Oncology Nurses' and Nurse Practitioners' Educational Experiences, Professional Attitudes and Behaviors Related to Oral Health Care for Patients with Breast Cancer

By

Jennifer Anne Suminski

This thesis was submitted in partial fulfillment
of the requirements for the degree of
Master of Science
(Dental Hygiene)
in the University of Michigan
2015

Thesis Committee:

Assistant Professor L. Susan Taichman, Chair
Professor Marita R. Inglehart
Assistant Professor Stephanie M. Munz
Associate Professor Catherine H. Van Poznak

Dedication

       I dedicate this work to my family and friends who have always supported me in my educational and overall life endeavors. Mom and dad, you instilled in me to always work hard and be proud of the work I put forth; you are my inspiration. To all of my friends and loved ones who were my cheerleaders every time I felt like giving up, who lifted me up and told me that I am going to amount to great things in this lifetime, thank you from the bottom of my heart. I am grateful for the love, support, and kind words you provided to allow me to accomplish one of the hardest challenges yet in my life. Finally, I dedicate this work to my two grandfathers who were two of the hardest working people I have ever known. I know you are looking up from Heaven smiling at me and watched as I walked across that stage at Hill Auditorium. I think of you often, and knowing how I would have made you so proud has been one of the biggest motivators as I work to reach my life goals.

Acknowledgements

I would like to whole heartedly thank my thesis committee members, Dr. L. Susan Taichman, Dr. Marita Inglehart, Dr. Stephanie Munz, and Dr .Cathy Van Poznak for their time, guidance, and dedication to my research experience and thesis project.

I would especially like to thank Dr. Taichman for her amazing support, encouragement, reassurance, and mentorship during my time in the MSDH program. I cannot thank you enough for being there when I needed you most.

I would like to thank Giselle Kolenic for her guidance and assistance during my statistical analysis.

I would like to thank Janet Kinney and Anne Gwozdek for their encouragement and guidance throughout my journey.

Finally, I would like to thank my classmate Sara Coppola. You were my rock through this entire experience. I would not have been able to accomplish what I have without you being here with me. There may be thousands of miles between us and a three hour time difference, but you were always there when I needed someone to talk to. Thank you my friend.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Appendix

A.   Survey Recruitment Letter

B.   Research Survey

C.   Health Sciences and Behavioral Sciences
      Institutional Review Board - Letter of Exemption

CHAPTER I

INTRODUCTION

1.1 Problem Statement

According to the Centers for Disease Control (CDC), breast cancer is the most prevalent cancer found in women among all races; about one in eight women in the United States will develop invasive breast cancer in their lifetime.[1] The American Cancer Society estimates for 2014 that over 230,000 new cases of invasive breast cancer will be diagnosed in women, and approximately 40,000 women will die from breast cancer in the United States.[2]

Treatment for breast cancer includes surgery, chemotherapy, endocrine therapy, and radiation treatment. Anti-cancer therapies have significant health impacts that include serious side effects on patients' oral cavities, some of the more prevalent being xerostomia and oral mucositis.[3-11] Oral health-related care plays an important role in patients with breast cancer because many patients undergo various and sometimes complex therapies which may increase the potential for the occurrence of oral side effects. If anti-cancer treatment induced oral side effects present, oftentimes dose reduction or interruption occurs, which prolongs treatment or may allow the cancer to progress.

Oncology nurses are licensed specialty health care professionals who play an important role in the prevention, identification, and management or oral side effects from anti-cancer treatments and are ideally situated to provide oral health information to their patients.[3] Communication with patients who are diagnosed with breast cancer about the potential effects of their upcoming treatment is important. Furthermore, knowing how to optimally manage any adverse oral effects is critical for these patients and contributes to maintaining a positive oral health-related quality of life.

Previous studies on the subject of nurses' education and knowledge of oral health showed an inverse correlation between adequate oral care provided to patients and the lack of education and knowledge in the subject of oral health covered in nursing curricula.[3,4] Most often, oral health care is generally given a low level of priority by nursing staff in various settings and it has been suggested that the nurses' attitudes, behaviors, and beliefs may be more focused on alleviation of other cancer or treatment related symptoms, such as pain, nausea, and dyspnea.[11-13] Research also suggested other attitudes and behaviors relating to the lack of oral care being provided partially due to the nurses' comfort level and availability of tools used in performing oral assessments.[3-4,7-8,11-17]

1.2 Goal Statement

Past and current literature suggests that nurses are aware of the importance of oral health-related impacts of anti-cancer treatment; however, they may still fail to recognize the need for performing oral health care assessments for their patients and/or lack the skills to engage in the management of adverse oral impacts.[3-4,6,14,18] The oncology team's lack of educational knowledge, attitudes and behaviors related to their

patients' oral health-related quality of life may ultimately have an impact and potentially compromise the patients' ability to progress through treatment comfortably and without anti-cancer therapy interruptions. Breast cancer oncology was chosen as the focus of this study because of the severity and high prevalence of oral complications, such as oral mucositis, reported during treatment. The intent of this study was to examine the education, attitudes, and behaviors of oncology nurses, who have additional specialty training beyond general nurses, concerning the oral health among patients with breast cancer who may experience adverse effects to their anti-cancer treatments.

1.3 Specific Aims

Specific Aim 1: To assess whether the extent of training oncology nurses and nurse practitioners obtained beyond a general registered nursing (RN) degree influences their awareness of the importance of oral health-related care in patients with breast cancer.

Hypothesis: It is predicted that the more training obtained by oncology nurses and nurse practitioners beyond a general registered nursing (RN) degree, the better educated they will be about the importance of oral health-related care.

Specific Aim 2: To evaluate oncology nurses' and nurse practitioners' perceptions of their knowledge and understanding of oral health issues patients with breast cancer face during anti-cancer treatment.

Hypothesis: It is predicted that oncology nurses and nurse practitioners' who express knowledge of oral health-related care are likely to report incorporating oral health assessments into their clinical care.

Specific Aim 3: To assess oncology nurses' and nurse practitioners' current professional attitudes concerning oral health-related care for patients with breast cancer.

Hypothesis: Oncology nurses and nurse practitioners will place a lower value on oral health-related care for patients with breast cancer.

Specific Aim 4: To assess if supportive oral health-related behaviors exist among oncology nurses and nurse practitioners caring for patients with breast cancer who are beginning or undergoing anti-cancer treatment.

Hypothesis: Oncology nurses and nurse practitioners rarely or never report incorporating oral health assessments in patients with breast cancer.

1.4 Significance

A comprehensive literature review revealed that this study would be, to the best of our knowledge, the first study which focuses on oncology nurses' and nurse practitioners' education, professional attitudes, and behaviors related to oral health care for patients with breast cancer. In working with a team of experts in the field of breast cancer treatment as well as OHRQoL at the University of Michigan, it is anticipated that this study would be adding a significant piece to the extensive knowledge bank of both oral health care and breast cancer research, and perceptions of oral health care in the field of nursing.

The results of this pilot study are expected to be used to define the existing level of awareness among oncology nurses and nurse practitioners concerning the importance of oral health-related quality of life during anti-cancer treatment in patients with breast cancer. Increasing awareness may lead to improved oral health education in nursing programs, early detection or prevention of oral side effects resulting in less dose reductions and therapy interruptions, and improved supportive care. Additional outcomes would be to see more referrals to dental professionals when oral health issues arise, increased interprofessional collaboration with possibilities of continuing education courses between health professions, and development of resource materials (such as leaflets) that can be given to patients with breast cancer with regards to the importance of their oral health during treatment.

CHAPTER II

REVIEW OF THE LITERATURE

2.1 Introduction

A. Prevalence of Breast Cancer

According to the Centers for Disease Control (CDC) breast cancer is the most prevalent cancer found in women among all races.[1] The American Cancer Society estimates for 2014 that over 230,000 new cases of invasive breast cancer will be diagnosed in women, and approximately 40,000 women will die from breast cancer in the United States.[2] Breast cancer death rates in developed countries, specifically the United States, have been declining since the late 1980's due to early detection, screening, increased awareness, and improved treatment options.[2] However, mortality rates are higher in developing countries due to lack of affordable treatment, screening and testing abilities, and access to care.[19]

B. Treatments for Breast Cancer

Depending on the stage of breast cancer a patient develops, anti-cancer treatment for breast cancer could vary. According to the National Cancer Institute, the standard treatments for breast cancer typically may include surgery to the breast and to the ipsilateral axilla, radiation therapy, chemotherapy, hormone therapy, targeted

therapy or a combination of these treatments.[20] Improved molecular understanding of breast cancer types has led to the development of single-targeted and multi-targeted treatment agents.[20] The selection, dosing, and administration of breast cancer regimens is complex.[20] The extent of tumor burden, and tumor specific biomarkers influence treatment options.[20] Once therapy has been initiated, the treatment course may undergo modifications of drug doses or schedules to aid in the management of treatment toxicities. For some situations, the focus of care is palliative due to the extent of tumor burden, the body's response to treatment, and other pre-existing confounding comorbidities.[19]

2.2 Oral Side Effects of Breast Cancer Treatments

Anti-cancer therapies may have significant adverse effects that include serious side effects affecting the patient's oral cavity. One of the more prevalent side effects are oral mucositis, which may affect oral functions like speech, nutritional intake, and nonverbal expression of feelings, thus compromising the patient's oral health-related quality of life.[3-4,7-8,15] Xerostomia, another potential side effect of chemotherapy drugs, is associated with an unpleasant sensation, difficulty with oral intake, and places the patient at an increased risk for developing dental caries due to the lack of salivary flow. Other relevant issues regarding the presence of anti-cancer treatment-induced oral side effects are the risk of dose reduction, therapy interruption, or patient compliance to treatment, which can prolong treatment or may allow the cancer to progress.

A. Oral Mucositis

The accepted medical definition of mucositis is "an inflammatory process involving the mucous membranes of the oral cavity and gastrointestinal tract."[8] Anti-cancer therapy-induced ulcerative oral mucositis is a well-defined medical phenomenon. However, its causative risk factors are not well understood.[8] Patients undergoing anti-cancer therapy, especially chemotherapy, often experience oral mucositis as a side effect. The highest prevalence of oral mucositis among breast cancer therapies is found in intravenous chemotherapy and an oral chemotherapy drug class called mTOR inhibitors. An alarming statistic found during the BOLERO-2 trial showed incidence of oral mucositis in 56% of patients undergoing everolimus therapy or which eight percent was grade three oral mucositis or higher.[22] Oral mucositis has a rapid onset within the first two weeks of therapy and presents as an erythematous inflammation, painful burning sensation, and occasional bleeding of the mucous membranes of the oral cavity, lips, or tongue.[22,23] Oral mucositis can affect the patient's quality of life due to pain, infection, altered nutrition intake, impaired oral functionality as well as commonly causing delay in treatment and dose reductions during anti-cancer therapy.[4,7-8,15] Suggested management and/or prevention of oral mucositis involves the use of topical analgesic mouth treatments and corticosteroids along with possible dose reduction, interruption of therapy, or change in anti-cancer therapy.[22]

B. Xerostomia

Xerostomia, also commonly known as "dry mouth", is a condition resulting from decreased or absence of salivary flow, and may or may not go hand in hand with an oral mucositis flare up.[8] Xerostomia on its own is a rare occurrence among breast cancer

patients. Most anti-cancer therapies used to treat various types of breast cancer simply do not have xerostomia as a recorded side effect of treatment, and most radiation treatments are localized to the affected area. However, a new study by Wilberg et al. suggests that some patients with cancer in regions other than the head and neck have shown signs of transient xerostomia associated with anti-cancer therapies such as chemotherapy and radiation in conjunction with other concurrent systemic medications.[11]

2.3 Role of the Oncology Nursing Team

The oncology nursing team (including oncology nurses and oncology nurse practitioners) are highly-trained specialists who promote positive outcomes in symptom management (including patient education), quality of life, and patient and family satisfaction and coping for the breast cancer patient. Referrals to and the integration of other healthcare professionals during this time to meet the patient's needs is necessary. They include dental referrals, psychological referrals for supportive and care and coping, and referrals to other professionals as see fit.[4,7-8,15-16,24-26]

A. Patient Education

Patient and caregiver instruction is an important part of the pre-treatment phase in which the oncology nursing team initiates instructions regarding treatment, prevention, and management of some side effects, including more serious adverse effects the patient could encounter during the anti-cancer therapy duration.[7,24] Educating patients can be one of the more challenging roles of the oncology nursing team. At the time of diagnosis, the patient retains about 20% or less of the important

health information provided to them due to being overwhelmed with fear and anxiety related to their cancer diagnosis.[7] Taking this into consideration, the oncology nursing team has to be cognizant that less information can oftentimes be more helpful, especially by stressing the essential points of what is to come. Scheduling time with other family members and/or caregivers to discuss more detailed information is usually best in order to allow them to assist their loved one through this process.[7,24]

