CHAPTER I

INTRODUCTION

1.1 Preamble

A malignant tumor can be dangerous and it is important to find it and treat it quickly, before it spreads. Cancers are named after the part of the body where they start. For example, cancer that starts in the colon but spreads to the liver is called colon with liver metastases. Cancer is a disease that starts in our cells. Our bodies are made up of millions of cells, grouped together to form organs or tissues such as the lungs, the liver, muscles and bones. Genes inside each cell order it to grow, work, reproduce and die. Normally these orders are clear, our cells obey and we remain healthy. Sometimes a cell’s instructions get messed up and it grows abnormally. After a while, groups of abnormal cells form lumps or tumors. If the abnormal cells stay in one place in the body, the tumor is benign. Benign tumors are not usually life-threatening. However, sometimes abnormal cells invade the tissues around then and spread to other parts of the body. When this happens, the tumor is malignant and the person has cancer. Tumor cells that spread to other parts of the body are called metastases. Often, the first sign that a malignant tumor has spread is the swelling of near by lymph nodes, but cancer can metastasize to almost any part of the body.

As per oldest description of cancer in humans was found in an Egyptian papyrus written between 3000-1500 BC. It referred to tumors of the breast. Hippocrates - the "Father of Medicine" who lived in Greece around 400 BC - is credited with being the first to recognize the difference between benign and malignant tumors. In fact, the name cancer comes from the ancient Greek word for crab, as scientists at the time thought that clusters of cancer cells looked like the legs of a crab. But progress on understanding and
treating cancer was slow over the next two thousand years. One of the very first people to suggest a cause for one type of cancer was Dr Percivall Pott, in 1775. Dr Pott noticed that many young boys employed as chimney sweeps went on to develop cancer of the scrotum in later life. He suggested that something in the soot was causing cancer. At the time no one knew exactly how soot caused this disease, but chimney sweeps were encouraged to wash more thoroughly. As a result, fewer men developed this cancer. A century later, scientists discovered the chemical in soot that causes cancer, proving that Dr Pott's observations were correct. It was not until the 18th century in Reims, France, that the first cancer hospital was founded, although this was in the mistaken belief that cancer was an infectious disease. The French gynecologist Recamier described the invasion of the bloodstream by cancer cells in 1839, coining the word metastasis (cancer spread). In 1895, Rontgen discovered the x-ray, and this radiation is still used for both cancer diagnosis and cancer treatment (radiotherapy). A momentous breakthrough in our understanding of cell biology came in 1953, when Francis Crick and James Watson unraveled the structure of DNA.

Since then we have begun to study and understand the causes of cancer at a molecular level, and there is a need to devise new treatments based on this knowledge.

1.1.1 Types of cancer

From one point of view, there are as many types of cancer as there are different people, because everyone's genes are different and so no two cancers are exactly alike. From another point of view, there are as many different types of cancer as there are different types of human cell - just over 200. However, cancers can be broadly grouped into different types, depending on which tissues they come from.
- **Carcinomas**, the most common types of cancer, arise from the cells that cover external and internal body surfaces. Lung, breast, and colon are the most frequent cancers of this type.

- **Sarcomas** are cancers arising from cells found in the supporting tissues of the body such as bone, cartilage, fat, connective tissue and muscle.

- **Lymphomas** are cancers that arise in the lymph nodes and tissues of the body's immune system.

- **Leukemia's** are cancers of the immature blood cells that grow in the bone marrow and tend to accumulate in large numbers in the bloodstream.

These terms often have prefixes that describe exactly what type of cell the cancer originated from. For example, an osteosarcoma is a cancer of the bone.

- Adeno- = gland
- Chondro- = cartilage
- Haemangio- = blood vessels
- Hepato- = liver
- Lipo- = fat
- Lympho- = white blood cell
- Melano- = pigment cell
- Myelo- = bone marrow
- Myo- = muscle
- Osteo- = bone
Since the first draft of human genome was published in 2002, a huge international effort began to classify all the genes involved in cancer. And further advances in gene sequencing are providing even more detailed information about the gene faults found in individual tumors.

