CHAPTER-I

INTRODUCTION

1.1 INTRODUCTION

Human life is becoming so difficult due to inadequate physical and psychological environment. People are perceiving surrounding environment full of competitive, insecure, corruptive, restless polluted and diseases generating atmosphere. We noticed that many persons facing higher level of tension, frustration, aggression, anxiety and stress. Persons who are unfortunately caught by cancer and tuberculosis diseases family life of such patients became disturbed due to soon and near coming death, so that their stress and anxiety levels are became higher as compare to others. Stress and anxiety are an integral part of our life. My keen interest is to care of these patients who are near to the end of their life. Through the individual or group counseling it would be my little but positive effort to keep away these patients from higher level of stress and anxiety.

Cancer and tuberculosis are one of the most socially stigmatized diseases. Cancer and tuberculosis patients not allowed contacting the community including family and friends. Even they find difficulties to enter public places, schools, colleges and public transport system. The looking attitude of people and community towards cancer and tuberculosis patients are very different as compare to other patients such as malaria, phileria, etc. Cancer and tuberculosis patients became disturbed due to unfortunately caught disease, social disturbance, finical problem and family problem. As a result they face much stress, tension and frustration and anxiety as compare to others.

Stress is a state of physical mental tension. Some take it as usual phenomena and some others take it rather seriously. Positive stress gives
energy to work and consequences in increased output. Besides, negative stress may lead to more serious and difficult situations. Hence stress is one of the very vital causes for increasing disease. To face the modern day stress filled anxiety flooded world of information technology it is difficult for cancer and tuberculosis patients to live a stress and anxiety free life without any extra care taken to maintain physical and mental balance. So it is my first duty to study stress and anxiety level of these patients who are faceting critical problem and near to the end of their life.

1.2 Stress

The word stress has its origin in the Latin words ‘strictus’, meaning tight or narrow and ‘stringere’, the verb meaning to tighten. The word ‘stress’ is defined as ‘a state of affair’ involving demand on physical or mental energy. By definition, stress is any uncomfortable “emotional experience accompanied by predictable biochemical, physiological and behavioral changes” - Baum (1990). Greenberg & Baron (2000) define stress as, “a complex pattern of emotional states, physiological reactions and related thoughts in response to external demands”.

According to Morgan et al. (1993), “We will define stress as an internal state which can be caused by physical demands on the body (diseased conditions, exercise, extremes of temperature and the like) or by environmental and social situations which are evaluated as potentially harmful, uncontrollable or exceeding our resources for coping.” Stress may be defined as, “a real or interpreted threat to physiological or psychological integrity of an individual that results in physiological or behavioral responses” (McEwen, 2000). Cox (1987) defined “stress as perceived phenomenon arising from a comparison between demands on an individual and one’s ability to cope. An imbalance in this mechanism gives rise to experience of stress and to stress response.”
Stress is considering major causes of mental and physical problems; its effect is not always undesirable. In fact, stress is a basic ingredient of life. Our biological system is equipped with some stress alarms that is essential for survival and allow one to function effectively in many situations. Without undergoing stress, there is no constructive and creative activity. Certain level of stress is necessary to perform better in examinations. Stress quite often increases our efficiency and makes us search for new coping resources. It improves our adaptive system and we are better able to deal with such situation in future to events that disrupt or threaten to disrupt our physical & psychological functioning.

1.2.1 **Sources of stress**

Studies in medical science are increasingly showing the role of stress in various disorders. In fact, many health professionals recognize that the concept of a single cause for an illness is no longer suitable. Many different sources of stress are known to precipitate illness like heart disease cancer and HIV/AIDS etc. Some of the important sources of stress are given below.

1) **Traumatic events**

These include fire, being a hostage, witnessing a gory crime, etc. In fact, the effects of such events may occur after the lapse of some time, may be months after the traumatic event has occurred. A victim may start feeling depressed or have flashbacks and relive the horror of the earlier experiences. Some victims also report nightmares.

2) **Recent life events**

It has been found that the effects of life changes cumulate and contribute to stress. Death of spouse, divorce, change in eating habits, personal, chronic diseases, retirement, trouble with one’s boss, mortgage
and major change in financial condition create stress. The exact effect of such events is not known but it is certain that they do contribute to stress in different degrees.

3) Hassles

These involve the happenings in everyday life. Thus preparing children for schools, looking after their home work, care of family and attending to various emergencies are daily hassles, experienced by a housewife. There are jobs in which such daily hassles are very frequent. Such stresses make life full of fear. These stresses may not be known to an outsider.

1.2.2 Type of Stress

Looking at the range of stressful experiences that are faced by people one may divide the stresses with reference to their area. There are three major types of stresses, i.e., environmental, social, psychological.

1) Environmental stress: These stresses could be of very high intensity, like earthquake, flood, fire, etc. that are sudden and have a powerful impact, and are more or less universal in terms of initial response. These are known as catastrophic events or disasters. These events may affect a large number of people at the same time and require a great deal of effort for effective coping. A second group of environmental stressors could be events, which impinges on all people uniformly, but there are large individual differences in the way people react to theme. These could be environmental pollution, crowding, industrial noise, etc., which have known and predictable health impairing consequences.

2) Social stress: Death and illness in family, divorce, relationships, strained, separation and hostile neighbors are some of example of social stressors. Many of these are major life stresses, which affect individuals at various
times in their lives. People differ widely in their life experiences. Some go through more hardships and personal tragedies than other do. Some suffer from chronic diseases, health problem and have to think in terms of long-term adjustment. For others, these life events could be one time happening. Some of these stressors involve minor irritating events, called ‘daily hassles’, which occur in the course of everyday life.

3) Psychological Stress: These are personal and unique to the person experiencing theme and are considered as internal sources of stress like frustration, conflict and tension.

1.2.3 Symptoms of stress

1) Physiological symptoms: Digestive problem, high blood pressure, change in immune system, change in hormonal functions, increase in production of cortical, activated chemical defense mechanisms, effect in protein and carbon dioxide metabolism are the physiological symptoms of stress.

2) Psychological and behavioral symptoms: Nervousness and tension, chronic worry, inability to relax, feelings of inability to cope, emotional instability, excessive use of alcohol, problems with sleep, non-cooperative attitude, poor motivation, low concentration and mental block etc. activates psychosomatic disorders are the Psychological and behavioral symptoms of stress.

1.2.4 How does stress affect people who have cancer?

Sklar & Anisman (1981) studied that stress influences neuro-chemical, hormonal and immunological functioning and that these changes are subject to many of the same manipulations that influenced the carcinogenic process suggests a relation between these 3 mechanisms and the stress-induced alterations of tumor growth.
Stress has been shown to be a tumor promoting factor. Both clinical and laboratory studies have shown that chronic stress is associated with tumor growth in several types of cancer (Alicia et al., 2010).

Studies have indicated that stress can affect tumor growth and spread, but the precise biological mechanisms underlying these effects are not well understood. Scientists have suggested that the effects of stress on the immune system may in turn affect the growth of some tumors. However, recent research using animal models indicates that the body’s release of stress hormones can affect cancer cell functions directly.

