CHAPTER - I

INTRODUCTION
Cancer is often thought of as an untreatable, unbearably painful disease with no cure. Cancer is undoubtedly a serious and potentially life-threatening illness. Our body is composed of many millions of tiny cells, each a self-contained living unit. Normally, each cell coordinates with the others that compose tissues and organs of our body. One way that this coordination occurs is reflected in how our cells reproduce themselves. Normal cells in the body grow and divide for a period of time and then stop growing and dividing. Thereafter, they only reproduce themselves as necessary to replace defective or dying cells. Cancer occurs when this cellular reproduction process goes out of control. In other words, cancer is a disease characterized by uncontrolled, uncoordinated and undesirable cell division. Unlike normal cells, cancer cells continue to grow and divide for their whole lives, replicating into more and more harmful cells.

The abnormal growth and division observed in cancer cells is caused by damage in these cells' DNA (genetic material inside cells that determines cellular characteristics and functioning). There are a variety of ways that cellular DNA can become damaged and defective. For example, environmental factors (such as exposure to tobacco smoke) can initiate a chain of events that results in cellular DNA defects that lead to cancer. Alternatively, defective DNA can be inherited from parents.

As cancer cells divide and replicate themselves, they often form into a clump of cancer cells known as a tumor. Tumors cause many of the symptoms of cancer by pressuring, crushing and destroying surrounding non-cancerous cells and tissues. Therefore, cancer is a group of diseases characterized by abnormal cell growth and cell activity. Different cancers possess and share different characteristics which are identified through neoplastic tissue cells. Neoplastic
cells or tumors can either be benign or malignant (Brannon & Feist 2004). Benign tumors are not cancerous, thus they do not grow and spread to the extent of cancerous tumors. Benign tumors are usually not life threatening. Malignant tumors, on the other hand, grow and spread to other areas of the body. The process whereby cancer cells travel from the initial tumor site to other parts of the body is known as metastasis.

In India, it is the leading cause of death in Americans under the age of 85, and the second leading cause of death in older Americans. There will be 1.5 million new cases of cancer occurring in the United States coming year, and over 570,000 deaths because of it not including basal and squamous skin cancers which are not reported but could add another two million cases per year (ACS, 2010). There are multiple types of cancer, many of which can today be effectively treated so as to eliminate, reduce or slow the impact of the disease on patients' lives. From the population census data for India in 1991, 609,000 new cancer cases were estimated to have been diagnosed in the country. This figure had increased to 806,000 by the turn of the century. The estimated age standardized rates per 100,000 were 96.4 for males and 88.2 for females.

In India, the most common cancers found in males the were cancers of the lung, pharynx, esophagus, tongue and stomach while among females cancers of the cervix, breast, ovary, esophagus and mouth were common. Lung cancer is the most common cancer amongst men in India with approximately 33,000 new cases ever year (Cancer Patients Aid Association). Almost 90% of patients coming forward with lung cancers are smokers with the male to female ratio of approximately 10:1. (Pathak et al., 2003)
Breast and cervical cancer are the two most important cancer types and account for one-third of all cases diagnosed in women of the developing world. The incidence of breast cancer is rising and is the most common cancer among urban women (Chopra, 2003).

Oral cancer is the most common cancer in India, Pakistan, and Sri Lanka and ranks high in several Southeast Asian countries. Tobacco use has been identified as the most important avoidable cause of oral cancer. (Cancer Detect Prev., 1986). In India cancer registries have confirmed a high incidence of oral cancer and case control and cohort studies have established that the high incidence is due to widespread habits of tobacco chewing and smoking (Gupta & Nandakumar, 1999).

The highest rates for stomach cancer are recorded in the population of Mumbai and the lowest in the rural population of Barshi in Maharashtra state. The incidence of cancers of the esophagus and stomach is declining in India. At the same time the incidence of cancers of the colon, pancreas, liver and gall bladder is rising, largely due to urbanization that leads to major changes in the diet and personal habits (Mohandas & Jagannath, 2000).

Carcinoma of esophagus has a more specific demographic and geographic distribution than any other cancer. It is predominantly a disease of older age and affects males more than females. In males in 1968-1972 cancer of the esophagus was the leading cancer, followed by lung, larynx, tongue and stomach while in 1988-2002, cancer of the lung is the most predominant, followed by hypo pharynx, esophagus, prostate and tongue (Yeole, 1999).
Ovarian cancer is the sixth most common cancer worldwide and the seventh most common cause of deaths from cancer in women. Recent annual worldwide figures reflect 204,000 new cases of ovarian cancer and 125,000 deaths. Treatment of advanced ovarian cancer involves a combination of surgery and chemotherapy, both of which may impact a woman's physical, social, and emotional well-being (Sun et al. 2007).