1.1.2 Symptoms of Cancer

Cancer patients experience many distressing symptoms during the course of their illness. In addition to pain, they commonly suffer from fatigue, anorexia, constipation, dyspnea, nausea, and vomiting. Further, some psychological conditions are also prevalent in these patients like fear of death, depression and anxiety. Therefore, it is important not only to diagnose and manage the cancer itself, but also to recognize and effectively treat associated symptoms, regardless of the outcome of the underlying disease. Some of the symptoms are due to the underlying disease, but some are due to adjuvant therapies. Symptoms of advanced cancer become chronic, and patients usually rate them as moderate or severe.1 Unrelieved suffering causes demoralization and may quickly impair quality of life.2 Nevertheless, understanding the principles of symptom management may help to improve quality of life in cancer patients. It has been seen that in patients with advanced cancer, the prevalence rates of various symptoms are approximately as follows (Donnelly and Walsh, 1995: 67-72; Walsh et al., 2002: 385-388; Komurcu et al.,: 2000: 24-33):

- Pain 89%
- Fatigue 69%
- Weakness 66%
- Anorexia 66%
- Lack of energy 61%
• Nausea 60%
• Dry mouth 57%
• Constipation 52%
• Early satiety 51%
• Dyspnea 50%
• Vomiting 30%.

Furthermore, patients with advanced cancer typically have multiple concurrent symptoms. Cancer-related fatigue is multidimensional and develops over time, diminishing energy, mental capacity, and psychological condition (Portenoy and Itri, 1999: 1-10). Patients may report feeling tired or being unable to complete their activities of daily living. People who were previously very active may be frustrated by their inability to participate in favorite leisure activities, which has a big impact on quality of life. Hence, there is a need to develop a programme which will be effective in controlling associated symptoms of cancer and improve their quality of life.

1.2 Relevance of Yoga in Cancer

Accumulating evidence suggest that Yoga which is a form of non-aerobic exercise that involves a program of precise postures, breathing exercises, and meditation can be a useful method to help relieve some symptoms of cancer and can lead to increased relaxation and physical fitness. Results from recent studies on yoga and cancer show that the complementary therapy can have many benefits for patients, both mentally and physically. Some of the benefits include: Combating the Side Effects of Treatment, Anxiety Relief, Reduction of Stress and Cortisol Levels, Immune System Response, Improves Coping Mechanism, Decreases Insomnia, Improves Depression Symptoms, Relief of Chronic Pain and
Providing Gentle Exercise. However, there is dearth of controlled experimental trails in relation to yoga and its effect on psycho-physiological aspects of cancer patients. Hence, the researcher has planned this study to see the efficacy of yoga practices on some of the psychological and physiological conditions in cancer patients.

1.3 Statement of the Problem

Cancer is a leading cause of mortality worldwide. Patients with cancer often have to deal with severe side effects and psychological distress due to adjuvant therapies, which have a considerable impact on their quality of life (Luebbert, Dahme and Hasenbring, 2001: 490-502). The most common symptoms of cancer and the adjuvant therapies used for treatment are fatigue (Barsevick, Newhall and Brown, 2008: 21-25) depression (Walker and Sharpe, 2009: 436-441), and pain (Christo and Mazloomdoost, 2008: 278-298). In addition to physical symptoms, people with cancer nearly always experience considerable levels of psychological distress. Due to demographic changes, the numbers of cancer cases are expected to increase within the next few decades (Edwards, 1973: 2766-2792). Often cancer is a severe and life threatening disease. Treatment of cancer is supposed to be harmful and results are also uncertain. Therefore functional abilities, presence of depression and depressive symptoms and quality of life are important topics within the care for cancer patients. The measurement of functional status/performance status has been established in oncology to rate patients overall fitness and the ability to care for themselves. Functional impairment or poor performance status are of adverse prognostic importance for overall survival, especially with regard to early death and treatment related toxicity (Buccheri et al., 1996: 1135-1141). A number of studies have reported a close interaction between performance status and quality of life (Schaafsma and Osoba, 1994: 413-414; Jordhoy et al., 2001: 1478-1485). Depression is a major
symptom cancer patients suffer from. Massie provided a systematic review on the prevalence of major depression and depressive symptoms in cancer patients. She reported a prevalence of major depression of 0-38%, and of 0-58% for depressive symptoms in cancer patients (Massie, 2004: 57-71). Risk factors of depression or depressive symptoms in cancer patients include functional disability, inadequate social support, uncontrolled pain, poor physical condition, advanced illness, previous history of depression, and the loss of a spouse or of family members (Breitbart et al., 2000: 2907-2911).