A review of studies that evaluated psychological factors and outcome in cancer patients suggests an association between certain psychological factors, such as feeling helpless or suppressing negative emotions, and the growth or spread of cancer, although this relationship was not consistently seen in all studies. In general, stronger relationships have been found between psychological factors and cancer growth and spread than between psychological factors and cancer development.

1.2.6 Can stress increase a person’s risk of developing cancer?

Arranz et al. (2010) studied that chronic stress is associated with tumor growth in several types of cancer. Nielsen et al. (2005) studied that high levels of stress at baseline were found to have a lower risk of increasing breast cancer. Studies done over the past 30 years that examined the relationship between psychological factors, including stress, and cancer risk have formed conflicting results. Although the results of some studies have indicated a link between various psychological factors and an improved risk of developing cancer, a direct cause-and-effect relationship has not been proven.
Some studies have indicated an indirect association between stress and certain types of virus-related tumors. Evidence from both animal and human studies suggests that chronic stress weakens a person’s immune system, which in turn may affect the incidence of virus-associated cancers, such as Kaposi sarcoma and some lymphomas.

Bertandt and Sodd (2012) study revealed that stress mediators contribute to lung cancer progression and that known inhibitors of the stress pathway might block such effects, thus adding to the impetus for studying cancer prevention strategies targeting the stress pathway. More recent research with animal models suggests that the body’s neuro-endocrine response can directly alter important processes in cells that help protect against the formation of cancer, such as deoxyribonucleic acid repair and the regulation of cell increase.

1.3 Anxiety

Anxiety (also called angst or worry) is a psychological and physiological state characterized by cognitive, emotional, somatic and behavioral components. The term anxiety is usually defined as a diffuse, vague, very unpleasant feeling of fear and apprehension. It is the displeasing feeling of fear and concern. The root meaning of the word anxiety is to ‘vex or trouble’; in either presence or absence of psychological stress, anxiety can create feelings of fear, worry, dread and uneasiness. Anxiety is considered to be a normal reaction to a stressor. It may help an individual to deal with a demanding situation by prompting them to cope with it.

Weinberg & Gould (2007) defined anxiety as “a negative emotional state characterized by nervousness, worry and apprehension and associated with activation or arousal of the body.” State anxiety refers to the ever
changing mood component. According to Spielberger (196 “an emotional state characterized by subjective, consciously perceived feelings of apprehension and tension, accompanied by or associated with activation or arousal of the autonomic nervous system”. Anxiety has been consistently conceptualized as having temporary, situational state components and more permanent trait components (Cattell & Scheier, 1961; Spielberger, 1966).

The magnitude of the person’s response to the feared stimulus clearly exceeds the objective threat, and phobias usually have debilitating effect on the person’s life (Kowalski, 2000). Freud (1936) conceptualized anxiety as a signal indicating the presence of a danger situation. The alleged presence of danger, whether from external sources or one’s own repressed thoughts and feelings, evokes this unpleasant state of anxiety which then serves to warn the individual that some form of adjustment is necessary. In his emphasis on adaptive utility of anxiety in motivating behavior that helps an individual either to avoid or to cope more effectively with danger, Freud’s danger signal theory is quite consistent with Darwin’s (1965) evolutionary perspective.

Sloan (1996) and Rosen (1998) reported that over the last few decades, people seem to have become more anxious, worrying about safety, social acceptance and job security more than that was in the past.

People often experience a general state of worry or fear before confronting something challenging such as a test, examination and interview. These feelings are easily justified and measured normal. Anxiety is considered a problem when symptoms interfere with a person's ability to sleep or otherwise function. Generally speaking, anxiety occurs when a reaction is out of proportion with what might be normally expected in a situation. Mild anxiety is vague and unsettling, while severe anxiety can be extremely debilitating, having a serious impact on daily life.

1.3.1 Types of Anxiety

According to Freud, S. (1936) there are three types of anxiety (Psychic pain).

I) Neurotic anxiety arises when the person’s id impulses threaten break through the ego control and results in a behavior that will lead to punishment. II) Moral anxiety arises when the individual does something in conflict with the super ego or moral values and arouses feeling of guilty. III) Reality anxiety arises when the person is confronted by danger or threats in the external World (Sharf, 2000).

1.3.2 Causes of Anxiety

An evolutionary psychology explanation is that increased anxiety serves the purpose of increased vigilance regarding potential threats in the environment as well as increased tendency to take proactive actions regarding such possible threats. This may cause false positive reactions but an individual suffering from anxiety may also avoid real threats. This may explain why anxious people are less likely to die due to accidents.

1.3.3 Symptoms of anxiety

1) Psychological symptoms of anxiety: The psychological (mental) symptoms of anxiety include feeling worried or uneasy a lot of the time, having difficulty sleeping, feel tired, being irritable, not being able to
concentrate, being extra alert, feeling on edge or not being able to relax, needing frequent reassurance from other people and feeling tearful.

2) Physical symptoms of anxiety: The physical symptoms of anxiety include a pounding heartbeat, breathing faster, palpitations (an irregular heartbeat), feeling sick, chest pains, sweating, loss of appetite, headaches, feeling faint and needing the toilet more frequently.

1.3.5 Problem of anxiety

We all become anxious from time to time. It becomes a problem when it interferes with life in the absence of real threat or goes on too long after the danger has past.

1.3.6 Effects of anxiety

Anxiety will have an effect on both the body and the mind.

1) Physical effects: Increased muscular tension can cause headaches and discomfort. Breathing rapidly may make person feel light-headed and unsteady and give person pins and senseless. Changes to the blood supply disturbing the digestive system may also cause sickness and vomiting. Increasing blood pressure can make person more aware of a beating heart. The effects on person nervous system may manifest themselves in an urgent want to visit the toilet and butterfly feelings in the stomach.

2) Psychological effects: The psychological effects of anxiety include fear, irritable, being on edge, heightened alertness and unable to relax or concentrate. Person may feel a severe desire to seek the support of others and to be weepy and dependent. The way person think can be affected: he may fear that the worst is going to happen and slot everything that occurs into a negative outlook on life.
1.4 Cancer

The term cancer really refers to collection of related diseases in which abnormal body cells multiply and spread wildly, forming a tissue mass known as a tumor. Cancer is one of the most feared diseases. It is a leading cause of death around the world mainly because half of those diagnosed with cancer, will die from it causing over 6 million deaths a year. The exact causes of most types of cancer are still not known. In the developed world, one in three people will develop cancer during their lifetimes. This is the second most general cause of death in the developed world and a similar trend has emerged in the developing countries too (Stewart & kleihues, 2003).

Cancer is a major public health problem in the greatest parts of the world. Currently, one in 4 deaths in the United States is due to cancer. The lifetime probability of being diagnosed with an invasive cancer is higher for men than women (Jemal et al., 2008).