Cancer is projected to become the leading cause of death worldwide in the year 2010. Low- and middle-income countries will experience the impact of higher cancer incidence and death rates more sharply than industrialized countries. Cases of cancer doubled globally between 1975 and 2000, will double again by 2020, and will nearly triple by 2030. There were an estimated 12 million new cancer diagnoses and more than 7 million deaths worldwide this year. The projected numbers for 2030 are 20 to 26 million new diagnoses and 13 to 17 million deaths.

India is a developing country with one of the most diverse populations and diets in the world. Cancer rates in India are lower than those seen in Western countries, but are rising with increasing migration of rural population to the cities, increase in life expectancy and changes in lifestyles. In India, rates for oral and esophageal cancers are some of the highest in the world. In contrast, the rates for colorectal, prostate, and lung cancers are one of the lowest. Studies of Indian immigrants in Western societies indicate that rates of cancer and other chronic diseases, such as coronary heart disease and diabetes, increase dramatically after a generation in the adopted country. Change of diet is among the factors that may be responsible for the changing disease rates. Diet in India encompasses diversity unknown to most other countries, with many dietary patterns emanating from cultural and religious teachings that have existed for thousands
of years. Very little is known, however, about the role of the Indian diet in causation of cancer or its role, if any, in prevention of cancer, although more attention is being focused on certain aspects of the Indian diet, such as vegetarianism, spices, and food additives. Of particular interest for cancer prevention is the role of turmeric (cur cumin), an ingredient in common Indian curry spice. Researchers also have investigated cumin, chilies, kalakhar, Amrita Bindu, and various plant seeds for their apparent cancer preventive properties. Few prospective studies, however, have been conducted to investigate the role of Indian diet and its various components in prevention of cancer. From a public health perspective, there is an increasing need to develop cancer prevention programs responsive to the unique diets and cultural practices of the people of India Sinha et al. (2003).

The causes of cancer are not fully understood, but years of research have brought to light risk factors that increase people's chances of getting particular types of cancer. Some of these risk factors are inevitable, while others can be avoided by choosing to live a healthy lifestyle. For example, smoking cigarettes is an avoidable risk factor. Changing one's lifestyle to get rid of unhealthy choices such as smoking can be difficult to accomplish (tobacco is an addictive drug and stopping smoking means beating that addiction), but the rewards are real. Stopping smoking and similar healthy lifestyle changes will not insure that one never get cancer, but they will reduce the cancer risk. It is important to note that cancer is not a uniform illness, but rather has many forms. Each specific type of cancer is different and consequently has a different set of associated risk factors and symptoms.
Apart from it, stress may influence the genesis of cancer by triggering dormant malignant cells or by impairing the immune system so that it does not identify and attack such cells (Grossarth et al. 1992). Studies indicated that social and psychological factors play a significant role in determining the course and onset of cancer. Feeling of hopelessness, inability to discharge negative emotions, and loss of support (Sklar & Anisman, 2001), absence of current social network (Patrick et al. 2003) social isolation (Kaplan & Reynolds, 1998) may elevate risk of dying from cancer. Depression, helplessness, anxiety, and grief have been cited as frequent precursors of cancer. (LeShan & Worthington, 2000). There have also been reports that often a person has feelings of hopelessness and loses a significant personal and dependent relationship near the time of the clinical onset of cancer. (Bahnson & Bahnson, 1996, Greene, 1998). The role of personality factors in the development of cancer has been suspected for centuries (LeShan & Worthington, 2000). For decades there has been a stereotype of a cancer-prone personality as an individual who is easy going and acquiescent, repressing emotion that might interfere with smooth social and emotional functioning. The so-called Type C, or cancer-prone personality has been characterized as responding to stress with depression and hopelessness, the muting of negative emotions, and the potential for learned hopelessness. (Temoshok, 1999). Moreover, there are a lot of emotional factors associated with cancer at each stage of the diagnosis. The patient’s responses are modulated by medical, psychological and interpersonal factors. While the medical factors include site of disease, symptoms, the predicted course, etc. the psychological factors include preexisting character style, coping ability, will power, developmental stage of life and the impact and meaning of the cancer at that stage. As for the interpersonal factors, it refers to the family and the social support and includes the inputs of the health care team. The acute stress faced by the cancer patients may be severe, but it is usually variable and transient, as
patients respond to their rapidly changing reality. Generally the stress is not so long lasting as to interfere with the significant areas of functioning. When impairment lasts for more than two weeks or symptoms are incapacitating, the patient needs to be evaluated for a psychiatric disorder.