Presence of depression in cancer patients has been linked to a reduced chance of survival in a variety of tumors, e.g. breast cancer (Watson et al., 1999: 1331-1336). A number of studies reported a close interaction between depression and quality of life in cancer patients (Smith et al., 2003: 509-513; Grassi et al., 1996: 300-307).

Nevertheless, current cancer treatments are efficacious for improving survival, but are toxic in numerous ways and produce negative short and long term physiologic and or psychologic effects (Courneya and Freidenreich 2001: 263-272). Moreover, cancer and its treatment may increase the risk of other common chronic diseases, such as diabetes or cardiovascular disease.

Thus against this background there is need to develop a training programme which will be effective in improving performance and quality of life. Further, the training which will reduce the symptoms related to adjuvant therapies is needed. Hence, the researcher after reviewing literature decided to plan this study to see the effect of yoga on psycho-physiological condition in cancer patients.
1.4 Problem and its Relevance to the Society

Cancer is one of the world’s most common diseases (Parkin et al., 2002: 74-108). Often cancer is a severe and life threatening disease. Treatment may be harmful and results may be uncertain. Therefore physical abilities, presence of death syndrome, anxiety, adjustment and some physiological attributes are important topics within the care for cancer patients. Patients with advanced cancer often report experiencing up to 5 symptoms at any given time, and significantly more when receiving chemo- or radiation therapy (Chang, Hwang, Feuerman, and Kasimis, 2000: 1175-1183; Feyer, Kleeberg, Steingraber, Gunther, and Behrens, 2008: 567-585). Recently, researchers have identified co-occurring pain, fatigue, and sleep disturbance as a common symptom cluster among persons with advanced cancer (Beck, Dudley and Barsevick, 2005: 48-55; Hoffman, Given, von Eye, Gift and Given 2007: 785-792). The presence of these co-occurring symptoms may significantly affect physical and psychological functioning, more so than any one of the symptoms experienced in isolation, and may contribute to greater suffering among patients affected by the symptom cluster (Dodd, Miaskowski and Paul 2001: 465-470; Miaskowski et al., 2006: 79-89).

Furthermore, most cancer patients experience a loss of energy and an impairment of physical performance in the course of the disease due to chemo or radiotherapy (Smets et al., 1993: 220-224). Many patients, suffering from fatigue which is a severe and limiting problem and that prevents from working or carrying out regular daily activities and hence results in a substantial reduction of the quality of life. In fact, patients report fatigue as a combination of symptoms including an inability to carry out physical exertion, tiredness, lack of interest, or motivation, and an impairment of short-term memory, attention, or concentration; these complaints are frequently associated with sleep disturbances, anxiety, and emotional
reactivity (Cella et al., 1998: 369-377). Several trials have evaluated different therapies for the treatment of cancer-related fatigue. It has been found that cognitive behavior therapies and psychotherapy may reduce fatigue in cancer patients (Given et al., 2004: 507-516). However, these interventions do not correct the impairment of physical performance frequently observed in this patient group (Dimeo et al., 1997: 1251-1255). Exercise has been proposed as a non-pharmacologic intervention for the treatment of cancer-related fatigue (Escalante, 2003: 79-83). When carried out during chemo- or radiotherapy, exercise reduces the impairment of performance status related to treatment. It has been shown that exercise programs improve the quality of life in women treated for breast cancer (Daley et al., 2007: 1713-1721). In fact, many patients with cancer use forms of complementary and alternative medicine to help manage the effects of their illness (Duncan, Leis and Taylor-Brown, 2008: 72-78). Complementary and alternative medicine encompasses a broad array of heterogeneous treatments, ranging from herbal medicine to yoga (Smith and Pukall, 2009: 465-475). According to a survey conducted on cancer patients in the United States, it was found that 21% patients are engaged in yoga practices (Fouladbakhsh and Stommel, 2010: 7-15). Further, it has been seen that as an adjunct to conventional cancer therapies, the complementary therapies improve quality of life through decreasing the adverse effects of anticancer treatments (Ernst, 2009: 499-500).