There is one tobacco-related death in every 8 seconds. In addition to smoking, use of smokeless tobacco, in a variety of forms, is widespread among both men and women (Pednekar et al., 2009). The most traditional form of tobacco use in India are traditional forms like betel leaf (paan), a combination of betel-leaf, areca nut, slaked lime, tobacco and condiments; combinations of ingredients are altered according to individual preferences, smoking bidi (hand rolled cigarette), chewing tobacco flakes with or without lime, tobacco tooth powder. Besides, the use of new products, its blends such as panmasala and gutkha are increasing in consumption not only among men but also among children, teenagers and women (Schulz et al., 2009). However, in India where chewing and smoking tobacco is practiced, there is a striking incidence of oral cancer that these cases account for approximately 50 per cent of all cancer cases (Schulz et al.,
Mack (2001) noticed that very high incidence rates in Indian women reflect the persistent importance in India of paan chewing, a habit that is equally common in the male and female. Paan generally contains calcium hydroxide, areca nut and betel leaf. Tobacco or various spices are commonly added.

1.4.1 Types of cancer

According to American cancer society (2010), there are different types of cancers. Cancer is a broad term used to encompass several malignant diseases. There are over 100 different types of cancer, affecting various parts of the body. Each type of cancer is unique with its own causes, symptoms and treatment. Like with all groups of disease, some types of cancer are more common than others. Cancer classified on the basis of body system they are follows:

1) Head and neck cancer: These types of cancer includes oral and lip, hypopharyngeal, oropharyngeal, laryngeal, metastatic squamous neck, nasopharyngeal, paranasal sinus and nasal cavity, parathyroid and salivary gland cancer.

2) Digestive/gastrointestinal cancers: These types of cancer includes liver (adult primary), liver, (childhood), anal, stomach (gastric), bile duct (extrahepatic), esophageal, gallbladder, carcinoid tumor (gastrointestinal) colon, pancreatic, rectal and small intestine cancer.

3) Respiratory cancers: These types of cancer include lung, non-small cell, small cell, thymoma, malignant mesothelioma and thymic carcinoma cance.
4) Blood cancer: These types of cancer include leukemia, lymphoma, multiple myeloma, waldenstrom’s and macroglobulinemia.

5) Bone Cancer: These types of cancer include osteosarcoma and ewing’s sarcoma.

6) Brain Cancer: These types of cancer contain adult brain tumor, brain stem glioma, cerebellar astrocytoma, cerebral astrocytoma /malignant glioma, ependymoma, medulloblastoma, and hypothalamic glioma.

7) Breast cancer: Types of breast cancer include lobular carcinoma in situ, inflammatory breast and invasive types of breast cancer.

8) Endocrine cancers: These types of cancer include adrenocortical carcinoma, parathyroid, pheochromocytoma, pituitary tumor and thyroid cancer, carcinoid tumor and islet cell carcinoma (endocrine pancreas) cancer.

9) Eye cancer: These types of cancer include melanoma and intraocular retinoblastoma.

10) Genitourinary cancers: These types of cancer include bladder, kidney, penile, prostate, renal pelvis, transitional cell, testicular, urethral cancer and other childhood kidney tumors.

11) Gynecologic cancers: These types of cancer include cervical, endometrial, gestational trophoblastic tumor, ovarian, uterine sarcoma, vaginal and vulvar cancer.

12) Skin cancers: These types of cancer include cutaneous t-cell lymphoma, melanoma, merkel cell carcinoma and non-melanoma skin cancer.
The cancer problem:

Thanuja & Jayaprakash (2011) studied that oral cancer is an important health problem in populations with diverse geographic variations, different age groups and gender. Cancers in all forms are causing 9 percent of deaths throughout the world. The global figures are broken down between the developed and developing countries, the ranking changes. In the developed world, cancer is the second leading cause of death, next to cardiovascular disease, according for 19 percent of all mortality. In the developing world, cancers ranks fourth as a cause of death.

Cancer problem in India:

Cancer is one of the 10 leading causes of death today in India, and advancing in rank year by year. The frequency of cancer is about 70 per 100,000 populations in India as against 289 per 100,000 populations in developed countries. This is almost one-fourth of the reported rate from the industrialized countries of the West. With the control of infectious diseases and increase in life expectancy, cancer in the country is raising.

Causes of cancer

1) Environmental factor

Environmental factors are normally held dependable for 80 to 90 percent of all human cancers. The major environmental factors include: (a) Smoking and chewing tobacco is the major environmental cause of cancers of lung, larynx, mouth, pharynx, oesophagus, bladder, probably kidney and pancreas. (b) Alcohol: Excessive intake of alcoholic beverages is related with liver cancer. (c) Dietary factors: Smoking fish is related to stomach cancer dietary fibre to intestinal cancer, beef consumption to bowel cancer and a high fat diet to breast cancer. (d) Viruses: The epstein barr virus (EBV) is related with an oncogenic agent.
2) Genetic factors

Genetic influences have long been suspected. For example, retinoblastoma occurs in children of the same parent. Mongols are more likely to develop cancer (leukaemia) than normal children. However, genetic factors are less obvious and more difficult to recognize. There is probably a complex relationship between hereditary susceptibility and environmental carcinogenic stimuli in the causation of a number of cancers.

1.4. 1 Mouth Cancer

The medical term for the mouth is the oral cavity. Oral cancer or oral cavity cancer, a subtype of head and neck cancer, is any cancerous tissue growth located in the oral cavity (Werning, 2007). Oral or mouth cancer most commonly involves the tongue. It may also occur on the floor of the mouth, cheek lining, gums, lips or roof of the mouth. Around 90% of oral cancer is squamous cell carcinomas.

Oral cancer is one of the ten most common cancers in the World. Out of the 10 million new cancer cases diagnosed each year in world, nearly 5.5 million are in the less developed countries. In the United States oral cancer accounts about 8 percent of all malignant growth. Men are affected twice as often as women. More than 90% of oral cancers occur in patients older than 45 years (Schantz & Yu, 2002).

Franceschi et al. (2000) reported that oral cavity and pharynx cancer is the first and third commonest cancer in Indian men and women, respectively. Whereas in most areas at high risk for oral cavity cancer other than India (e.g., central and Eastern Europe, South America). The male-to-female ratios are 1 in Madras and lower than 0.5 in Bangalore. Oral cancer constitutes 12 percent of all cancers in men and 8 percent of all cancers.
among women. It is a major health problem in India. According to Craig (2010) “People are dying of oral cancer because of ignorance.”

Tatiana et al. (2011) studied mouth cancer awareness and investigate the associated factors in a United Kingdom general population sample. Overall, 81 percent of participants reported that they were aware of mouth cancer. Mouth cancer awareness was related to younger age, higher levels of education and better general health.

**Types of mouth cancer:**

Types of mouth cancer are follows:

1) Mouth and oropharyngeal cells: Several types of tissue make up the mouth. Each tissue contains several types of cells. Cancer can develop from any of these cell types.

2) Squamous cell cancers of the mouth and oropharynx: Squamous cells are the flat, skin like cells that cover the inside of the mouth, nose, larynx and throat. Carcinoma just means cancer. More than 9 out of 10 mouth cancers (90%) are squamous cell carcinoma.