Some cancer symptoms are manifest outwardly, and are relatively easy to notice and identify (such as a lump in the breast for breast cancer or blood in the stool corresponding to colorectal cancer). Other symptoms are observable, but harder to decipher. For instance, two of the major symptoms for lung cancer are a bronchitis-like deep cough and excessive shortness of breath. Still other forms of cancer produce no observable symptoms until they are at a very advanced (and therefore hard to treat) stage. A physician who suspects a patient may have a specific form of cancer will perform a series of tests and procedures to diagnose (or rule-out) a cancer. Commonly, doctors will collect a sample of tissue or fluid from the area believed to contain a cancerous tumor so that it may be analyzed in the laboratory under a microscope. This collection and observation procedure is known as a biopsy. Often, performing a biopsy and analyzing the resulting samples is the only way that doctors can accurately determine a diagnosis of cancer.

Doctors prescribe cancer treatment regimens based on a variety of factors specific to patients' individual circumstance. These factors often include the cancer's stage (type, location, and size of the cancer being treated), as well as patients' age, medical history, and overall health. Each form of cancer is different and calls for a different set of treatment approaches. This being
true, there are two common approaches used to treat almost all types of cancer. These two treatments are chemotherapy and radiation therapy.

Chemotherapy: Chemotherapy is one of the most commonly used methods to treat cancer patients. It is commonly prescribed for patients whose cancer is not localized but instead has possibly metastasized, or spread, to various locations in the body. Chemotherapy can be used to reduce the symptoms and pain associated with cancer as well as to slow the growth of cancerous tumors.

Radiation therapy: Radiation therapy is a method of treating cancer that utilizes radiation energy. Radiation is most commonly used to treat localized cancers as opposed to cancer that has spread throughout the body. The goal of radiation therapy is to kill cancer cells or at least limit their ability to grow and divide by damaging their genetic material.

Leukemia is a type of cancer that occurs in the blood or bone marrow. Leukemia causes an uncontrolled growth of abnormal white blood cells, the infection fighting cells in the blood. Leukemia is one of the most common types of cancer. Leukemia is most treatable and curable if caught in the earliest stages of the disease. Untreated and/or advanced leukemia results in a proliferation of abnormal white blood cells that spread throughout the blood stream. These abnormal cells crowd out normal white blood cells. The abnormal white blood cells are not able to fight infections as effectively as the normal white blood cells. This results in increased infections. The abnormal white blood cells of leukemia also crowd out red blood cells, resulting in anemia, a low number of red blood cells. Leukemia also results in lower numbers of platelet
cells in the blood, which are needed for normal clotting. This results in impaired clotting. The abnormal white blood cells formed in leukemia also accumulate in the organs of the body, such as the spleen, liver, lymph nodes, testes, and brain, and interfere with normal organ functioning. The cause of many cases of leukemia is unknown, but in some cases, leukemia is caused by abnormalities in the chromosomes. People at risk for developing leukemia include those who have been exposed to high doses of radiation, certain types of chemotherapy, or chemicals, such as benzene. Having Down syndrome or Franconia's syndrome increases the risk as well. Additionally, certain viruses, such as Epstein-Barr virus, are associated with the development of leukemia. Smoking also increases the risk of leukemia. The prognosis for people with leukemia varies depending on the type of leukemia and other factors. However, many types of leukemia can be effectively treated and some can be cured. Survival rates for leukemia have risen dramatically in the last four decades due to improvements in treatment. Treatment of leukemia varies, depending on the specific type of leukemia, the patient's age, health history, overall health status, and other factors. Treatment may include chemotherapy, bone marrow transplant and enrollment in clinical trials. A study done by Daniel (2003) suggested that Gleevec is the new gold-standard treatment for chronic myeloid leukemia (CML). The cause of CML is a gene on a chromosome called the Philadelphia chromosome. The gene makes a poisonous protein that causes cancer in white blood cells. Gleevec is a drug that inhibits the actions of the gene on the Philadelphia chromosome. There's only one cure for CML. It's a drastic bone marrow transplant. Only people with marrow-matching brothers or sisters -- or those who can find an acceptable unrelated donor -- can get it. It doesn't always work. And it's a drastic operation that too often kills the patient. Gleevec doesn't cure CML. But the new study shows it can prevent the white-blood-cell changes that signal worsening disease and death. And it does so much better than what
used to be the best treatment, interferon alpha plus low-dose cytarabine chemotherapy (Brien, The New England Journal of Medicine, 2003). Nearly all of the patients who got Gleevec – 87% -- had a "major" response after 18 months. This was seen in only 34.7% of patients getting interferon alpha plus cytarabine. There was a "complete" response (defined as the absence of cells with the abnormal gene) in 76% of Gleevec patients vs. only 14.5% of the interferon/cytarabine patients. Moreover, there were far fewer side effects in the Gleevec group. Virginia Commonwealth University Massey Cancer Center researchers have identified that a combination of novel anti-cancer compounds is able to kill chronic myelogenous leukemia cells previously resistant to conventional forms of therapy (Science Daily, 2008).

