type of oral hygiene care that women should have before pregnancy	299	99.6
3. The best way to prevent dental caries and periodontal diseases	296	98.6
3. The common symptom of gingivitis	295	98.3
4. The main cause of periodontal diseases	291	97.0
5. The best way to practice oral care for inpatients that are able to do it by themselves	282	94.0
6. The oral diseases should be treated first for patients with cardio-vascular diseases	281	93.6
7. The cause of dental caries	276	92.0
8. The oral diseases should be treated first for patients with diabetes	258	86.0
9. The best way to clean the denture	258	86.0
10. The final consequence of dental caries	254	84.6
11. The specific symptom of dental caries	248	82.6
12. The dangerous consequence of periodontal diseases	225	75.0
13. The most necessary oral care measures for inpatients that are unable to do it by themselves	185	61.6
14. The good mouth rinse solutions for prevention of oral diseases	163	54.3
15. Number of at least times of oral health care practice for inpatients	75	25.0

The level of knowledge among respondents was calculated based on score from 15 questions. It was then categorized according to Benjamin, Bloom scale. It was found that only small proportion of 6.7% (20) had poor knowledge level with under 9 correct answers. A high proportion of 54.33% (163) had good knowledge level with minimum 13 correct answers. And 39.0% (117) of respondents had moderate knowledge level with 10 to 12 correct answer. The mean score of correct answer was 12.29 with standard deviation of 1.63. The range of correct answer was 6 – 15 scores. Table 6 is to demonstrate the level of knowledge by number and percentage of respondents.

Table 6 Frequency and percentages of respondents by level of knowledge

Knowledge score on related oral health issues	**Number (n=300)**	**Percentage %**
Good: ≥ 80% total scores (≥13)	163	54.3
Moderate: 61 to 79 % total scores (10-12)	117	39.0
Poor: ≤ 60% total scores (≤9)	20	6.7
Mean ± SD = 12.3 ± 1.6 Median = 13	(Min = 6 ; Max = 15)	

4.3 Attitude toward oral health care

Table 7 indicated the frequency and percentage distribution of attitude toward oral health care for in patients of 300 nurses. The row percentage of each Likert five point scale was applied. There were 8 positive and 7 negative statements. The values of negative statements were recoded to be a consistent range of the whole statement of attitude. Total score of attitude was recorded and used for inferential statistical analysis. Most of nurses had positive answers toward oral health care for inpatients. A few of them still had negative or undecided attitude, especially with negative statements.

Table 7 Distribution of attitude toward oral health care (Likert five points scale)

Statements	Strongly agree	Agree	Not sure	Disagree	Strongly Disagree
1. Brushing teeth immediately after meals can prevent oral diseases.	196	101	0	2	1
2. Mouth rinse by fresh water can help prevent oral diseases.*	26	160	34	60	20
3. Dental flossing after meal can prevent oral diseases.	68	153	48	31	0
4. Poor oral hygiene is not a risk of oral diseases and other diseases.*	89	165	6	33	7
5. Regular dental check up for every 6 months is necessary for early detection of oral diseases.	154	145	0	0	1
6. Oral health care is the responsibility of inpatients only.*	69	219	6	5	1
7. It is not necessary to provide oral health care for inpatients at hospitals.*	101	192	3	3	1
8. Treatment of oral diseases is necessary for inpatient with cardiovascular diseases.	89	172	20	15	4
9. Treatment of oral diseases is not necessary for inpatients with diabetes.	82	183	9	13	13
10. Before pregnancy, women should be treated oral diseases as soon as possible.	110	183	2	3	2
11. After delivery, woman should be treated oral diseases as soon as possible.	60	181	37	18	4
12. Inpatients don't need to have guideline about oral hygiene practice in hospital.*	62	210	4	16	8
13.Inpatients need to visit dentist if they have oral health problems.	88	203	3	5	1
14. It is necessary to clean the denture daily.	115	181	0	2	2
15. It is not necessary to clean the denture immediately after each meal.*	62	210	4	16	8

Note: statements with * mark were negative statement

Table 8 shows the level of attitude toward oral health care among respondents classified by 15 statements. The total attitude score ranged from 46 to 74 with mean of 62.07 and standard deviation of 4.53. A proportion of 35.7% (107) of nurses was good attitude and 33.7% (126) with moderate attitude. There was 30.6% (92) of respondents was poor attitude toward oral health care for inpatients.

The criteria of cut-off points of attitude level was based on tertile with T1 = 59.8 and T2 = 63.79 scores.

Good attitude : $\geq$ T2 ($\geq$ 64)

Moderate attitude: > T1 < T2 (60 – 63)

Poor attitude: $\leq$ T1 ($\leq$ 59)

Table 8 Frequency and percentages of respondents by level of attitude toward oral health care for inpatients

Level of Attitude toward oral health care	**Number (n=300)**	**Percentage %**
Good	107	35.7
Moderate	101	33.7
Poor	92	30.6
Mean $\pm$ SD = 62.07 $\pm$ 4.5 Median = 62	**(**Min = 46 : Max = 74)	

4.4 Training on oral health care

As shown in table 9, a major part of respondents 87.33% (251) had been trained on oral health care in the college, while 10.67% (32) of respondents attended training courses over the past year, 5.33% (16) got lecture by hospital dentist, 4.0% (12) participated in seminar on oral health care, 49% (147) received advice from chief of nurse or physician.

Table 9 Frequency and percentages of respondents by training activity on OHC for inpatients

Training on oral health care	Number (n=300)	Percentage (%)
Training course in college	251	87.3
Training course during past year	32	10.7
Lecture by hospital dentist	16	5.3
Seminar on oral health care	12	4.0
Advice from chief of nurse/physician	147	49.0

4.5 Oral health care skills for inpatient among nurses

As shown in table 10, most respondents have good skill in supervise and remind patients in practice individual oral hygiene care with proportion more than 90% of total respondent. There was about 75.7 % (227) respondents had skills in guiding patients for denture care, including cleaning the denture for patients, guiding patient to clean the denture, as compare to 89% of nurses who could assist patients with limitation of movement.

Table 10 Frequency and percentages of respondents by OHC skills for inpatients

Oral health care skills for inpatients Percentage	Number (n=300)	(%)
To assist patients with limitation of movements	267	89.0
To guide inpatient about oral health care	280	93.3
To remind inpatients to practice oral care	285	95.0
To clean the denture for patients	230	76.7
To guide patient to clean the denture	227	75.7

4.6 Patient workload among nurses

The result from table 11 indicated that patient workload was the number of patients that one nurse had to be responsible for a working day in their clinical ward. The proportion of nurses with moderate patient workload was 38.0% (114) with less than 10 patients a day, while the proportion of nurses with high patient workload was 62.0% (186) with more than 10 patients a day.

Table 11 Frequency and percentages of respondents by number of patients covered by each nurse

Number of patients daily	**Number (n=300)**	**Percentage %**
0 – 9 patients	114	38.0
≥ 10 patients	186	62.0
Mean ± SD = 13.77 ± 13.28	(Min = 2 : Max = 70)	

4.7 Supervision on oral health care among nurses

As shown in table 12, a high proportion 42.0% (126) of respondents had no supervision on oral health care. 42.3% (127) of nurses had received supervision from chief of nurses. And only 5.7% (17) of respondents received supervision from hospital dentist, 10% (30) of total respondents received supervisions from physician.

Table 12 Distribution of supervision on oral health care

Type of supervising member	**Number (n=300)**	**Percentage**
1. Hospital dentist	17	5.7
2. Chief of nurse	127	42.3
3. Physician	30	10.0
4. None of them	126	42.0

4.8 Oral health care performance for inpatients

The measure of OHC performance was divided into two components, namely oral health care performance for functionally dependent patients, and oral health care for functionally independent patients. Each component included five activities as shown in table 13.

Table 13 Distribution of performance by frequency and percentage of activities by respondents

Oral health care for functionally dependent patients (n=300)					
Activities	After each meal (4)	Morning &evening (3)	Evening before sleep (2)	Morning only (1)	Never (0)
To assist patients to practice toothbrush	75 (25.0%)	129 (43.0%)	4 (1.3%)	54 (18.0%)	38 (12.7%)
To assist patients to rinse mouth	156 (52%)	70 (23.3%)	4 (1.3%)	39 (13.0%)	31 (10.3%)
To clean the mouth for patients	64 (21.3%)	78 (26%)	15 (5.0%)	91 (30.3%)	52 (17.3%)
To brush the patient's denture	62 (20.7%)	67 (22.3%)	23 (7.7%)	30 (10.0%)	118 (39.3%)
To rinse the patient's denture	64 (21.3%)	54 (18%)	26 (8.7%)	28 (9.3%)	128 (42.7%)
Oral health care for functionally dependent patients (n=300)					
Activities	Regularly (4)	Sometime at patient meeting (3)	Once per admission only (2)	Requested by chief of nurse (1)	Never (0)
To encourage/supervise inpatients to brush their teeth	205 (68.3%)	49 (16.3%)	34 (11.3%)	2 (0.7%)	10 (3.3%)
To instruct inpatients to brush their teeth	177 (59.0%)	58 (19.3%)	48 (16%)	0	17 (5.7%)
To encourage/supervise inpatients to rinse their mouth	209 (69.7%)	62 (20.7%)	18 (6.0%)	0	11 (3.7%)
To encourage/supervise inpatients to clean their denture	138 (46.0%)	64 (21.3%)	30 (10.0%)	2 (0.7%)	66 (22.0%)
To instruct inpatients to clean their denture	138 (46.0%)	57 (19.0%)	34 (11.3%)	3 (1.0%)	68 (22.7%)

Table 13 indicated the detailed distribution of nurses of each activity on oral health care performance and the two components of performance. Generally, oral health care for functionally dependent patients had higher frequency of the non-fulfillment (answer 'never') than oral health care for functionally independent patients. In both components, the denture care reflected that this activity was less paid attention than other oral care activities with higher frequency of "never" answer.

