Chapter – II

REVIEW OF LITERATURE

Review of literature is an essential part in the development of research project. It includes both research and non research literature. On account of this study the retrieval of relevant literature was done from published articles, research articles, Medline and Internet, journals, books and other related materials.

Leary (2004) said “review of literature helps to relate the findings from one to another with a view to develop a comprehensive body of scientific knowledge in a professional discipline from which valid and pertinent theories may be developed.

The reviewed literatures are presented under following sub headings

1. Incidence of cancer
2. Holistic Symptoms
   • Physiological
   • Psychological and Psychosocial
   • Spiritual
3. Oral Mucositis and Oral Care
4. Pain and sleep in cancer patients
5. Music therapy
6. Counselling
7. Quality of Life

**Literatures on incidence and diagnosis of head and neck cancer**

Compared to the U.S. states and District of Columbia, the adult population in South Carolina ranks in the high five in oral cavity and pharynx cancer mortality rate and top ten for incidence rate. This study assessed the oral cancer knowledge health and experience of medical students in an academic setting. This IRB approved cross-sectional survey used a self-administered pilot-tested questionnaire and the census of the Medical University of South Carolina medical students. Significant (p<0.001) differences were found between pre-clinical and clinical students for knowledge of risk factors, signs and symptoms of oral cancer, and tobacco cessation techniques; with clinical students more knowledgeable but at less than 78% accuracy. Most (75%) of fourth year students felt adequately trained to palpate neck lymph nodes. However, less than 7% of all students perceived they were adequately trained to examine patients for oral cancers. Results suggest that these students may not receive adequate exposure to oral cancer prevention and detection knowledge and practices. Additional training to increase knowledge of risk factors and cessation counselling, and
knowledge of signs and symptoms and examination skills may improve oral cancer prevention and detection (Reed, 2005).

Tachezy (2009) conducted a study on demographic and risk factors in patients with head and neck tumor. In this study on 86 head and neck cancer patients and 124 controls, data regarding demographics, behavioral risk factors, and risks related to HPV exposure were collected. Head and neck cancer cases report significantly more oral-anal contact (P = 0.02) and tobacco and alcohol use than controls (P = 0.001; P = 0.02, respectively). The prevalence of HPV-specific antibodies was significantly higher in cases than in controls (adjusted P < 0.0001). These results provide epidemiological and immunological evidence for HPV as a strong risk factor (OR = 44.3, P < 0.0001) for head and neck cancer, even after controlling for age, tobacco, and alcohol use.

Warnakulasuriya (2008) conducted a study on significant oral cancer risk associated with low socioeconomic status. Studies were identified independently by two reviewers and were included if the subject was oral and oropharyngeal cancer. They used case-control methodology and collected data regarding socioeconomic status (SES; e.g. educational attainment, occupational, social classification and
income) for both cases and controls. Methodological assessment of selected studies was undertaken. Countries where the study was undertaken were classified according to level of development and income as defined by the World Bank. Meta-analyses were performed on the following subgroups: SES measure, age, sex, global region, development level, time-period and lifestyle factor adjustments. Compared with individuals who were in high SES strata, the pooled OR for the risk of developing oral cancer were 1.85 (95% CI, 1.60-2.15; N=37 studies) for individuals with low educational attainment versus 1.84 (95% CI, 1.47-2.31; N=14) for those with low occupational social class versus low income 2.41 (95% CI, 1.59-3.65; N=5) for people with low incomes. Subgroup analyses showed that low SES was significantly associated with increased oral cancer risk in high- and lower-income countries, across the world, and remained when adjusting for potential behavioural confounders. Oral cancer risk associated with low SES is significant and related to lifestyle risk factors.

**LITERATURES ON HOLISTIC SYMPTOMS**

**Physiological**

Patients with advanced cancer frequently experience distressful symptoms and receive numerous medications. A retrospective,
cross-sectional study was conducted and reviewed the charts of consecutive adult cancer patients attending palliative care clinics and who were no longer receiving cancer-directed therapy. From the medical records, information collected about self-reported symptoms (screened for with the numerical Edmonton symptom assessment system scale; range, 0-10, with 10 worst symptom) and medication profiles. Two hundred fifty five patients met the inclusion criteria. The most frequent self-reported symptoms of any severity were fatigue (77%), pain (75%), and lack of appetite (66%). These were also the most severe symptoms that was fatigue (median ESAS score=7), pain (median ESAS = 5), and lack of appetite (median ESAS=5). The median number of medications per patient after consultation in the palliative care service was 6, and the most common classes of drugs prescribed were opioids (67%), laxatives/stool softeners (54%), corticosteroids (41%), and acetaminophen (41%). Palliative care physicians made at least one medication change in 75% of the patients, with the most frequent change being the addition of new medication(s). Dexamethasone was the most commonly added individual drug (18% of the patients). The medication profile represented drugs that could both to alleviate and contribute to these symptoms (Riechelmann, 2007).
Carroll, Locher and Canon (2008) evaluated the effect of pretreatment swallowing exercises on posttreatment swallowing function as measured by videofluoroscopy. Eighteen patients with advanced squamous cell carcinoma of the oropharynx, hypopharynx, and larynx treated at University of Alabama at Birmingham with CRT were included in the study. Nine patients received pretreatment swallowing exercises prior to CRT, and nine patients received swallowing exercises during routine posttreatment management. Approximately 3 months after completing treatment, standard videofluoroscopy examinations were conducted. Performing pretreatment swallowing exercises produces measurable improvements in posttreatment swallowing function in patients who undergo organ-preservation CRT for head and neck cancer. This study provided an initial foundation for the development of noninvasive, cost-effective, evidence-based interventions in this group of vulnerable patients.

Salama, Stenson and List (2008) conducted a study on characteristics associated with swallowing changes after concurrent chemotherapy and radiotherapy in patients with head and neck cancer. University hospital tertiary care referral center and the study included 95 patients treated under a multiple institution, phase 2 protocol who underwent a videofluorographic oropharyngeal
motility (OPM) study to assess swallowing function prior to and within 1 to 2 months after the completion of concurrent chemotherapy and radiotherapy. The mean pretreatment and posttreatment OPM scores were 3.09 and 3.77, respectively. The study finding was patients undergoing concurrent chemotherapy and radiotherapy, improved swallowing function over baseline was associated with advanced T₄ stage.

A study conducted by Chou, Dodd, Abrams and Padilla (2007) to explore the cancer symptom experience, self-care strategies, and quality of life (QOL) among Chinese Americans during outpatient chemotherapy. Twenty five Chinese-speaking patients with cancer completed the study. Participants were first-generation immigrants with low levels of acculturation. Study instruments were translated into Chinese language that included symptoms, self-care, QOL, and acculturation. Participants reported experiencing about 14 symptoms weekly. Lack of energy, hair loss, dry mouth, sleep difficulty, and loss of appetite were reported most frequently.

Tsai, Wu, Chiu, Hu and Chen (2006) conducted a study on symptom patterns of advanced cancer patients in a palliative care unit. This study involved longitudinal evaluations of symptom severity and
describes the symptom patterns of 77 terminal cancer patients (median age: 62 years; 61% female), selected from 537 consecutive patients admitted to the palliative care unit of the National Taiwan University Hospital. The most common primary cancer sites in these patients were lung (23.4%), liver (15.6%), and stomach (13%). Nineteen physical and psychological symptoms were assessed using different scales. The median number of symptoms was 11 (range: 1 - 18) on admission, among which weakness, fatigue, anorexia, pain, and depression were the most common. As symptom management is an essential component of palliative care, holistic care, which encompasses physical, psychosocial and spiritual aspects, represents a rational approach for the relief of these incurable symptoms at the end stage of life for these patients.

Williams, Piamjariyakul and Ducey, (2006) conducted a study on cancer treatment, symptom monitoring, and self-care in 37 adults receiving chemotherapy primarily for leukemia, lymphomas, or breast cancer or radiation therapy for head and neck or lung cancers. The Therapy-Related Symptom Checklist and demographic and interview forms on self-care for identified symptoms were used. Severe symptoms on the Therapy-Related Symptom Checklist subscales fatigue, eating, nausea, pain, numbness in fingers/toes, hair loss, and
constipation were reported by patients on chemotherapy. Those on radiation therapy reported severe symptoms on the eating, fatigue, skin changes, oropharynx, and constipation subscales. The first category was predominantly used by patients in both treatment types. Medications were prescribed also to help control symptoms (e.g. pain and nausea). Symptom monitoring and self-care for symptoms identified may be facilitated by the Therapy-Related Symptom Checklist; based on reported symptom severity, care providers may prioritize interventions. A larger study needs to be done on (a) the use of the Therapy-Related Symptom Checklist as a clinical tool to assess symptoms that oncology patients experience during therapy; (b) whether care providers, based on patient-reported symptom severity, can prioritize interventions--and how this influences the efficiency of care; (c) the self-care strategies used by patients on chemotherapy or radiation therapy or both; and (d) how useful these strategies are in alleviating symptoms.