B. Referral to Healthcare Providers

Before and during the treatment phase, the oncology team works together to provide regular assessments and any necessary care.[7] As the oncology nursing team observes any physical, emotional, social, or spiritual effects during the process of patient care assessment, they are trained to make the proper recommendations and referrals to healthcare providers outside of the oncology team. Emotional effects often seen among patients and caregivers include higher occurrence of stress, anxiety, depression, and fear which would most likely require the assistance of a counselor, therapist, or psychologist.[26] Some of these professionals would be able to potentially assist the patient and caregivers in any social effects from treatment as well, such as relationship strain, communication issues among the patient-caregiver dyad, and limits in social life. Physical effects have a very wide range from oral effects, to cardiovascular effects, sleep disturbances, and many more which would require an appropriate referral and follow up communication to a specialist outside of the oncology team. Many times spiritual effects encountered during cancer treatment can be a transformational and positive experience.[26] Referrals made to appropriate spiritual professionals affiliated

with the patient and caregivers can be made to help patients understand a greater acceptance of things, help caregivers be more empathetic, and bring families closer.[24-26]

2.4 Breast Cancer Oncology Nurses' and Nurse Practitioners' Education and Knowledge Concerning Oral Health

It has been noted in previous literature that the oncology nursing team is ideally situated to provide information regarding oral health to the patients they care for, particularly for the elderly and those with chronic illness.[3-4,7-8,27-28] Oncology nurses and nurse practitioners play a central role in preventing and managing oral side effects and reducing its effects on the patient's overall quality of life; including effective assessment and monitoring of the oral cavity and patient education.[4] Previous studies on the subject of nurses' education and knowledge about oral health predicted that a major barrier to providing adequate oral care is related to the lack of education and knowledge in the subject of oral health in nursing curricula.[3,4]

A. Educational Requirements for Licensure/Certification

Certification in oncology nursing is a formal recognition of clinical expertise and competence beyond a traditional registered nurses' degree.[24] Historically, the Oncology Nursing Certification Corporation (ONCC) has conducted role delineation studies in order to determine and define the responsibilities of various roles in oncology nursing, including the knowledge required for competent job performance in that defined role.[25] Oftentimes additional certifications or degree are obtained by registered nurses to practice in oncology nursing, but some facilities do not always make this a necessary

11

requirement to practice in oncology nursing. Despite trends to create mandatory certification, little research exists to support its necessity.[24]

B. Education Relative to Oral Health

Over the last fifteen to twenty years, there has been a national call to action to promote good oral health care and emphasized need for all healthcare providers to be proactive with oral disease prevention.[3] As previously stated, the oncology nursing team is ideally situated to provide patient education to patients they care for. However, while nursing curricula now include health assessment, health promotion, and other issues related to patient needs, the topic of oral health is still not being well integrated into nursing curricula.[3,18] Lack of knowledge has been identified as one of the barriers to implementing oral care standards and educating patients and caregivers within the oncology nursing profession.[3-4,7-8, 27-28] Literature also suggested that part of the problem might be a lack in understanding the importance of good oral health care, as education on oral issues for nursing staff is not routinely offered.[12,18,28] Furthermore, nurses and nurse practitioners have little training in recognizing, diagnosing, and managing oral complications.[11] Continuing efforts to increase knowledge among oncology nurses and nurse practitioners about the relationship between oral health and general health is critical, especially in countries where cancer survival rates are shown to be highest because prevalence of cancer in these countries is also very high.[28]

a. Presence of Oral Health Education in Nursing School Curricula

Education about oral care appears to continue to be insufficient within some nursing curricula within the U.S.[3,29] A report by Ohrn et al. described that only four

percent of nurses who participated in the survey reported an education in the topic of oral health and oral care during their initial nursing education.[29] However, it was found that specialty nursing organizations have more comprehensive guidelines for their certifications and include questions related to prevention and management of oral complications within their actual certification examinations.[29]

A study by Clemmons et al. concluded that more emphasis should be placed on nursing students to increase knowledge, skills, and attitudes needed to practice effectively which includes preventative strategies such as oral health care for their patients.[3] While many of the questions posed to students in this study revolved around patient oral assessments, 100% of participants answered that there is a positive correlation between periodontal disease and other health conditions. However, based on other incorrect answers to knowledge questions relating to oral health, it was clear that although participants viewed oral health as an important part of the nursing profession, only 25% of students were able to correctly identify the components of an oral health assessment. This study showed evidence that they did not have a full understanding of the key components of oral health care and patient oral health education strategies.[3]

According to a report by Southern, oncology nurses who were certified (7.1%) reported that they received a great deal of education in oral care during their certification education.[18] Several suggestions on how to integrate oral health care continue to be suggested by oral health professionals, including a cross-teaching model where dental professionals/faculty could participate in teaching nursing students in oral care and complications of the oral cavity.[7] While it seems that cancer nursing teams are

more well-educated about oral health, dental health professionals continue to stress the importance of more substantive preparation should be required for health professionals both in the general and oncology nurse settings.[7,18]

b. Post-Graduation Training in Oral Health

Although not well studied, the amount of post-graduation training in oral health care has been shown to be a factor in caring properly for patients who experience oral health symptoms due to anti-cancer therapies.[28,29] A study by Costello and Coyne suggested that nurses and nurse practitioners learn some information about the oral cavity during their schooling and receive training in oral care through training on the job, however on the job training is of short duration and updates on oral care topics are infrequent.[12] Lack of on-the-job training and continuing education courses related to oral health contribute to the low confidence levels nurses and nurse practitioners have in their ability to identify and treat oral health symptoms which present in patients they treat.[18]

Specific to cancer nursing, a study by Wardh et al. showed that significant knowledge and confidence in providing oral care was gained by oncology nurses who underwent a four hour oral health training session as part of their on the job training and suggested that a new standard in oncology nursing should be to include routine updates about oral healthcare.[28] On-the-job training increases the nurses' and nurse practitioners' confidence in performing oral assessments and improves the outcome of oral cavity disease state evaluations.[4]

A report by Ohrn et al. revealed that 94.5% of all respondents in the study indicated a need for all oncology nurses to have continuing education about oral health-related care.[29] However only eleven percent of general nurses and about twenty percent of oncology nurses attended an oral care continuing education course within the last year.[4,18] Knowledge about prevention, treatment, and risk factors of developing oral conditions are as important as knowing how to treat other side effects brought on by anti-cancer therapies. Nurses and nurse practitioners have the responsibility to seek additional education in the area of oral care and health.[4]

2.5 Breast Cancer Oncology Nurses' and Nurse Practitioners' Attitudes and Behaviors toward Oral Health Care

Oral health care is generally given a low level of priority by nursing staff and it has been suggested that the nurses' and nurse practitioners' attitudes, behaviors, and beliefs may be more focused on alleviation of other cancer or treatment related symptoms, such as pain, nausea, and dyspnea.[11-13] Previous research suggested that a nurses' or nurse practitioners' comfort level and tools available to perform oral assessments play a significant role in the lack of oral care provided to the patient with breast cancer.[3-4,7-8,11-17] It is also noteworthy that demographic influences and attitudes of the nursing teams' own personal dental health could affect the level of oral care provided to their patients.[13]

A. Performing Oral Health Assessments on the Patient

i. Time Factors Hindering the Completion of Oral Health Assessments

Nurses' and nurse practitioners' need to prioritize oral health can result in overlook when other rival activities take precedence. A shortage of staff limits the time spent evaluating each cancer patient, and additional expansion of the nurses' and nurse practitioners' role itself which includes more paperwork. Oftentimes when oral health attracts the attention of the oncology nursing team, it is not until problems in the oral cavity are already present.[11-12,17] In a study by Miller et al, patient oral care documentation was completed by oncology nurses through the use of an oral care diary. While half of the nurses participating in the study predicted that the oral care diary would improve oral assessment and care for patients, by the end of the study 88% of the participant population agreed that this oral assessment diary placed quite a bit of extra demands on them. Oftentimes oral health care is left to the patient, delegated to an untrained staff member or regarded as the responsibility of dental professionals only.[17]

ii. Tools Used to Perform Oral Assessments

Several studies suggested that the lack of appropriate equipment within the facilities hinder the delivery of adequate oral care for cancer patients.[4,8,12,15] A study by Moore found that many cancer treatment facilities stocked mouthwash and foam swabs rather than toothbrushes, or that the toothbrushes were of poor quality or where not made readily available.[12] This is an area where education regarding effective oral hygiene methods may be useful to teach oncology nurses in order to bring about changes in oral health protocol and precedence.[13] Several assessment tools are available to assess patient oral health, but many of the facilities do not use these

standard assessment scales (such as mucositis grade scales) due to lack of knowledge about their availability or how to use them or due to time constraints.[12,15-17]

2.6 Conclusion and Recommendations

Dental health assessment is considered an integral and essential element of the overall breast cancer management paradigm for all patients at risk for developing oral complications before, during, and after anti-cancer therapies.[16] Given the potential risk that poor oral health will increase the risk for systemic disease that could potentially complicate the patient's breast cancer treatment, it is important that medical and dental professionals be knowledgeable with regard to performing oral assessments, providing thorough breast cancer patient education, and implementing oral health protocols in breast cancer care facilities.[27] An interdisciplinary health care team and cross training approach has been recognized as the best model for the delivery of specialized care.[7,16]

CHAPTER III

MATERIALS AND METHODS

3.1 Study Design

This study had an observational cross-sectional descriptive design. Data were collected using a Qualtrics electronic survey which was divided into the categories of basic demographic information, educational background, professional attitudes and behaviors regarding oral health-related care.

3.2 Source Population

A total of 5,000 participants were identified with the assistance of the ONS based on the inclusion criteria provided to them. ONS is a United States-based, professional association open to registered nurses, nurse practitioners, and other health care professionals involved in oncology care.[30] Their mission and vision is to promote excellence in oncology nursing and quality cancer care, as well as take the lead in the transformation of cancer care.[30]

Another eleven participants were identified through contacting two Michigan hospitals; Troy Beaumont Cancer Care Clinic and Henry Ford Macomb Hospital Oncology Clinic. The administrative staff distributed surveys among their staff who fit the inclusion criteria of the study.

3.3 Inclusion and Exclusion Criteria

Individuals were eligible to participate in the study if they were registered oncology nurses and nurse practitioners who possessed a background in treating patients with breast cancer. The participants also had to be currently practicing (non-retired) and fully licensed at the time the survey was taken. If participants did not meet these criteria or were a member of another health profession other than oncology nursing, their data were excluded.

3.4 Participant Recruitment Strategy

The 5,000 participants received a recruitment email sent from ONS on behalf of the study's research team explaining the study and the potential benefits of participating in the survey which aid in defining factors affecting the interface between patients and oncology nurses/nurse practitioners (Appendix A). The survey was disseminated to the identified breast oncology nurses and nurse practitioners by the Oncology Nursing Society (ONS) two times to increase the chance of response. Participants were asked to participate in a study about their educational experiences, professional attitudes and behaviors related to oral health care in patients with breast cancer.

Additionally, two Michigan hospital cancer centers were contacted by phone and received the survey in order to gain additional survey respondents for data analysis. Troy Beaumont Hospital's Breast Care Center was sent the invitation to participate in the survey via an email to the corporate business manager after initial phone contact. Henry Ford Hospital North Campus Oncology Center received paper surveys which

were delivered physically by the principal investigator and distributed by the head nurse so all respondents remained anonymous.

3.5 Data Collection

A comprehensive questionnaire was designed and modified from a recently published pediatric oncology nursing study which examined educational experiences, professional attitudes, and behaviors of RNs related to oral health care.[31] The survey contained 19 questions and investigated factors related to three topics; oncology nurses' and nurse practitioners' (1) educational experiences, (2) professional attitudes, and (3) behavior related to oral health care for patients with breast cancer. Demographic and practice characteristics were also collected and included gender, age, the year their first nursing degree was obtained, any additional degrees or certifications, current employment setting, average hours worked per week, and questions pertaining to the number of hours of patient contact.

To best capture the responses, different types of questions such as Likert scale, close-ended, and open-ended questions were used. The data were collected through an electronic survey method. Qualtrics online survey software, free to all University of Michigan members, was used for dissemination of the survey. All accounts were password protected and servers are protected by high-end firewall systems. Vulnerability scans are performed regularly by the quality assurance department members at Qualtrics.[32] (See Appendix B for the questionnaire.)