The component of oral health care performance for functionally dependent patients included five activities. The lowest score of performance was activity 'to brush the patient's denture' with 39.33% (118) responded of 'never' and "to rinse patient's denture" with 42.7% (128) responded of 'never'. The highest score of performance was activity 'assist patients to rinse mouth' with 52.0% (156) responded of 'after each meal', as shown in figure 7.

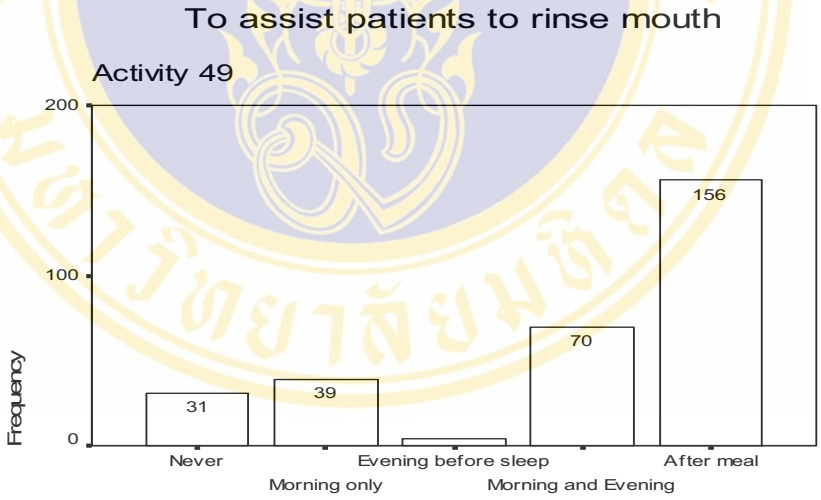

Figure 7 Frequency of activity 'to assist patients to rinse mouth'

In the component of oral health care for functionally independent patients, the highest score of performance was at 'To encourage/supervise inpatients to brush their teeth' with 68.3% (205) responded to 'regularly' and 'to encourage/supervise inpatients to rinse their mouth' with 69.7% (209) answer 'regularly'. The lowest score with answer 'never' is at the activity 'encourage/supervise inpatients to clean their

denture' with 22% (66) answers 'never' and 'to instruct inpatients to clean their denture' with 22.7% (68) response, as shown in table 13.

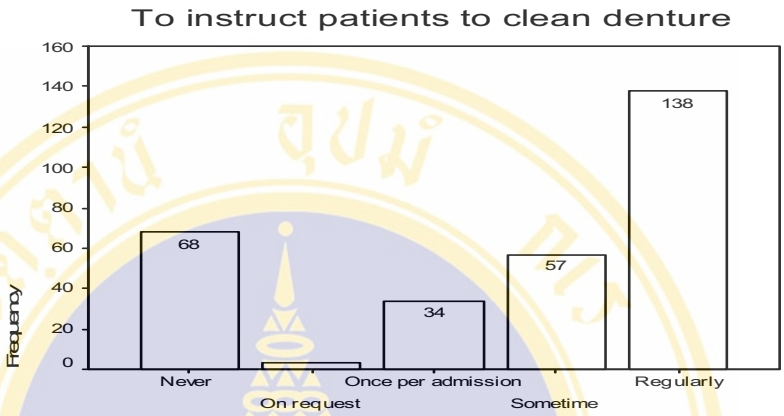

Figure 8 Frequency of activity to encourage/supervise patients to clean denture

In order to evaluate the overall picture of oral health care performance among nurses, the total performance score ranged from 0 to 40 with mean value was 26.45, standard deviation was 9.4. The proportion of good performance was 31.7% (95); the moderate performance was 38.0% (114), and poor performance was 30.3% (91) of total respondents. The cut-off point for classification of level of performance was by tertile with T1 = 22 and T2 = 32.

Table 14: Number and percentage of respondents by level of performance

Level of oral health care performance	**Number (n=300)**	**Percentage %**
Good > 32 (T2)	95	31.7
Moderate : 22 – 32 (≤T2; >T1)	114	38.0
Poor < 22	91	30.3
Median = 28 (T1 = 22; T2 = 32) (Min = 0 ; Max = 40)		

Part two: Inferential Statistical Analysis

4.9 Association between dependent and independent variables

4.9.1 Association between OHC performance and socio-demographic characteristics

In order to simplify the statistical analysis, age group is classified into three groups including less than 30 years of age, from 30 to 39 years of age and above 40 years of age. Regarding age group, the Chi-square value indicated that there was no statistical significant association between age group and oral health care performance for inpatients among nurses (χ^2 = 1.421 ; p-value = 0.841), as shown in table 15.

Concerning the gender, there was no statistical significant association between gender and performance (χ^2 = 0.255; p-value = 0.888). 274 respondents are women while there were only 26 of them are male. Due to the specific characteristics of this nursing job, the number of female contributed the majority part of the total population. This implied that no gender preference is absolutely required in achieving good performance of oral health care, shown in table 15.

Regarding the educational level there was no statistical significant association between level of education and oral health care performance by nurses (χ^2 = 7.84; p-value = 0.098). There were 290 nurses with secondary level, while only 4 of them had college level and 6 of them had bachelor level as shown at table 15.

Regarding types of clinical ward, there was a statistical significant association between clinical ward and oral health care performance (χ^2 = 18.96; p-value = 0.004). It was found that the number of good performance in Surgery ward was 32 and Obstetric ward was 28 is higher than that of Diabetes ward was 22 and Cardio-vascular ward was 13, as shown in table 15.

In term the duration of working, it was divided into 3 groups ranging from 0-9 years; 10-19 years; and 20-35 years. There was no statistical significant association between duration of working and level of OHC performance (χ^2 = 1.024; p-value = 0.906) as shown in table 15.

Table 15 Association between socio-demographic characteristics and level of oral health care performance

Socio demographic characteristics	Level of performance						
	Good		Moderate		Poor		Total
	n	(%)	n	(%)	n	(%)	(300)
Age							
Under 30	48	(31.4)	61	(39.9)	44	(28.8)	153
30 to 39	16	(27.6)	22	(37.9)	20	(34.5)	58
Above 40	31	(34.8)	31	(34.8)	27	(30.2)	89
	χ^2 = 1.421		(df) : 4		P- value = 0.841		
Gender							
Male	8	(30.8)	11	(42.3)	7	(26.9)	26
Female	87	(31.8)	103	(37.6)	84	(30.7)	274
	χ^2 = 0.255		(df) : 2		P- value = 0.880		
Education							
Secondary level	72	(24.8)	145	(50.0)	73	(25.2)	290
College level	2	(50.0)	1	(25.0)	1	(25.0)	4
Bachelor level	2	(33.3)	1	(16.7)	3	(50.0)	6
	χ^2 = 7.84		(df) : 4		P- value = 0.098		
Wards							
Surgery	32	(40.0)	27	(33.8)	21	(26.2)	80
Obstetric	28	(35.0)	24	(30.0)	28	(35.0)	80
Diabetes	22	(33.8)	32	(49.2)	11	(16.9)	65
Cardio-vascular	13	(17.3)	31	(41.3)	31	(41.3)	75
	χ^2 = 18.96		(df) : 6		P- value = **0.004***		
Working duration							
0-9 years	58	(31.2)	73	(39.2)	55	(29.6)	186
10-19 years	12	(28.6)	15	(35.7)	15	(35.7)	42
20-35 years	25	(30.6)	26	(36.1)	21	(29.2)	72
	χ^2 = 1.024		(df) : 4		P- value : 0.906		

* Statistical significant level is α = 0.05

4.9.2 Association between level of OHC performance and knowledge on related oral health care issues

There was no significant association between level of knowledge about oral health care and level of OHC performance for inpatients of nurses (χ^2 = 8.802; p-value = 0.084), in the cross table the number of good performance among nurses with good knowledge nurses was nearly ten times greater than that of nurses with poor knowledge as shown in table 16.

Table 16 Association between level of OHC performance and level of knowledge about oral disease and oral health care.