**Symptoms of mouth cancer:**

Following are the symptoms of mouth cancer

Pain in the mouth, speech problems, white or red patches in the mouth or throat, difficulty in swallowing, a lump in the neck, weight loss and bad breath, thickening on the lip, a lump in the mouth or throat, unusual bleeding or numbness in the mouth and difficulty moving the jaw.

**Stages of mouth cancer:**

There are four main stages of mouth cancer. They are as follows:

Stage1: Cancer has begun to grow through the tissues lining the mouth or oropharynx and into the deeper tissues underneath. The cancer is no more
than 2 cm across and has not spread to nearby tissues, lymph nodes or other organs.

Stage 2: Tumor is larger than 2 cm across, but less than 4 cm. The cancer has not spread to lymph nodes or any other organs.

Stage 3: Either the cancer is bigger than 4 cm but has not spread to any lymph nodes or other parts of the body. Or the tumor is any size but has spread to one lymph node on the same side of the neck as the cancer.

Stage 4: Stage 4 means the cancer is advanced. It is divided into 3 stages

- Stage 4a means the cancer has grown through the tissues around the lips and mouth - lymph nodes in the area may or may not contain cancer cells.
- Stage 4b means the cancer is any size and has spread to more than 1 lymph node on the same side of the neck as the cancer, or to lymph nodes on both sides of the neck, or any lymph node is bigger than 6 cm.
- Stage 4c means the cancer has spread to other parts of the body such as the lungs or bones.

**Causes and risks of mouth cancer:**

Following are the causes and risks for mouth cancer

1) Smoking and alcohol

Anna et al. (2011) studied the interaction of smoking and alcohol significantly increases the risk for digestive cancers. Smoking tobacco and alcohol drinking are the main risk factors for mouth cancer. The interaction between smoking and alcohol consumption seems to be dependable for a significant amount of disease.
Anthony et al. (2010) examined the primary risk factor for oral cancer in the US, smoking and tobacco use, among the specific US states that experienced short-term increases in oral cancer incidence and mortality. Humphris (2004) investigated whether primary care patients who claim to smoke tobacco gain greater benefit of a patient information leaflet (PIL) on oral cancer than nonsmokers. Both studies confirmed that smokers knew less about oral cancer than nonsmokers when access to the leaflet had been denied.

2) Chewing tobacco or betel quid

Chewing tobacco or betel quid is very common in Asia. It is also popular in some migrant groups in Europe, North America and Australia. Tobacco (gutkha) or without tobacco (pan masala) have been strongly concerned in the recent increase in the incidence of oral submucous fibrosis, especially in the very young, even after a short period of use (Urmila, 2004).

The large majority understood that smoking and chewing tobacco were risk factors (84.7% and 80.1% respectively) but only 19.4% recognized alcohol use as a risk factor. In multiple logistic regression analyses controlling for relevant demographic factors, smokers and those with more frequent alcohol consumption were less likely to recognize early signs (Croucher, 2006).

3) Diet

A lack of zinc or other vitamins and minerals may increase risk of certain types of mouth cancer. A well balanced diet, with plenty of protein, is unlikely to be short of zinc. A diet high in fresh fruit and vegetables seems to reduce the risk of rising mouth cancer. A lot of antioxidant vitamins and other substances that help prevent damage to body cells.
Vitamin A deficiency increases risk of developing mouth cancer. Poor eating patterns are common in people who drink a lot alcohol.

4) Human papilloma virus (HPV)

Rodrigues et al. (2011) examined that human papilloma virus has a definitive role in oral cancers and these vaccines could have a positive impact in prevention of its ever-increasing incidence, though gray areas in research like optimal dosing schedule, efficacy in men, duration of protection and oral cancer specific studies remain unanswered. Oral cancer growth is tobacco-related chemical carcinogens and human papilloma virus (HPV) infection (Park & Kang, 2000).

5) Mouth cleanliness

Vargas & Arevalo (2009) studied that oral health is associated with overall health and dental care. Most oral diseases are avoidable at early stages. Studies showed that people who brush their teeth only once a day or less, compared to two or more times a day, and people who go to the dentist rarely, have a slightly increased risk of oral cancer.

6) Mouthwash

Tatiana et al. (2011) studied mouth cancer awareness. There was no significant association found with gender, deprivation and oral health or mouthwash use. Some studies have suggested that mouthwashes with high alcohol content could increase the risk of mouth cancer. But other studies have found that this is not the case. More studies are needed before we can say for sure that there is or is not association between mouthwash and mouth cancer.

7) Low immunity

Research has found that people have an increased risk of mouth cancer if they have a reduced immunity due to HIV/AIDS. Taking
medicines to suppress immunity after organ transplants also gives a higher risk of mouth cancer than in the general population.

8) Sunlight and sunbeds

Skin cancers are relatively general on the face and neck. Face and neck areas are often uncovered to ultraviolet light. Both the sun and tanning beds give off ultraviolet light rays. Ultraviolet light rays can cause skin cancers in unprotected skin. Some studies showed an increase of skin cancer in people who regularly use sunbeds.

9) Previous cancer

People who have had mouth cancer have an increased risk of getting a second one. Women have a higher risk of a second oral cancer than men.

10) Irritation to the lining of the mouth

Long term irritation to the lining of the mouth can cause mouth cancer. It is important to clean and wash them twice a day. Clean and wash helps to prevent substances known to cause mouth cancer, such as tobacco and alcohol.

11) Family history: Parent, brother, sister or child has higher risk of cancer because someone in their family has it.

12) Body weight: Lower risk of mouth cancer is overweight or obese.

**Diagnosing mouth cancer:**

Mouth cancer can be diagnosed by biopsy, scalpel biopsy, nasoendoscopy, fine needle aspiration, panendoscopy, chest x-ray, ct scan, mri scan, ultrasound scan, orthopantomogram (opg or opt), pet-ct scan, and barium swallows.
Treatment for mouth cancer:

Surgery, radiotherapy, chemotherapy and biological therapy used for mouth cancer treatment.

Preventing mouth cancer:

1) Diet: A fresh fruit and vegetables seems to reduce the risk of mouth cancer. Some researchers and doctors believe that A, C and E vitamins and minerals may help to prevent mouth cancer.

2) Drugs: Aspirin may help protect some people from certain types of cancer. Cyclooxygenase-2 (COX-2) inhibitors are a group of drugs that reduce irritation. Cyclooxygenase-2 (COX-2) helps protect from mouth cancer.

Living with mouth cancer:

a) Learning to cope with mouth cancer: Coping with mouth cancer, both practically and emotionally can be extremely difficult. At first, patient is probable to feel very upset, confused and frightened.

b) Physical changes caused by mouth cancer and its treatment: Mouth cancer and its treatment changes can be very difficult to cope with mouth cancer. Such changes can change patient self esteem and the way patient tell to close family and friends. Another problem patient may have to cope with is feeling very tired and lethargic a lot of the time, especially during and for a while after treatment. Head and neck cancer and its treatment can cause changes in speech, eating and breathing appearance.

d) Stopping smoking: Patient may be trying to stop smoking, to reduce patient risk of developing another cancer. Stop smoking can be extremely difficult especially if patient have smoked for many years.
e) Managing practically: As well as coping with the fear and anxiety that a diagnosis of cancer brings, person has to work out how to manage practically. There may be money matters to sort out. Person job or career may be affected.