3.6 Statistical Analysis

The data were imported from Qualtrics into SPSS. The data were reviewed and recoded for errors and inconsistencies. Using SPSS, analyses were performed using descriptive statistics such as frequency distributions, percentages, and measures of central tendency and variation to provide an overview of results. Bivariate analysis, such as independent sample t-tests, were used to test whether the average responses of different subgroups were significantly different. Spearman rho correlations were used to determine whether significant relationships exist between the continuous variables whereas Chi-square tests were used for categorical variables.

3.7 Sample Size Estimation

An a priori power analysis with the program package G*Power 3.1.2 (http://www.psycho.uni-duesseldorf.de/abteilungen/aap/gpower3) was conducted to determine the needed sample size given alpha = .05, the power = .80, and a small effect size of .10, when using one sided tests to test for the significance of correlations between the respondents' educational experiences and attitudes or professional behavior. The results showed that a sample size of 614 respondents was needed. The response rate to email surveys is usually about 15%, therefore the recruitment email was sent to approximately 5,000 members to target 614 survey responses.

3.8 Protection of Human Rights

The survey and proposal were submitted to and approved under an exempt status by the University of Michigan Institutional Review Board (IRB) for the Behavioral and Health Sciences. The University of Michigan IRB number assigned to this study is

HUM00089103 (Appendix C). There was no more than a minimal risk to participants, and there was no direct benefit for participation nor consequence for non-participations. The researchers who conducted the study had completed PEERRS training concerning the protection of human subjects.

CHAPTER IV

RESULTS

Figure 1 provides an overview of the survey respondent recruitment and enrollment. The total number of potential respondents recruited for participation was 5,000. From 5,000 potential recipients of the electronic ONS survey, 194 initiated the survey. Another 11 nurses were identified at Troy Beaumont Cancer Care Clinic and Henry Ford Macomb Hospital Oncology Clinic. Therefore, the total number of respondents assessed for eligibility were n=205. Of the 205 eligible respondents, 37 were excluded because they did not meet inclusion criteria of being currently practicing, non-retired, fully licensed oncology nurses. From the 168 surveys, only 106 had complete data relating to education, professional attitudes and behavior categories which related to the specific aims of the study. Due to the high number of incomplete surveys and types of comparative data analysis tests run, we chose to only include surveys that had complete data for all questions related to the specific aims of the study in order to achieve the highest statistical accuracy and precision possible. This equates to a 49% dropout rate. The total response rate of the survey out of 5,011 disseminated was 2.1%

4.1 Demographics

  Table 1 provides an overview of the demographic characteristics of 168 respondents who initiated the survey and of the 106 respondents who completed the survey in its entirety. The age range of respondents was between 24-69 years old and the mean age of the respondents was 48 years old respectively between the two groups. In both groups, the majority of respondents were female. More than half earned their degree since 1990. Between both groups of respondents, approximately 65% reported not having an additional nursing degree, while about 34% went on to earn an additional degree past their initial nursing degree. The most common additional degree was a bachelor degree in nursing, and the second most common was a master (or graduate) degree. However, approximately 70% of respondents respectively hold an additional certificate in the area of oncology nursing.

  Table 2 describes the practice characteristics of the survey respondents. The average number of hours worked per week was approximately 37 respectively, where the majority of respondents indicated working between 30 to 40 hours. The number of patient contact hours per week was relatively close to the number of hours worked per week, where 80% to 84% of respondents indicated face-to-face contact between 20 and 40 hours per week respectively. Nurses reported seeing approximately 47 patients per week, where most nurses approximately 71% cared for under 50 patients per week, 20.8% of nurses cared for 50 to 100 patients per week, and approximately 6% of nurses cared for over 100 patients per week. Out of these patients that are seen throughout the week, about 80% of nurses cared for under 25 patients with breast cancer per week,

12% of nurses cared for between 25-50 patients with breast cancer per week, and 4.5% of nurses cared for over 50 patients with breast cancer per week.

As many respondents failed to complete the whole survey, the potential non-response bias between those who completed the whole survey and those who did not was investigated. No significant differences were seen in age, gender, degrees and certifications earned, and practice settings between those who completed the entire survey and those who did not. However, due to the impact of missing data on the Spearman-Rho Correlation Coefficients analyses, only those respondents with complete survey data were included from this point forward.

4.2 Practice Setting Characteristics

Figure 2 provides information relating to the practice settings of the 168 respondents. The most common setting of the oncology nurses/nurse practitioners was in the hospital setting (44.6%). The second most common setting of the respondents was listed as an outpatient clinic setting (39.9%). A private practice setting was recorded as 7.7%, followed by a setting other than the choices given was recorded as 6%, and an educational setting (0.6%).

4.3 Educational Influences on Awareness of Oral Health-Related Care

Table 3 and 4 contain the results of the independent samples t-tests relating back to our first hypothesis predicting that the more training obtained by the oncology nursing team beyond an RN degree, the better educated they will be about the importance of oral health-related care. This series of independent samples t-tests were performed to investigate whether or not a significant difference exists between the awareness of the importance of oral-health related care in patients with breast cancer

and a nurse or nurse practitioners' education level. Table 3 illustrates the comparison of oral health awareness question responses of nurses who possess an additional nursing degree, such as a Masters or Doctoral degree, to those who do not hold an additional nursing degree beyond a general Registered Nursing degree. No statistically significant oral health awareness differences were seen between those who possess an additional nursing degree to those who do not possess an additional nursing degree. Analyses were run with survey questions regarding sufficient educational preparation and confidence to perform a patient oral health education/instructions ($t(103)=0.170$, $p=0.919$), to perform a patient oral health assessment ($t(103)= -0.064$, $p=0.949$), and to detect or diagnose dry mouth, mucositis, or other oral conditions ($t(104)=1.121$, $p=0.265$). This data did not demonstrate a difference in awareness of oral health-related patient care does not vary between nurses with different levels of education with regard to additional nursing degrees.

Table 4 illustrates oral health awareness question responses of nurses who possess additional certifications to treat oncology patients to those who do not hold additional certification to treat oncology patients. No statistically significant oral health awareness differences were seen between those who possess additional certifications to treat oncology patients to those who do not possess additional oncology certification to treat oncology patients with regard to sufficient educational preparation and confidence to perform a patient oral health education/instructions ($t(103)= -0.217$, $p=0.829$), to perform a patient oral health assessment ($t(103)= -0.516$, $p=0.607$), and to detect or diagnose dry mouth, mucositis, or other oral conditions ($t(104)=1.309$, $p=0.193$). On average, awareness of oral health-related patient care does not vary

between levels of education with regard to additional certifications to treat oncology patients.

4.4 Oral Health Perceptions of Knowledge from Educational Preparation

Table 5 relates back to Aim 2 regarding evaluating the perceptions of respondents' knowledge from education and our hypothesis which predicted that oncology nurses and nurse practitioners' who express knowledge about oral health are likely to report incorporating oral health assessments into their clinical care.

The respondents were provided three questions regarding the knowledge they obtained from their education and how confident they felt in performing oral health related care. Approximately 32% of respondents rated their confidence in their knowledge to perform oral health instruction as "not at all" and "rarely". About 32% of respondents rated their confidence in their knowledge to perform a patient oral health assessment as "not at all" and "rarely". Lastly, confidence in their knowledge was rated high at almost 77% in being able to diagnose oral pathologies or conditions.

Interestingly, when respondents were asked if they had attended a continuing education course within the past year regarding oral health care, Table 6 shows that 77% indicated that they had not and 85% of respondents wished they had more knowledge about oral health related care or topics in oral health.

4.5 Educational Influences on the Inclusion of Oral Health-Related Patient Care

Table 7 provides information about the relationship between nurses' or nurse practitioners' knowledge of oral health-related patient care and their behaviors of incorporating oral health assessment during various phases of anti-cancer therapy/procedures and upon presentation of any dental symptoms. Prior to initiating a

27

new anti-cancer therapy, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.329, p=0.001), perform oral health assessments (r=0.355, p<0.001), detect/diagnose dry mouth, mucositis or other oral conditions (r=0.466, p<0.001) and the nurse or nurse practitioners' behavior of assessing patient oral health. Similarly, upon admission/arrival to appointment, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.388, p<0.001), perform oral health assessments (r=0.412, p<0.001), detect/diagnose dry mouth, mucositis or other oral conditions (r=0.530, p<0.001) and the nurse or nurse practitioners' behavior of assessing patient oral health. Prior to invasive procedures, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.370, p<0.001), perform oral health assessments (r=0.372, p<0.001), detect/diagnose dry mouth, mucositis or other oral conditions (r=0.384, p<0.001) and the nurse or nurse practitioners' behavior of assessing patient oral health. Prior to discharge/end of appointment, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.323, p=0.001), perform oral health assessments (r=0.414, p<0.001), detect/diagnose dry mouth, mucositis or other oral conditions (r=0.380, p<0.001) and the nurse or nurse practitioners' behavior of assessing patient oral health. A modest and statistically significant association was noted between the nurse or nurse practitioner possessing knowledge to confidently detect and diagnose dry mouth, mucositis, or other oral conditions and assess oral health with the patient presenting with dental symptoms

(r=0.473, p<0.001). Also noted was a modest and statistically significant association between the nurse or nurse practitioner possessing knowledge to confidently perform an oral health assessment (r=0.254, p=0.009) and confidently detect and diagnose dry mouth, mucositis, or other oral conditions (r=0.438, p<0.001) at the request of the patient. Correlations between performing oral health education/instructions and performing oral health assessments were interestingly not statistically significant with a patient presenting with dental symptoms. Also, performing oral health knowledge/instructions when it was requested by the patient was not statistically significant.

A positive correlation was seen between the nurses' knowledge and confidence level of performing oral health-related care and it being incorporated into the patient's phases of treatment. As a nurse's knowledge and confidence to perform oral health-relate care increases, the incorporation of oral health-related patient care provided during various phases of patient treatment is also expected to increase.

Table 8 shows the relationships between a nurses' or nurse practitioners' knowledge of oral health-related patient care and their behaviors of incorporating oral health assessment for the presence of dry mouth, stomatitis grade, mucositis, oral pain level, or other intraoral pathologies. When assessing for presence of dry mouth, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.377, p<0.001), perform oral health assessments (r=0.271, p=0.006), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.469, p<0.001) and the nurse or nurse practitioners' behavior. When assessing for presence of other intraoral pathologies, modest and statistically significant

29

associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.370, p<0.001), perform oral health assessments (r=0.322, p=0.001), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.373, p<0.001) and the nurse or nurse practitioners' behavior. When assessing presence of mucositis, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health assessments (r=0.293, p=0.003), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.538, p<0.001) and the nurse or nurse practitioners' behavior. When assessing stomatitis grade, a modest and statistically significant association exists between possessing knowledge to confidently detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.499, p<0.001) and the nurse or nurse practitioners' behavior. When assessing oral pain level, a modest and statistically significant association exists between possessing knowledge to confidently detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.530, p<0.001) and the nurse or nurse practitioners' behavior. Correlations between performing oral health education/instructions and performing oral health assessments were interestingly not statistically significant being able to assess stomatitis grade and oral pain level. Also, performing oral health knowledge/instructions at the presence of mucositis was not statistically significant.

A positive correlation was seen between the nurses' knowledge and confidence level of performing oral health-related care and their ability to assess the mouth for common oral complications from anti-cancer treatment and provide patient care instructions. As a nurse's knowledge and confidence to perform oral health-related patient care increases, their ability to assess the mouth for common oral complications

from anti-cancer treatment and provide patient care instructions is also expected to increase.

Table 9 illustrates the relationship between a nurses' or nurse practitioners' knowledge of oral health-related patient care to their behaviors of incorporating oral health-related care practices, referrals, and interprofessional collaboration with dental professionals. When using an oral assessment guide, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.275, p=0.005), perform oral health assessments (r=0.280, p=0.005), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.284, p=0.004) and the nurse or nurse practitioners' behavior. When educating caregivers or patients about oral health issues, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.308, p=0.002), perform oral health assessments (r=0.441, p<0.001), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.382, p<0.001) and the nurse or nurse practitioners' behavior. When using a tongue depressor or flashlight for intraoral assessment, modest and statistically significant associations exist between possessing knowledge to confidently perform oral health education/instructions (r=0.270, p=0.006), oral health assessments (r=0.359, p<0.001), detect/diagnose dry mouth, stomatitis or other oral conditions (r=0.417, p<0.001) and the nurse or nurse practitioners' behavior. When assessing ability to perform oral hygiene care using an oral cleaning tool, a modest and statistically significant association exists between possessing knowledge to confidently perform oral health assessments (r=0.266, p=0.007), and detect/diagnose dry mouth, stomatitis or other

oral conditions (r=0.189, p=0.057) and the nurse or nurse practitioners' behavior. When assessing dental provider referrals, a modest and statistically significant association exists only between possessing knowledge to confidently perform oral health assessments (r=0.267, p=0.008) and the nurse or nurse practitioners' behavior. Correlations between dental provider referrals and possessing confidence in performing oral health education/instructions and being able to detect or diagnose oral pathologies were interestingly not significant. Also, we see that collaboration with dentists during the patients' treatment was not statistically significant at all.