Leukemia is a general term for four types of malignant disease of the blood and bone marrow. These include acute lymphocytic leukemia and acute myelogenous leukemia, which progress rapidly. The other forms of leukemia, chronic lymphocytic leukemia and chronic myelogenous leukemia, progress more slowly.

Acute leukemia is a malignant proliferation of white blood cell (WBC) precursors (blasts) in bone marrow or lymph tissue and their accumulation in peripheral blood, bone marrow, and body tissues. Its most common forms are acute lymphoblastic (lymphocytic) leukemia (ALL), an abnormal growth of lymphocyte precursors (lymphoblast’s); acute myeloblastic (myelogenous) leukemia (AML), the rapid accumulation of myeloid precursors (myeloblasts); and acute monoblastic (monocytic) leukemia, or Schilling's type, a marked increase in monocyte precursors (monoblasts). Other variants include acute myelomonocytic leukemia and acute erythroleukemia. Untreated, acute leukemia is invariably fatal, usually because of complications
that result from leukemic cell infiltration of bone marrow or vital organs. With treatment, prognosis varies. In ALL, treatment induces remissions in 90% of children (average survival time: 5 years) and in 65% of adults (average survival time: 1 to 2 years). Children between ages 2 and 8 have the best survival rate — about 50% — with intensive therapy. In AML, the average survival time is only 1 year after diagnosis, even with aggressive treatment. In acute monoblastic leukemia, treatment induces remissions lasting 2 to 10 months in 50% of children; adults survive only about 1 year after diagnosis, even with treatment.

Research on predisposing factors isn't conclusive but points to some combination of viruses (viral remnants have been found in leukemic cells), genetic and immunologic factors, and exposure to radiation and certain chemicals. Pathogenesis isn't clearly understood, but immature, nonfunctioning WBCs appear to accumulate first in the tissue where they originate (lymphocytes in lymph tissue, granulocytes in bone marrow). These immature WBCs then spill into the bloodstream and from there infiltrate other tissues, eventually causing organ malfunction because of encroachment or hemorrhage.

Acute leukemia is more common in males than in females, in whites (especially people of Jewish descent), in children (between ages 2 and 5; 80% of all leukemia’s in this age-group are ALL), and in people who live in urban and industrialized areas. Acute leukemia accounts for 20% of all adult leukemia’s. Among children, however, it's the most common form of cancer. Incidence is 6 out of every 100,000 people.
Signs of acute leukemia are sudden onset of high fever accompanied by thrombocytopenia and abnormal bleeding, such as nosebleeds, gingival bleeding, purpura, ecchymosed, petechiae, easy bruising after minor trauma, and prolonged menses. Nonspecific signs and symptoms, such as low-grade fever, weakness, and lassitude, may persist for days or months before visible symptoms appear. Other insidious signs and symptoms include pallor, chills, and recurrent infections. In addition, ALL, AML, and acute monoblastic leukemia may cause dyspnea, anemia, fatigue, malaise, tachycardia, palpitations, systolic ejection murmurs, and abdominal or bone pain. When leukemic cells cross the blood-brain barrier and thereby escape the effects of systemic chemotherapy, the patient may develop meningeal leukemia (confusion, lethargy, and headache).

Chronic lymphocytic leukemia is a generalized, progressive disease that's common in the elderly, chronic lymphocytic leukemia (CLL) is marked by an uncontrollable spread of abnormal, small lymphocytes in lymphoid tissue, blood, and bone marrow. Nearly all patients with CLL are men older than age 50. According to the American Cancer Society, this disease accounts for about 25% of all new leukemia cases annually.

Although the cause of CLL is unknown, researchers suspect hereditary factors (higher incidence has been recorded within families), still-undefined chromosome abnormalities, and certain immunologic defects (such as ataxia-telangiectasia or acquired agammaglobulinemia). The disease doesn't seem to be associated with radiation exposure, carcinogenic chemicals, or viruses.
Approximately 2 out of every 100,000 people develop CLL annually, with 90% of cases found in people who are older than age 50. Many cases go undetected by routine blood tests in people who are asymptomatic. The disease is common in Jewish people of Russian or Eastern European descent, and is uncommon in Asia. CLL is the most benign and the most slowly progressive form of leukemia. Clinical signs derive from the infiltration of leukemic cells in bone marrow, lymphoid tissue, and organ systems.