Level of Knowledge	Level of OHC performance							
	Good		Moderate		Poor		Total	
	n	(%)	n	%	n	(%)	n	(%)
Good	53	(32.5)	67	(41.1)	43	(26.4)	163	(54.3)
Moderate	36	(30.8)	44	(37.6)	37	(31.6)	117	(39.0)
Poor	6	(30.0)	3	(15.0)	11	(55.0)	20	(6.7)
	χ^2 = 8.202		(df) : 4				P- value = 0.084	

Statistical significant level is α = 0.05

4.9.3 Association between OHC performance and level of attitude toward oral health care.

There was a statistical significant association between level of attitude toward oral health care for patients and level of OHC performance (χ^2=10.412 and p-value = 0.034), in the cross table the distribution of level of OHC performance by level of attitude seems equal proportion. This relationship trend to be positive association, as shown in table 17.

Table 17 Association between level of OHC performance and level of attitude toward oral health care

Level of Attitude	Level of OHC performance							
	Good		Moderate		Poor		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Good	39	(36.4)	34	(31.8)	34	(31.8)	107	(35.7)
Moderate	21	(20.8)	49	(48.5)	31	(30.7)	101	(33.7)
Poor	35	(38.0)	31	(33.7)	26	(28.3)	92	(30.6)
	χ^2 = 10.412		(df) = 4				P- value = **0.034***	

* Statistical significant level is α = 0.05

4.9.4 Association between OHC performance among nurses and learning experience on oral health care.

With aspect on learning experience on oral health care, the association between level of OHC performance and learning experience on oral health care included five categories namely training during college period, training during working period, lecture by hospital dentist, seminar on OHC and advice from chief of nurse/physician. Table 18 indicated the association between OHC performance and learning experience on oral health care during their college years (χ^2 = 16.091; P-value = 0.001). The number of good performance among group had learning experience was nearly six times higher than that of the group with no learning experience. The number of moderate performance of group with learning experience was more than ten times higher than group with no learning experience, as shown in table 18.

There was no statistical association between OHC performance and training on oral health care during working time (χ^2 = 8.155; P-value = 0.083). The number of good performance of the group with no training on job (80) was five times higher than that of with training on oral health care (15) during their working time. The number of moderate performance of the group with no training on job (100) was seven times

higher than that of the group with training (14) on oral health care during their working time, as shown in table 18.

Table 18 indicated the association between oral health care performance and attendance in lecture on oral health care by dentist. There was not significant association between two variable (χ^2 = 5.173; P- value = 0.075) . The total number of respondent who had not attained any lecture by dentist during working time is 284 (94.6%), while only 16 (5.4%) of total respondents had attained lecture on oral health care by dentist during working time. The number of good performance of the nurses had no lecture (87) was almost ten times higher than that of nurses who attained lecture by dentist (8). The number of moderate performance of the nurses had no lecture was almost thirteen times higher than that of the nurses had attained lecture by dentist.

Table 18 indicated the association between oral health care performance and attendance in seminar on oral health care during working time. There was not significant association between two variable (χ^2 = 0.257; P- value = 0.880). The number of good and moderate performance of nurse with no seminar attendance was significantly higher than that of nurse who had attended seminar on oral health care.

Table 18 indicated the statistically significant association between OHC performance and receiving advice on oral health care from chief of nurse/physician (χ^2 = 19.947; P-value < 0.001). The total number of respondent who had received advice on oral health care from chief of nurse/physician is 147 (49.0%), while 153 (51.0%) of total respondents had not received advice on oral health care during working time. The number of poor performance of nurses with no advice was two times higher than that of nurse who had received advice from chief of nurse.

Table 18 Association between OHC performance and learning experiences on oral health care issues of nurses.

	Level of OHC performance							
	Good		Moderate		Poor		N=300	
	n	(%)	n	(%)	n	(%)	n	(%)
Learning on OHC during college time								
Learning	81	(32.3)	105	(41.8)	65	(25.9)	251	(83.7)
No learning	14	(28.6)	9	(18.4)	26	(53.1)	49	(16.3)
	χ^2 = 16.091				(df) = 2		P- value = **0.000***	
Training on OHC during working time								
Training	15	(32.3)	14	(41.8)	3	(25.9)	32	(89.3)
No training	80	(29.9)	100	(37.3)	88	(32.8)	268	(10.7)
	χ^2 = 8.155			(df) = 2			P- value = **0.017***	
Lecture on OHC by dentist during working time								
Lecture	8	(50.0)	7	(43.8)	1	(6.3)	16	(5.4)
No lecture	87	(30.6)	107	(37.7)	90	(31.7)	284	(94.6)
	χ^2 = 5.173			(df) = 2			P- value = 0.075	
Attendance in seminar on OHC during working time								
Seminar	3	(25.0)	5	(41.7)	4	(33.3)	12	(4.0)
No seminar	92	(31.9)	109	(37.8)	87	(30.2)	288	(96.0)
	χ^2 = 0.257			(df) = 2			P- value = 0.880	
Advice about OHC from chief of nurse/ physician								
Advice	44	(29.9)	73	(49.7)	30	(20.4)	147	(49.0)
No advice	51	(33.3)	41	(26.8)	61	(39.9)	153	(51.0)
	χ^2 = 19.947			(df) = 2			P- value = **0.000***	

* Statistical significant level is $\alpha = 0.05$

4.9.5 Association between OHC performance and skill on OHC

With aspect of skills on oral health care, namely skill to assist patient under limitation of movement; to guide patient to practice oral care; to remind patients to practice oral care; to clean the denture for patients and to guide patient to clean the denture, there was a statistical significant association between oral health care and skill to assist patient with limitation in movement to practice oral health care (χ^2 = 26.317; p- value < 0.001). The number of respondent who had skill to assist patients under limitation of movement is 267 (89.0%), in which 86 (32.2%) had good performance, 112 (41.9%) had moderate performance and 69 (25.8%) had poor performance, while only 33 (11.0%) of total respondents had no skill to assist patients, as shown in table 19.

There was a statistical significant association between OHC performance and skill to guide patient how to practice oral health care (χ^2 = 12.434; P- value = 0.002). The number of respondent who had skill to guide patients is 280 (93.4%), in which 88 (31.4%) of them had good performance, 113 (40.4%) of them had moderate performance and 79 (28.2%) of them had poor performance, while only 20 (6.6%) of respondents had not any skill to guide patients how to practice oral health care, as shown in table 19.

There was a statistical significant association between OHC performance and skill to remind patient to practice oral health care daily (χ^2 = 11.076; P- value = 0.004). The majority of respondent who had skill to remind patients is 285 (95.0%), in which 91 (31.9%) of them had good performance, 113 (39.6%) of them had moderate performance and 81 (28.2%) of them had poor performance. There were only 15 (5.0%) of total respondents had not any skill to remind patients to practice oral health care everyday, as shown in table 19.

There was a statistical significant association between OHC performance and skill to clean the denture for patient (χ^2 = 25.016; P- value < 0.001). The majority of respondents had skill to clean the denture is 230 (76.6%). Among group with skill to

clean the denture, 79 (43.3%) of them had good performance, 98 (42.6%) of them had moderate performance and 53 (23.0%) of them had poor performance. There were only 70 (23.3%) of total respondents who had not any skill to clean the denture, as shown in table 19.

There was a statistical significant association between OHC performance and skill to guide patient to clean the denture. It was found that there was a significant association between two variables (χ^2 = 31.093; P- value < 0.001). The number of respondent who had skill to guide patient to clean the denture is 227 (75.7%), in which 49 (21.6%) of them had good performance, 151 (66.5%) of them had moderate performance and 27 (11.9%) of them had poor performance. There were only 73 (23.4%) of total respondents who had no skill to guide patients to clean the denture, as shown in table 19.

Table 19 Association between OHC performance and skills on oral health care for patients of nurses

	Level of performance							
	Good		Moderate		Poor		N=300	
	n	(%)	n	(%)	n	(%)	n	(%)
Skill to assist patients with imitation of movement in OHC								
Skill	86	(32.2)	112	(41.9)	69	(25.8)	267	(89.0)
No skill	9	(27.3)	2	(6.1)	22	(66.7)	33	(11.0)
	χ^2 = 26.317			(df) = 2			P- value = **0.000***	
Skill to guide patients how to practice OHC								
Skill	88	(31.4)	113	(40.4)	79	(28.2)	280	(93.4)
No skill	7	(35.0)	1	(5.0)	12	(60.0)	20	(6.6)
	χ^2 = 12.434			(df) = 2			P- value = **0.002***	
Skill to remind patients to practice OHC everyday								
Skill	91	(31.9)	113	(39.6)	81	(28.2)	285	(93.4)
No skill	4	(26.7)	1	(6.7)	10	(66.6)	15	(6.6)
	χ^2 = 11.076			(df) = 2			P- value = **0.004***	
Skill to clean the denture for patients								
Skill	79	(43.3)	98	(42.6)	53	(23.0)	230	(76.6)
No skill	16	(22.9)	16	(22.9)	38	(54.2)	70	(23.4)
	χ^2 = 25.016			(df) = 2			P- value = **0.000***	
Skill to guide patients to clean the denture								
Skill	78	(34.4)	99	(43.6)	50	(22.0)	227	(76.6)
No skill	17	(23.3)	15	(20.5)	41	(56.2)	73	(23.4)
	χ^2 = 31.093			(df) = 2			P- value = **0.000***	

* Statistical significant level is $\alpha = 0.05$

4.9.6 Association between level of OHC performance and patient workload

There was a statistical significant association between OHC performance and patient workload (χ^2 = 7.073; P- value = 0.029). The patient workload was classified by two groups including group of less than 10 patients daily and group of more than 10 patients daily. There were 186 (62.0%) of total respondents had to be responsible for more than 10 patients a day. There were 114 (38.0%) respondents had to be responsible for less than 10 patients a day. The number of poor and moderate OHC performance among group with more than 10 patients a day was nearly double than that of the group with less than 10 patients a day, as shown in table 20.