Positive correlations between the nurses' knowledge and confidence level in performing oral health-related care and their ability to provide general oral health-related care were found. As a nurse's knowledge and confidence to perform oral health-related patient care increases, their ability to include general oral health-related care to their patients is also expected to increase. However, we did not see a correlation between nurses' knowledge and confidence in performing oral health-related care and utilizing interprofessional care between them and dental providers.

4.6 Professional Attitudes toward Patient Oral Health-Related Care

Oncology nurse and nurse practitioners' current professional attitudes concerning oral health-related care for patients with breast cancer were evaluated using Likert Scale answer scales (disagree strongly, disagree, neither agree or disagree, agree, or strongly agree) in this survey. Table 10 provides nurses' current professional attitudes toward these oral issues. A total of 104 respondents answered this question out of 106 total survey respondents.

When assessing the importance in knowing how medical treatments or interventions can affect the oral health of a patient with breast cancer, the majority of respondents (96.1%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect of patient care. Three respondents (2.8%) answered 3=neither agree or disagree, and 1 respondent (0.9%) strongly disagreed with the proposed concept of oral health-related patient care.

Table 10 also provides nurses' current professional attitudes toward the importance of knowing the signs and symptoms of dental disease in patients with breast cancer. Again the majority of respondents (94.2%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect in patient care. Five respondents (4.8%) answered 3=neither agree or disagree, and 1 respondent (0.9%) strongly disagreed with this proposed concept of oral health-related patient care.

Nurses' attitudes toward the importance of knowing how to perform oral assessments, oral hygiene care and oral health education to patients with breast cancer were also assessed (Table 10). A high percentage of respondents indicated a 4=agree or 5=strongly agree response respectively to these three questions (95.2%, 91.3%, and 94.2%), thus suggesting this is an important aspect in patient care. Two respondents (1.9%), 5 respondents (4.7%) and 3 respondents (2.8%) answered 3=neither agree or disagree respectively to these three questions. Finally, 3 respondents (2.9%), 4 respondents (3.8%), and 3 respondents (2.9%) respectively answered with a 2=disagree or 1=strongly disagree with this proposed concept of oral health-related patient care.

When nurses' current professional attitudes toward the importance of recognizing stomatitis/mouth ulcers, dry mouth, osteonecrosis of the jaw, and other abnormal intraoral pathologies was queried, 101 respondents (97.1%), 100 respondents (96.1%), 89 respondents (86.4%) and 87 respondents (85.2%) answered with a 4=agree or 5=strongly agree respectively to these four questions, thus suggesting this is an important aspect in patient care. One respondent (0.9%), 3 respondents (2.8%), 8 respondents (7.5%), and 10 respondents (9.4%) respectively answered 3=neither agree or disagree respectively to these four questions. Finally, 2 respondents (1.9%), 1 respondent (0.9%), 6 respondents (5.8%), and 5 respondents (4.9%) respectively answered with a 2=disagree or 1=strongly disagree with this proposed concept of oral health-related patient care. Results are shown in Table 10.

As breast patients may be hospitalized at some point in their breast cancer treatment, nurses' current professional attitudes toward the importance of performing oral hygiene on hospitalized patients with breast cancer was assessed (Table 10). Ninety respondents (86.5%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect of patient care. Ten respondents (9.6%) answered 3=neither agree or disagree, and 4 respondents (3.8%) strongly disagreed with the proposed concept of oral health-related patient care.

Nurses were also asked about their professional attitudes toward the importance of collaborating with dental care providers throughout the phases of patient anti-cancer treatment. Eighty-four respondents (80.7%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect of patient care. Thirteen respondents (12.3%) answered 3=neither agree or disagree, and 7 respondents (6.7%) answered

34

with a 2=disagree or 1=strongly disagree with this proposed concept of oral health-related patient care.

Table 10 provides nurses' current professional attitudes toward the importance of using an oral assessment guide when providing treatment to patients with breast cancer. Ninety-two respondents (88.5%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect of patient care. Six respondents (5.8%) answered 3=neither agree or disagree, and 6 respondents (5.8%) answered with a 2=disagree or 1=strongly disagree with this proposed concept of oral health-related patient care.

The respondents were also asked about their attitudes toward the importance of performing an oral assessment with every patient (Table 10). Fewer respondents (80.8%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect of patient care. Eleven respondents (10.6%) answered 3=neither agree or disagree, and 9 respondents (8.7%) answered with a 2=disagree or 1=strongly disagree with this proposed concept of oral health-related patient care.

Finally, respondents were asked about the importance of understanding that oral health issues are just as important as systemic health issues. Ninety-eight respondents (93.3%) answered with a 4=agree or 5=strongly agree, thus suggesting this is an important aspect in patient care. Four respondents (3.8%) answered 3=neither agree or disagree, and 3 respondents (2.8%) strongly disagreed with this proposed concept of oral health-related patient care.

4.7 Professional Behaviors toward Patient Oral Health-Related Care

Figures 3, 4, and 5 focus on behaviors of oncology nurses and nurse practitioners where they indicated an often or very often response. Figure 3 displays respondents' reported behaviors regarding assessment of oral health during various phases of treatment. Prior to discharge or the end of an appointment, approximately 26% of respondents indicate assessing their patient's oral health. Prior to invasive procedures 32% of respondents assess oral health. About 75% of respondents will assess oral health at the request of the patient. Eighty-four percent of respondents indicated they assess oral health at the presentation of dental symptoms. Upon admission or at the arrival of the appointment, 46% of respondents indicated they assess patient oral health, and lastly 45% of respondents indicated they assess oral health prior to initiating a patient's new anti-cancer therapy.

Figure 4 depicts respondents' answers of often and very often with regard to assessment for various oral conditions or pathologies. Approximately 44% of respondents regularly assess for various intraoral pathologies. About 72% of respondents assess the patient's oral pain level. Respondents reported assessing patient stomatitis grade regularly at 67% and presence of mucositis at 75%. Lastly, about 63% of respondents indicated regularly assessing their patients for dry mouth.

Figure 5 displays respondents' oral health practices, referrals, and education. Forty-one percent of respondents indicate regularly using a tongue depressor or flashlight for patient oral assessment. Approximately 52% of respondents indicate that they educate caregivers or patients about oral health issues. Only about 20% of respondents indicated performing oral hygiene care using a toothbrush or oral cleaning

tool with their patients. Only 13% of respondents indicated that they collaborate with dental professionals before, during, and/or after their patient's anti-cancer treatment and 15% indicate referring patients to see their dentist through the phases of anti-cancer treatment. Lastly, 14% of respondents indicated they regularly use an oral assessment guide during patient care.

4.8 Limitations to Oral Health-Related Care

Table 11 describes the limitations or obstacles nurses indicated that impacted their ability to perform oral health-related patient care. Seventy-one respondents (67.0%) indicated that lack of time is at least sometimes a factor in being able to perform oral health care. Thirty-five respondents (33.0%) indicate that lack of time is rarely or never a factor in providing oral health-related patient care. Having an uncooperative patient was another factor where 42 respondents (40.0%) indicated an inability to be able to perform oral health care, and 63 respondents (60.0%) indicated that this was rarely or never a factor that hindered oral health care from being provided. Interestingly, 52 respondents (49.5%) reported that lack of staff was rarely or never an issue that affected their ability to perform oral health-related patient care, while 53 respondents (50.5%) reported lack of staff an issue to providing care at least some of the time. Lack of knowledge of oral health care was reported by 47 respondents (45.2%), while 57 respondents (54.8%) reported that lack of knowledge was not a limitation in providing oral health-related patient care. Overwhelmingly, 73 respondents (70.2%) reported that lack of interest in oral care was not a factor that played a role in preventing oral health-related patient care from being provided, while 31 respondents (29.8%) reported that it at least sometimes played a role. Interestingly, 39 respondents

37

(37.1%) reported that they rate (at least some of the time) oral health-related care of low importance or priority when caring for the patient, while 66 respondents (62.9%) indicated the opposite in belief. Lastly, lack of resources was indicated by 49 respondents (47.6%) to be a factor hindering the ability to provide adequate oral health-related patient care, while 54 respondents (52.4%) indicated they had proper resources to provide oral health care to their patients.

CHAPTER V

DISCUSSION

Oral health-related care by the oncology nursing team plays an important role in patients with breast cancer because many patients undergo various and sometimes complex therapies which may increase the potential for the occurrence of oral side effects. Most recently, a high occurrence of oral mucositis has been noted in patients undergoing anti-cancer treatment with mTOR inhibitors, which is a chemotherapy drug taken orally.[22] If anti-cancer treatment induced oral side effects present, many times dose reduction or interruption occurs, which in turn prolongs treatment or may allow the cancer to progress.[20] Therefore this study assesses whether the extent of nursing education beyond a registered nurse (RN) degree influenced awareness of the importance of oral-health related care. The data analysis suggests that awareness of the importance of oral health-related patient care does not vary between levels of education with regard to nursing professionals possessing additional degrees or oncology certifications beyond a RN degree.

We also evaluated the oncology nurses' and nurse practitioners' perceptions of their knowledge and understanding of oral health issues that patients commonly face during various phases of treatment, and how it impacts the patient's overall quality of

life. The data analysis suggests as an oncology nurse's knowledge and confidence to perform oral health-relate care increases, the incorporation of oral health-related patient care provided during various phases of patient treatment is also expected to increase.

Additionally, assessed were current attitudes and behaviors toward oral health-related patient care, including evaluating possible limitations the nursing team experience which may impact their ability to provide any variety of oral health care assessments. According to survey respondents, the oncology nurses generally embrace oral health-related patient care. Data revealed that approximately ninety percent of respondents felt that it was important to perform oral assessments, oral hygiene care, and oral health education when treating their patients. Interestingly, about twelve percent of respondents felt indifferent when it came to collaborating with dental care providers during the various phases of the patient's anti-cancer treatment, and seven percent of respondents felt that it was not necessary at all to include dental providers in the treatment of their patient.

Finally, several potential limitations the oncology nursing team faces in being able to provide oral health-related patient care were examined. Limitations of nurses incorporating oral health-related patient care were overwhelmingly a lack of time (67%), lack of staff (50%), lack of resources (42%), and lack of knowledge (44%). Interestingly, about 37% of respondents listed that placing a low importance or low priority of oral health was not a limitation of care.

It has been noted by numerous authors that nurses are ideally situated to provide information regarding oral health to the people they care for, particularly for the elderly and those with chronic illness.[12-16,18,22] However, previous studies have discovered that

nurses and nurse practitioners lack the necessary knowledge about oral health care with respect to treating their patients.[3,4] A report by Ohrn et al. described that only four percent of nurses who participated in the survey reported an education about oral health and oral care during their initial nursing education.[29] However, it was found that specialty nursing organizations provide more comprehensive guidelines for their certifications, including prevention and management of oral complications within their actual certification examinations.[29]

Previous studies on the subject of nurses' education and knowledge of oral health found a major barrier of adequate oral care provided being related to the lack of education and knowledge in the subject of oral health among nursing curricula.[12-13] Interestingly, the respondents in this study reported that they have been sufficiently educated about oral health topics including performing oral health assessments, oral health instruction, and identifying many oral health anomalies that may occur during anti-cancer treatment. Also interesting was that no significant oral health awareness differences were seen from those who possess an RN degree and those who possess a higher education or additional training. Communication with patients who are diagnosed with breast cancer about the potential effects of their upcoming treatment is important. Knowing how to optimally manage any adverse oral effects is critical for these patients and contributes to maintaining a positive oral health-related quality of life.