In early stages, patients usually complain of fatigue, malaise, fever, and nodal enlargement. They're particularly susceptible to infection. In advanced stages, patients may experience severe fatigue and weight loss, with liver or spleen enlargement, bone tenderness, and edema from lymph node obstruction. Pulmonary infiltrates may appear when lung parenchyma is involved. Skin infiltrations, manifested by macular to nodular eruptions, occur in about one-half of the cases of CLL. As the disease progresses, bone marrow involvement may lead to anemia, pallor, weakness, dyspnea, tachycardia, palpitations, bleeding, and infection. Opportunistic fungal, viral, and bacterial infections commonly occur in late stages.

Though cancer is often thought of as a single disease there are in fact many different cancer variations. Each different type of cancer has a different set of risk factors, different rates of progression, different treatment options, and a different prognosis. Further, the subtypes of cancer get classified and named based on the area of the body where they are originally observed. For instance, breast cancer starts in the breast and lung cancer begins in the lungs. Though cancers do share disease processes in common, there is not really one form of cancer; there are, instead, many different types. There are 5 subtypes: breast cancer, colorectal cancer, lung cancer, prostate cancer, and skin cancers. Cancer within itself, as a term, is fairly disturbing.
The thought of possibly developing any form of cancer is just as terrifying. However, the notion of being diagnosed with cancer and going through certain treatments for cancer is roughly equally devastating for the individual and his/her loved ones (Mathews et al. 2002). Among the varieties of cancers, breast cancer is one of the most frequently diagnosed cancers among women; however, it is not as common in men (American Cancer Society [ACS] 2006). There are four main types of breast cancer: (1) inflammatory breast cancer, (2) Paget's disease of the breast, (3) invasive lobular cancer, and (4) ductile carcinoma in situ. Inflammatory breast cancer is a rare type of breast cancer and accounts for 1-2% of all breast cancers.

Breast cancer occurs when a malignant (cancerous) tumor originates in the breast. As breast cancer tumors mature, they may metastasize (spread) to other parts of the body. The primary route of metastasis is the lymphatic system which, ironically enough, is also the body's primary system for producing and transporting white blood cells and other cancer-fighting immune system cells throughout the body. Metastasized cancer cells that aren't destroyed by the lymphatic system's white blood cells move through the lymphatic vessels and settle in remote body locations, forming new tumors and perpetuating the disease process. Breast cancer is fairly common. Because of its well publicized nature, and potential for lethality, breast cancer is arguably the most frightening type of cancer diagnosis someone can receive. However, it is important to keep in mind that, if identified and properly treated while still in its early stages, breast cancer can be cured. Breast cancer is not just a woman's disease. It is quite possible for men to get breast cancer, although it occurs less frequently in men than in women.
The causes of breast cancer are not yet definitively known. However, extensive research efforts have uncovered various risk factors that are associated with increased incidence of breast cancer in women. Though some of these risk factors are unavoidable and uncontrollable, some of them are very avoidable, making it possible for people to take action so as to minimize their cancer risk. There is no way to pre-determine whether a person will get breast cancer until they have either been diagnosed with it or they have lived a breast-cancer free lifetime. Some of the risk factors for breast cancer that are difficult or impossible to control include age, family and genetic history, BRCA gene mutation, previous breast cancer, race, previous benign tumor biopsy results, prior radiation treatment in the chest area, menstrual cycles, use of birth control pills, hormone replacement therapy, obesity and poor diet, failing to exercise, breast feeding, excessive alcohol intake. Nutritional factors also play an important role in preventing the development of breast cancer. Results suggested that nutrition is an important aspect of ones lives and plays a role in the maintenance of our health, physiological and psychological well-being. However, the consumption of particular foods and mineral compounds has been linked with the prevention of various diseases, including breast cancer. Various foods and their impact and role with breast cancer were evaluated. Also, cultural differences in terms of dietary content and perspectives of how nutrition impacts either the development or the prevention of cancer were analyzed (Symposium, 2003).

Breast cancer is a disease that progresses in stages, building in intensity over time. During the early stages of breast cancer there may be no discernable symptoms. When symptoms are present they may be subtle and easy to confuse with benign conditions. During the early and middle stages of breast cancer symptoms can include the following:
- A lump, dimple or thickening in the breast
- A lump or swelling in the armpit (an enlarged lymph node)
- Change in the shape of the breast
- Change in the size of the breast, including swelling
- Change in the color or texture of the breast and/or nipple, including redness, scaly, dimpled, retracted, or puckered appearance
- Breast pain, especially if in one breast only
- Abnormal discharge from the nipple