1.4.2 Liver cancer

Liver cancer is the seventh most common cancer in women and the fifth in men. Liver cancer has higher rate in Europe, Australia and the United States (Liver cancer incidence and mortality worldwide in 2008 summary). Liver cancer is a cancer arising from the liver. Liver cancer arising from the liver is also known as hepatoma or primary liver cancer. The liver is made up of different cell types (for example, bile ducts, blood vessels, and fat-storing cells). However, liver cells (hepatocytes) make up 80% of the liver tissue. Thus, the majority of primary liver cancers (over 90%-95%) arises from liver cells and is called carcinoma or hepatocellular cancer.

Patients or physicians are often referring to cancer that has spread to the liver and originated in colon, stomach, pancreas, breast and lung. This type of liver cancer is called secondary liver cancer or metastatic liver cancer. Secondary liver cancer is a much more general problem around the world than primary liver cancer and frequently leads to confusion, because the term liver cancer actually can refer to either hepatocellular cancer or metastatic liver cancer.

Liver cancer is the fifth common malignant tumor worldwide. Liver cancer is closely related to the infections of hepatitis B virus (HBV) and hepatitis C virus (HCV). Hepatitis B virus and hepatitis C virus infections are somewhat common in China and other Southeast Asian countries (Jing-ting et al., 2007).
Types of liver cancer

Following are the types of liver cancer

1) Hepatocellular carcinoma (HCC)

   Hepatocellular carcinoma (HCC) is a major liver growth possessing a high mortality rate in China and Asia. While surgery is the most effective treatment for liver tumor, about 80% of hepatocellular carcinoma patients are untreatable at presentation and die early due to late diagnosis (Stella et al., 2010).

   Hepatocellular carcinoma also called hepatoma or hepatocellular carcinoma. The most common type of liver cancer is hepatocellular carcinoma. hepatocellular carcinoma is the consequence of a tumor formed by the abnormal growth of the liver-specific cells called hepatocytes. Most patients with this type of cancer are over 50 and it is more common in males than in females. Hepatocellular carcinoma can metastasize, and when it does, it frequently goes to close lymph nodes and to the lungs (Hepatocellular carcinoma).

2) Cholangiocarcinoma

   Cholangiocarcinomas are adenocarcinomas (they form in glandular tissue) but they frequently grow slowly. Cholangiocarcinomas has little specific symptoms and can be confused with other liver conditions (hepatitis or cirrhosis). Cholangiocarcinoma is hardly detected early stage. It is usually detected in advanced stages. This kind of carcinoma, also known as bile duct cancer, arises from the connective tissues of the tubes that connect the liver to the gallbladder and the gallbladder to the small intestine.

3) Hepatoblastoma
Hepatoblastoma typically grows in children and it is often diagnosed in infants between 14 and 24 months and approximately all patients are diagnosed by the age of 5. Older children and adults can develop this carcinoma, but it is very uncommon. Hepatoblastoma is usually found in only one place (unifocal). This malignancy is the result of an uncontrolled proliferation of undeveloped liver cells. Hepatoblastoma is uncommon for it to metastasize.

**Symptoms of liver cancer:**

Unfortunately, the signs and symptoms of liver cancer do not become apparent until the disease has progressed to a late stage. Many of the symptoms are nonspecific, meaning they can be vague and caused by many conditions. Following are the symptoms are liver cancer.

- Unexplained weight loss
- Persistent lack of appetite
- Persistent abdominal pain
- Persistent feeling of being very full after only a small meal
- Swelling of the abdominal area with or without breathing difficulties
- Sudden jaundice (yellow-green coloration of the skin and eyes)
- A sudden change in chronic hepatitis or cirrhosis
- Liver enlargement or a mass that can be felt in the liver area

**Stages of liver cancer:**

Stage 1 - the tumor is now in/on the liver and nowhere else.

Stage 2 - either there are several little tumors, but all within the liver, or one tumor that has reached a blood vessel.
Stage 3 - either there are various large tumors, or there is just one that has reached the main blood vessel(s). Cancer may have also reached the gallbladder.

Stage 4 - metastasis. The liver cancer has spread to other parts of the body.

**Causes and risk factors of liver cancer:**

1) Hepatitis B infection

Manami et al. (2009) examined that coffee consumption may reduce the risk of liver cancer regardless of hepatitis C virus and hepatitis B virus infection status, whereas green tea may not decrease this risk. Xiaodong et al. (2006) and Levrero (2006) studied that hepatitis B virus (HBV) infections play an important role in the development of cirrhosis and hepatocellular carcinoma (HCC). Hepatocellular carcinoma is a major growth in many parts of the world, especially in Asia and Africa (Yick-Pang et al., 2003).

Hepatitis B can be caught from infected blood products or used needles or sexual contact but is frequent among Asian children from infectivity at birth or even biting among children at play. The role of hepatitis B virus (HBV) infection in causing liver cancer is well established.

2) Hepatitis C infection: Hepatitis C infection usually requires direct contact with infected blood, blood products or needles. Hepatitis C virus is also associated with the development of liver cancer. Hepatitis C virus infection is more complex to get than hepatitis B. In several retrospective-prospective studies (looking backward and forward in time) of the natural history of hepatitis C, the average time to develop liver cancer after exposure to hepatitis C virus was about 28 years.
In hepatitis C virus patients, the risk factors for rising liver cancer include the presence of cirrhosis, older age, male gender, elevated baseline alpha-fetoprotein level (a blood tumor marker), alcohol use, and co-infection with hepatitis B virus. Some earlier studies suggested that hepatitis C virus genotype 1b may be a risk factor, but more recent studies do not support this finding.

3) Alcohol: Cirrhosis caused by chronic alcohol consumption is the most common association of liver cancer in the developed world.

4) Aflatoxin B1: Aflatoxin B1 is the most powerful liver cancer-forming chemical known. It is a creation of a mold called Aspergillus flavus, which is found in food that has been stored in a hot and humid environment. Aspergillus flavus is found in peanuts, rice, soybeans, corn and wheat.

5) Drugs, medications and chemicals: This type liver tumors that may have the potential to become malignant (cancerous). Therefore in some individuals, hepatic adenoma can develop into cancer. Female hormones (estrogens) and protein-building (anabolic) steroids are associated with the development of hepatic adenomas. Thorotrast, a previously used contrast agent for diagnostic imaging studies, caused a cancer of the blood vessels in the liver called hepatic angiosarcoma. Also, vinyl chloride, a compound used in the plastics developed, can cause hepatic angiosarcomas that appear many years after the exposure.

6) Hemochromatosis: Patients at the most risk are those who develop cirrhosis with their hemochromatosis. Liver cancer will develop in up to 30% of patients with hereditary hemochromatosis. Unfortunately, once cirrhosis is established, effective removal of excess iron will not reduce the risk of developing liver cancer.
7) Diabetes and obesity: Diabetes and obesity can cause chronic damage and growth of fat within the liver. Over the past decade, the rate of liver cancer in the United States has grown significantly, paralleling the rise in obesity.