Oral health care is generally given a low level of priority by nursing staff in various settings and it has been suggested that the nurses' attitudes, behaviors, and beliefs may be more focused on alleviation of other cancer or treatment related symptoms, such as pain, nausea, and dyspnea.[17,22] Previous research also suggested a

lack of comfort level and unavailability of tools used in performing oral assessments, as well as complex patient demographics, and attitudes of the nurses' own personal dental health affecting the level of oral care provided to their patients.[12-17,19,22-24] While investigating professional attitudes and behaviors of oncology nurses' toward oral health-related patient care, generally there was a positive and confident attitude seen toward providing this care. Interestingly, nurses seemed to not be as confident in assessing stomatitis grade, oral pain level, and with providing oral health instructions to patients when mucositis is present. These areas where a lack of significant correlation to oral health care were present was of concern because presence of anti-cancer treatment-induced oral side effects runs a risk of dose reduction, therapy interruption, or patient compliance to treatment, which can prolong treatment or allow the cancer to progress.

Commonly, when oral health attracts the attention of nursing staff, it is not until problems in the oral cavity are already present.[17,22,24] Oftentimes oral health care is left to the patient, delegated to an untrained staff or regarded as the responsibility of dental professionals only.[24] This study's findings reflect those of previous studies, that time and lack of staff were the most frequently reported reason for performing little to no oral health-related patient care.

Several studies suggested that the lack of appropriate equipment within the facilities hinder the delivery of adequate oral care in cancer patients.[13,15-16,22] A study by Moore found that many cancer treatment facilities stocked mouthwash and foam swabs rather than toothbrushes, or the toothbrushes were of poor quality or where not made readily available.[22] There are several assessment tools available via a Likert scale

42

response from the patient or upon general oral examination of the oncology nurse, but many of the facilities do not implement use of these standard assessment scales (such as mucositis grade scales) due to lack of knowledge about their availability or how to use them and time constraints.[16,19,22,24] This study supports the findings of these previous studies that about half of its respondents reported not having adequate resources to perform oral assessments or diagnose oral anomalies related to anti-cancer treatment.

This study was the first of our knowledge to assess education, professional attitudes and behaviors of oncology nurses and nurse practitioners who treat patients with breast cancer. Previous studies focused on general nursing populations treating patients, or nurses in other specialties. Breast cancer oncology was chosen as the focus of this study because of the severity and high prevalence of oral complications, such as oral mucositis, reported during treatment. The results of this study may serve to provide a preliminary foundation for future studies on this subject.

From a broad perspective, this study sheds light on the complex challenges in oral health that oncology nurses face when counseling patients before, during and after breast cancer therapies. In particular, oral health ramifications are one of multiple challenges, and while important, there are barriers to meeting these needs. It is understood that time and resources are limited, and that further burden should not be placed on oncology nurses. Oncology nurses should appreciate the role oral health professionals play in the management of complications of breast cancer therapies. Oncology nurses should indeed be able to communicate the oral risks and possible complications of cancer therapies to their patients, but more importantly, they

should be able to direct patients via referral or consultation to an oral health professional who may be best equipped to reduce and treat these complications in order to improve oral health-related quality of life as well as reduce the potential for interruptions in cancer therapies.

This study begins to assess the limitations of oncology nurses' ability to emphasize oral health and its management: it is recognized that nurses may not be able to bill for the time and effort they spend on oral health, nurses are not necessarily optimally trained for this type of evaluation and care, and nurses have many other competing factors to address during patient care, including nutrition, pain management, and treatment compliance. These competing factors are disincentives to a larger focus on oral care. This study also begins to show the need for interprofessional collaboration. It should be encouraged that dentists, hygienists and other oral health professionals fill this important role and work collaboratively with not only oncology nurses, but the entire oncology team to address oral complications of breast cancer therapies.

This study did have some limitations. First, it must be recognized that the respondents completed the survey voluntarily and thus may have conveyed a more positive message about their concern and emphasis for oral health and its complications during breast cancer therapies. Secondly, the study's response rate was 2.1% which is not representative of the entire oncology nurse or nurse practitioner population. Therefore this study is only a pilot given 106 responses, and while the results are interesting, they are preliminary.

Future studies may consider using these data to study more narrow areas within this broad study that was performed and may give more specific evidence of nurses' perceptions of oral health-related patient care.

CHAPTER VI

CONCLUSIONS

The objective of this investigation was to examine the education, attitudes and professional behaviors of oncology nurses and nurse practitioners who may have had additional specialty training beyond an RN degree, concerning the oral health among patients with breast cancer who may experience adverse effects from anti-cancer treatment. Trends in demographics, experience, education, attitudes, behaviors, and limitations were assessed in this study. The results from this study indicate that no significant differences were noted between various levels of education and knowledge of oral health-related patient care. Furthermore, respondents generally had low confidence in knowledge obtained from education to provide oral health education and performing an oral health assessment, but were very confident in their ability to detect and diagnose several oral pathologies and conditions.

Regarding nurses' attitudes toward oral health-related care responses revealed a high percentage of respondents believed that oral health care is an important aspect of care and whole-patient wellness. Interestingly, while nurses' attitudes toward the incorporation of oral health-related care was high, their reported behaviors of its inclusion was inversely correlated. Less than half of respondents regularly perform an oral assessment on their patients, and less than a quarter of respondents provide

referrals to or collaborate with dental professionals. However, some limitations to providing oral health-related patient care, such as time restrictions, lack of staff, lack of resources, and uncooperative patients were reported.

Increasing awareness of the importance of oral health-related quality of life during anti-cancer treatment in patients with breast cancer may lead to improved oral health education in nursing programs, early detection or prevention of oral side effects resulting in fewer dose reductions and therapy interruptions, and improved supportive care. Additional educational outcomes could be to see more referrals to dental professionals when oral health issues arise, interprofessional collaboration with possibilities of continuing education courses between health professions, and development of resource materials (such as leaflets) that can be given to patients with breast cancer with regards to the importance of their oral health during treatment.

This pilot study is expected to be used to define the existing level of awareness among oncology nurses and nurse practitioners concerning the importance of oral health-related quality of life during anti-cancer treatment in patients with breast cancer. Increasing awareness may lead to improved oral health education in nursing programs, early detection or prevention of oral side effects resulting in fewer dose reductions and therapy interruptions, and improved supportive care. Additional outcomes of this study would indicate the necessity for more frequent referrals to dental professionals when oral health issues arise. Interprofessional collaboration between dental professionals and oncology nursing professionals through continuing education courses or cross-training between these professions, and the development of resource materials (such

as leaflets) that can be provided to patients with breast cancer regarding the importance

of their oral health during treatment.

FIGURES

Figure 1

Overview of the Survey Respondent Recruitment and Enrollment Process
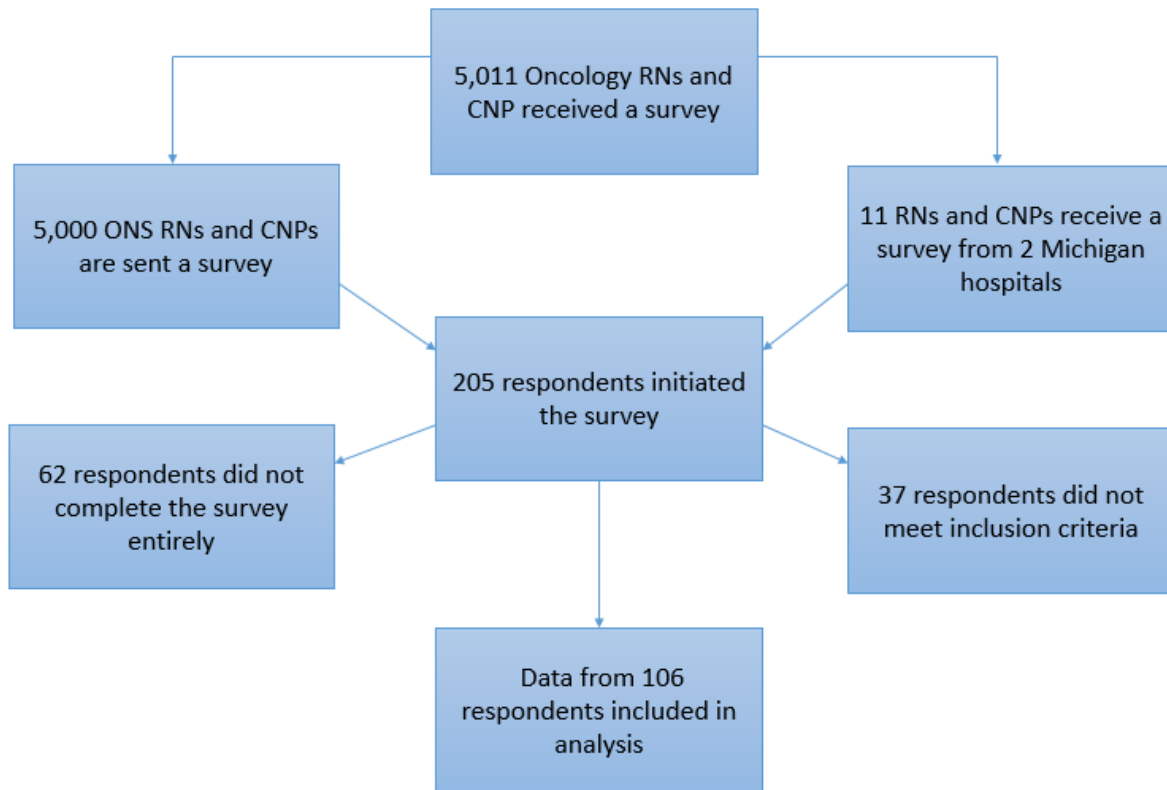
Figure 2
Respondent Practice Settings