Linda (2005) conducted a study on the relationship of cancer symptom clusters to depressive affect in the initial phase of palliative radiation research on 268 cancer patients across cancer symptoms, including pain, fatigue, and depression, could suggest if crossover effects from symptom-specific interventions are plausible. Patients
self-reported difficulty controlling each physical symptom over the past month on a Likert scale and depressive symptoms on a validated depression measure Center for Epidemiologic Studies-Depression (CES-D) over the past week on a four-category scale were used. An index of depressive affect was based on items of negative and positive affect from the CES-D. In predicting depressive affect, synergistic interactions of pain with fever, fatigue, and weight loss suggest separate pathways involving pain. A similar interaction with fever occurs when nausea was tested in place of pain. Further, the interaction between pain and fatigue is similar in form to the interaction between difficulty breathing and fatigue (when sleep is not a problem). The significance and form of these interactions were remarkably consistent. Similar sickness mechanisms could be generating: 1) pain and nausea during fever; 2) pain and fatigue during weight loss; and 3) pain and breathing difficulty when fatigue is pronounced.

Nguyen, Moltz and Frank (2004) conducted a study on dysphagia following chemoradiation for locally advanced head and neck cancer. Patients who underwent chemotherapy and radiation for head and neck malignancies were evaluated for their ability to resume oral feeding following treatment. At a median follow-up of 17 months
(range 6-48 months), 25 patients (45%) developed severe dysphagia requiring prolonged tube feedings for more than 3 months (22 patients) or repeated dilatations (three patients). Among 33 patients who underwent MBS following treatment, 12 patients (36%) had silent aspiration (grade 6-7 dysphagia). Thirteen patients (39%) developed grade 4-5 dysphagia which required prolonged enteral nutritional support to supplement their oral intake. Most patients had severe weight loss (0-21 kg) during treatment, likely due in part to mucositis in the orodigestive tube. The finding of the study was dysphagia is a common, debilitating and potentially life-threatening sequela of concurrent chemoradiation for head and neck malignancy.

Richardson (1996) posited a study on the experience of fatigue and other symptoms in patients receiving chemotherapy. Fatigue has been recognized as the most frequently reported symptom of cancer and cancer therapy. As part of a larger study examining the pattern of fatigue in cancer patients who were undergoing a course of chemotherapy treatment, patients perceptions of fatigue and tiredness and the nature, pattern and causes of fatigue in relation to cancer and its treatment were obtained. In addition to a diary, interviews were conducted at two time points, at the beginning and end of a cycle of chemotherapy, with over 100 cancer patients. Just under 90% of the
sample reported fatigue at some point during a cycle of chemotherapy. The majority of the sample did not consider tiredness and fatigue to constitute the same feelings. Subjects attributed their fatigue to a combination of factors but most frequently mentioned treatment, changes in sleep patterns and other symptoms.

**Psychological and Psychosocial**

Chen, Jennelle and Grady (2009) conducted a prospective study to determine the prevalence of psychosocial distress among patients undergoing radiotherapy (RT) for head and neck cancer and to examine the association between depression and anxiety and demographic and medical variables. A total of 40 patients (25 men and 15 women) with nonmetastatic head and neck cancer were enrolled in this prospective study and underwent RT administered with definitive (24 patients) or postoperative (16 patients) intent. Twenty patients (50%) received concurrent chemotherapy. The prevalence of severe pre-RT anxiety was 7%. The depression levels, as determined by the Hospital Anxiety and Depression Scale and Beck Depression Inventory-II instrument increased significantly during RT and remained elevated at the first follow-up visit (p < 0.001 for both). The variables that were significantly associated with post-RT depression included a greater pre-RT depression level, employment status
(working at enrollment), younger age (<55 years), single marital status, and living alone (p < 0.05, for all). The results of the study have shown that an alarming number of patients undergoing RT for head and neck cancer have symptoms suggestive of psychosocial distress even before beginning treatment. This proportion increases significantly during RT.

Haisfield (2009) conducted a study on Prevalence and correlates of depression among patients with head and neck cancer: Certain patient demographic characteristics (e.g. marital status, education), symptoms, and specific time points in the illness trajectory (e.g. time of treatment) are correlated with depression. The study finding showed specific patient variables at diagnosis, such as depression, can predict depression at later time points. This was concluded that the comprehensive summary of existing research literature related to the prevalence and correlates of depression among adult patients with head and neck cancer provides evidence-based information that can be used by oncology nurses in their practice.

Choi, Lee and Lim (2008) conducted a study on effects of group music intervention on depression, anxiety, and relationships in psychiatric patients. To test whether group music therapy is effective for improving depression, anxiety, and relationships in psychiatric
patients. Twenty six patients were non-randomly allocated to either a music intervention group or a routine care group. The music intervention group received 60 minutes of music intervention for 15 sessions (1 or 2 times weekly). These findings suggest that music can improve depression, anxiety, and relationships in psychiatric patients.

Sela (2007) conducted a study to assess the prevalence of depression in palliative cancer patients attending a pain and symptom control clinic and to investigate the validity and utility of a depression visual analogue scale in detecting depression in the advanced cancer outpatient population. One hundred and thirty-two oncology outpatients who came for consultation at a multidisciplinary pain and symptom control clinic. The majority of participants (72%) indicated clinically significant depressive symptoms (21% in the “mild” depressive symptoms range, 32% in the “moderate” range, and 19% in the “severe” range). The results of the study underline the importance of routine screening to detect depressive disorder in palliative care patients to improve their quality of care. The depression visual analogue scale was found to be an effective simple screening tool, easy to administer and use.
Pruyn, Jong, Bosman, Borne and Ryckman (2006) did a systematic analysis of the literature on psychosocial aspects in head and neck cancer patients. Patients with head and neck cancer experience a variety of physical as well as psychosocial problems. Physical problems include swallowing or chewing, speech and physical appearance. Psychosocial problems include anxiety, depression, loss of self-esteem and uncertainty about the future. The result showed that because of these problems, isolation from friends typically occurs, re-employment is difficult, and there are social and sexual tensions within families.

Sherwood et al. (2005) evaluated the effectiveness of a cognitive behavioral intervention in decreasing symptom severity in patients with advanced cancer undergoing chemotherapy. Using prospective, randomized clinical trial at six urban cancer centers in the Midwestern United States and 124 patients 21 years of age or older were recruited and randomized to receive conventional care or conventional care and an intervention. Participants were newly diagnosed with stage III, stage IV, or recurrent cancer (solid tumor or non-Hodgkin Lymphoma), undergoing chemotherapy, cognitively intact, and able to read and speak English. Nurses with experience in oncology delivered a five-contact, eight-week intervention aimed at teaching patients problem-
solving techniques to affect symptom severity. Gender, site of cancer, age, symptom severity and depressive symptoms at baseline, group (i.e., experimental versus control), and total symptom severity. The finding was patients in the experimental group and those with lower symptom severity at baseline had significantly lower symptom severity at 10 and 20 weeks; the experimental difference at 10 weeks occurred primarily in those 60 years of age and younger.

Holley (2003) conducted a study on counselling the head and neck cancer patient. The laryngectomy patient faces many of the same psychological, social and physical problems as the elderly. This study findings showed that early counselling motivation and positive psychosocial experience strongly influence the desire to communicate, even among the more severely impaired individuals and among the older patients. True, each did not obtain the more desirable method of speech, "esophageal speech", but each was able to communicate orally, along with non-verbal and gesture skills. Research suggested that more research should be obtained and utilized in each agency that works with this population.

Lengacher, Bennett, Kip, Gonzalez, Jacobsen and Cox (2000) conducted a study to identify the use of complementary and alternative
medicine (CAM) for relief of symptoms and side effects among women diagnosed with breast cancer. A convenience sample of 105 predominantly Caucasian women (mean age = 59 years) with a diagnosis of breast cancer was recruited from the Tampa Bay area and a rural Midwestern area. The most frequently cited reason for use of CAM was to reduce the symptom of psychological distress, whereas the lowest frequency of CAM use was because of dissatisfaction with traditional medical care. Frequency of specific use according to type of CAM was higher and more specific than reported in other studies. Patients who had undergone chemotherapy were most likely to use CAM. Oncology nurses are in a key position to identify which symptoms or side effects patients are experiencing and which CAM therapies may be helpful to relieve patients’ symptoms related to treatment and psychological distress related to their cancer.