Table 20 Association between OHC performance and patient workload.

Patient workload	**Level of performance**							
	Good		**Moderate**		**Poor**		**Total**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Less than 10 patients	46	(40.4)	35	(30.7)	33	(28.9)	114	(76.6)
More than 10 patient	49	(26.3)	79	(42.5)	58	(41.2)	186	(23.4)
χ^2 = 7.073	(df) = 2						P- value = **0.029***	

* Statistical significant level is α = 0.05

4.9.7 Association between OHC performance and supervision on OHC

There was a statistical significant association between OHC performance and supervision on oral health care. In this analysis, supervision was classified into two categories including ‘yes’ and ‘no’. It means that the supervision from dentist, chief of nurse and physician is understood as ‘yes’ and ‘no’ if there were not any supervision.

It was found that there was a significant association between OHC performance and supervision on oral health care (χ^2 = 25.40; P-value <0.001). The number of respondents who had supervision is 174 (58.0%) in which 51 (29.3%) respondents had good performance; 97 (55.7%) respondents had moderate performance and 26 (14.9%) had poor performance. The number of respondents who

had not any supervision is 126 (42.0%), in which 25 (19.8%) respondents had good performance; 50 (39.7%) had moderate performance and 51 (40.5%) had poor performance, as shown in table 21.

Table 21 Association between oral health care performance and supervision on oral health care

Supervision on oral health care	**Level of performance**							
	Good		**Moderate**		**Poor**		**Total**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Supervision	65	(37.4)	76	(43.7)	33	(19.0)	174	(76.6)
No supervision	30	(23.8)	38	(30.2)	58	(46.0)	126	(23.4)
$\chi^2 = 25.40$	(df) = 2						P- value = **0.000***	

* Statistical significant level is $\alpha = 0.05$

In summary, the statistical significant associations between oral health care performance and dependent variables were presented in table 21. In the socio-demographic characteristics, clinical ward was associated with oral health care performance ($\chi^2 = 18.962$; p-value = 0.004. Predisposing one variable associated with OHC performance was attitude toward oral health care ($\chi^2 = 10.412$; p-value = 0.034).

Enabling factors had two factors in training and almost factors in skill on OHC.

Among reinforcing factors, a statistical significant association between patient workload ($\chi^2 = 7.073$; p-value = 0.029) and supervision ($\chi^2 = 25.40$; p-value <0.001) with OHC performance

These associations reflected that the OHC performance of nurses was mainly influenced by attitude, learning experience, OHC skills, patient workload and supervision on oral health care. These factors indicate that the performance needs supports from training and other management measures for improvement of the quality of care.

Table 22 Summary of Pearson Chi-square Test between OHC performance and its related factors

Independent variables		χ^2	P-value
1. Socio-demographic characteristics	- Clinical Ward	18.962	0.004
2. Predisposing factors	- Attitude toward oral health care	10.412	0.034
3. Enabling factors	- Learning experience on oral health care during college time	16.091	<0.001
	- Learning experience on oral health care during working time	8.115	0.017
	- Advice from chief of nurse/physician	19.447	<0.001
	- Skill to assist functionally dependent patients in oral care practice	26.317	<0.001
	- Skill to remind functionally independent patients	12.434	0.002
	- Skill to instruct functionally independent patients	11.076	0.004
	- Skill to clean the denture for patients	25.016	<0.001
	- Skill to guide patient to clean their denture	31.093	<0.001
4. Reinforcing factors	- Patient workload	7.073	0.029
	- Supervision on oral health care	25.40	<0.001

* Statistical significant level is $\alpha = 0.05$

Due to the distribution of the dependent variable and some continuous independent variable is not normal, non parametric correlation (Spearman's Rank Correlation) test was applied to test the correlation. There were not any significant correlation between oral health care performance and other independent variable as shown in Table 22.

Table 23 Correlation between oral health care performance and independent variables

Independent variables	Oral health care Performance	
	r_s	p-value
1. Age	-0.04	0.949
2. Working duration	0.047	0.412
3. Knowledge about oral health care	-0.04	0.949
4. Attitude toward oral health care	-0.13	0.818
5. Patient workload	-0.065	0.262

Statistical significant level is α =0.01.

4.9.7 Multiple Logistic Regression

The main objective of this study is to determine how much the independent variables influence the oral health care performance. Multiple logistic regression analysis was performed with the significant level set up at α = 0.05. The OHC performance was classified into two categories namely adequate and inadequate performance. The cut off point was greater than second tertile for adequate performance (>T2); less and equal to second tertile for inadequate performance ($\leq$ T2).

From Chi-square test, there were nine significant variables statistically associated with oral health care performance among independent variables, which were employed for logistic regression model. In the group of enabling factors, advice from chief of nurse was negatively related to OHC performance (OR: 0.43; 95% CI: 0.23-0.82; p = 0.010). In the group of reinforcing factors, patient workload was negatively related to OHC performance (OR: 0.52; 95% CI: 0.3-0.9; p = 0.019), the OR showed that the number of patients increases may reduce quality of oral care.

Logistic regression model also indicated the strength of association between each independent variable and OHC performance. Obviously, supervision on oral health care appeared to be the strongest predictor of OHC (OR: 3.81; 95% CI: 1.66-6.61; p = 0.000), Odd ratio indicated that the likelihood of OHC performance among nurse who exposed to supervision on OHC was 3.8 times greater than those without supervision, as shown in table 24.

Table 24 Multiple logistic regression analysis predicting oral health care performance among nurses

Predictors	Odds ratio	95% CI for OR		P- value
Predisposing factors		Lower	Upper	
- Attitude toward oral health care	1.18	0.85	1.64	0.322
Enabling factors				
- Learning experience on oral health care in the college	0.98	0.46	2.10	0.96
- Learning experience on oral health care during working time	1.82	0.80	4.14	0.151
- Advice from chief of nurse/physician	0.43	0.23	0.82	**0.010***
- Skill to assist functionally dependent patients	0.89	0.25	3.16	0.862
- Skill to instruct functionally independent patients	0.28	0.05	1.43	0.126
- Skill to remind functionally independent patients	1.52	0.28	8.16	0.622
Reinforcing factors				
- Patient workload	0.52	0.3	0.9	**0.019***
- Supervision on oral health care	3.81	1.66	6.61	**0.000***

* Statistical significant level is α = 0.05

CHAPTER 5
DISCUSSION

This study was based on the primary data collection from nurses who had been working for hospitals in Hanoi city. A total of 300 nurses were interviewed. The main objective of the study was to assess the oral health care performance among nurses at selected hospitals in Hanoi city. In addition, the related factors such as socio-demographic characteristics, predisposing factors, enabling factors, and reinforcing factor were determined in this study.

In this study, the respondents were selected from surgery, obstetric, diabetes and cardio-vascular ward from 7 hospitals in Hanoi by using purposive sampling technique. Hence, the criteria for selection of studied sample and area set up at the beginning of study were met. The instrument used for data collection was pretest before the actual study. To ensure the reliability of the study, knowledge and attitude questions were revised to make them more clear and understandable for the respondents.

5.1 Oral health care performance among nurses.

The oral health care performance for patients is one of the essential contents of holistic patient care. In order to have overview of oral health care performance, it was classified and analyzed by three categories as good, moderate and poor based on the protocol of oral health care performance as designed in the questionnaire. The cut-off point for classification was by Tertile. In general, there were 31.7% of total nurses in this study had good performance (scores from 33 to 40), 38.0% of total nurses had moderate performance (scores from 22 to 32) and 30.3% of total nurse had poor performance (scores from 0 to 21). The measurement of OHC performance is the uniqueness, no comparison with other study.

The OHC performance among nurses was separated by two components namely oral health care performance for functionally dependent patients and oral health care for functionally independent patients. Each component included five activities.

In the first component, the performance for functionally dependent patients had a character that the proportion of high performance and low performance is not much different distributed. The two activities in denture care for patients had highest proportion of low performance. The activity ‘to brush denture for patients’ received 39.3% answers ‘never’. The activity ‘to rinse denture for patient’ had 42.7% answers ‘never’. This reflects the actual practice that in the clinical ward of this study may not have many patients who use denture. Therefore the nurses had not much experience in denture care.