Practice Settings

- Hospital
- Outpatient Clinic
- Private Practice
- Educational
- Other

45%

40%

8%

1%

6%
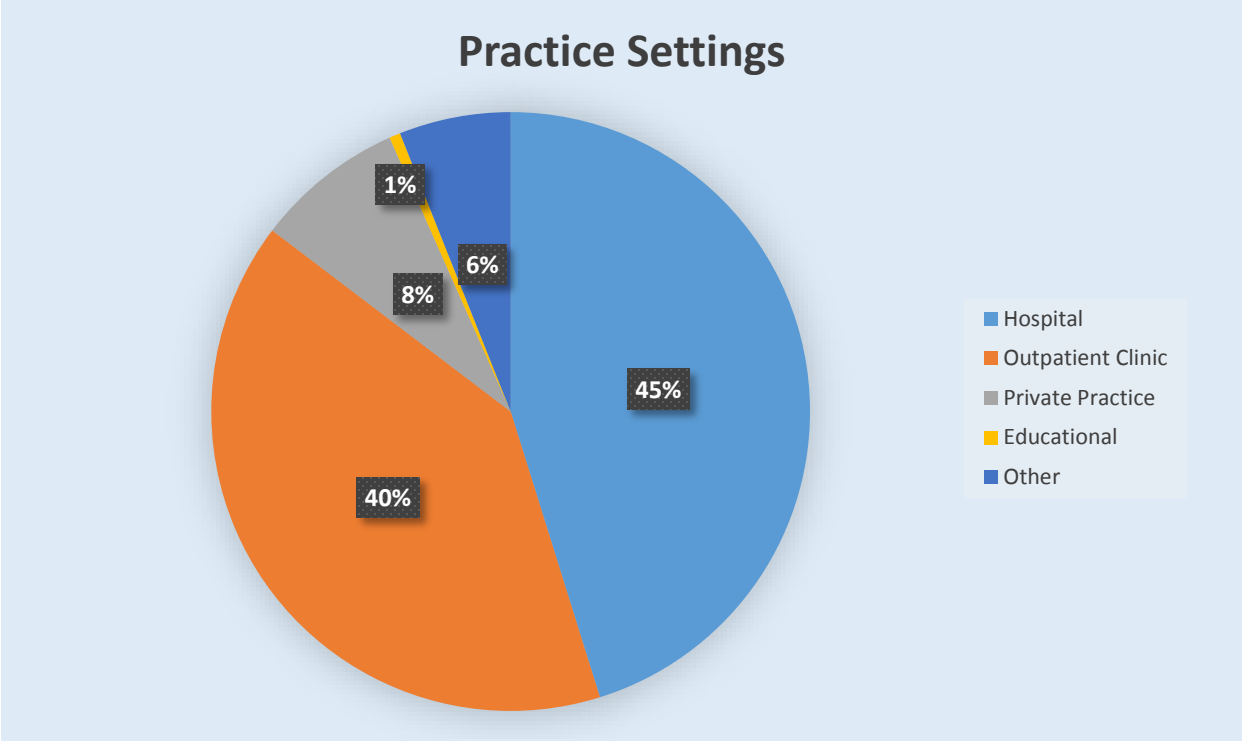
Figure 3
Percentages of Respondents Who Reported Behaviors Regarding Assessment of Oral Health during Various Phases of Anti-Cancer Treatment
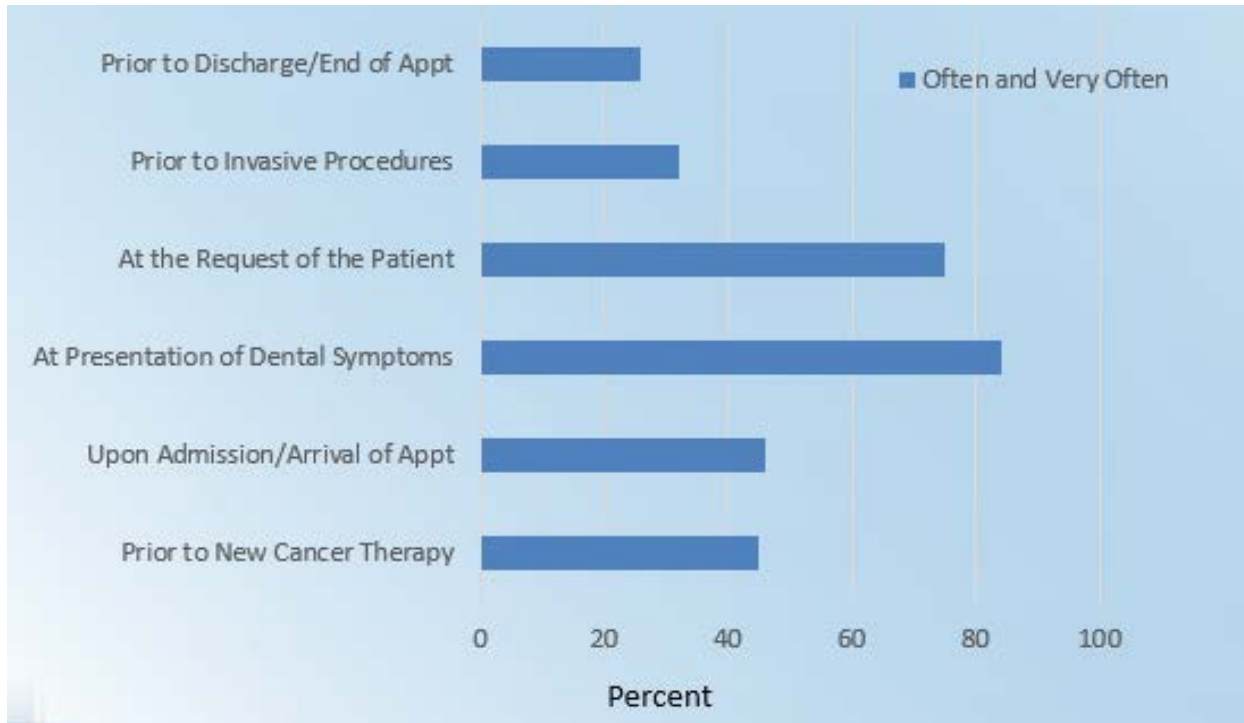
Figure 4
Percentages of Respondents Who Reported Behaviors Regarding Assessment of Various Oral Conditions or Pathologies
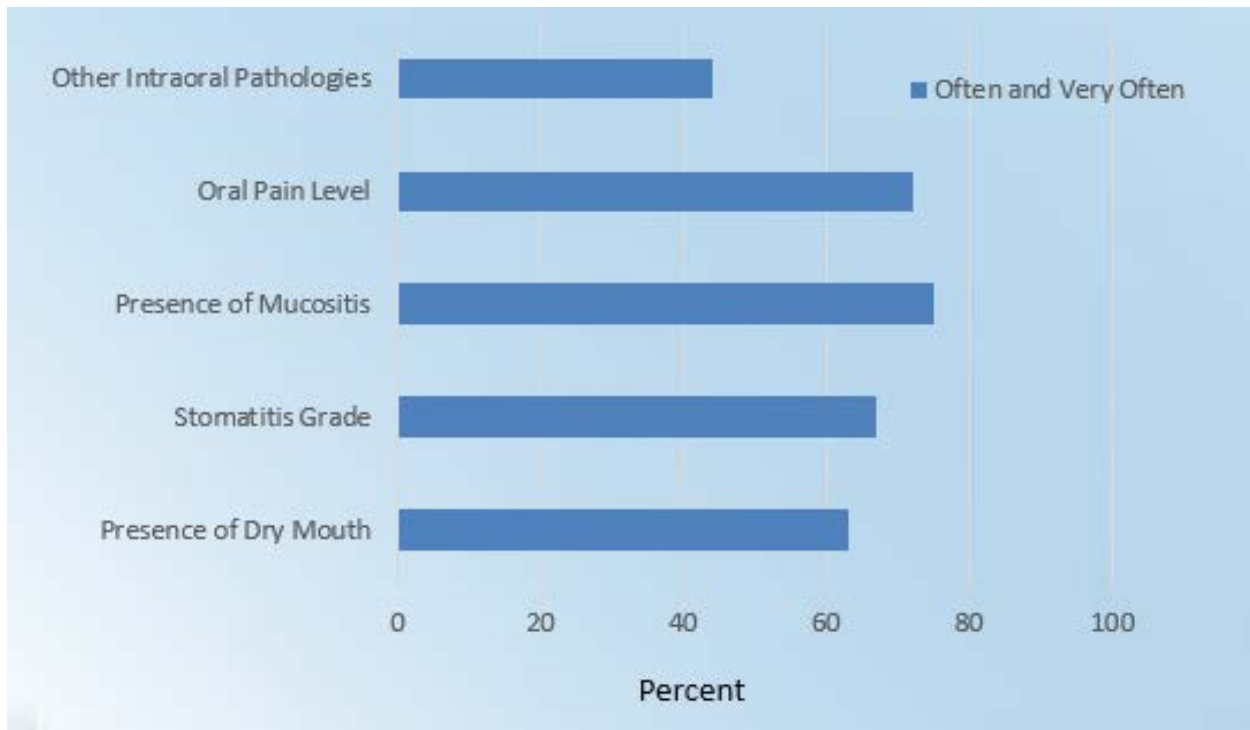
Figure 5

Percentages of Respondents Who Reported Behaviors Related to Oral Health
Practices, Referrals and Education
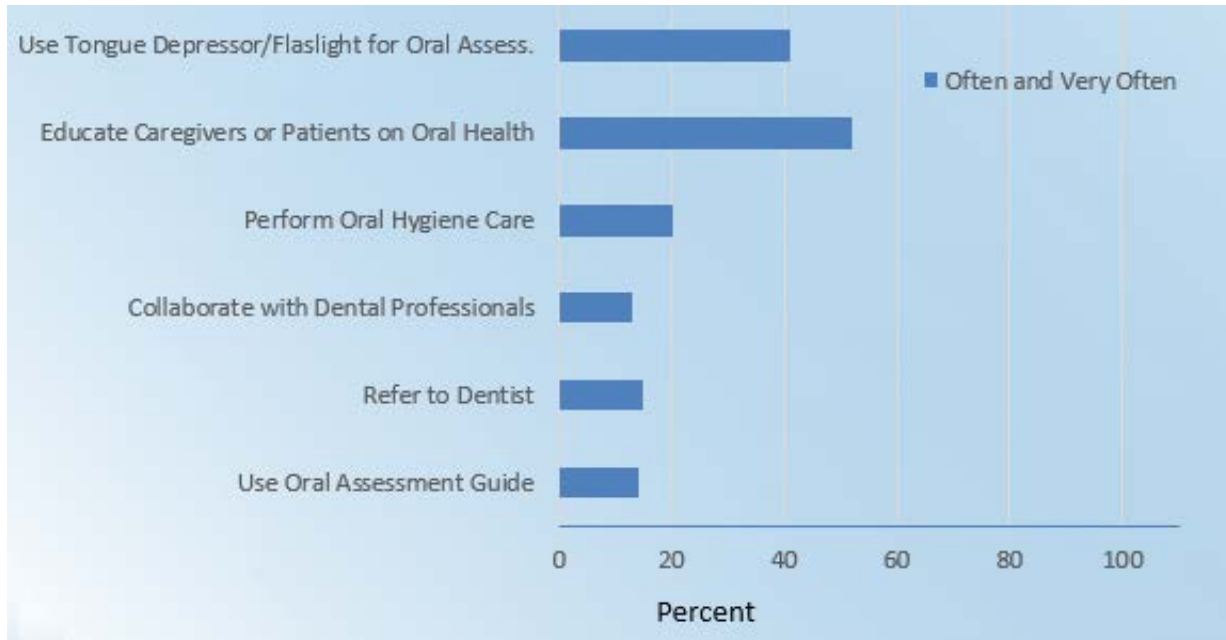
TABLES

Table 1

Descriptive Demographic Characteristics of Respondents

Characteristics	N = 106* (complete surveys)		N = 168* (incomplete surveys)		P Value^
	N	%	N	%	
Gender:					
Female	104	98.1	162	96.4	0.57
Male	2	1.9	5	3.0	
Age:					
30 years and under	10	9.4	21	12.5	
31 - 49 years	40	37.7	62	36.9	0.77
50 years and over	54	50.9	85	50.6	
Year Obtained First RN Degree:					
1960 - 1969	1	0.9	3	1.8	
1970 - 1979	17	16.0	33	19.6	
1980 - 1989	29	27.4	42	25.0	
1990 - 1999	19	17.9	27	16.1	0.96
2000 - 2009	28	26.4	44	26.2	
2010 - 2014	12	11.3	18	10.7	
Additional Nursing Degree:					
Yes	37	34.9	57	33.9	0.87
No	69	65.1	111	66.1	
Additional Oncology Certifications:					
Yes	76	71.7	118	70.2	0.80
No	30	28.3	50	29.8	

*Differences in the total number for each demographic category and the subtotals for each of the variables are due to missing data.
^Test of association using the Chi-Square test of independence.

Table 2

Practice Characteristics of the Survey Respondents

Characteristics	N = 106* (complete surveys)		N = 168* (incomplete surveys)		P Value^
	N	%	N	%	
Average Hours Worked Per Week:					
Less than 30	10	9.4	21	12.5	
30 to 40	74	69.8	113	67.3	0.69
41 and Over	22	20.8	31	18.5	
Hours of Patient Contact Per Week:					
Less than 20	9	8.5	14	8.3	
20 - 40	89	84.0	134	79.8	0.82
41 and Over	8	7.6	16	9.5	
Patients Seen Per Week:					
Under 50	77	72.6	116	69.0	
50 - 100	22	20.8	35	20.8	0.93
Over 100	7	6.6	9	5.4	
Patients with Breast Cancer Seen Per Week:					
Under 25	88	83.0	127	75.6	
25 - 50	13	12.3	21	12.5	0.95
Over 50	5	4.7	7	4.2	

*Differences in the total number for each demographic category and the subtotals for each of the variables are due to missing data.
^Test of association using the Chi-Square test of independence.