Morin et al. (1999) conducted a review by a task force on psychological and behavioral therapies for insomnia; a systematic review was conducted on 37 treatment studies published between 1998 and 2004. Each study was systematically reviewed with a standard coding sheet and the following information was extracted. Psychological and behavioral therapies produced reliable changes in several sleep parameters of individuals with either primary insomnia
or insomnia associated with medical and psychiatric disorders. Stimulus control therapy, relaxation, paradoxical intention, sleep restriction, and cognitive-behavior therapy. The researcher suggested that further research is needed to develop therapies that would optimize outcomes and reduce morbidity, as would studies of treatment mechanisms, mediators, and moderators of outcomes. Effectiveness studies are also needed to validate those therapies when implemented in clinical settings (primary care), by non-sleep specialists.

Olson and Shedd (1998) conducted a study on 51 laryngectomy patients on disability and rehabilitation in head and neck cancer patient after treatment. In all cases, the following areas in which disability could occur were identified and explored: physical appearance, speech, deglutition, mastication, salivation, sensory deficits, cranial motor—nerve deficits, pain, nutrition, activities of daily living, psychosocial functioning, vocational status, environmental parameters, and delayed complications. Where appropriate, ratings and delineations of severity were compiled. Nine methods of rehabilitation were assessed with regard to frequency of utilization: surgical therapy, rehabilitation nursing, occupational therapy, vocational rehabilitation, rehabilitation counselling, and social service.
The study did that half of the patients studied had sustained significant disability in three to four areas, while 43% had moderate or severe disability in five to nine areas. Additionally, the head and neck surgeon was found to have used surgical reconstruction and dental-maxillofacial prosthetic measures, as well as the services of seven categories of allied health professionals, to provide rehabilitation.

**Spiritual**

A study was conducted to explore the role of the arts in spirituality and spiritual care and the importance of the arts and creativity in health care settings, particularly where individuals are confronting life-threatening illness. The arts are now viewed as an integral component of holistic care for patients and families. By offering opportunities to engage in the arts and creative expression, persons with cancer can be enabled to mourn, grieve, celebrate life, be empowered to endure their situation and find healing and meaning. Comprehensive supportive care for cancer patients requires the efforts of an interdisciplinary team. Oncology nurses must be knowledgeable of the role of the creative expression in the provision of care to patients with cancer and how to incorporate the arts into the cancer care setting (Bailey, 1997).
A study conducted by Renz (2005) recognized an increasingly important in palliative care that spiritual needs of terminally ill patients. Spiritual experiences can have a great impact on physical and emotional well being (alleviate pain, release from anxiety and despair, engender feelings of serenity and wholeness) and facilitate dying. Music therapy, psychotherapy and spiritual assistance offer essential methods for Psycho-Oncology and Palliative Care. A holistic and interdisciplinary approach is needed to assist patients in their complex suffering.

**Literatures on Oral Mucositis and Oral Care**

Elting, Cooksley, Chambers and Garden (2007) posited to study the risk, outcomes, and costs of radiation-induced oral mucositis (OM) among patients receiving radiotherapy (RT) to head and neck primary cancers. A retrospective cohort consisting of 204 consecutive head-and-neck cancer patients who received RT with or without chemotherapy during 2002 was formed; their records were reviewed for clinical and resource use information. Oral mucositis was more common among patients with oral cavity or oropharynx primaries (odds ratio (OR), 44.5; 95% confidence interval (CI), 5.2 to >100; p <0.001), those who received chemotherapy (OR = 7.8; 95% CI, 1.5-41.6; p = 0.02), and those who were treated with altered
fractionation schedules (OR = 6.3; 95% CI, 1.1-35.1; p=0.03). Patients with OM were significantly more likely to have severe pain (54% vs. 6%; p < 0.001) and a weight loss of > or = 5% (60% vs. 17%; p<0.001). The findings of the study showed oral mucositis is associated with severe pain, significant weight loss, increased resource use, and excess cost. Preventive strategies are needed.

Wong, Lee and Mok (2006) determined the pattern, severity, and time course of RT-induced mucositis pain; self-care behaviors (SCBs) used to manage mucositis pain; and the effectiveness of these behaviors in relieving such pain. Forty-nine patients with of HNC were assessed. All patients developed pain due to RT-induced mucositis. The most effective SCBs for RT-induced mucositis pain were mouth rinsing and using oral analgesics. However, more severe pain with swallowing was not managed well throughout the study. Researchers recommended that future studies needed to test more effective strategies to manage RT-induced mucositis pain.

Goldberg, Chiang, Selina and Hamaraman (2004) conducted a study on patient perceptions about chemotherapy - induced oral mucositis (OM), the painful inflammation of oropharyngeal tissues, is an economically costly chemotherapy toxicity. Of 514 patients
providing completed surveys from among approximately 1625 patients (32% response rate), 167 (32%) reported experiencing OM. Factors associated with developing OM included number of chemotherapy cycles (P=0.001), hematologic malignancy (P=0.02), female gender (P=0.03), age (P=0.05), and treatment with anthracyclines (P=0.001), vinca alkaloids (P=0.001), cyclophosphamide (P=0.001), fludarabine (P=0.01), cis/carboplatin (P=0.05) and radiotherapy (P=0.005). Among patients experiencing OM, 69% considered OM to be an important toxicity with 7% rating their OM very severe, 18% severe, 36% moderate and 29% mild. Recurrent OM was reported by 87 patients (53%) and was judged similar in severity by 67%, milder by 27% and more severe by 8%. The result was considered the sixth most distressing complication behind (in descending order) fatigue, hair loss, nausea, numbness and diarrhea, and more important than anxiety and heartburn. High-risk populations can be identified, permitting targeting of primary prophylaxis strategies whereby all patients possessing high-risk factors are treated to prevent oral mucositis.

Harris and Knobf (2004) stated in their article that acute pain is the major clinical problem associated with mucositis. Mucosal tissue injury is a dose-limiting toxicity of many cancer therapies. Because the number of patients treated with combinations of high-dose
chemotherapy agents is likely to increase, more patients are at risk for mucositis. Currently, no consensus exists regarding mucositis prevention, assessment, or treatment. Similarly, research is needed in methods to accurately assess and manage pain for mucositis. Multiple interventional approaches are needed to decrease the emotional and physical distress caused by acute oral pain and mucositis. An assessment tool that includes physical, functional, and pain parameters is presented. Although approaches to prevent and treat mucositis are increasing, appropriate assessment and timely directed interventions can minimize patient distress.

Chan, Chang, Molassiotis, Lee and Lee (2003) conducted a study on oral complications in 94 Chinese cancer patients undergoing chemotherapy to assess the oral status and mucositis-related symptoms. Data were collected by a research nurse at three stages over a period of 16 days: at the start, on day 8, and on day 16 of chemotherapy. The majority of subjects experienced a mild to moderate degree of mucositis with the highest score reported on day 8. Patients with head and neck cancer had consistently higher scores for mucositis and symptoms in most phases. Careful monitoring of patient diet preferences, cancer site, and use of Chinese medicine is recommended for comprehensive oral assessment. The results showed that the
alleviation of oral mucositis and the associated symptoms through promotion of an appropriate food/fluid intake and more frequent use of mouthwashes should be emphasized in oral care.

A prospective, longitudinal study was aimed to describe the prevalence, severity and pattern of symptoms over the course of radiation therapy in persons with nasopharyngeal carcinoma and to explore symptom severity by treatment modality. Thirty-seven patients completed this study, and 46% received chemotherapy before radiation therapy. All patients experienced dry mouth, taste change, difficulty in swallowing, difficulty in opening their mouth, hoarseness, sore throat, and observable mucositis. Most reported moderate-to-severe were dry mouth, difficulty in swallowing, and sore throat from weeks 3 through 7. Patients also lost an average of 3.9 kg during the therapy. Author suggested that patient education about expected side effects may help to mitigate the anxiety that patients experience when these symptoms occur (Huang, 2000).

A study was done to refine the Western Consortium for Cancer Nursing Research stomatitis staging system. Fifty-six adult cancer patients were accrued. Using all eight descriptors, 96.4% of the participants were correctly staged. Using only lesions, colour and
bleeding, however, 92.9% of the cases were correctly staged. Based on the findings of this study, the WCCNR stomatitis staging system has been shortened to include only lesions, colour and bleeding (WCCNR, 1999).

**Literatures on Pain and Sleep**

The control of cancer pain is an essential goal in the care of patients with cancer. Inadequate pain assessment by health care providers is a major risk factor for under treatment of pain. Repeated and accurate pain assessment is required for optimal pain management. Pain assessment tools such as simple rating scales and short pain questionnaires can facilitate routine measurement of cancer-related pain in clinical and research settings. In addition to measuring pain intensity, it is important to determine the impact of pain on patients function, mood, and quality of life. Developmental issues must be considered when assessing the pain of children and elderly individuals with cancer. Novel technologies may be used to improve accurate and timely pain measurement.