In the second component, the performance for functionally independent patients had a character that the distribution of high performance is much higher than low performance. So the activities on denture care were still at lower performance than other activities. In the activity ‘to encourage/supervise patient to clean the denture’, there were 22.0% answer ‘never’. In the activity ‘to instruct patient to clean the denture, there were 22.7% answer ‘never’ which is much higher proportion than other activities in this component. Due to the number of patients who use denture was low at the place of study, the nurses might not have much job regarding denture care.

Table 25 showed the comparison of OHC performance between this study and previous related studies. In comparison with research by Belal Hijji in Acute Care Hospital in UAE, 2003 there was 37.8% of nurses involved in tooth brushing for inpatient (28). In this study, the proportion of nurse in activity to assist patients to brush their teeth comprehensively was 25.0%. This is due to several factors that may be barriers to service that nurses can provide to patients in hospital in Vietnam, such as patient workload and other more important and necessary nursing care.

Regarding research by Jose Antonio Gil-Montoya in Spain, 2006, it was reported that 23.6% of nursing staff involved in tooth brushing for patients, 20.0%

involved in brushing denture, 52.7% involved in rinsing denture. There were 41.8% nurses involved in encouraging/supervising tooth brushing for patients (11).

Regarding the research of Jo Grap et al in Virginia in US, 2003, the result has shown that 75% of nurse at ICU, Neuro Science, and Surgical trauma had provided oral care for patients 2-3 times a day in a large academic medical center. 76% had provided mouthwash, and 81% provided tooth brushing for patients (29).

In addition, the research of Jenifer L.Cohn in Indiana in US, 2005 indicated that 65% of nurse provided mouthwash for patients and 100% of nurse provide tooth brush for patients in Midwestern metropolitan tertiary hospital (30).

Research by Itaba Reiko in Tokyo, Japan showed that 66% nurses provide oral care, 30% nurse performed less frequency (31).

Table 25 Comparison of oral care activities with previous related studies.

Activity	This study Vietnam	Other previous studies			
		Belal Hijji, UAE	Jose Antonio, Spain	Jo Grap, US	Jenifer L. US
Tooth brushing	25.0%	37.8%	23.6%	81%	100%
Mouth wash	52.4%	53%	61.8%	76%	65%
Denture care	50.7%	-	52.7%	-	-

5.2 Knowledge about oral health care

The result from data indicated that there were 54.3% of total respondents had good knowledge level, 39.0% of them had moderate knowledge level and 6.7% of them had poor knowledge level. It means that only more than a half of respondents had good knowledge level. The other part had not sufficient knowledge on oral disease and oral health care. The knowledge about frequency of oral care provided for patient is insufficient with 25% correct answer. In fact, almost nurse in Vietnam understood that the minimum frequency of oral care for patients was twice a day as

traditional care routine and it is the regulation in the Hospital regulation of the Ministry of Health in 1997 and it is also according to the theory of nursing practice during their college period.

The knowledge about mouth rinse solution recorded 54.3% correct answers. This was due to the generalization of using chlorhexidine in Vietnam is limited. This kind of solution was accepted in dental professionals for nearly a decade only and not so popular in other medical service area. Therefore the information of this product is not available for nurses at the site of this study. This reflected that the information about the advantage of chlorhexidine was not widely addressed to clinical nurses in hospital.

5.3 Attitude toward oral health care

From the result of descriptive statistical analysis, attitude score was classified into three categories by Tertile cut-off point. There were 35.7 of total respondent with good attitude, 33.7% of them with moderate attitude and 30.6% of them had poor attitude. Looking at the distribution of attitude answer, a majority was at the group of neutral answer including agree, not sure and disagree. The actual situation of clinical work in Vietnam had shown that almost nurse in hospital considered that oral health care was a less priority nursing activity than other nursing activity such as nutrition for patient or drug administration and monitoring of vital signals. Another reason is limitation of time to take care for patients due to high workload in some hospitals in Hanoi. Lack of equipment also affected to performance.

According to research carried out by Inger Wardh in 1997 in Sweden, 22% of respondents had negative attitude toward tooth brushing for patients. 17% of respondent said that oral care should be individual self care of patients only. The proportion of poor attitude in this study was higher due to some factors may affected to the attitude of respondents. It also reflected the nurses in hospitals still did not pay attention enough in oral health care for patients.

5.4 Association between oral health care performance and socio-demographic characteristics.

The result from inferential statistic indicated that age, gender, education, working duration had no significant association with OHC performance. There was a statistical significant association between OHC performance and clinical ward (χ^2=18.96; p=0.004).. According to the result, the nurses belong to Surgery and Obstetric had a higher proportion of good performance than Diabetes and CVD wards. The other related study had no result or report on the significance association between clinical ward and practice.

Regarding duration of working, the result from tabulation table indicated that in the group with working experience under 10 years, the performance was high proportion of good performance. It was a trend that the younger nurses had paid more attention on oral health care than other group of age. This result was similar to study by Hilary Southern, 2005 which indicated that nurses who always informed patients about oral hygiene were younger and had greater self-rated knowledge about oral care.

5.5 Association between OHC performance and predisposing factors

5.5.1 Association between OHC performance and knowledge

Regarding knowledge about oral health care, more than half of respondents had good knowledge score and half of them were at moderate and poor level of knowledge. Result of this study indicated that there was no significant association between oral health care performance and knowledge. This result also reflects the situation that knowledge about oral health care did not influence to OHC performance. This is implied that even the high knowledge score, the proportion of good performance will not increase accordingly. Hence, the performance level is influenced by other factors need more analysis.

5.5.2 Association between OHC performance and attitude

Concerning the attitude toward oral health care of nurses, only 35.7% of total nurse had good attitude. The other part of nurses still had moderate and poor attitude due to the perception that oral health care is less important than other nursing care. Result of this study indicated that there is a significant association between OHC performance and attitude (χ^2 : 10.412 ; p-value = 0.034). In the actual situation, almost nurses consider oral health care is less important nursing activity than the others.

According to study of Inger Wardh 1997, Sweden, there were 22.9% respondents considered tooth brushing is most undesirable. Nurses at all level of education also have negative and in-cooperative attitude toward oral health care, even they perceived that it is individual responsibility or the care giver should be in charge of oral hygiene for patients.

The situation in Vietnam is not exceptional case. During data collection, the researcher also observed the real practice of nurses and found that very few of them were interested in oral care, or just on request of patients or care giver that some complaints of patients need treatment or assistance from dentist.

5.6 Association between oral health care performance and enabling factors.

5.6.1 Association between OHC performance and learning experience on OHC

In term of learning experience on oral health care, the result from data of this study showed that there was significant association between oral health care performance and training during college time (χ^2 : 16.9; p-value < 0.001); Training during working time (χ^2 : 8.15; p-value = 0.017) and receiving advice from chief of nurse/ physician with (χ^2 : 19.94; p-value < 0.001). The training of oral health care activity for nurse in Vietnam still a small content in nursing college, with only about 2 weeks of practice in hospitals for nursing students. Even during working period, major part of nurse never participate in other training activity. This is the reason why the practice of oral care is still inadequate in major part of respondents.

According to study of Hilary Southern, 2006, there were 45.8% of nurse had received both theoretical and clinical in oral care during their general nurse education, and 87% of nurse had never attended in continuing education in oral care. 94.5% of nurses answer that they need for continuing education in oral care. In this study, there were 83.7% of nurses had been trained in oral care during college time, and 89% of nurses never participate in any continuing education in oral care.

The update of knowledge and information during working period also play a major role of oral care performance and it is suggested that the continuing training should be implemented in hospital to enhance quality of performance. Even the practice time in hospitals should be extended more in order to provide more clinical practice experience for nurses.

5.6.2 Association between oral health care performance and OHC skills

In connection with oral health care skills, the result from this study indicated that oral health care performance had strong significant association with all oral care skills in two aspects: skills to assist functionally dependent patients to practice oral health care (χ^2 : 16.09; $p < 0.001$); skill to instruct patient how to practice oral health care with (χ^2: 12.43; $p= 0.002$); skill to remind patient to practice oral health care (χ^2: 11.076; $p=0.004$); skill to clean the denture for patients (χ^2: 25.01; $p< 0.001$); skill to guide patients to clean the denture (χ^2: 31.09; $p < 0.001$).

In the actual clinical practice, the skills of nurse depend on the experience of working and environment of working where the nurse with high level of skills will be a good example for others to follows, especially chief of nurse. Oral health care skills would be different in each specific clinical ward, it also be influenced by the characters of clinical wards that the nurse was working for. In this study, the proportions of skills obtained from the answers of nurses are very high, so it is not reflect the real practice skills of nurses. It means the answer is just collected from answer sheet. This point suggests that the observation study is recommended to evaluate more exactly the practical skills of nurses in oral health care.