Table 3

Awareness of Oral Health-Related Patient Care and Nurse Education Level

Knowledge Obtained through Educational Preparation	Additional Degree (Yes)	Additional Degree (No)	P*
Confidence to perform oral health education/instructions	n=37	n=68	0.919
Confidence to perform oral health assessment	n=36	n=69	0.949
Confidence to detect/diagnose dry mouth, mucositis, or other oral conditions	n=37	n=69	0.265

* Independent samples t-test

Table 4

Awareness of Oral Health-Related Patient Care and Possession of Oncology Certifications

Knowledge Obtained through Educational Preparation	Additional Certifications (Yes)	Additional Certifications (No)	P*
Confidence to perform oral health education/instructions	n=76	n=29	0.829
Confidence to perform oral health assessment	n=75	n=30	0.607
Confidence to detect/diagnose dry mouth, mucositis, or other oral conditions	n=76	n=30	0.193

* Independent samples t-test

Table 5

Oral Health Perceptions of Knowledge Obtained from Educational Experiences

Question	Not at all	Rarely	Sometimes	Frequently	Very Much
Do you feel the education you were provided gave you sufficient knowledge and confidence to:	N (%)	N (%)	N (%)	N (%)	N (%)
perform oral health education/instructions?	7 (6.7%)	26 (24.8%)	34 (32.4%)	29 (27.6%)	9 (8.6%)
perform a patient oral health assessment?	14 (13.3%)	20 (19.05)	29 (27.6%)	32 (30.5%)	10 (9.5%)
confidently detect and/or diagnose dry mouth, mucositis, stomatitis, or other oral conditions?	1 (0.9%)	3 (2.8%)	18 (17.0%)	42 (36.9%)	42 (39.6%)

Table 6

Knowledge and Continuing Education

Question	Yes	No
Have you attended a continuing education course related to oral health care within the past year?	24 (22.6%)	82 (77.4%)
Do you wish you had more knowledge about oral health care and oral health related topics?	89 (84.8%)	16 (15.2%)

Table 7

Spearman-Rho Correlation Coefficients - Inclusion of Oral Health-Related Care throughout Anti-Cancer Treatment Based on Knowledge Obtained through Educational Preparation

		Knowledge Obtained Through Educational Preparation		
		Knowledge - Oral Health Education and Instruction	Knowledge - Oral Health Assessment	Knowledge - Detect/Diagnose Dry Mouth, etc…
Phase of Cancer Treatment	Prior to anti-cancer therapy initiation	0.329**	0.355**	0.466**
	Upon admission/arrival to appointment	0.388**	0.412**	0.530**
	Patient presenting with dental symptoms	0.231*	0.242*	0.473**
	At request of patient	0.121	0.254**	0.438**
	Prior to invasive procedures	0.370**	0.372**	0.384**
	Prior to discharge/end of appointment	0.323**	0.414**	0.380**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
All correlations have been adjusted using the Bonferroni correction

Table 8

Spearman-Rho Correlation Coefficients - Incorporation of Oral Health Assessments
Based on Knowledge Obtained through Educational Preparation of Oral Pathologies

		Knowledge Obtained Through Educational Preparation		
		Knowledge - Oral Health Education and Instruction	Knowledge - Oral Health Assessment	Knowledge - Detect/Diagnose Dry Mouth, etc…
Various Oral Conditions	Assessing Dry Mouth	0.377**	0.271**	0.469**
	Assessing Stomatitis Grade	0.200*	0.229*	0.499**
	Assessing Mucositis	0.232*	0.293**	0.538**
	Assessing Oral Pain Level	0.192	0.227*	0.530**
	Assessing Other Pathologies	0.370**	0.322**	0.373**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
All correlations have been adjusted using the Bonferroni correction

Table 9

Spearman-Rho Correlation Coefficients - Inclusion of Oral Health-Related Practices, Referrals, and Education

		Knowledge Obtained Through Educational Preparation		
		Knowledge - Oral Health Education and Instruction	Knowledge - Oral Health Assessment	Knowledge - Detect/Diagnose Dry Mouth, etc…
Various Oral Care Behaviors	Use Oral Assessment Guide	0.275**	0.280**	0.284**
	Refer Patient to Dentist	0.190	0.267**	0.232*
	Collaborate with Dentists during the Patient's treatment	0.205*	0.069	0.193
	Perform Oral Hygiene Care (Using an Oral Cleaning Tool)	0.191	0.266**	0.189**
	Educate Caregivers or Patients about Oral Health Issues	0.308**	0.441**	0.382**
	Use a Tongue Depressor or Flashlight for Intraoral Assessment	0.270**	0.359**	0.417**

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
All correlations have been adjusted using the Bonferroni correction

Table 10

Professional Attitudes of Oncology RN's and Nurse Practitioners' Concerning Oral Health Related Care

It is important that oncology nurses/nurse practitioners providing treatment to breast cancer patients:	Disagree Strongly =1				Agree Strongly =5
know about medical treatments/interventions that affect a person's oral health	1 (0.9%)	0 (0.0%)	3 (2.8%)	36 (34.0%)	64 (60.4%)
know signs and symptoms of dental disease in breast cancer patients	1 (0.9%)	0 (0.0%)	5 (4.7%)	34 (32.1%)	64 (60.4%)
provide/perform an oral assessment	1 (0.9%)	2 (1.9%)	2 (1.9%)	40 (37.7%)	59 (55.7%)
provide/perform oral hygiene care	2 (1.9%)	2 (1.9%)	5 (4.7%)	36 (34.0%)	59 (55.7%)
provide/perform oral hygiene education	1 (0.9%)	2 (1.9%)	3 (2.8%)	37 (34.9%)	61 (57.5%)
recognize stomatitis/ mouth ulcers	1 (0.9%)	1 (0.9%)	1 (0.9%)	29 (27.4%)	72 (67.9%)
recognize dry mouth	1 (0.9%)	0 (0.0%)	3 (2.8%)	31 (29.2%)	69 (65.1%)
recognize osteonecrosis of the jaw	2 (1.9%)	4 (3.8%)	8 (7.5%)	29 (27.4%)	60 (56.6%)
recognize other abnormal intraoral pathologies:	2 (1.9%)	3 (2.8%)	10 (9.4%)	34 (32.1%)	53 (50.0%)
perform oral hygiene on hospitalized patients	4 (3.8%)	0 (0.0%)	10 (9.4%)	38 (35.8%)	52 (49.1%)
collaborate with dental professionals throughout anti-cancer treatment	4 (3.8%)	3 (2.8%)	13(12.3%)	45 (42.5%)	39 (36.8%)
use an oral assessment guide	2 (1.9%)	4 (3.8%)	6 (5.7%)	45 (42.5%)	47 (44.3%)
perform an oral assessment with every patient	4 (3.8%)	5 (4.7%)	11(10.4%)	39 (36.8%)	45 (42.5%)
see that oral health issues are as important as systemic health issues	3 (2.8%)	0 (0.0%)	4 (3.8%)	42 (39.6%)	56 (52.8%)

Answers were given on a scale from l=strongly disagree to 5=strongly agree.

Table 11
Limitations of Nurses to Perform Oral Health-Related Patient Care

Limitation:	Not at All=1				Very Much= 5
Lack of time	14(13.2%)	21 (19.8%)	40 (37.7%)	20 (18.9%)	11 (10.4%)
Uncooperative patient	23 (21.7%)	40 (37.7%)	37 (34.9%)	4 (3.8%)	1 (0.9%)
Lack of staff	24 (22.6%)	28 (26.4%)	35 (33.0%)	11 (10.4%)	7 (6.6%)
Lack of knowledge	29 (27.4%)	28 (26.4%)	32 (30.2%)	10 (9.4%)	5 (4.7%)
Lack of interest	44 (41.5%)	29 (27.4%)	28 (26.4%)	3 (2.8%)	0 (0.0%)
Low Priority Of oral health	37 (34.9%)	29 (27.4%)	27 (25.5%)	7 (6.6%)	5 (4.7%)
Lack of resources	31(29.2%)	23 (21.7%)	31 (29.2%)	13 (12.3%)	5 (4.7%)

Answers were given on a scale from l=Not at all to 5 =Very much.

APPENDICES

APPENDIX A: Recruitment Letter for the Survey

Dear Colleague,
September 2014

Oral health is a critical component to one's overall health status, yet we have limited data on the oral health of our patients with breast cancer.

As part of a multidisciplinary team, we are asking for your help to gain an understanding of the present professional attitude, knowledge and behaviors of oncology nurses and nurse practitioners who are at the forefront of patient education and care.

Please participate in our survey which is expected to take less than 15 minutes of your time and will aid in defining factors affecting the interface between patients and oncology nurses and nurse practitioners when addressing oral health.

We encourage you to support these research efforts and respond to the attached questionnaire by clicking the website link below.

--- link ---

There are no more than everyday life risks involved in participating in this study. Please be assured that your responses are anonymous and confidential. There are no links to identify personal information of those who participate in this survey

If you are interested in the results of this study, please, email Jennifer Suminski at jsuminsk@umich.edu. Study results can be provided approximately 3 to 6 months after the data collection is finished.

Thank you for your support and participation in this study.

Sincerely,

Jennifer Suminski, RDH, BS
Master of Science in Dental Hygiene Candidate
University of Michigan – School of Dentistry

Catherine H. Van Poznak, MD
University of Michigan
Department of Internal Medicine Oncology

Stephanie M. Munz, DDS
University of Michigan
Department of Oral and Maxillofacial Surgery

L. Susan Taichman, RDH, MPH, PhD
University of Michigan
Department of Periodontics and Oral Medicine
Division of Dental Hygiene

Marita R. Inglehart, Dr. phil. habil.
University of Michigan
Department of Periodontics and Oral Medicine
Division of Prevention and Geriatrics

University of Michigan – School of Dentistry
Survey of Oncology Nurses' and Nurse Practitioners' Educational Experiences,
Professional Attitudes and Behaviors Related to the Oral Health of Patients with Breast Cancer

Thank you for participating in this study. Your responses are completely anonymous. This survey is being performed to gain a better understanding of how to best inform oncology nurses about how anti-cancer treatments affect the oral health of patients with breast cancer.

The first questions are about your background and your current work situation:

1.   Are you male or female? Male ☐   Female ☐

2.   How old are you?   I am _____ years old.

3.   When did you obtain your first nursing degree?   Year: _____

4.   Do you hold an additional nursing degree?   Yes ☐   No ☐

   If yes: please tell us which degree(s) and when you received it:

   Degree   Year obtained

   _____   _____

   _____   _____

5.   Do you hold additional certifications to treat oncology patients?   Yes ☐   No ☐

   If yes: please tell us which certification(s) and when you received it:

Certification   Year obtained

_____   _____

_____   _____

6.   Please choose one of the following to describe your current status as a nurse/nurse practitioner.

        Are you a:

        Currently licensed and practicing oncology nurse/nurse practitioner ☐   or   Retired oncology nurse/nurse practitioner ☐

7.   Where are you currently employed?
        Hospital ☐   Outpatient Clinic ☐   Private practice ☐   Educational ☐   Other ☐
        If other, please explain:_____

8.   On average, how many hours per week do you work?   _____hours/week

9.   How many of these hours per week do you have patient contact?
        (including face-to-face contact, phone conversations and
        contact via email)   _____hours/week

10.   How many of these hours of patient contact per week do you spend

        - in an outpatient setting?   _____hours/week

        - in an inpatient setting?   _____hours/week

11.   How many patients do you interact with in an average week?   _____patients/week

        How many of these patients are diagnosed with cancer?   _____patients/week

        How many of these patients are diagnosed with **breast cancer**?   _____patients/week

The next questions are about your nursing education with a focus on the education you received about oral health:

12. Think about if you learned about dental issues (A) during your education for your first nursing degree, and (B) if you had a second nursing degree: for your second/speciality nursing degree, (C) during your continuing education requirement experiences, and (D) during your clinical experiences on site. Please check either YES or NO for each of the following questions pertaining to your education and clinical experiences.

Note: If you do not possess a secondary nursing degree, please leave column (B) blank.

During the curriculum of my education and clinical training, I was educated on the topics of:

	(A) 1st Degree		(B) 2nd Degree		(C) Continuing Education		(D) Clinical Experiences	
a. The importance of your patient's oral health	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
b. The function of the oral cavity	Yes	☐	Yes	☐	Yes	☐	Yes	☐
(swallowing, speech, eating, etc.)	No	☐	No	☐	No	☐	No	☐
c. The relationship between oral and systemic health	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
d. The access to oral health care in the U.S.	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
e. How breast cancer therapies may affect oral health	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
f. How to provide oral health education to patients	Yes	☐	Yes	☐	Yes	☐	Yes	☐

	No	☐	No	☐	No	☐	No	☐
g. How to identify oral conditions related to breast	Yes	☐	Yes	☐	Yes	☐	Yes	☐
cancer therapies	No	☐	No	☐	No	☐	No	☐
h. How to perform an oral health assessment	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
i. Make recommendations to prevent oral conditions	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐
j. When/how to refer patients to a dentist	Yes	☐	Yes	☐	Yes	☐	Yes	☐
	No	☐	No	☐	No	☐	No	☐

Additional questions pertaining to your education:

13. On a scale from 1 = not at all to 5 = very much, please answer the following questions pertaining to oral health and your education:

	Not at All				Very Much
a. How well did your education provide you with					
sufficient knowledge and confidence					
to perform oral health education/instructions?	1 2 3 4 5				
b. Do you feel the education you were provided					
gave you sufficient knowledge and confidence					
to perform a patient oral health assessment?	1 2 3 4 5				
c. Can you confidently detect and/or diagnose dry					

71

mouth, mucositis, stomatitis, or other oral conditions?　　　　　　1　　　2　　　3　　　4　　　5

Miscellaneous questions pertaining to your education of oral health care:

14. Have you attended a continuing education course

　　related to oral health or oral health care within the

　　past year?　　　　　　　　　　　　　　　　　　　Yes ☐　　No ☐

15. Do you wish you had more knowledge about oral

　　health and oral health care topics?　　　　　　　　Yes ☐　　No ☐

The following questions are concerned with your attitudes about oral health issues:

16. On a scale from 1 = diagree strongly to 5 = agree strongly, how much do you disagree/agree with the following statements:

	Disagree Strongly				Agree Strongly

It is important that oncology nurses/nurse practitioners providing treatment to **breast cancer** patients:

- learn about oral health issues in school.	1	2	3	4	5
- learn about oral health issues in clincial settings.	1	2	3	4	5
- learn about oral health issues in continuing education.	1	2	3	4	5
- know about the relationship between oral health and systemic health.	1	2	3	4	5
- know about how medical conditions affect a person's oral health.	1	2	3	4	5
- know about how medications affect a person's oral health.	1	2	3	4	5
- know about how medical treatments / interventions affect a patient with breast cancer's oral health	1	2	3	4	5
- know the signs and symptoms of dental disease in patients with **breast cancer**.	1	2	3	4	5
- can perform/provide:					

o Oral Assessments	1	2	3	4	5
o Oral Hygiene Care	1	2	3	4	5
o Oral Health Education	1	2	3	4	5

- can recognize:

o stomatitis/mouth ulcers	1	2	3	4	5
o dry mouth	1	2	3	4	5
o osteonecrosis of the jaw	1	2	3	4	5
o other abnormal intraoral pathologies	1	2	3	4	5
- perform oral hygiene in hospitalized patient with breast cancer.	1	2	3	4	5
- collaborate with dental care providers.	1	2	3	4	5
- use an oral assessment guide.	1	2	3	4	5
- perform an oral assessment with every patient.	1	2	3	4	5
- see that oral health issues are as important as systemic health issues.	1	2	3	4	5

The following questions are concerned with your oral health-related profesional behavior during the time spent with your patients with breast cancer:

17. How often do you engage in the following professional behaviors? Please give your answers on a 5 point scale with 1=never, 2=rarely, 3=sometimes, 4=often and 5=very often:

How often do you assess oral health:

	Never	Rarely	Some-times	Often	Very Often
- prior to initiating a new anti-cancer therapy?	1	2	3	4	5
- upon admission/arrival to appointment?	1	2	3	4	5
- at presentation of dental symptoms?	1	2	3	4	5
- at request of patient?	1	2	3	4	5
- prior to the invasive procedures?	1	2	3	4	5
- prior to discharge/end of appointment?	1	2	3	4	5

How often do you assess:

- presence of dry mouth	1	2	3	4	5
- stomatitis grade	1	2	3	4	5
- presence of mucositis	1	2	3	4	5
- oral pain level	1	2	3	4	5

- presence of other intraoral pathologies?	1	2	3	4	5

How often do you

- use an oral assessment guide for oral care?	1	2	3	4	5
- refer to hospital dentistry or patient's primary dentist?	1	2	3	4	5
- collaborate with dentists during your patient's treatment?	1	2	3	4	5
- perform oral hygiene care (using a toothbrush/oral cleaning tool)?	1	2	3	4	5
- educate caregivers or patients about oral health issues?	1	2	3	4	5
- tongue depressor or flashlight intraorally for oral assessment?	1	2	3	4	5

How much do the following factors keep you from performing oral health care?

	Not at all			Very Much	
- Lack of time	1	2	3	4	5
- Uncooperative patient	1	2	3	4	5
- Lack of staff	1	2	3	4	5
- Lack of knowledge	1	2	3	4	5
- Lack of interest	1	2	3	4	5
- Low importance of oral health	1	2	3	4	5
- Lack of resources	1	2	3	4	5
- Other factors: please explain: _____					

Additional questions on professional behaviors during time spent with your patient with <u>breast cancer</u>:

18. Please give your answers on a 5 point scale with 1=never, 2=rarely, 3=sometimes, 4=often and 5=very often:

	Never	Rarely	Some-times	Often	Very Often
- Do you inquire if your patient sees their dentist regularly for dental cleanings and treatment?	1	2	3	4	5
- Do you inquire if your patient has dental insurance to see a dentist for treatment?	1	2	3	4	5

19. If your patient states that they do not have dental insurance to obtain routine dental care, what steps do you take to assist them in their oral health maintenance before and during treatment?

a. Referral to social work, dental school clinics, or other community resources as may be available?   Yes ☐   No ☐
b. Alter the plan of cancer care?   Yes ☐   No ☐
c. Decrease the frequency or intensity of oral recommendations due to concerns that dental follow-up may be impractical for this individual?   Yes ☐   No ☐
d. Other? Please explain: _____

Thank you very much for participating in this study. If you are interested in the results of this study, please feel free to contact Jennifer Suminski at jsuminsk@umich.edu

Appendix C: Health Sciences and Behavioral Sciences Institutional Review Board - Letter of Exemption

To: Jennifer Suminski

From:

Thad   Polk

Cc:

Jennifer   Suminski

Stephanie   Munz

Susan   Taichman

Catherine   Van Poznak

Marita   Inglehart

Subject: Notice of Exemption for [HUM00089103]

SUBMISSION INFORMATION:
Title: Oncology Nurses' Educational Experiences, Knowledge, Professional Attitudes and Behavior Related to Oral Health Care in Patients with Breast Cancer
Full Study Title (if applicable):
Study eResearch ID: HUM00089103
Date of this Notification from IRB: 7/25/2014
Date of IRB Exempt Determination: 7/25/2014
UM Federalwide Assurance: FWA00004969 (For the current FWA expiration date, please visit the UM HRPP Webpage)
OHRP IRB Registration Number(s): IRB00000246

IRB EXEMPTION STATUS:
The IRB HSBS has reviewed the study referenced above and determined that, as currently described, it is exempt from ongoing IRB review, per the following federal exemption category:

EXEMPTION #2 of the 45 CFR 46.101.(b):
Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Note that the study is considered exempt as long as any changes to the use of human subjects (including their data) remain within the scope of the exemption category above. Any proposed changes that may exceed the scope of this category, or the approval conditions of any other non-IRB reviewing committees, must be submitted as an amendment through eResearch.

Although an exemption determination eliminates the need for ongoing IRB review and approval, you still have an obligation to understand and abide by generally accepted principles of responsible and ethical conduct of research. Examples of these principles can be found in the Belmont Report as well as in guidance from professional societies and scientific organizations.

SUBMITTING AMENDMENTS VIA eRESEARCH:
You can access the online forms for amendments in the eResearch workspace for this exempt study, referenced above.

ACCESSING EXEMPT STUDIES IN eRESEARCH:
Click the "Exempt and Not Regulated" tab in your eResearch home workspace to access this exempt study.

Thad Polk
Chair, IRB HSBS

BIBLIOGRAPHY

1. Centers for Disease Control and Prevention [Internet]. Atlanta (GA): Centers for Disease Control and Prevention; c2013. Cancer among women; 2013 Oct 24 [cited 2014 May 8]; [about two and a half screens]. Available from: http://www.cdc.gov/cancer/dcpc/data/women.htm

2. American Cancer Society: the official sponsor of birthdays [Internet]. Atlanta (GA): American Cancer Society; c2014. What are the key statistics about breast cancer?; 2014 Jan 31 [cited 2014 May 8]; [about three screens]. Available from: http://www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-key-statistics

3. Clemmens D, Rodriguez K, Leef B. Knowledge, attitudes, and practices of baccalaureate nursing students regarding oral health assessment. J Nurs Educ. 2012;51:532-5.

4. Potting CMJ, Mank A, Blijlevens NMA, Donnelly JP, van Achterberg T. Providing oral care in haematological oncology patients: nurses' knowledge and skills. Eur J Oncol Nurs. 2008;12:291-8.

5. Honnor A, Law A. Mouth care in cancer nursing: using an audit to change practice. Br J Nurs. 2002;11:1087-96.

6. McGuire DB. Barriers and strategies in implementation of oral care standards for cancer patients. Support Care Cancer. 2003;11:435-41.

7. Daniel BT, Damato KL, Johnson J. Educational issues in oral care. Semin Oncol Nurs. 2004;20(1):48-52.

8. Eilers J, Million R. Clinical update: prevention and management of oral mucositis in patients with cancer. Semin Oncol Nurs. 2011;27(4):e1-16.

9. Fulton JS, Middleton GJ, McPhail JT. Management of oral complications. Semin Oncol Nurs. 2002;18(1):28-35.

10. Wallace KG, Koeppel K, Senko A, Stawiaz K, Thomas C, Kosar K. Effect of attitudes and subjective norms on intention to provide oral care to patients receiving antineoplastic chemotherapy. Career Nurs. 1997;20(1):34-41.

11. Wilberg P, Hjermstad MJ, Ottesen S, Herlofson BB. Chemotherapy-associated oral sequelae in patients with cancer outside the head and neck region. J Pain Symptom Manage. 2014:1-10.

12. Costello T, Coyne I. Nurses' knowledge of mouth care practices. Br J Nurs. 2008;17:264-8.

13. Tewogbade A, Fitzgerald K, Prachyl D, Zurn D, Wilson C. Attitudes and practices of nurses on a pediatric cancer and stem cell transplant ward: adaptation of an oral care protocol. Spec Care Dentist. 2008;28:12-8.

14. Miller M, Taylor A, Wells M, Roe L, Hagen S, Parson F, et al. Health professionals' views of the feasibility and acceptability of an oral care diary by patients during chemotherapy. Eur J Oncol Nurs. 2007;11:82-4.

15. Barker GJ, Epstein JB, Williams KB, Gorsky M, Raber-Durlacher JE. Current practice and knowledge of oral care for cancer patients: a survey of supportive health care providers. Support Care Cancer. 2005;13:32-41.

16. Epstein JB, Parker IR, Epstein MS, Gupta A, Kutis S, Witkowski DM. A survey of National Cancer Institute-designated comprehensive cancer centers' oral health supportive care practices and resources in the USA. Support Care Cancer. 2007;15:357-62.
17. Paulsson G, Wardh I, Ohrn K. Comparison of oral health assessments between nursing staff and patients on medical wards. Eur J Cancer Care. 2008;17:49-55.
18. Southern H. Oral care in cancer nursing: nurses' knowledge and education. J Adv Nurs. 2006;57:631-8.
19. Perez EA, Spano JP. Current and emerging targeted therapies for metastatic breast cancer. Cancer. 2012;118:3014-25.
20. National Cancer Institute [Internet]. Bethesda (MD): National Cancer Institute at the National Institutes of Health; c2014. Breast cancer treatment (PDQ): treatment option overview; 2014 May 23 [cited 2014 Jun 27]; [about five screens]. Available from: http://www.cancer.gov/cancertopics/pdq/treatment/breast/Patient/page5
21. Semiglazov VF, Semiglazov VV, Dashyan GA, Ziltsova EK, Ivanov VG, Bozhok AA, et al. Phase 2 randomized trial of primary endocrine therapy versus chemotherapy in postmenopausal patients with estrogen receptor-positive breast cancer. Cancer. 2007;110:244-54.
22. Barroso-Sousa R, Santana IA, Testa L, de Melo Gagliato D, Mano MS. Biological therapies in breast cancer: common toxicities and management strategies. Breast. 2013;22:1009-18.
23. Rugo HS, Pritchard KI, Gnant M, Noguchi S, Piccart M, Hortobagy G, et al. Incidence and time course of everolimus-related adverse effects in postmenopausal women with hormone receptor-positive advanced breast cancer: insights from BOLERO-2. Ann Oncol. 2014;25:808-15.
24. Coleman EA, Coon SK, Lockhart K, Kennedy RL, Montgomery R, Copeland N, et al. Effect of certification in oncology nursing on nursing-sensitive outcomes. Clin J Oncol Nurs. 2009;13:165-72.
25. Brown CG, Cantril C, McMullen L, Barkley DL, Dietz M, Miller Murphy C, et al. Oncology nurse navigator role delineation study: an oncology nursing society report. Clin J Oncol Nurs. 2012;16:581-5.
26. Northouse LL. Helping patients and their family caregivers cope with cancer. Oncol Nurs Forum. 2012;39:500-6.
27. Blue C, Isringhausen K, Dils E. Raising oral health awareness among nephrology nurses. J Dent Hyg. 2011;85:151-7.
28. Wardh I, Paulsson G, Fridlund B. Nursing staff's understanding of oral health care for patients with cancer diagnoses: an intervention study. J Clin Nurs. 2008;18:799-806.
29. Ohrn KEO, Wahlin YB, Sjoden PO. Oral care in cancer nursing. Eur J Cancer Care. 2000;9:22-9.
30. Oncology Nursing Society (ONS) [Internet]. Pittsburgh (PA): Oncology Nursing Society; c2014 [cited 2014 May 8]. Available from: https://www.ons.org
31. Kloostra S. Pediatric nurses' educational experiences, knowledge, professional attitudes and behavior related to oral health care for hospitalized pediatric patients. University of Michigan. 2015.

32.   Qualtrics. Qualtrics security white paper defining security, procedures, and operations. Rev. 2014 Jan 20. Provo (UT): Qualtrics. 34p.