Yoga, now a days, used as a complementary therapy in improving symptoms related to cancer, is a combination of breathing techniques, physical postures, and meditation that have been practiced as various styles of hatha yoga for over 5,000 years (Hadi, 2007: 829-837). Previous research reports revealed that yoga improves blood pressure, reduce stress, and improve coordination, flexibility, concentration and sleep (Barnes et al., 2002: 1-19). Some studies have specifically demonstrated potential psychological benefits of yoga in various clinical populations, including patients with
depression, stress and anxiety (Uebelacker et al., 2010: 22-33; Shapiro et al., 2007: 493-502).

However, there are very few studies examining the effect of yoga practices on cancer patients. Given the growing population of survivors, there is a need to establish the extent to which yoga is appropriate for cancer survivors during and after treatment, as well as whether yoga is effective for improving the health and well-being of survivors across the cancer control continuum. As yoga is a simple, low-risk intervention and is associated with positive effects on the physical and psychological health it was thought to find out its effect on cancer survivors. In fact, it could play a relevant role in the rehabilitation and therapy of limitations associated with cancer and its treatment. On the basis of these considerations, the researcher has conducted this study entitled “Progressive yoga relaxation for reversing death syndrome and associated homeostatic imbalances in cancer patients”.

1.5 Objectives of the Study

The present study has been conducted with the following objectives in perspective:

- To measure the status death syndrome and associated neuro-immunological, psycho-physiological and biochemical attributes of cancer patient.
- To study the effect of progressive yoga relaxation on death syndrome and psycho-neuro-immunological, biochemical and physiological responses in cancer patients.
- To evaluate the role of yoga in establishing homeostasis in cancer patients for better living.
1.6 Hypotheses

Based on the literature, the researcher hypothesized the followings:

\( H_1 \): Progressive yoga relaxation may cause considerable reduction in death syndrome and favourable changes in psycho-neuro-immunological, physiological and biochemical conditions.

\( H_2 \): Progressive yoga relaxation may re-instate the homeostasis in cancer patients.

1.7 Delimitation of the Study

Cancer is a multidimensional health hazard. The treatment of cancer as available with us is not cent percent successful. Therefore, lot of research is in progress. The present study has been planned in the similar lines. However, this study has been delimited as follows:

- It is difficult to get specific cancer group of patients for experiment. Therefore, homogeneous cancer group patients have been included in this study.

- This study has been delimited to the patients who are in the preliminary stage of cancer, were pulled as sample from Bharat Sevashram Sangha, Vashi, New Mumbai, who are taking treatment in the Tata Memorial Hospital, Jera bai Wadia Road, Parel, Mumbai.

1.8 Limitations of the Study

- Since cancer can appear at any age, it is difficult to get subjects having similar age.
• Similarly intensity of suffering and types of cancers differ from patients to patients. Therefore, the researcher has gone for a sampling from heterogeneous group.

• Some of the patients died during the experiment due to serious conditions of suffering. Although the researcher is aware of this, he has to continue the experiment with the minimum number of sample.