5.7 Association between oral health care performance and reinforcing factors.

5.7.1 Association between oral health care performance and patient workload

In actual clinical practice, patient workload is a factor that affect to the nursing care practice for patients. Generally, if the number of patients increases while the number of nurses in not adequate to serve, the quality of nursing care can not be assured. In this study, there was a statistical significant association between OHC performance and patient workload (χ^2: 7.07; p-value = 0.029). It reflected that when the workload is higher, the proportion of poor performance was also going up. It is implied that the more patient the more nursing care provided only and the studies of nursing care performance need more observation and other tool of data collection. Due to large number of patients, nurses must pay more attention for the other more important nursing care.

5.7.2 Association between oral health performance and supervision on oral health care

In every hospital, the supervision on nursing care is very necessary to ensure the optimum quality of service. The result of this study indicated a strongly significant association between oral health care performance and the supervision on oral health care (χ^2: 25.40; p< 0.001). It reflected that the more supervision provided, the better quality of performance will be gained. In this study, there were 58% of nurses was getting supervision from dentist, physician or chief of nurse in their clinical ward. With supervision, the number of good performance increased accordingly.

The supervision activity is one of the major factors of quality control in heath care service. The managerial personnel is not only remind or request the nurse to implement their task, but also to be an instructor for nurse in health care practice. The actual situation in Vietnam showed that almost managerial are more concern about other administration work than the professional care for patients, event in some place the nursing care is left over to the caregiver or to the patient by themselves with poor

knowledge of nursing health care. Concerning oral health care, as above mentioned this nursing care activity was less important than other nursing care activities. In term of enhancing quality of holistic patient care, the oral health care should be added in the routine nursing care for patient and it also need supervision and instruction from managerial personnel at hospital level. The inpatients need oral health care as daily hygiene care and this kind of practice for patients need to be a routine task of nurses in hospital.

5.7.3 Prediction of OHC Performance

Result from logistic regression revealed that three variables were statistically significant predictors of OHC performance. The advice from chief of nurse was statistically significant predictor of OHC performance (OR: 0.43; CI 95%: 0.23-0.82; p=0.01). If the reference group is no advice, the result showed that the nurse received advice from chief of nurse had 0.82 time of inadequate performance than the nurse who did not receive advice from chief of nurse and the improvement of quality of OHC is just to reduce the number of inadequate performance. It was not totally a good predictor for OHC performance. In fact, if the chief of nurse give advice to the nurses, the quality of performance should be improve accordingly. This result showed that chief of nurse has not paid enough attention on OHC performance for patients. The advice from chief of nurse might not influence to OHC performance of nurses.

Patient workload was statistically significant predictor with inverse association with OHC performance (OR: 0.52; CI 95%: 0.3-0.9; p=0.01). Reference group is low workload (less than 10 patients a day), the number of patients increase, the number of adequate performance decrease accordingly 0.5 times. In fact, the number of patients affected to the quality of nursing care in general and to OHC for patients in particularly. This is a good predictor for OHC performance, which suggested for appropriate measure to adjust the patient workload or to encourage the involvement of caregiver or volunteer to OHC performance for inpatients.

Supervision on OHC was statistically significant predictor with positive association with OHC performance (OR: 3.81; CI 95%: 1.66-6.61; p=0.01). Reference group was no supervision, in case the nurse receive supervision, the number of adequate performance is double than the nurse who had no supervision. This is an important predictor to OHC performance. It suggested that the supervision and regulation in clinical ward need to be maintained and reinforced for the assurance of the quality of nursing care. In fact, the supervision plays a necessary position in control of OHC performance by nurse for inpatients. In case the supervision is not implemented effectively, the quality of care would be reduced significantly.

5.8 Strength and Limitation of this study

5.8.1 Strength of this study

In order to improve the quality of holistic patient care, Hanoi Health Department established a study on oral health care performance among nurses in hospitals. There are several studies focus on the performance of health personnel for example, studies on hand washing in hospital; contamination in hospital; satisfaction of patients by nursing care. This study was the first project focused on oral health care subject in hospital. The aim of this study was to initial survey on nursing oral health care performance in hospitals of Hanoi city. The data collected was useful for finding measure to improve quality of holistic patient care.

In history, oral health care in Vietnam was only responsibility of dentist or oral health professional. In addition, the inpatients received very poor oral health care performance during their hospitalization. By the perception that oral diseases are preventable, the promotion of oral hygiene protocol in hospital needs to be prioritized and pay more attention on training and management. A new direction to approach primary health care in oral health will be established for the development of oral health care service to community.

Concerning the study site, the seven purposively selected hospitals in Hanoi area had similar characteristics of clinical ward as criteria established from the

beginning of study. Additionally, the clinical wards were randomly selected among above hospitals. Therefore the research findings of this study could be used by other hospital or clinical ward with the same criteria with these hospitals in Hanoi city.

Regarding the use of the instrument for data collection, pretest of questionnaire was done in Dong Da Hospital which was excluded from the selected hospitals of this study. The inappropriate questions or not clear statement were reviewed and revised to make them more clear and understandable for respondents. Moreover, the trained interviewers were also involved in both pretest and data collection process. These procedures minimized the misunderstanding of questionnaire contents among interviewers and respondents.

5.8.2 Limitation of the study

There were some limitations in this study, which need to be mentioned for improvement of similar research in future.

1. Regarding validity of responses on questionnaire. The self-administered questionnaire was based on the subject answer choices of respondent. If the answer could not be subjected by respondent, the result of data would not reflect the true idea of the respondent. This even happened when the respondents answered together in one room or in a group. In that condition, the content of answer may be converted from other colleague with potential invalidation of results. The result of knowledge may not be reflected the actual performance or the performance may not actually be performed.

2. Concerning population of the study, the nurses from clinical wards were purposively selected, therefore the result might be well represented for the similar clinical ward in other hospital under the same selection criteria. However it may not be represented to the other clinical wards or hospitals. Result of this study cannot be generalized to the wider population due to a convenience enrollment of sample used. The information from answer sheet was not reflect enough the actual performance of nurses, therefore further instrument such as observation, in depth

interview or group discussion should be applied to have more exact evaluation of performance.

3. Regarding to the time and schedule of data collection, the duration for data collection was so limited, it is suggested that the time should be extended so that the researcher will have more time to revise instrument for better quality of answers as well as to have more time for respondent to answer questionnaire more comprehensively.

In summary, this study is the first survey on oral health care performance by nurse in hospital in Hanoi, Vietnam. The self-administered questionnaire was employed for data collection. The proportion of good performance is nearly one third of total respondent. It reflected that OHC performance was implemented inadequately. This result can be understood that some factors related to performance of nurses may be the barriers to the OHC performance for patients in hospital. Over all, the patient workload seems to be the difficulty for nurse in OHC performance for patients. On the other hand, the ratio of nurse/ population of Vietnam is still low with 6/27 nurses per 10,000 inhabitant comparing with other region in the world. Nursing shortage in hospital was negatively impact to the quality of oral health care performance for patients in hospitals, it was also a limitation of nursing care for inpatient.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This cross sectional survey study was conducted at seven hospitals in Hanoi city, Vietnam in order to assess the oral health care performance for inpatients among nurses. A structured interview questionnaire was used for data collection. The sample size of this study was 300 nurses who were working for Surgery, Obstetric, Diabetes and Cardio-vascular ward. Pretest was conducted on 4th January, 2008 and after that data collection process was carried out during January, 2008 in Hanoi, Vietnam. Data analysis was conducted by Epi Data 3.0 and MINITAB 13 software. The following conclusions were based on the findings and interpretation of this study.

1. Socio demographic characteristics:

The survey study was conducted among 300 respondents with mean of age was 33.3 ranged from 21 to 55 years of age. Female was 91.3% of total respondents. There were 96.7% of total respondents were graduated at secondary level; 2% of them had bachelor degree and 1.33% of them had college level. The result showed that there were 26.67% of respondent was working for Surgery ward, 26.67% of respondent was working for Obstetric ward, 21.67% of respondent was working for Diabetes ward and 25.0% of respondent was working for Cardio-vascular ward. There were 48.7% of respondents had less than 5 years of working experience and 51.3% had more than 5 years of working experience.

2. Oral health care performance for inpatients among nurses

In general, almost nurses answered that they had performed oral health care for inpatients. The result of total performance score showed that 31.7% of respondent was good performance, 38.0% was moderate performance and 30.3% was poor

performance. However study showed that performance in the two components was not the same. The frequency of OHC activities for functionally dependent patients looks like moderate performance, while the frequency of OHC activities for functionally independent patients trends to good performance with high frequency of good points.

3. Association between OHC performance and predisposing factors

The association between oral health care performance and attitude was statistically significant. Regarding to knowledge about oral health care, the result reflected that a part of respondent with good knowledge score may have not good performance score. It could be explained by the other factor related to performance such as workload, limitation of time or lack of supervision from managerial personnel.

Regarding to attitude toward oral health care, the proportion of good attitude was 35.7% was not high, and 38.0% moderate attitude, and 30.7% poor attitude. This reflected that attitude among respondents trend to be moderate, majority of respondents were not willing to involve in oral health care. It is needed to have appropriate measure for improvement of nurse's attitude toward oral health care.