One hundred oncology outpatients who came for consultation at a multidisciplinary pain and symptom control clinic were asked and agreed to complete a self-report questionnaire about their sleeping habits, sleep concerns, sleep enhancement strategies, and related
communication with health care providers. The majority of participants (72%) reported a wide variety of sleep disturbances, after cancer diagnosis, with the three most frequent elevated symptoms (> or = 5) being not feeling rested in the morning (72%), difficulty staying asleep (63%), and difficulty falling asleep (40%). Approximately one-fifth of participants (19%) reported having insomnia problems prior to their cancer diagnosis. Fifty-three percent of participants reported using a variety of interventions for their sleep problems, the most frequent being sleep medication (37%). Of the 52 participants who reported an elevated level of concern about their sleeping difficulties (> or = 5), 48 (92%) discussed their concerns with a health care provider. The results of this study underline the importance of routine clinical assessments to detect sleep problems and interventions designed specifically to improve the overall sleep quality of cancer patients (Sela, Watanabe and Nekolaichuk, 2005).

Kwekkeboom (2005) conducted a study on the pain management strategies used by patients with breast and gynecologic cancer with postoperative pain. With growing interest in complementary therapies, the scope of nonpharmacologic interventions used by patients with cancer to manage pain may be very different than 10-15 years ago. A secondary analysis was completed using data from 34 women who
participated in a randomized trial of guided imagery. Techniques used included positioning, distraction, relaxation, heat, and eating/drinking. Compared to results of previous studies, increased use of relaxation strategies (breathing, imagery, music, meditation) was noted in the current study. The majority of participants used nonpharmacologic strategies in addition to analgesic medications. Pain-related outcomes were similar among persons who used analgesic medications alone and those who used a combination of analgesics and nonpharmacologic strategies. Author had concluded by starting that nurses may benefit from knowing which pain management strategies patients find helpful so that they can encourage their use and teach similar strategies to the patients who find them useful.

Bostr, Sandh, Lundberg and Fridlund (2004), conducted a study on 30 patients to describe how patients with cancer-related pain in palliative care perceive the management of their pain. The interviews were analysed using a phenomenographic approach. Patients described 10 different perceptions of pain and pain management summarized in the three categories: communication, planning and trust. When they felt trust in the health care organization as a whole, and in nurses and physicians in particular, they described improved ability and willingness to participate in pain management. While the
findings are limited to patients in palliative care, questions are raised about others with cancer-related pain without access to a palliative care team. They expressed a wish to be pain-free, or attain as much pain relief as possible, with a few side effects as possible.

Chen (2003) did a study on pain and hope in patients with cancer: a role for cognition. This study had three purposes: 1) to examine the effect of disease status on hope levels among patients with cancer who have pain; (2) to compare the level of hope between patients with cancer who have pain and those do not; and (3) to determine which dimensions of pain are associated with hope. Patients (n = 226) with various cancer diagnoses completed the Herth Hope Index. The patients’ disease stage did not affect their level of hope, but their perception of treatment effect was associated with this factor. No difference in level of hope was found between patients with pain and those without pain. For those with pain, the cognitive dimension of pain (meaning ascribed to pain) was significantly correlated with hope, whereas sensory dimensions (pain intensity and relief) showed no such correlation. The study results support the role of cognition in promoting the psychological well-being of patients with cancer.
Turk, Monarch and Williams (2002) had written an article on cancer patients in pain: considerations for assessing the whole person. Pain is a subjective perception that is influenced by psychosocial and behavioral factors and physical pathology. Pain assessment must become part of routine care. Ratings of pain should be performed on a regular basis, just as vital signs are taken on a regular basis. When a new type of pain or exacerbation of pain is identified, additional attention beyond pain severity and location. In some circumstances, such as when patients are unwilling or unable to report on their pain, it is useful to gather information from caretakers. At a minimum, the severity, location, and pattern of pain and patients’ functional activity and mood should be assessed. The study findings revealed that timely, appropriate, and thorough assessment and treatment of cancer patients experiencing pain should reduce their suffering and improve the quality of their lives.

Hall (2000) described the nature of pain. Pain is complex and difficult to define; Managing pain is challenging for all members of the interprofessional team; Untreated pain is harmful to the patient; Pain is a subjective and unique experience for the individual, which we, as health professionals, should not judge; staff do not know best—listen to what the patient is telling you; Base your evaluation of pain upon a
thorough clinical assessment and an evaluation of treatment/care. Use pain measurement tools to aid this process; Effective communication with patients is essential for effective pain management.

Miaskowski and Lee (1999) conducted a study on pain, fatigue, and sleep disturbances in oncology outpatients receiving radiation therapy for bone metastasis. This study evaluated 24 oncology patients who were receiving radiation therapy for bone metastases to (1) describe the patterns of pain intensity and fatigue severity over a 48-hour period; (2) evaluate for sleep disturbances; (3) describe the relationships between these symptoms and various treatment characteristics; and (4) describe the self-care strategies used by patients to manage pain and fatigue. Patients reported moderate amounts of pain and fatigue. Average pain scores did not vary significantly over a 48-hour period. However, patients reported significantly lower fatigue scores in the morning compared to the evening. In addition, patients experienced significant sleep disturbances, with a mean sleep efficiency index of 70.7% (estimated using wrist actigraphy). The researcher had recommended that additional research is warranted to describe more completely the patterns of pain, fatigue, and sleep disturbances in oncology outpatients receiving radiation therapy.
Sloan, Vanderveer, Snapp, Johnson and Sloan (1999) evaluated the skills of hospice nurses in assessing the severe pain of a cancer patient and the pain management recommendations they would present to the patient’s primary care physician. Twenty-seven hospice nurses (ranging in experience from 1 month to 10 years) were presented with the same standardized patient with cancer pain. In the admission pain assessment, hospice nurses did well in assessing pain intensity (85%), pain location (70%), and pain-relieving factors (59%). However, only 48% of the nurses adequately assessed the pain onset, and only 44% adequately assessed other symptoms the patient might be experiencing. In Part B, 96% of the nurses recommended opioids, 96% recommended the oral route of administration, and 82% recommended regular dosing of the opioids. Fifty-six percent of nurses included a breakthrough medication in their analgesic recommendations. All of the hospice nurses treated the patient’s fear of addiction in an appropriate manner, and 93% of the nurses recommended increasing the patient’s opioid dosage to treat the persisting pain problem. Most practicing hospice nurses were judged to be competent in the assessment and management of the severe pain of the standardized cancer patient, although some deficits were noted.
Regular oral opioids were the analgesics of choice. Co-analgesics were rarely recommended.

**Literatures related on Music Therapy**

Music therapy in the United States of America began in the late 18th century. However, using music as a healing medium dates back to ancient times. This is evident in biblical scriptures and historical writings of ancient civilizations such as Egypt, China, India, Greece and Rome. Today the power of music remains the same but music is used much differently than it was in ancient times.

Music therapy was defined as an intervention designed to improve health status that included musical interaction between therapist and patient within a structured theoretical framework and in which outcomes were born of music, talk inspired by music or therapeutic relationship.

Music therapy is more than just listening to music. Other interventions include songwriting, making music, improvising with instruments and using music in conjunction with other activities like painting or writing. Richmond and Virginia (2006) admits that it’s still hard for many doctors to accept her line of work. “Music is a touchy-feely thing, and that’s why it’s such a hard sell to the medical
community”, she says. “However, there are lots of studies that indicated the benefits of music”. Scientific data suggested that music does trigger physical responses, including:

- Reducing blood pressure, heart rate and breathing.
- Increasing feelings of self-worth and decreasing depression.
- Decreasing one’s perception of pain.
- Occupying neurotransmitters that would otherwise be used to transmit pain messages to the brain.
- Reducing levels of stress, anxiety and fear.

**Effect of music therapy in reducing anxiety**

Choi, Lee and Lim (2008) conducted a study on effects of group music intervention on depression, anxiety, and relationships in twenty six psychiatric patients. The music intervention Group received 60 minutes of music intervention for 15 sessions (1 or 2 times weekly). After 15 sessions, the music intervention Group showed significant improvements in depression, anxiety, and relationships compared with the control Group. These findings suggest that music can improve depression, anxiety, and relationships in psychiatric patients. However, we cannot elucidate the nonspecific effects. Furthermore, objective and
replicable measures are required from a randomized controlled trial with a larger sample size and an active comparable control.

Music has been shown to affect portions of the brain. Part of this therapy is the ability of music to affect emotions and social interactions. Research by Nayak et al (2007) showed that music therapy is associated with a decreased in depression, improved mood, and a reduction in state of anxiety. Both descriptive and experimental studies have documented effects of music on quality of life, involvement with the environment, expression of feelings, awareness and responsiveness, positive associations, and socialization. Additionally, found that music therapy had a positive effect on social and behavioral outcomes and showed some encouraging trends with respect to mood.