Breast cancer is far easier to treat when it is identified earlier rather than later. Early identification of breast cancer can present a problem; however, as breast cancer often occurs without producing symptoms. Doctors use several methods to screen women for breast cancer. What follows is some general information on two of the most commonly used tests. Clinical Breast Exam, Mammogram, Auxiliary Dissection and Biopsy, Hormone receptor testing. There are two general approaches to treating cancers: local treatment and systemic (whole body) treatment. Local treatment involves treating just the small areas of the body containing tumors while affecting the rest of the body as little as possible. Systemic treatment approaches, on the other hand, are used to treat cancer that has spread throughout the body. Local treatment approaches alone may be all that is required for treatment of early stage breast cancer (e.g., before metastasis - the spreading of cancerous tissues through the body -- has occurred). Combined local and systemic approaches may be necessary for treatment of more advanced cancers. Surgical approaches tend to fall into the local treatment category, while chemotherapy
approaches fall into the systemic category. Radiation therapy approaches can be local or systemic depending on how they are administered.

The majority of women who are afflicted by breast cancer will require some type of surgery. The goal of the surgical procedure is to remove the cancerous tumor while preserving as much of the healthy breast tissue as possible. Later stage breast cancers often require more extensive surgeries as more tissues get involved in the disease process. Some of the surgical procedures used to treat breast cancer are: Lumpectomy, Partial Mastectomy, Modified Radical Mastectomy, Radical Mastectomy, Hormonal therapy.

There are four stages of breast cancer. Stage I and Stage II are the early stages of breast cancer. Stage I is indicative that the tumor size is no more than one inch in diameter and that the cancer cells have not spread beyond the breast. The survival rate of Stage I is 98%. Stage II means one of the following: (1) the tumor in the breast is less than 1 inch in diameter and the cancer have spread to the lymph nodes under the arm, or (2) the tumor is between 1 – 2 inches or the tumor is larger than 2 inches and has not spread to the lymph nodes under the arm. The survival rate of Stage II is 88%. Stage III is also known as advanced localized cancer where the tumor in the breast is fairly large (more than 2 inches) and the cancer has spread to the lymph nodes in the underarm. For example, inflammatory breast cancer is a form of locally advanced breast cancer. The survival rate for Stage III is 56%. Stage IV is called metastatic cancer meaning that the cancer has spread beyond the breast to other parts of the body as well. The survival rate for Stage IV is 16% (NBCF 2005).
Contrary to common belief, most women diagnosed with breast cancer are not turning to mastectomy as their first choice for treatment but are first trying more conservative approaches, such as lumpectomy. The researchers found that those women who did opt for mastectomy instead of breast-conserving surgery often did so because of their own preference and probably because of the perception that mastectomy offered better odds against the cancer coming back (Health Day News, 2009).

Women with a history of breast cancer are the largest group of female cancer survivors and account for about 41% of the total. Earlier stage at diagnosis and the use of systemic adjuvant therapy have improved the likelihood of long-term, disease-free survivorship. A number of studies have examined recovery after breast cancer during the first year after diagnosis and shortly beyond. Few studies have examined the quality-of-life (QOL) outcomes in women who remain disease free for an extended period of time. As part of a larger program of research, we performed a longitudinal, follow-up assessment of QOL outcomes in breast cancer survivors who were initially evaluated between 1 and 5 years after diagnosis and who were free of disease at the time of initial assessment. Reports from the initial assessment focused on health-related QOL and sexual functioning, the impact of surgery and systemic adjuvant therapy on QOL outcomes, and the correlates of fatigue in breast cancer survivors. In conclusion, long-term, disease-free survivors of breast cancer have an excellent QOL, many years after their breast cancer diagnosis. There are modest age-related changes in functioning over time, and troublesome symptoms associated with the menopause or tamoxifen decline statistically significantly; however, the adverse effects of systemic adjuvant therapy on physical health status appeared to persist and worsen when evaluated 5–10 years after diagnosis. The quality of the social support received by
survivors also seems to be an important predictor of better health-related QOL. Consequently, psychosocial interventions aimed at increasing social support beyond the acute phase of treatment may have a vital role in the ongoing care of breast cancer survivors.

The term quality of life is used to evaluate the general well-being of individuals and societies. The term is used in a wide range of contexts, including the fields of international development, healthcare, and political science. Quality of life should not be confused with the concept of standard of living, which is based primarily on income. Instead, standard indicators of the quality of life include not only wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time, and social belonging (Gregory et al., 2009). According to ecological economist Robert Costanza: While Quality of Life (QOL) has long been an explicit or implicit policy goal, adequate definition and measurement have been elusive. Diverse "objective" and "subjective" indicators across a range of disciplines and scales, and recent work on subjective well-being (SWB) surveys and the psychology of happiness have spurred renewed interest (Costanza et. al., 2008). Also frequently related are concepts such as freedom, human rights, and happiness. However, since happiness is subjective and hard to measure, other measures are generally given priority. It has also been shown that happiness, as much as it can be measured, does not necessarily increase correspondingly with the comfort that results from increasing income. As a result, standard of living should not be taken to be a measure of happiness.