4. Association between OHC performance and enabling factors

Concerning training on oral health care, the training during college period and advice from chief of nurse/physician had strongly significant association with oral health care performance. This result suggested that training on oral health care in college or during working period or continuing training should be developed in system of nursing school and hospital. The other more effective training activity is hospital based education and on-the-job training by the cooperation between university and hospitals is necessary for updating knowledge and skills for nurses. The policy on training and education, it is necessary to update and develop the content of oral health care for college and other continuing training programs.

5. Association between oral health care performance and reinforcing factors

Statistical tests showed the significant association between patient workload and performance. In fact, this factor influenced to oral health care performance as well as other nursing performances. The higher workload will lead to the higher rate of poor performance. In Vietnam, especially in provincial level or in big cities, the over workload happened in almost hospitals and it became a burden for health service and it also influenced to the quality of patient care.

Supervision was statistically significant associated with oral health care performance ((χ^2 = 25.40; p-value < 0.001). This is an important factor influenced to nursing oral care performance. In actual situation, supervision on oral health care depends on the specific character of each clinical ward. Generally, it is necessary to put oral health care content in the routine task of nurse in clinical practice.

Logistic regression model showed that OHC performance was best predicted by supervision on OHC (β= 1.24; OR=3.8; 95%CI: 1.6-6.6). On the contrary, patient workload was inversely associated with OHC performance (β= -0.71; OR=0.52; 95%CI: 0.3-0.9).

As mentioned in the study, supervision from chief of nurse is one of major factors influenced to oral health care performance. The responsibility of chief of nurse is to maintain nursing care of the ward. Regarding oral health care, in almost clinical wards, oral health care is not consider as routine task, some time it was passed to patients themselves or to caregiver to do it for patients. It is necessary to change perception of the chief of nurse toward oral health care for patients. The supervision by dentist or physician is just occurred when the patients had chief complains on oral cavity. The role of dentist or physician is how to encourage nurse to take care of oral health for patients.

6.2 Recommendation

This study revealed that oral health care performance for inpatients of nurses in general and particularly in oral health care for functionally dependent patients and the activities of denture care was inadequate. Some selected factors of socio-demographic, predisposing factors, enabling factors and reinforcing factors were statistical significant associated to oral health care performance. Based on the finding of the study, the following recommendations are suggested.

6.2.1 Recommendation for implementation

In order to enhance the oral health care performance for inpatients among nurses, the following actions based on findings of the study should be implemented

1. Health administration:

It is recommended that the Hanoi Health Department and should establish program for enhancement of patient care in hospital. The patient holistic care is policy from government, at provincial level the administrator need specific rule for implementation of holistic care, in which the oral health care need to be emphasized and implemented widely. It is necessary to design a specific program for oral health care in hospital according to patient holistic care regulation by the Ministry of Health.

Hanoi Health Department should recruit oral health professional to open training course for hospital administrator, chief of nurse and physician, in order to improve their knowledge on oral health care issues. On the other hand, training or oral health care supervision team for each hospital is necessary, this would be an effective activity for improvement of oral nursing care in clinical practice. On the job training on oral health care for nurses would also be suggested. Ultimate objective of on the job training is to update knowledge and showing the benefit of OHC for both patients and nursing staffs.

2. Hospital administrations:

Hospitals need to establish specific regulation on OHC for inpatients according to holistic patient care and the actual practice of each hospital. Based on the current situation that supervision on oral health care were not widely obtained attentions in hospital due to characters of clinical activities, it is suggested that the managerial personnel need more update information about oral health care and the connection between oral disease and systemic diseases. It is suggested that the oral health care for patients would be the responsibility of health care personnel, not only be the responsibility of patients or assigned to the caregiver.

Continuing education on oral health care for nurses should be conducted regularly to improve knowledge, skills of practice and update of oral health care for nurses by hospital based training programs. This kind of training should be conducted with the cooperation from university and other oral health professionals by the way of on-the-job training or continuing training programs. Hospitals need to coordinate with health administration offices to organize training course on OHC in hospital according to the program of enhancement of patient care quality. They need to have plan for nurses to participate in training program on OHC issues during their job or participate in other seminar on OHC issues.

Facing with the situation of nursing shortage, it is suggested that OHC performance need the involvement of caregiver and volunteer to recover the scenario of high patient workload in most provincial and central hospitals. The basic contents of OHC should be instructed and transferred to caregivers, so that they can assist patients to practice OHC performance regularly in both hospital and their home.

3. Training curriculum in nursing college: based on the actual situation that the practical and theoretical contents of oral health care in the college are still limited, it is recommended that the extension and more update information about oral health care should be added to the training contents for nursing students. The training time on OHC issues need to be extended in both theoretical and practical aspects to improve the information input of OHC for nursing students.

6.2.2 Recommendation for future studies

As the oral health care performance for inpatients in this study was not really good and inadequate, there may be some factors affecting the performance, while the statistical tests could not determine all factors were most powerful in predicting the OHC performance of nurses. Beside, the self-administered questionnaire was applied to collect data and the result may not reflect the actual performance. The other more effective method of data collection should be applied.

1. In order to have more effective evaluation of performance, the use of in depth interview or focus group discussion in combination with observation, should be employed to evaluate the actual performance.

2. Similar researches with a larger sample sized and employing both techniques of quantitative and qualitative approach as above mentioned to overcome the limitation of study is recommended.

3. Researches to evaluate OHC performance for long stay and dependent patients should be considered due to these groups of patients need more comprehensively OHC performance.

4. Similar researches focused on a group of specific clinical wards are also recommended to find out the real situation of oral care in such type of clinical ward. Result obtained may contribute to the appropriate measure for improving quality of oral care in specific clinical wards.

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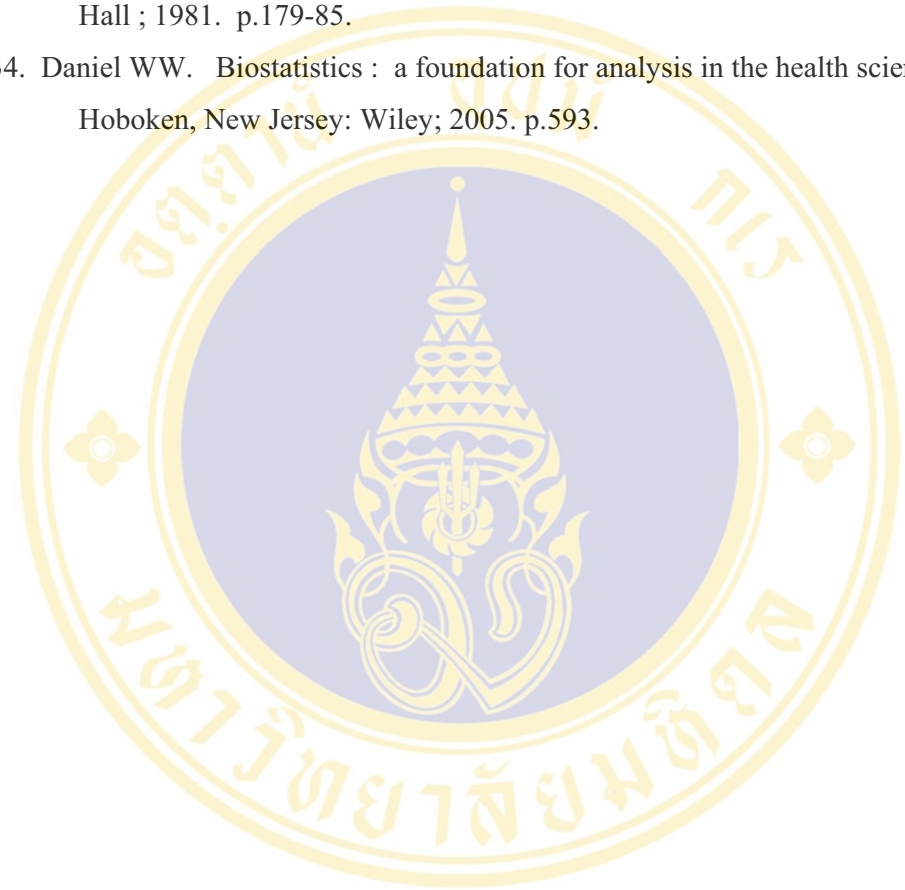

APPENDIX

APPENDIX A

QUESTIONNAIRE

ORAL HEALTH CARE PERFORMANCE FOR INPATIENTS AMONG NURSES AT HANOI CITY HOSPITALS, VIETNAM

Date of registration: ……../January/2008 Registration No: ☐☐☐

Part 1 : Socio Demographic Characteristics

Please check (√) only one correct answer in one blank box to each question.

1. How old are you?….. years What is your date of birth?……../……./ 19…

2. What is your gender? ☐ 1. Male ☐ 2. Female

3. What is your level of graduation?

☐ 1. Preliminary certificate ☐ 2. Secondary certificate

☐ 3. College ☐ 4. Bachelor

4. What is your clinical ward?

☐ 1. Surgery ☐ 2. Obstetric

☐ 3. Diabetes ☐ 4. Cardio-vascular

☐ 5. Other, specify…….....