Mandel, Hanser and Secic (2007) conducted a study on effects of music therapy on health-related outcomes in cardiac and rehabilitation. On sixty-eight of 103 recruited patients, 30 to 80 years of age, completed the protocol through posttreatment. Physiological and psychological outcomes were measured. Music therapy included musical experiences, counselling, and Music-Assisted Relaxation and Imagery. Interpretation of changes at 4 months posttreatment in anxiety, general health, and social functioning are limited, due to small
sample sizes at follow-up. Pre to post-music therapy session improvements were also reported. Findings suggest that some health-related outcomes may be affected positively by participation in music therapy in addition to cardiac rehabilitation. Attrition contributed to limitations in statistical power.

Hanser, Bauer and Kubicek (2006) conducted a study on effects of a music therapy intervention on quality of life and distress in 70 women with metastatic breast cancer. The MT consisted of three individual sessions led by a music therapist. Psychological symptoms were measured with the Hospital Anxiety and Depression Scale and quality of life with the Functional Assessment of Cancer Therapy-General plus a Spirituality subscale at baseline approximately 6 weeks and 3 months later. Visual analog scales, heart rate, and blood pressure were assessed in the MT group immediately before and after individual session. Significant immediate effects of MT were observed: relaxation, p = < .00001; comfort, p = < .00001; happiness, p = < .00001; heart rate, p = .0003; although no significant differences between conditions were found over time.

A single case study was done on a Squamous Cell Carcinoma-Hypopharynx patient, to find out if receptive music therapy could be
combined with comprehensive counselling and also if health information could be provided as a cognitive behavioral intervention to address psychological distress and situational anxiety, which are common problems with cancer patients in a hospital environment. Baseline data was collected from the patient using Spielberger’s State-Trait Anxiety Inventory. Assessments were done for situational anxiety before, during and after the music and counselling interventions. Pre-and Post-test composite anxiety scores were state anxiety, the unique experiences of listening to music, which could be explained only by the patient listening to music and the self report made by the patient when analyzed reflected the spiritual dimensions of the music therapy (Sundar, 2006).

Music therapy has decreased anxiety levels in many medical settings. A randomized clinical trial examined the effectiveness of a music listening intervention, delivered by a board-certified music therapist, in patients undergoing curative radiation therapy (RT). Emotional distress (anxiety, depression, and treatment-related distress) and symptoms (fatigue and pain) were measured at baseline, mid-treatment, and end of treatment in 63 patients undergoing RT. Although patients who listened to self-selected music reported
lower anxiety and treatment-related distress, there was a decline in symptoms (Nancy, 2006).

Lee, Chung and Chan (2005) conducted a study on music and its effect on the physiological responses and anxiety levels of 64 patients receiving mechanical ventilation for 30 minutes of music intervention. The subjects were asked to answer the Chinese State Trait Anxiety Inventory scale before and after the study period and physiological indices and resting behaviours were recorded before and after the study period in both groups. The subjects' satisfaction with music was also obtained after music intervention. The findings indicate that patients on mechanical ventilation that listened to a single 30-minute session of music appeared to show greater relaxation as manifested by a decrease in physiological indices and an increase in comfortable resting behaviours. Music can provide an effective method of reducing potentially harmful physiological responses arising from anxiety in mechanically ventilated patients. As indicated by the results of this study, music therapy can act as a simple and safe nursing intervention to allay anxiety and promote patient comfort. Interest and comments on music therapy provided as a relaxation technique should be elicited from both nurses and patients.
Chlan, Evans, Greenleaf and Walker (2000) conducted a study on the effects of a single music therapy intervention on anxiety, discomfort, satisfaction, and compliance with screening guidelines in outpatients undergoing flexible sigmoidoscopy (FS). Music therapy is one nonpharmacologic intervention that has been shown to be effective in allaying anxiety, reducing discomfort, and promoting satisfaction in other patient populations. A two-group pretest, posttest experimental design with repeated measures study recruited 64 subjects undergoing FS from one Midwestern tertiary care center. Subjects were randomly assigned to a control condition of usual procedural care or to an experimental condition of music therapy during the examination. State and trait anxieties were measured at pretest. Subjects in the music group reported less anxiety and discomfort than subjects in the control group. The study findings concluded that Nurses caring for patients undergoing screening FS can offer music therapy as one nonpharmacologic intervention to ameliorate anxiety and reduce discomfort.

Watkins (1997) conducted a study on Music therapy: proposed physiological mechanisms and clinical implications. Studies suggest that music therapy can be an effective nursing intervention in stressful situations for decreasing anxiety, blood pressure, and heart rate. This
article (1) reviews research related to the effect of music on anxiety, blood pressure, and heart rate; (2) proposes a potential physiological framework for the effects of music; and (3) suggests clinical implications for the use of music therapy in acute- and chronic-care settings by clinical nurse specialists (CNSs). Findings from clinical research suggesting that music may facilitate a reduction in the stress response include decreased anxiety levels, decreased blood pressure and heart rate, and changes in plasma stress hormone levels. Findings from laboratory research using animal models, provide beginning, although speculative, support for a physiological framework of music's influence on the stress response. Music therapy may be useful in a wide range of clinical settings with patients experiencing health problems as diverse as hypertension/cardiovascular disease, migraine headaches, and gastrointestinal ulcers. Suggestions for development of a music therapy procedure and for areas in need of additional research are offered.

Effect of music therapy in cancer and other conditions in reducing pain

Klassen, Liang and Tjosvold (2008) conducted a study on music for pain and anxiety in children undergoing medical procedures. Two reviewers independently screened 4559 citations and reviewed the full
manuscript of 393 studies. Music was used as an intervention, and the study measured pain or anxiety. The 19 included trials involved 1513 subjects. The methodological quality of the studies was generally poor. Overall, MT showed a significant reduction in pain and anxiety (standardized mean difference [SMD] -0.35; 95% confidence interval [CI], -0.55 to -0.14; 9 studies; N = 704; I(2) = 42%). When analyzed by outcome, MT significantly reduced anxiety (SMD -0.39; 95% CI, -0.76 to -0.03; 5 studies; n = 284; I(2) = 52.4%) and pain (SMD -0.39; 95% CI, -0.66 to -0.11; 5 studies; N = 465; I(2) = 49.7%). There was no evidence of publication bias. Music is effective in reducing anxiety and pain in children undergoing medical and dental procedures. Music can be considered an adjunctive therapy in clinical situations that produce pain or anxiety.

Richardson, Babiak, and Frenkel (2008) conducted a study on music therapy in a comprehensive cancer center. Music therapy is a common modality that is used in hospital settings as part of complementary and integrative medicine programs. It is also a key therapeutic tool used within most integrative medicine programs at large cancer centers in the United States. When used in conjunction with conventional cancer treatments, music therapy has been found to help patients promote a better quality of life; better communicate their
fear, sadness, or other feelings; and better manage stress, while alleviating physical pain and discomfort. In this article, they review the literature on the value of integrating music therapy in cancer care and describe the experience of music therapy at a large comprehensive cancer center and the benefits that patients with cancer obtain from this service.

Richards, Johnson, Sparks and Emerson (2007) conducted a study on the effect of music therapy on patients' perception and manifestation of pain, anxiety, and patient satisfaction. An extensive review and synthesis of current research was completed to identify the clinical benefit of using music therapy in the hospital setting. It demonstrated that music therapy has the potential to improve the hospital experience of patients.

Igawa, Wu and Harrigan (2007) conducted a study on music and cancer pain management. A comprehensive systematic evaluation of the data based literature was undertaken and analyzed using matrix analysis. Studies investigating the efficacy of music therapy during invasive cancer procedures and chemotherapy demonstrated the role that attention states play in distracting patients from, and therefore minimizing their experience of, the pain associated with such
treatments. Other studies examining diverse outpatient populations revealed similar findings, illustrating well the cognitive-affective dimensions of pain perception. Although these findings fail to adequately address the ambiguity surrounding music therapy's role in cancer pain management, music therapy has nonetheless been shown to significantly reduce anxiety and, in so doing, indirectly lessen the intensity of pain while improving patient quality of life.

Robert (2007) described in his article about the process and results of a three-months music therapy study conducted with 80 hospice patients. Subjects were observed for, or self-reported, their levels of pain control, physical relaxation, both before and after each music therapy sessions. Music included live active and passive music-based experiences. These were designed to establish rapport with patient or family, to facilitate family interaction and patient support and comfort, to facilitate relaxation, to enable reminiscence and life framework for spiritual exploration and validation, and to encourage to identify of feelings of anticipatory mourning and grief. One-tailed t-tests were performed for subjects pain control, physical comfort, and relaxation. These results suggested that the music therapy interventions appear to be effective in decreasing pain, increasing comfort, and relaxation during both data collection scenarios.
A study was conducted on the effect of single session of music therapy increasing relaxation and reducing anxiety in adults who receive mechanical ventilation. Four intensive care units of 3 urban university attached teaching hospitals in Midwestern USA and 54 adults who were in the intensive care unit and needed mechanical ventilation were studied. Patients were provided with a restful atmosphere for 30 minutes: eyes were closed, lights were dimmed, a “do not disturb” sign was put on the door of each patient’s room, and patients were told to relax and to think of something pleasant. 27 patients were allocated to receive 30 minutes of music therapy using cassette tape players and headphones. Music contained lyrics, was designed to be relaxing, and had 60-80 beats/minute. Results showed reduction of anxiety (Clark, 2006).