Definition of QOL according the Word Net Dictionary (2002) is “our personal satisfaction (or dissatisfaction) with the cultural or intellectual conditions of life (as distinct from
material comfort). According to the QOL Research unit (2004), the QOL is related to communities, families, and individual from a variety of population groups. The study of QOL is an examination of factors that contribute to the goodness and well being of life, as well as people’s happiness. It also explores the inter-relationship among these factors. The ideological thrust of QOL study is to promote means for the people, within their environments, to live in the way that is best for them.

Under normal circumstances, quality of life is mostly defined as companionship with family and friends, rewarding work (paid or volunteer), the knowledge that we make a difference in the lives of others, the freedom to pursue a multitude of interests, the joy of learning something new.

Under the abnormal circumstance of receiving a cancer diagnosis and undergoing treatment, these sources of satisfaction and self-esteem can be severely compromised. Quality of life diminishes very quickly when one is fearful, fatigued, in pain, enduring therapeutic side effects, or contemplating the possibility of treatment failure and death.

To people living with cancer, life is precious. When pain becomes part of each day, of one's daily life, these days are diminished and quality of life is eroded. The list of damage that pain does to quality of life includes:

- Sleep is disturbed
- Ability to work is impaired
- Exhaustion can become a constant companion
• Sadness, depression and worry are commonly felt emotions
• Appetite diminishes
• Simple pleasures such as enjoying one's family are impaired or given up
• Trips and vacations are uncomfortable or impossible
• Reluctance to move or exercise is experienced
• Feelings of isolation from the world increase
• Family and friends who are caregivers become exhausted.

Pain is said to be one of the most feared and distressing symptoms of cancer and one that disrupts all aspects of life. One study purports to compare depression and quality of life among Iranian cancer patients with and without pain; and to determine the relationships between pain beliefs and depression and quality of life. A consecutive sample of gastrointestinal cancer patients attending to Tehran Cancer Institute were entered into the study. Three standard instruments were used to measure quality of life (the EORTC QLQ-C30), depression (the HADS) and pain beliefs (the PBPI). A total of 142 hospitalized gastrointestinal cancer patients, 98 with pain and 44 without pain were studied. The main findings of this study were that cancer patients with pain reported significantly lower levels of role functioning, emotional functioning and global quality of life. They also showed higher levels of depression than cancer patients who did not experience pain. Among patients with pain, higher scores on pain permanence and pain consistency were positively and significantly associated with higher depression. Also, higher scores on pain consistency were negatively and significantly associated with global quality of life (Tavoli et al., 2008).
The central threat to experience a meaningful life is the awareness of death's inevitability (Fisher and Fisher, 1993). Death, a word that can mean the end or the beginning. The interpretation solely depends on how we perceive death to be. If perceived as the end, it can instill a lot of fear and anxiety while if thought of as a beginning it can bring in feelings of calmness, satisfaction and hope. The Oxford Dictionary defines death as the “end of life; ceasing to be; destruction” (1985). In medical terms death is defined as follows: Death: 1. the end of life, the cessation of life. 2. The permanent cessation of all vital bodily functions. 3. The common law standard for determining death is the cessation of all vital functions, traditionally demonstrated by "an absence of spontaneous respiratory and cardiac functions." 4. The uniform determination of death. The fear of death has been rated as the most common and the second worst fear that troubles us. Many fear the death of the loved ones. The fear of death is largely due to four reasons. Firstly, the fear of the unknown, secondly, the fear of losing our loved ones, thirdly, fear of pain and suffering and/or being alone at the time of death and finally, the fear of ceasing to exist or the finality of death. Many suffer from death anxiety but are able to function. Yet they fear for their lives and that of their significant others. Death is viewed, as a tragedy.

Every person is preoccupied with Death anxiety and is persistently defending against it with strategies such as simple denial, religious faith in immortality, exaggerated expectations of medical “cure,” and the acting out of heroic “Nothing can terminate me” fantasies (Becker, 1973; Zilboorg, 1943). Interestingly, asking people to contemplate their own mortality reliably results in defensive responses even though people do not report being anxious or upset by thoughts of their own death. Becker (1973), in his book The Denial of Death, asserts that the fear of death is natural and present in everyone no matter how disguised it may be. The fear of death is an
emotional manifestation of the self-preservation instinct. Most people probably rarely think about death or their ultimate individual value. Rather, they think about their goals and aspirations relevant to their careers, relationships, hobbies, and the means through which these goals are achieved.