8) Cirrhosis: Hereditary state that can cause emphysema and cirrhosis, may lead to liver cancer. Liver cancer is also highly related with hereditary tyrosinemia, a childhood biochemical abnormality that results in early cirrhosis. Persons with most types of cirrhosis of the liver are at an improved risk of developing liver cancer. Recent studies showed that the rate of liver cancer in primary biliary cirrhosis is higher that other forms of cirrhosis.

9) Family history: Mother, father, brother or sister with liver cancer have a higher risk of increasing liver cancer than others.

10) Low immunity: HIV/AIDS and weakened immune systems persons have a risk of liver cancer that is five times greater than other healthy persons.

11) Obesity: Obesity increases the risk of raising liver cancer.

12) Gender: Males have higher percentage of liver cancer than females. Males tend to smoke and abuse alcohol more than females.

13) Ababolic steroids: Ababolic steroids used by athletes and weight lifters. These male hormones, if used regularly and for long enough can raise the risk of developing liver and other cancers.

**Diagnosing liver cancer:**

1) Blood tests: The most widely used biochemical blood test is alpha-fetoprotein (AFP). Other blood test can be used as elevated liver tests (bilirubin or transaminase), reduced albumin and elevated blood urea nitrogen (BUN) or low serum sodium.
2) Imaging studies: Computerized axial tomography (CT scan), magnetic resonance imaging (MRI), positron emission tomography (PET) can be used for liver cancer diagnosis.

3) Liver biopsy or aspiration: Tissue can be sampled with a very thin needle called fine needle aspiration. When a larger needle is used to get a core of tissue, the method is called a biopsy.

4) Hepatocellular carcinoma screening: High risk individuals for hepatocellular carcinoma should have regular screenings for liver cancer.

**Treatment for liver cancer:**

Following are the types of liver cancer treatment.

Chemotherapy and biotherapy, radioembolization, biotherapy, hepatic arterial infusion of chemotherapy, chemoembolization, ablation techniques, radiofrequency ablation therapy, percutaneousethanol injection, cryoablation, stereotactic radio-surgery and proton beam therapy

**Preventing liver cancer:**

Alcohol: Long-term, regular high alcohol intake significantly increases the risk of liver cancer. It stands to reason, therefore, that moderating one’s alcohol intake can significantly reduce the risk of developing liver cancer.

**Problem of liver cancer:**

Liver cancer is the third most common cancer in the world. Liver cancer will kill almost all patients who have it within a year. In 2000, it was estimated that there were about 564,000 new cases of liver cancer worldwide, and a similar number of patients died as a result of liver cancer. Almost three-quarters liver cancer cases are found in Southeast Asia (China, Hong Kong, Taiwan, Korea, and Japan). Liver cancer is also very common in sub-Saharan Africa (Mozambique and South Africa).
The rate of liver cancer in Southeast Asia and sub-Saharan Africa is greater than 100 cases per 100,000 populations. In contrast, the rate of liver cancer in North America and Western Europe is less than five per 100,000 populations. However, the rate of liver cancer among native Alaskans is equal to that seen in Southeast Asia. This reflects the frequency of hepatitis B infection, which is the most common cause of this cancer worldwide. Recent data show, however, that the rate of liver cancer in the United States overall is rising. This increase is due primarily to rising obesity, diabetes, chronic hepatitis C.

1.4.3 Lung cancer

Lung cancer is the uncontrolled increase of abnormal cells that start off in one or both lungs and it is usually in air passages. The abnormal cells divide rapidly and form tumors. As tumors become larger and more numerous, they damage the lung’s ability to provide the bloodstream with oxygen. Tumors that remain in one place and do not appear to spread are known as “benign tumors”.

Lung cancer now ranks as the leading cause of cancer related deaths in men and women. Although ongoing to decline in men, incidence rates remain level in women following an increase throughout the 1990’s. Trends in lung cancer related death reflect trends in smoking over the past several decades (Alberg et al., 2005). The cancer often grows rapidly and spreads to other regions including lymph nodes, bone, brain, adrenal glands and the liver (Jackman & Johnson, 2005)

Types of lung cancer:

Following are the types of lung cancer
I) Small cell lung cancer

According to Jackman & Johnson (2005) small cell lung cancer is more dangerous than non-small cell lung cancer and it usually spreads faster. Risk of developing small cell lung cancer is highly associated with tobacco smoking. Only less than 5% of patients diagnosed with small cell lung cancer have never smoked. Small cell lung cancer (SCLC) accounts for about 14% of all lung cancers (Cancer facts and figures, 2010).

II) Non-small cell lung cancer (NSCLC)

Non-small cell lung cancer is the most common type of lung cancer. Out of all lung cancer patents approximately 86% cases are Non-small cell lung cancer. There are three categories of non-small cell lung cancer, based on appearance and other characteristics of the cancerous cells. Three categories are follows:

- **Adenocarcinoma**: Adenocarcinomas usually develops in the outer region of the lungs (American cancer society, 2010).
- **Squamous cell carcinoma (SCC)**: SCC is highly associated with tobacco smoking and central region of the lungs (American cancer society, 2010).
- **Large cell carcinoma (LCC)**: Large cell carcinoma is associated with rapid tumor growth and poor prognosis (American cancer society, 2010).

Other types of lung cancers include carcinoid tumors, hamartomas, adenoid cystic carcinomas, lymphomas and sarcomas (American cancer society, 2010).
Symptoms of lung cancer:

Symptoms of lung cancer not seem in early stage, it is appear in advanced stage. The American cancer society lists the following symptoms associated with advanced stage lung cancer (Cancer facts and figures, 2010). They are- sputum streaked with blood, persistent cough, voice change, chest pain, recurrent pneumonia or bronchitis. Other less common symptoms of lung cancer are difficult in swallowing, a hoarse voice, swelling of the face, swelling in the neck, finger clubbing, pain in chest or shoulder and pain or discomfort under ribs on right side and shortness of breath.

Stages of lung cancer:

There are four stages of lung cancer. They are as follows:

Stage 1 -the cancer is small and only in one region of the lung (localised)

Stage 2 and 3 -the cancer is larger and may have developed into the nearby tissues and there may be cancer cells in the lymph nodes (locally advanced)

Stage 4 -the cancer has spread to another part of the body

Causes and risk factors of lung cancer:

The causes and risk factors for smoking contain (Cancer facts and figures, 2010). Some of these and other risk factors are discussed below.

1) Family history of lung cancer

Yang et al. (2004) examined person with inherited susceptibility that chooses to smoke may be at an increased the risk of developing lung cancer than other smokers. It is possible to inherit defective genes that lead to the development of a familial form of a particular cancer type. For example, certain genes influence a person’s ability to metabolize some of the
carcinogenic chemicals in cigarette smoke. Risk is higher if an immediate family member has been diagnosed with lung cancer.