Mok and Wong (2003) conducted a study on effects of music on patient anxiety. Undergoing surgery with local anesthesia is stressful because patients often are aware of their surroundings. This study investigated music as a method of reducing patients' anxiety during minor surgery with local anesthesia. For this study, researchers assessed the effectiveness of music as a relaxation modality by measuring patients' vital signs and self-reported anxiety before and after surgery. Study results indicate that patients who listened to their
choice of music during surgery experienced significantly lower anxiety levels, heart rates, and blood pressure than patients who did not listen to music.

Kwekkeboom (2003) conducted a study on music versus distraction for procedural pain and anxiety in sixty patients with cancer. Participants completed measures of pain and anxiety before and after their medical procedures and provided a rating of perceived control over pain and anxiety after the procedure. Procedural pain, state anxiety, and perceived control over pain and anxiety. Contrary to hypotheses, outcomes achieved with music did not differ from those achieved with simple distraction. Moreover, outcomes achieved under treatment as usual were not significantly different from those obtained with music or distraction interventions. Some patients found that the interventions were bothersome and reported that they wanted to attend to the activities of the surgeon and the medical procedure itself. The effects of music, distraction, and treatment as usual are equivocal. In addition, patients have individual preferences for use of distraction during painful or anxiety-provoking procedures.

Evans (2002) conducted a study on the effectiveness of music as an intervention for hospital patients: A total of 29 studies were
identified that fulfilled the inclusion criteria, of which 10 were subsequently excluded following critical appraisal. Music played via headphones reduces anxiety of patients during normal care, but it has no impact on the anxiety of patients undergoing procedures such as bronchoscopy, sigmoidoscopy or surgery with a spinal anaesthetic. Music produces a small reduction in respiratory rate during normal care delivery, but appears to have little effect on other vital sign parameters. Music also appears to improve the mood and tolerance of patients. This review demonstrates the effectiveness of music for the reduction of anxiety during normal care. Given the inexpensive nature of this intervention, and the lack of adverse events, it is recommended as an adjunct to normal care practices. This review also highlights the need for further research into many aspect of this intervention.

Wang, Kulkarni and Dolev (2002) conducted a study on music and preoperative anxiety. Adult patients undergoing anesthesia and surgery were randomly assigned to two study groups. Subjects in Group 1 (n = 48) listened to a 30-min patient-selected music session, and subjects in Group 2 (n = 45) received no intervention. Patients were evaluated before, during, and after administration of the intervention. The study revealed that after intervention, subjects in the music group reported significantly lower anxiety levels as compared with the
control group (F(1,91) = 15.4, P = 0.001). That is, the postintervention anxiety level of subjects in the music group decreased by 16% as compared with the preintervention level, whereas the anxiety level of the control group did not change significantly. In conclusion, under the conditions of this study, patients who listened to music before surgery reported lower levels of state anxiety. Physiological outcomes did not differ, however, between the two study Groups. Patients who listen to music of their choice during the preoperative period report less anxiety.

Magill (2001) conducted a study on the use of music therapy to address the suffering in advanced cancer pain. Pain associated with advanced cancer is multifaceted and complex, and is influenced by physiological, psychological, social, and spiritual phenomena. Music therapy is a treatment modality of great diversity that can offer a range of benefits to patients with advanced cancer pain and symptoms of suffering. A variety of music therapy techniques may be used, including vocal techniques, listening, and instrumental techniques. These techniques provide opportunities for exploration of the feelings and issues compounding the pain experience. Case examples are presented to demonstrate the "lifting", "transporting", and "bringing of
peace" qualities of music that offer patients moments of release, reflection, and renewal.

Muller and Hoffmann (1997) conducted a study on active music therapy for chronic pain: a prospective study. The clinical parameters of each patient were related to the observations in the audio- and video-documented music therapy settings and to the self-reported changes in pain intensity and pain behaviour. There was a significant reduction of pain intensity and pain-related disability in the music group compared to a control group, but no change in the depression and anxiety score. Psychophysiological and psychodynamic models are presented to explain the effectiveness of music therapy on pain reduction. Clinical studies on music therapy as well as on other "art therapies" should relate the analysis of clinical parameters to the descriptive-phenomenological documentation of the therapeutic process to demonstrate systematically the influence of music and art in the individual case.

Effect of music therapy in medical and surgical condition

Guetin, Portet and Picot (2009) conducted a study on impact of music therapy on anxiety and depression for patients with Alzheimer's disease and on the burden felt by the main caregiver. The impact of music therapy on dementia care for patients with Alzheimer's disease
(AD) is well-recognized. Around 10 case studies presenting various results from receptive music therapy sessions on patients with Alzheimer's disease were assessed. The results of these studies point out the interest of music therapy in the multidisciplinary care of Alzheimer's disease and its related syndromes. It has been deemed useful for significantly reducing the medication given to AD patients. A music therapy protocol, specifically tailored to the patient's needs has been shown to significantly reduce anxiety, depression and aggressiveness in patients suffering from Alzheimer's disease. This individual session was always followed by an interview with the music therapist in order to allow the patient to express the emotions felt during the session and to stimulate the patient's cognitive functions by recalling memories and images from his past life experience. The significance threshold has conventionally been set at 5% for all tests used. Alzheimer's disease is a recognized indication for music therapy. A simple oral consent was collected prior to the study inclusion. Five patients were included for a total of 44 sessions. The patients' regular attendance at the music therapy sessions showed its feasibility. Oral feedback, were able to see that music therapy was very well-accepted both by patients and caregivers. After the sessions, all patients expressed a sensation of well-being and pleasure, such as: "Music made
me feel better, I feel more relaxed", "I feel better", "I didn't know that music could have such an impact on me".

Okada, Kurita and Takase (2009) conducted a study on effects of music therapy on autonomic nervous system activity, incidence of heart failure events, and plasma cytokine and catecholamine levels in elderly patients with cerebrovascular disease and dementia. Investigated the effects of MT on congestive heart failure (CHF) events. Eighty-seven patients with pre-existing CVD were enrolled in the study. Assigned patients into an MT group (n = 55) and non-MT group (n = 32). The MT group received MT at least once per week for 45 minutes over 10 times. Cardiac autonomic activity was assessed by heart rate variability (HRV). Compared the incidence of CHF events between those two groups. In the non-MT group, there were no significant changes in any HRV parameters. Among cytokines, plasma interleukin-6 (IL-6) in the MT group was significantly lower than those in the non-MT group. Plasma adrenaline and noradrenaline levels were significantly lower in the MT group than in the non-MT group. CHF events were less frequent in the MT group than in the non-MT group (P < 0.05). These findings suggest that MT enhanced parasympathetic activities and decreased CHF by reducing plasma cytokine and catecholamine levels.
Tam, Wong and Twinn (2008) conducted a study on effect of music on procedure time and sedation during colonoscopy. Due to patient and staff interests, integrated treatment often includes complementary and alternative therapies, including music and art therapy. This study was a prospective naturalistic non-randomized pilot study without a control group that sought to evaluate how participation in a music therapy program affected treatment outcomes for individuals with co-occurring mental illness and addiction. In summary, music therapy appears to be a novel motivational tool in a severely impaired inpatient sample of patients with co-occurring disorders. Future studies of music therapy in integrated co-occurring disorder setting should include a control group.

Sarkamo, Tervaniemi and Laitinen (2008) conducted a study on music listening enhances cognitive recovery and mood after middle cerebral artery stroke. In humans, music listening activates a widespread bilateral network of brain regions related to attention, semantic processing, memory, motor functions, and emotional processing. This single-blind, randomized, and controlled trial was designed to determine whether everyday music listening can facilitate the recovery of cognitive functions and mood after stroke. In the acute recovery phase, 60 patients with a left or right hemisphere middle cerebral
artery (MCA) stroke were randomly assigned to a music group, a language group, or a control group. Fifty-four patients completed the study. Results showed that recovery in the domains of verbal memory and focused attention improved significantly more in the music group than in the language and control groups. The music group also experienced less depressed and confused mood than the control group. These findings demonstrated for the first time that music listening during the early post-stroke stage can enhance cognitive recovery and prevent negative mood.