5. How long have you been working in this ward?……. years

Part 2 : Knowledge about oral oral health care issues

Please check (√) only one correct answer for each question.

6. What is the common symptom of gingivitis?

☐ 1. Reddened or swollen gum ☐ 2. Sialorrhea

☐ 3. Toothache ☐ 4. Dry mouth

7. What is the main cause of periodontal diseases?

☐ 1. Staphylococus aureus ☐ 2. Candida albicans

☐ 3. Hepatitis Virus ☐ 4. Trichomonas

8. What is the **dangerous** consequence that periodontal diseases lead to?

☐ 1. Infection to other organs of the body ☐ 2. Tooth loss

☐ 3. Tooth mobilization ☐ 4. Limitation of mastication

9. What is the specific symptom of dental caries?

☐ 1. A black hole on the surface of tooth ☐ 2. Gum bleeding

☐ 3. Toothache ☐ 4. Tooth mobilization

10. What is the cause of dental caries?

☐ 1. Streptococus Mutans ☐ 2. E.coli

☐ 3. Herpes Virus ☐ 4. Chlamydia

11. What is the final consequence of dental caries?

☐ 1. Tooth abscess ☐ 2. Toothache

☐ 3. Tooth bleeding ☐ 4. Tooth mobilization

12. What is the best way to prevent dental caries and periodontal diseases?

☐ 1. Tooth brushing after meal ☐ 2. Mouth rinse everyday

☐ 3.Use tooth stick ☐ 4. Limit to use sugar

13. Which of the following oral diseases should be treated first for patients with cardio-vascular diseases?

☐ 1. Periodontitis and dental caries ☐ 2. Herpes lesion

☐ 3. Discoloration of teeth ☐ 4. Tooth sensitivity

14. Which of the following oral diseases should be treated first for inpatients with diabetes?

☐ 1. Periodontitis and calculus ☐ 2. Herpes lesion

☐ 3. Discoloration of teeth ☐ 4. Tooth sensitivity

15. What type of oral hygiene care that woman before pregnancy should have in order to avoid the consequences of oral diseases during and after pregnancy?

☐ 1. Scaling and dental caries treatment ☐ 2. Making denture

☐ 3. Bleaching the teeth ☐ 4. Aesthetic restoration

16. Oral health care practice for inpatients should be taken at least how many times per day in your clinical ward?

☐ 1. At least one time ☐ 2. At least two times

☐ 3. At least three times ☐ 4. More than three times

17. Which of the following measures is most necessary for oral health care practice for inpatients that are unable to practice by themselves in your ward?

☐ 1. Clean mouth by Peroxide solution ☐ 2. Tooth brushing

☐ 3. Use dental floss ☐ 4. Visit hospital dentist

18. Which is the best way to practice oral health care for inpatients that are able to practice by themselves in your ward?

☐ 1. Tooth brushing ☐ 2. Clean the mouth by Peroxide solution

☐ 3. Use tooth stick ☐ 4. Visit hospital dentist

19. Which one of the following mouth rinse solutions is good for prevention of oral diseases?

☐ 1. Sodium chloride solution ☐ 2. Chlorhexidine solution

☐ 3. Mint flavor solution ☐ 4. Fresh water

20. What is the best way to clean the denture?

☐ 1. Brush denture without toothpaste ☐ 2. Brush with toothpaste

☐ 3. Brush with detergent ☐ 4. Brush with salt

Part 3: Attitude toward oral health care

Please check (√) the most suitable answer according to your opinion

No	Statement	Strongly agree	Agree	Not sure	Disagree	Strongly Disagree
21	Brushing teeth immediately after meals can prevent oral diseases.					
22	*Mouth rinse by fresh water can help prevent oral diseases.					
23	Dental flossing after meal can prevent oral diseases.					
24	*Poor oral hygiene is not a risk of oral diseases and other diseases.					
25	Regular dental check up once every 6 months is necessary for early detection of oral diseases.					
26	*Oral health care is the responsibility of inpatients only.					
27	*It is not necessary to provide oral health care for inpatients at hospitals.					
28	Treatment of oral diseases is necessary for inpatient with cardiovascular diseases.					
29	*Treatment of oral diseases is not necessary for inpatients with diabetes.					
30	Before pregnancy, women should be treated oral diseases in order to avoid its consequence both during and after pregnancy.					
31	After delivery, woman should be treated oral diseases as soon as possible.					
32	*Inpatients don't need to have guideline about oral hygiene practice in hospitals.					
33	Inpatients need to be recommended to visit dentist if they have oral health problems.					
34	It is necessary to clean the denture everyday.					
35	*It is not necessary to clean the denture immediately after each meal.					

Note: question with * mark is negative statement

Part 4: Training on oral health care

Please check (√) only one correct answer for each question.

36. Have you ever been trained about oral health care during your study in nursing college?

☐ 1. Yes ☐ 2. No

37. Do you get any training course on oral health care during your work over the past year?

☐ 1. Yes ☐ 2. No

38. Do you attend any lecture on oral health care provided by hospital dentist in your hospital over the past year?

☐ 1. Yes ☐ 2. No

39. Do you attend any seminar on oral health care over the past year?

☐ 1. Yes ☐ 2. No

40. Do you receive any advice about oral health care for inpatients from chief of nurse or physician in your clinical ward?

☐ 1. Yes ☐ 2. No

PART 5: Oral health care skills

Please check (√) only one correct answer for each question.

41. Do you have any skill to assist inpatients that are under some limited movement to practice oral hygiene by themselves?

☐ 1. Yes ☐ 2. No

42. Do you have any skill to guide inpatients about how to practice oral health care for those that are able to practice by themselves?

☐ 1. Yes ☐ 2. No

43. Do you have any skill to remind inpatients to practice oral health care for those that are able to practice by themselves everyday in your ward?

☐ 1. Yes ☐ 2. No

44. Do you have any skill to clean denture for inpatients?

☐ 1. Yes ☐ 2. No

45 Do you have any skill to guide patients to clean their denture?

☐ 1. Yes ☐ 2. No

PART 6. Patient workload

Please fill in the blank with your most appropriate answer.

46. How many patients are you in charge in your ward daily? ……patients

PART 7. Supervision on oral health care

Please check (√) more than one answer if you think it is possible

47. From whom do you receive any supervision or instruction on practice oral health care for inpatients in your ward?

☐ 1. Hospital dentist ☐ 2. Chief of Nurse

☐ 3. Physician in your ward ☐ 4. None of them

☐ 5. Other (please specify)……

PART 8: Oral health care performance

Please check (√) only one suitable answer for each of the following questions based on your actual practice of oral health care for inpatients.

Oral health care performance for functionally dependent patients						
No	**Activities**	After each meal	Morning &Evening before sleep	Evening before sleep only	Morning only	Never
48	How often do you assist inpatients to brush their teeth?					
49	How often do you assist inpatients to rinse their mouth?					
50	How often do you clean the mouth of inpatients with gauze?					
51	How often do you brush denture for inpatients?					
52	How often do you rinse denture for inpatient?					
Oral health care performance for functionally independent patients						
No	**Activities**	Regularly	Some time	Once per admission Only	Upon request by chief of nurse	Never
53	How often do you encourage/supervise inpatients to brush their teeth for those that know how to do it correctly?					
54	How often do you instruct inpatients to brush their teeth for those that don't know how to do it correctly?					
55	How often do you encourage/supervise inpatients to rinse their mouth by oral disinfection solutions?					
56	How often do you encourage/supervise inpatients to clean their denture for those that know how to do it correctly?					
57	How often do you instruct inpatient to clean their denture for those that don't know how to do it correctly?					

Scoring of Oral health care performance

1. OHC performance for functionally dependent patients

After each meal	4 scores
Morning &Evening before sleep	3 scores
Evening before sleep only	2 scores
Morning only	1 score
Never	0 score

2. OHC performance for functionally independent patients

Regularly	4 scores
Sometime	3 scores
Once per admission only	2 scores
Upon requested by chief of nurse	1 score
Never	0 score

APPENDIX B

Letter of Consent

Oral health care in one of the contents of holistic patient care. In order to improve the quality of holistic patient care, Hanoi Health Department developed a study project to investigate the oral health care performance for inpatient among nurses in Hanoi city by self-administered questionnaire.

We are honor to request your participation in this study project. Please read carefully and fulfill all answers which are most appropriate by your own ideas. After finishing answer questionnaire, please to check again to find out the unanswered questions and to complete the answers sheet. The information collected from the questionnaire will be kept in confidential and it is just used for research purpose only.

Your enthusiasm and objective participation is valuable to this study. We highly appreciated your meaningful contribution of information data for finding the measure for improvement of patient care quality in Hanoi city.

Director of Program for Improvement of Patient Care Quality

Dr.Pham Le Tuan- Vice Director, Hanoi Health Department.

BIOGRAPHY

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