2) Smoking

Pfeifer et al. (2002) studied that smoking is leading risk factor for lung cancer. There are more than 60 molecules in cigarette smoke that are thought to be carcinogenic in humans. According to Surgeon general report 2004 smoking harmful effects on health (The health consequences of smoking, 2004). Two carcinogens highly associated with lung cancer are benzo apyrene and N-nitrosamine. These molecules attach to deoxyribonucleic acid and proteins, forming adducts. The presence of adducts increases the chance of deoxyribonucleic acid mutation and interferes with the proper function of proteins. Studies showed that the level of adducts drops when a person quits smoking (The health consequences of smoking, 2004).

3) Second-hand smoke and air pollution

Second-hand smoke highly develops risk of lung cancer. According to surgeon general reported second-hand smoke effects on health. Second-hand smoke contains over 50 cancer-causing chemicals and can lead to lung cancer and it is very harmful to the developing lungs of infants and children (The health consequences of involuntary exposure to tobacco smoke, 2006). Air pollution may reason lung cancer. One study has revealed that people living in areas with high levels of nitrogen oxides (mainly from cars and other vehicles) have their lung cancer risk increased by about a third.

4) Radon

According to Zielinski et al. (2006) radon is one of the leading risk factors for lung cancer. Radon is a naturally occurring, colorless, odorless gas. Laboratory studies with radon have shown cellular damage that
appears comparable to the damage caused by tobacco smoke, suggesting a similar mechanism of action. The structure of reactive oxygen intermediates that can cause deoxyribonucleic acid damage is a likely event in mutagenic process caused by radon (Alavanja, 2002).

5) Asbestos

Nelson & Kelsey (2002) studied that asbestos particles may help bring concentrated tobacco carcinogens to cells lining the lungs. Asbestos is a naturally happening mineral. Asbestos particles are easily inhaled into the lungs, where they cause damage to lung tissue that can lead to lung cancer. Individuals who are exposed to asbestos and tobacco smoke are at a significantly increased risk of lung cancer.

6) Chronic lung diseases such as tuberculosis

Littman et al. (2004) studied that chronic lung diseases such as asbestosis, asthma, chronic bronchitis, emphysema, pneumonia and tuberculosis have been suggested to increase risk of lung cancer. The first disease does not reason the second. Besides, the chronic diseases may help in the buildup of harmful toxins in the lungs, resulting in cell/tissue damage and causing an increase in cancer (Littman. et al., 2004).

**Diagnosis and detection of lung cancer:**

Ganti & Mulshine (2006) studied that at the time of lung cancers diagnosed, the majority of lung cancers have progressed to an advanced state. Despite ongoing study into screening technology, research shows that lung cancer death rates have not improved. The disease is sometimes caught in its early stages by tests that are performed for other reasons. Lung cancer screening is not currently routine practice (Humphrey et al., 2004). The most common methods of lung cancer detection include:
• Chest x-ray
• Chest CT (computer tomography) scan
• Bronchoscopy (Insertion of a tube into the bronchi)
• Sputum cytology (examination of cells in the phlegm)

Treatment for lung cancer:

Types of treatment for lung cancer are as follows:

- Surgery
- Radiation

Preventing lung cancer:

The following factors may help to preventing lung cancer.

1) Diet

The antioxidant vitamins A, C and E were thought to help reduce the risk of lung cancer. Researchers have been looking relationship between vitamins and lung cancer. Fresh fruit and vegetables may help to prevent cancer because they contain chemicals that can stop cell injure. But there is now strong evidence that flavonoids, found in many fruits and vegetables. Early results suggested that vitamin supplements do not help to prevent lung cancer.

2) Physical activity

Work, household and walking these physical activity may lead to a 20 to 40% decrease in lung cancer risk. One study has shown that workouts, cycling or jogging may be more helpful in reducing lung cancer risk.
3) Aspirin

Aspirin can protect people from a number of health situation found that taking aspirin daily for at least 5 years compact the risk of dying from lung cancer.

1.5 Tuberculosis

Tuberculosis (TB) is a chronic bacterial infection that usually infects the lungs. TB is primarily an airborne disease (spread by air droplets from infected people when they sneeze or cough). TB is an infection caused by slow-growing bacteria that raise best in areas of the body that have lots of blood and oxygen. There is a difference between being infected with the TB bacterium without illness and having active tuberculosis illness.

Symptoms of tuberculosis:

Different symptoms are TB is present depending upon the age of the child affected. The following are the most common symptoms for TB. However, each child may experience symptoms differently. Symptoms may include:

- In children: Fever, decrease in weight, sweating at night, swollen, cough, glands, chills, enlarged lymph nodes.
- In adolescents: Greater than three weeks cough, productive cough, pain in the chest, blood in their sputum, fatigue, swollen glands, weight loss, decrease in appetite, fever and night sweats.

Stages of tuberculosis:

Following are the stages of tuberculosis

Stage one:

The first stage starts from first week after the inhalation of the TB bacillus. Once the bacillus reaches the alveoli in the lung, it gets picked up
by macrophages. These macrophages usually sit inside the tissue of the alveoli.

Stage two:

If the macrophage cannot contain the TB bacillus, TB infection enters its second stage after about a week.

Stage three:

After the third week, the bacilli do not grow exponentially anymore, and the infection enters its third stage - it seems that at that stage, bacilli growth and destruction by macrophages are balanced.

Stage four:

Primary complex does not cure and the TB bacilli become re-activated after a period of 12 to 24 months after the initial infection, it is called stage 4 infections.

**Types of tuberculosis:**

1.5.1 **Pulmonary tuberculosis**

A TB infection of the lungs is known as pulmonary TB. Pulmonary tuberculosis is an infection caused by catching bacteria in the lungs.

**Types of pulmonary tuberculosis:**

The types of pulmonary tuberculosis may include

I) Primary tuberculosis pneumonia

Primary tuberculosis pneumonia is unusual type of TB. Patients have a high fever and prolific cough and it occurs frequently in very young children and the elderly. It is also seen in patients with HIV/ AIDS patients.
II) Tuberculosis pleurisy

Pleurisy increases shortly after first infection. A granuloma located at the edge of the lung ruptures into the pleural gap. A couple of tablespoons of fluid can be found in the pleural gap.

III) Cavitary TB

Cavitary TB locates the upper lobes of the lung. The bacteria cause progressive lung damage by forming cavities, or enlarged air spaces. This type of TB occurs in reactivation disease. Cavitary TB can occur shortly after primary infection.

IV) Miliary TB

Miliary TB is spread TB. ‘Miliary’ look like millet seeds on chest x-ray. Miliary TB can occur shortly after primary infection.

V) Laryngeal TB

TB can infect the larynx (vocal cord region). It is very infectious.

Symptoms of pulmonary TB:

- a constant cough of more than three weeks that brings up phlegm.
- breathlessness, which is usually mild to begin with and slowly gets worse
- lack of appetite and weight loss
- a high temperature of 38°C (100.4°F) or above
- night sweats
- extreme tiredness or fatigue
- unexplained pain for more than three weeks

Causes of pulmonary TB:

A cause of pulmonary TB is bacteria mycobacterium tuberculosis. Lung infection is called primary TB. Most people recover from primary TB.
infection without further evidence of the disease. The infection may continue inactive for years. Most people who build up symptoms of a TB infection initial became infected in the past. In some cases, the disease becomes active within weeks after the primary infection.