**Effect of music therapy in insomnia**

Ziv, Rotem and Arnon (2008) conducted a study on the effect of music relaxation versus progressive muscular relaxation on insomnia in older people and their relationship to personality traits. The present study had three aims: first, to compare two relaxation techniques—music relaxation and progressive muscular relaxation—on various objective and subjective measures of sleep quality; second, to examine the effect of these techniques on anxiety and depression; and finally, to explore possible relationships between the efficiency of both techniques and personality variables. Fifteen older adults took part in the study. Results show music relaxation was more efficient in improving sleep. Sleep efficiency was higher after music relaxation than after
progressive muscular relaxation. Moreover, anxiety was lower after music relaxation.

**Effect of music therapy in health care intervention**

Mathur, Duda and Kamat (2008) conducted a study on knowledge and use of music therapy among pediatric practitioners in Michigan. The objective of our study was to determine the awareness, knowledge and use of music therapy by members of the Michigan chapter of the American Academy of Pediatrics in their health care practice. Although the majority of respondents were aware of the use of music therapy in health care settings, very few had referred their own patients for music therapy services. Music therapy is an inexpensive and noninvasive treatment modality being used increasingly, especially to alleviate pain, stress, and anxiety among patients in a variety of conditions. Pediatric practitioners in Michigan, who responded to our survey, expressed a strong interest in learning more about music therapy and learning about ways to incorporate music therapy into their health care practice.

O'Callaghan (2001) conducted a study on bringing music to life: a study of music therapy and palliative care experiences in a cancer hospital. A music therapy research study aimed at understanding patients', visitors' and staff members' experiences of a music therapy
program in a cancer hospital over a three-month period is described. Respondents' answers to brief open-ended questions, as well as the music therapist researcher's interpretations of the program's relevance, were examined using thematic analysis based on grounded theory. ATLAS.ti software supported data management and analysis. Themes encapsulating 128 patients' reflections about music therapy were delineated and substantiate how music therapy can support palliative care aims throughout the cancer illness trajectory.

Janelli and Kanski (1997) conducted a study on music intervention with physically restrained patients. Lack of appropriate alternatives to the use of restraints in hospitals and rehabilitation settings is a major concern of nurses. The purpose of this pilot study was to determine the behavioral effects of music intervention with physically restrained patients. The results demonstrated that the number of positive behaviors increased significantly during the music-listening period, during which patients were not restrained, as compared to their typical restrained status. No differences were found that related to the number of negative behaviors displayed before, during, or after the music intervention. Listening to music of their own choosing may help to produce positive behaviors in previously
restrained patients; however, further studies are needed to confirm this.

Updike (1990) conducted a study on music therapy results for ICU patients. The physiological and emotional responses to taped music programs of patients in coronary and surgical Intensive Care Units (ICU) were studied. Previous studies have investigated physiological or psychological impact individually, but rarely explored the effects simultaneously. The results of this study support music therapy as a nursing intervention which supports the holistic care of the critically ill patient.

**Effect of music therapy in pre and post operative condition**

Nilsson (2008) conducted a study on the anxiety- and pain-reducing effects of music interventions. Musical interventions have been used in health care settings to reduce patient pain, anxiety, and stress, although the exact mechanism of these therapies is not well understood. This article provides a systematic review of 42 randomized controlled trials of the effects of music interventions in perioperative settings. Music intervention had positive effects on reducing patients' anxiety and pain in approximately half of the reviewed studies. Further research into music therapy is warranted in light of the low cost of
implementation and the potential ability of music to reduce perioperative patient distress.

Camara, Ruszkowski and Worak (2008) conducted a study on the effect of live classical piano music on the vital signs of 203 patients undergoing ophthalmologic procedures in a period during which a piano was present in the operating room of St. Francis Medical Center. Blood pressure, heart rate, and respiratory rate measured in the preoperative holding area were compared with the same parameters taken in the operating room, with and without exposure to live piano music. A paired t-test was used for statistical analysis. One hundred and fifteen patients who were exposed to live piano music showed a statistically significant decrease in mean arterial blood pressure, heart rate, and respiratory rate in the operating room compared with their vital signs measured in the preoperative holding area (P < .0001). The control group of 88 patients not exposed to live piano music showed a statistically significant increase in mean arterial blood pressure (P < .0002) and heart rate and respiratory rate (P < .0001). Live classical piano music lowered the blood pressure, heart rate, and respiratory rate in patients undergoing ophthalmic surgery.
Walworth, Rumana and Nguyen (2008) conducted a study on effects of live music therapy sessions on quality of life indicators, medications administered and hospital length of stay for 27 patients undergoing elective surgical procedures for brain. Anxiety, mood, pain, perception of hospitalization or procedure, relaxation, and stress were measured using a self-report Visual Analog Scale (VAS) for each of the variables. Experimental subjects received live and interactive music therapy sessions, including a pre-operative session and continuing with daily sessions until the patient was discharged home. Control subjects received routine hospital care without any music therapy intervention. Results indicated statistically significant differences for 4 of the 6 quality of life measures: anxiety (p = .03), perception of hospitalization (p = .03), relaxation (p = .001), and stress (p = .001). No statistically significant differences were found for mood (p > .05) or pain (p > .05) levels. Administration amounts of nausea and pain medications were compared with a Two-Way ANOVA with One Repeated Measure resulting in no significant differences between Groups and medications, F(1, 51) = 0.03; p > .05. Results indicate no significant differences between groups for length of stay (t = .97, df = 25, p > .05). This research study indicates that live music therapy using patient-preferred music can be beneficial in improving quality of
life indicators such as anxiety, perception of the hospitalization or procedure, relaxation, and stress in patients undergoing surgical procedures of the brain.

Siedliecki and Good (2006) conducted a study on effect of music on power, pain, depression and disability on 60 patients aged 21-65 years. Previous studies have found music to be effective in decreasing pain and anxiety related to postoperative, procedural and cancer pain. They were randomly assigned to a standard music group (n = 22), patterning music Group (n = 18) or control group (n = 20). The music groups had more power and less pain, depression and disability than the control group, but there were no statistically significant differences between the two music interventions. The model predicting both a direct and indirect effect for music was supported. The study results suggested nurses can teach patients how to use music to enhance the effects of analgesics, decrease pain, depression and disability, and promote feelings of power.

Byers and Smyth (1997) conducted a study on effect of a music intervention on noise annoyance, heart rate, and blood pressure in cardiac surgery patients. Based on results of power analysis, the sample size was 40. Subjects were recruited preoperatively, and their
sensitivity to noise was assessed. On the first postoperative day, repeated-measures data were collected on levels of noise annoyance and physiological variables during 15 minutes of baseline and 15 minutes of music intervention on two occasions. Heart rate and systolic blood pressure decreased during the music intervention compared with baseline. Diastolic blood pressure decreased during the music intervention from baseline during time 2, but not time 1. Subjects rated the music intervention as highly enjoyable regardless of their baseline noise sensitivity or noise annoyance. Results of this study support the idea that noise annoyance is a highly individual phenomenon, influenced by a transaction of personal and environmental factors. Use of a music intervention with cardiac surgery patients during the first postoperative day decreased noise annoyance, heart rate, and systolic blood pressure, regardless of the subject's noise sensitivity.

Augustin and Hains (1996) conducted a study on effect of music on 42 ambulatory surgery patients' preoperative anxiety. The study results indicate that music can be more beneficial than preoperative instruction alone in reducing ambulatory surgery patients' anxiety. Patients who listened to their choice of music before surgery in addition to receiving preoperative instruction had significantly lower heart rates than patients in the control group who received only
preoperative instruction. Differences in experimental and control
group patients' blood pressure measurements and respiratory rates
approached significance. The authors suggest that perioperative nurses
offer music as a viable option to reduce anxiety in ambulatory surgery
patients who believe music is a method of relaxation.

**Literatures on Counselling**

Karnell, Funk and Hoffman (2003) conducted a study to assess
the relative importance on patients’ lives of multiple outcomes
resulting from the management of head and neck cancer (HNC). HNC
patients filled out a disease-specific quality of life (QOL) survey
covering 5 domains (speech, eating, aesthetics, pain/discomfort, and
social/role functioning). In univariate analyses, all 5 domains were
significantly correlated to QOL (p<.0001), with correlation coefficients
ranging from 48 for eating to 64 for social / role functioning. Logistic
regression indicated that speech and eating best predicted QOL
(R(2) = .4647), with odds-ratios of 2.96 for speech and 2.49 for eating.
These data demonstrated that, for this Group of patients, speech has
the most impact on well-being, whereas eating has a substantial,
unrelated influence. This is important information in counselling
patients about treatment plans that have different levels of impairment.
Shiener (2001) conducted a study and reported that cancer patients show emotional distress. Psychosocial support should be offered to severely distressed patients. In a consecutive series of 298 cancer patients undergoing radiotherapy, distress, perceived social support and desire for supportive counselling were assessed using screening instruments. Oncologists recognized the presence of severe distress only in 11 of the 30 severely distressed patients. Correct perception of distress was lower in patients with head and neck cancer and lung cancer and in lower class patients. Oncologists' recommendations for supportive counselling did not correlate with patient distress or the amount of perceived support but rather with progressive disease and less denial behaviour. These results underline the need for educating oncologists in order to improve their ability to identify patient distress.