The fear of death must be behind all normal functioning in order for people to aim towards self-preservation, but not constantly present in one's mental functioning, else the person could not function. Continued questioning of one's value as a person may ultimately lead one to a direct consideration of death and the experience of existential terror. The fear must be repressed enough to allow us to live comfortably and normally, yet accessible enough to allow us to react appropriately to any threat to our continued existence. Fear keeps us safe; it is adaptive in the sense that it signals the need for behavior to reduce any threats (Pyszczynski, et. al., 1991). This may be why those persons who have near death experiences tend to rethink their priorities in life—death is a reality check.

Bower et al. (2005) conducted study with cancer patients who practiced Yoga for a long duration and survivors yielded modest improvements in sleep quality, mood, stress, cancer related distress, cancer related symptoms, and over all quality of life. Yoga has been practiced for thousands of years to improve physical and emotional well-being. The word “Yoga” is derived from the Sanskrit root ‘Yuj’, which means to join or to yoke. In philosophical terms, yoga refers to the union of the individual self with the universal self. Yoga is one of six branches of classical Indian philosophy and has been practiced for thousands of years. References to yoga are made throughout the Vedas, ancient Indian scriptures that are among the oldest texts in
existence. Two thousand years ago the Indian sage Patanjali codified the various philosophies and methodologies of yoga into 196 aphorisms called "The Yoga Sutras", which helped to define the modern practice of yoga. The sutras outline eight limbs, or disciplines, of yoga: Yamas (ethical disciplines), Niyamas (individual observances), Asana (postures), Pranayam (breath control), Pratyahara (withdrawal of senses), Dharana (concentration), Dhyana (meditation), and Samadhi (self-realization). The effects of yoga have been explored in a number of patient populations, including individuals with asthma, cardiac conditions, arthritis, epilepsy, headache, depression, diabetes, pain disorders, gastrointestinal disorders, and addictions, as well as in healthy individuals.

According to Cohen et al. (2004), women who took yoga classes during breast cancer treatment reported they could function better physically and felt better about their health. 62 women who were undergoing radiation treatment for breast cancer were randomly assigned to attend yoga classes twice a week or be put on a waiting list to start yoga after their treatment. The women who practiced yoga reported better physical functioning, such as the ability to walk in a mile, climb stairs and lift groceries. They also felt better about their overall health and reported less fatigue and problem of sleeping. Breast cancer incidence rates increase with age, but the rate of increase is greater up to age 50 than afterwards.

According to Stuyck (2005), people with cancer are opting to use a variety of mind/body techniques that they hope will decrease their stress, lower their pain and improve their quality of life. In fact, nearly half of the patients with cancer use mind/body techniques such as visualization and relaxation. Delmonte (1995) demonstrated that meditation leads to increased alpha EEG frequency and reduced blood pressure. Meditation promotes an ability to control
heart rate, ventilation and blood flow (Wallace & Benson, 1972) and thereby causes mental calmness and relaxation. Benson (1989) also shows that meditation acts to reduce the release and responsively of norepinephrine throughout the central nervous system. Smith and Johnson (2000) reported greater degree of self-actualization and increased locus of control with practiced meditation.

It is a fact that living with cancer is a very stressful experience, as patients cope with a diagnosis of a life-threatening illness and the side effects of treatment. Yoga based intervention produces beneficial effects on both physiological determinants and psychological risk factors or associated with cancer disease. Behavioral and yoga-based intervention approaches to the management of cancer-related problems have focused on pain, appetite control, side effects associated with chemotherapy and radiation therapy, and other treatments of cancer. Pain is a relatively common problem among cancer patients and often provokes anxiety or depression, which may exacerbate its severity. Although pain killers remain the primary method of treating cancer-related pains, increasingly. Yoga based intervention are being adopted in an effort to reduce pain and its associated adverse psychological side effects (Davis & Burish, 2000). Relaxation therapy, hypnosis, cognitive-reappraisal techniques, visual imaging, and self-hypnosis, yoga techniques, meditation, Pranayam have all proven to be at least somewhat useful in the management of pain due to cancer. Because it is the most debilitating of the side effects of cancer treatment, chemotherapy has also been a particular focus of psychological interventions. Yoga based interventions, including meditation and Pranayam can help to control these effects (Burish & Lyles. 2002). In these approaches patients are taught the techniques and urgent to practice them at home before the chemotherapy sessions, in the hopes that this counter conditioning will enable them to cope more successfully. In an evaluation of this procedure,
patients who received yoga training, and practiced daily meditation, reported feeling less anxious and less nauseated during chemotherapy.

Thus it can be said that by providing yoga based interventions to breast and leukemia cancer patients, we can enhance their quality of life. The present study is an effort in this direction.