1.9 Significance of the Study

The state of progressive relaxation achieved by the cancer patients during the yoga training may probably help them in reducing death syndrome. It may also alter positively the psycho-neuro-immuno-physiological and biochemical responses in them. This may leads to a considerable reduction in their agony and restores homeostasis to live longer. Although this study does not claim about its cure but firmly believes that progressive part of yoga intervention may obviously increase the pain-tolerance ability of the cancer patients. Along with cancer patients, Medical profession can take benefit of Yoga in treating cancer patients. However, other researchers being engaged with this field would also be benefited by the result of the present study.

1.10 Operational Definition of Terms Used

Progressive Yoga Relaxation

The ability to relax under “tensions” and “stress” of contemporary living is becoming an ever-increasing problem. An understanding of the purpose and of the value of relaxation techniques can be approached from at least two viewpoints: 1) Natural relaxation (i.e., awareness of exhilarating feeling or emotion release that arises from physical activity, games, sports
etc.), and 2) Conscious relaxation (Consciously awareness of muscular tension helps release tension). In either case, the major purpose is for the provision of emotional release from “tension.” The ability to relax at-will appears to be an important tool for relax.

The term progressive relaxation is an invention of Dr. Edmund Jacoson (1938). Progressive relaxation is a method by which relaxation may be achieved progressively. The value of this method how appears similar to “Shavasana” or “Dead Pose” which we find in our ancient literature of Indian Yoga system. Progressive yoga relaxation is a process confining to certain yoga practices to be practiced from simple to complex manner.

**What is Cancer?**

Cancer is a condition in which cells in certain tissue of the body reproduce wildly and without limit. This disease, or rather group of disease has been found in all ages and all races of man.

**Status of Cancer**

1. Living normally - 1 stage
2. Residual cancer - 2 stage
3. Progressive cancer - 3 stage
4. Died cancer - 4 stage

**Types of Cancer**

Medical sciences classify cancer according to many factors:

- The type of tissue involved;
- the speed of its growth;
- the portion of the body involved; and
• some times even according to the chemical changes that take place within the body.

**Diagnosis of Cancer**

• Some cancers are easily seen or felt, such as breast and skin cancers;

• Some can be detected or suspected by rectal or vaginal examination and by introduction of instruments into the stomach;

• Some by X-ray, by blood or urine tests and by other techniques.

   Certain cancers – for instance, breast cancers are found predominantly in women, lung and mouth cancers are more common in men.

   The symptoms of early cancer are often barely noticeable, therefore everyone must complete a thorough medical checkup at least once a year, and often if abnormal symptoms occur.

**Fitness**

1. The ability to carry out daily task with vigour and alertness without undue fatigue with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies.

2. Fitness as the capacity for sustained physical activity without excessive fatigue.

**Health**

   Being alive without any disease is called health or it is a state of complete physical, mental, emotional, spiritual and social well-being and not merely an absence disease.

**Yoga**

Yoga means the experience of oneness or unity with one’s inner being. This unity comes after dissolving the duality of mind and matter into the
supreme reality. Yoga provides psychophysiological relaxation techniques, which are very helpful in reducing stress and tensions.

**Anxiety**

“Feeling anxious or fear spread out then” - anxiety is a feeling one has when he thinks in an anticipation that something unpleasant is going to happen in the future.

**Depression**

When one suffers from disappointment - depression has a purely cause. One does not feel like working or psychologically can not carry out work due to low spirit.

**Homeostasis**

It is a state of balanced functions of all the systems of human body that reflect not merely the absence of disease, but also a balanced personality.

**Psycho-Physiological and Haematological attributes**

Psychology is a study of behaviour, whereas physiology describes the functional ability of different organs. Thus, psycho-physiological knowledge gives us information about the psychological attributes that influences the functional ability of different physiological organs. However, the nature of haematological attributes also changes according to the functional states of one’s psychophysiology.

**Death Syndrome**

It is a state that is mostly dominated by the severity of one’s psychological malfunctioning. This syndrome appears when state of homeostasis is jeopardized due to fear of death.