**Literatures on Quality of life**

Costa, Azevedo and Vartanian (2008) conducted a study on quality of life related to swallowing after tongue cancer treatment. Evaluating the quality of life related to these swallowing alterations is important to further our knowledge about the impact of such alterations from the patient's point of view. Our objective was to describe the quality of life related to swallowing in patients treated for
tongue cancer, using specific questionnaires. Twenty-nine patients participated in the study for a minimum of one year after oncologic treatment. Patients with advanced disease who underwent radiotherapy had significantly worse scores in most domains. The aspects related to how to deal with deglutition problems, time taken for meal consumption, pleasure in eating, chewing problems, food sticking in throat and mouth, choking, and the knowledge of feeding restrictions, which were evaluated by different domains of SWAL-QOL, were factors that contributed to a negative impact for patients with advanced-stage tumors who underwent radiotherapy.

Cleeland (2007) stated that patients with cancer experience multiple symptoms including pain, dyspnea, fatigue, depression, and cognitive impairment. These symptoms impair patients’ daily functioning and their quality of life. Recently, better methods for symptom assessment have been developed, including brief self-report tools for the assessment of multiple symptoms and interactive voice response systems for assessing symptoms at home. Symptom assessment can be linked to evidence-based or best practice guidelines to expedite optimal symptom treatment. Because patients with cancer receiving radiotherapy are seen in the clinic frequently, the radiation oncologist can play an integral role in a comprehensive approach that
involves both the medical and radiotherapeutic treatment of cancer-related symptoms.

Borggreven, Verdonck and Muller (2007) conducted a study on quality of life and functional status in 80 patients with cancer of the oral cavity and oropharynx. The results revealed a wide range of health related quality of life (HRQOL) and functional deficits before treatment. HRQOL appeared to be related to some extent to tumor site and tumor classification. Comorbidity appeared to have a major impact. Patients with comorbidity had significantly worse scores on several scales/items on both the EORTC questionnaires. Functional deficits were related to tumor site, classification and comorbidity. Patients with oral cavity tumors (versus oropharyngeal tumors), patients with T3-T4 tumors (versus T2 tumors), and patients with comorbidity (versus without comorbidity) scored significantly worse on several speech and oral function tests. Impaired speech and oral function appeared to be clearly related to global quality of life (QLQ-C30) and self-reported speech (QLQ-HandN35). Many patients with advanced oral and oropharyngeal cancer have compromised HRQOL and functional status before the start of treatment. In addition to tumor site and tumor classification, comorbidity appears to have a major impact on HRQOL and functional status. Knowledge of pretreatment
HRQOL and functional status levels is useful for better understanding the impact of treatment on these outcomes over time.

Mehanna and Morton (2006) conducted a study on deterioration in quality-of-life of late (10-year) survivors of two hundred head and neck cancer of-life at 10 years measured by Auckland QOL questionnaire, and analysed for associations with the following co-variates: age, gender; co-morbidities (alcohol intake and smoking), type and stage of disease; treatment modality; and QOL measures. At 10 years following diagnosis, overall QOL (life satisfaction), decreased significantly by an average of 11% (95% CI: -5, -17) compared with before treatment, and by 15% when compared with years 1 and 2. Pretreatment QOL significantly predicted late QOL, whilst QOL 1 year after treatment did not. None of the socio-demographic, disease- or treatment-related factors predicted long-term QOL on univariate analysis, but this may be due to the small sample size. This observed, late drop in the QOL of head and neck cancer patients requires further corroboration and investigation. Due to small sample sizes associated with long-term studies in head and neck cancer cohorts, studies of predictors of long-term QOL will only be likely to succeed if done as multi-centre studies. As there is some evidence to suggest that psychosocial interventions improve the QOL of head and neck cancer
patients, it may be appropriate to consider screening for risk of a late deterioration in QOL in order to plan appropriate psycho-social intervention.

Llewellyn, McGurk and Weinman (2005) conducted a study on psycho-social and behavioural factors related to health related-quality of life in patients with head and neck cancer. A systematic review was undertaken of studies that have investigated psycho-social or behavioural factors associated with HR-QOL in this patient group. Literature was systematically searched using electronic databases and hand-searching relevant journals. Sixteen studies fulfilling the inclusion criteria were identified and reviewed. Five main factors were associated with varying degrees with HR-QOL, personality, social support, satisfaction with consultation and information, behavioural factors, such as consuming alcohol and smoking, and depressive symptoms. The major difficulty with synthesising the findings was the amount of different indices of QOL that have been used. However, a number of psycho-social factors have been investigated in relation to HR-QOL in head and neck cancer patients, some of which are potentially modifiable, such as those related to informational needs. Further research is needed to investigate other psychological factors which may influence aspects of HR-QOL. By understanding the relationship between HR-QOL and potentially modifiable variables,
interventions can be designed with the aim of improving a patient’s long-term well-being.

Terrell, Ronis and Fowler (2004) conducted a study on clinical predictors of quality of life in 570 patients with head and neck cancer. A self-administered health survey was constructed to collect demographic, health, smoking, alcohol, depression symptom, and QOL information. Tumor site and tumor stage, clinical, and treatment data were abstracted from the patient medical records. Of the 570 eligible respondents, the presence of a feeding tube had the most negative impact on QOL, with significant decrements in 6 of the 8 SF-36 scales and all 4 HNQOL scales (P<.01). In descending order of severity, medical comorbid conditions, presence of a tracheotomy tube, chemotherapy, and neck dissection were also associated with significant (P<.05) decrements in QOL domains. Patients who took the survey more than 1 year after diagnosis had improved QOL in 7 of 12 domains. Hospital location, age, education level, sex, race, and marital status were also significant predictors of QOL.

Hilliard (2003) conducted a study on the effects of music therapy on the quality and length of life of 80 subjects diagnosed with terminal cancer patients living in their homes receiving hospice care. Groups
were matched on the basis of gender and age. Functional status of the subjects was assessed by the hospice nurse during every visit using the Palliative Performance Scale. All subjects received at least two visits and quality of life and physical status assessments. A repeated measures ANOVA revealed a significant difference between groups on self-report quality of life scores for visits one and two. Quality of life was higher for those subjects receiving music therapy, and their quality of life increased over time as they received more music therapy sessions. Subjects in the control group, however, experienced a lower quality of life than those in the experimental group, and without music, their quality of life decreased over time. There were no significant differences in results by age or gender of subjects in either condition. This study provides an overview of hospice/palliative care, explains the role of music therapy in providing care, and establishes clinical guidelines grounded in research for the use of music therapy in improving the quality of life among the terminally ill.

Ronis, Duffy and Fowler (2000) conducted a study on changes in quality of life over 1 year in 300 patients with head and neck cancer. Health-related QOL was assessed using the 36-item Short-Form Health Survey and a head and neck cancer-specific QOL scale. Over 1 year, QOL decreased for physical functioning measures and eating but
improved for mental health QOL. Depression and smoking were major predictors of poor QOL at baseline. Major predictors of change in QOL from baseline to 1 year were treatment factors, especially feeding tube placement (9 scales), chemotherapy (3 scales), and radiation therapy (3 scales). Baseline smoking and depressive symptoms also remained significant predictors of several QOL scales at 1 year. Health-related physical QOL tended to decline over 1 year and mental health QOL improved. The major predictors of change in QOL were treatment factors, smoking, and depressive symptoms. Physicians should alert patients to the relative effects on QOL one may experience with different treatments.

Hammerlid, Bjordal and Ahlner (1997) conducted a study on prospective, longitudinal quality-of-life study of patients with head and neck cancer. The main purpose of this pilot study was to find out whether this cancer population would answer quality-of-life questionnaires repeatedly (six times) over a 1-year period and whether the chosen questionnaires Forty-eight consecutive patients agreed to participate in the study. The most common tumor locations were the oral cavity (17) and the larynx (12). Almost all patients received combined treatment: 45 of 48 radiation therapy, 18 of 48 chemotherapy, and 17 of 48 surgery. After the primary treatment, 40 patients had complete tumor remission. Four of the 48 patients did not answer any
questionnaires and were therefore excluded from the study. Of the remaining 44 patients, 3 died during the study year, and another 6 withdrew for various reasons. Thirty-five (85%) of the 41 patients alive at the 1-year follow-up answered all six questionnaires and thus completed the study. The greatest variability was found for symptoms and functions related specifically to head and neck cancer. The symptoms were swallowing difficulties, hoarse voice, sore mouth, dry mouth, and problems with taste. They all showed the same pattern, with an increase of symptoms during and just after finishing the treatment. The HAD scale revealed a high level of psychological distress, with 21% probable cases of psychiatric morbidity at diagnosis.