**Diagnosis of pulmonary tuberculosis:**

- Biopsy of the affected tissue (rare)
- Bronchoscopy
- Chest CT scan
- Chest x-ray
- Interferon-gamma release blood test such as the QFT-Gold test to test for TB infection
- Sputum examination and cultures
- Thoracentesis
- Tuberculin skin test (also called a PPD test)

**Treatment for pulmonary tuberculosis:**

The purpose of treatment is to treat the infection with drugs that fight the TB bacteria. Treatment of active pulmonary TB will always involve a combination of four drugs. All of the drugs are constant until lab tests show which medicines work best. Commonly used drugs include: isoniazid, pyrazinamide, ethambutol, amikacin, ethionamide, moxifloxacin, para-aminosalicylic acid and streptomycin

1.5.2 Extra-pulmonary TB

Outside of lungs TB is called extra-pulmonary TB. Many people do not understand it but TB can infect nearly any place in the body: the inner organs, bone, brain, spine etc. TB cannot infect is our hair or nails. One in five TB patients are infected by extra-pulmonary TB and it is very hard to diagnose.
Types of extra-pulmonary TB:

Types of extra-pulmonary TB are as follows:

1) Lymph node disease: Lymph nodes have macrophages that detain the bacteria. Any lymph node can harbor uncontrolled replication of bacteria. The infection can expand a tube from the lymph node to skin.

2) Tuberculosis peritonitis: Mycobacterium tuberculosis can engage the facing inside the abdominal wall, producing increased tuberculosis pleuritis fluid and the outer linings of the intestines. Enlarged fluid directs to abdominal distention and pain. Patients are rather ill and have fever.

3) Tuberculosis pericarditis: The covering nearby the heart is affected in this state. This causes the space between the pericardium and the heart to fill with fluid, impeding the heart’s ability to fill with blood and beat efficiently.

4) Osteal tuberculosis: Infection of any bone can occur. Spinal infection can lead to compression ruptures and defect of the back.

5) Renal Tuberculosis: Renal tuberculosis can source asymptomatic pyuria and can increase to the reproductive organs and influence reproduction.

6) Adrenal tuberculosis: TB of the adrenal glands can lead to adrenal deficiency. Adrenal deficiency is the failure to increase steroid production in times of stress.

7) TB Meningitis: Meninges can infect by mycobacterium tuberculosis and can be leading to permanent injury and death.

1.5.3 Active Tuberculosis

Active TB means the bacteria are active in the body. The immune system is incapable to stop these bacteria from causing illness. People with active TB in their lungs can pass the bacteria on to anyone they come into
close contact with. When a person with active TB coughs, sneezes or spits, people nearby may breathe in the tuberculosis bacteria and become infected.

**Risk for TB:**

Some people are more likely than others to get TB. This includes:

- Have HIV or another illness that weakens the immune system.
- Have close contact or living in the same house with someone who has active TB.
- Caretaker of patient who has active TB.
- Live or work in crowded places, such as prisons, nursing homes, or homeless shelters, where other people may have active TB.
- Have poor access to health care, such as homeless people and migrant farm workers.
- Abuse drugs or alcohol.
- Travel to or were born in places where untreated TB is common.
- It is important for people who are at a high risk for getting TB to get tested once or twice every year.

### 1.6 Review of related literature

It is an attempt to discover relevant material published earlier in the problem of study. The related literature to the present study has been presented in the following.

#### 1.6.1 Review of stress, anxiety and mouth cancer

Compas et al. (1994) studied anxiety/depression and stress response symptoms in adult cancer patients, spouses, and their children near the patients’ diagnoses to identify family members at risk for psychological
maladjustment. Patients’ and family members’ distress was associated to appraisals of the seriousness and stressfulness of the cancer but not related to objective characteristics of the disease. Patients and spouses did not differ in anxiety/depression or in stress-response symptoms. Both stress-response and anxiety/depression symptoms differed in children as a function of age, sex of child, and sex of patient. Adolescent girls whose mothers had cancer were the most significantly distressed.

Bergdahl & Bergdahl (2000) studied the association of medication, anxiety, depression and stress with unstimulated salivary flow and subjective oral dryness. Anxiety, depression and stress were assessed. Oral dryness was significantly related with female gender, age and intake of psychotropics, antihypertensives, analgesics, anti-asthmatics and diuretics. Subjective oral dryness and unstimulated salivary flow were significantly related with depression, trait anxiety, perceived stress, state anxiety, female gender and intake of antihypertensives. Age and medication played a very important role in female gender and psychological factors.

Llewellyn et al. (2001) examined 46 publications devoted to oral cancer in the young adult. Studies suggested that 4-6% of oral cancers arise at ages younger compare than 40 years. Some studies examining risk factors for oral cancer younger patients, who have never smoked or consumed alcohol. Information on many aspects of etiology for this disease in the young implicating familial risk, occupational, immune deficits and virus infection are meager. The range of genetic abnormality disclosed is similar to older patients, there is lack of specific studies involving younger cohorts, but predisposition to genetic instability has been hypothesized as a likely cause. Contradictory evidence is also noticed on the sex distribution and older patients.
Hassanein et al. (2001) studied influence of age, sex, place and stage of tumor and primary treatment on their functional status. They also studied the association between functional status and psychological outcome measured by the HADS, style of coping measured and social support. Young patients, women, advanced tumors stage patients, oropharyngeal tumors patients, surgery and radiotherapy patients. The bad the functional area was associated with anxiety, depression and ineffective coping style and better functional scores were weakly associated with fighting spirit, level of social support and satisfaction with that support. They have known patients at need and tinted their problems. Dealing with these problems may finally improve the perception of function after treatment of oral cancer.

Edelman (2005) studied cancer is influenced by psychological factors, and that both the start and progression of the disease are affected by stress, depression, social isolation and coping style. Although hundreds of studies reported on this issue, much of the research has been undermined by small sample size and failure to manage for confusing factors. A lot of studies failed to find any association between psychological factors and cancer. To date there is inadequate facts to conclude that psychological factors play a significant and direct role in disease processes in cancer.

Watson et al. (2008) studied the impact of stress, coping style, socioeconomic status (SES) and discrimination on health disparities in a large urban multi-ethnic sample. There was a significant interaction between coping style and socioeconomic status for oral health. Coping style was not significantly related to general health. Coping style was associated to oral health for blacks and for whites. For Whites, low active coping coupled with low SES was significantly related with poorer oral health. For blacks, active coping was associated with better self-reported
Higher perceived stress was a significant correlate of poorer general health for all ethnoracial groups and poorer oral health for hispanics and blacks. SES was directly related to general health for hispanics and whites but this relationship was mediated by perceived stress.

Chen et al. (2009) examined postoperative levels of physical and anxiety, depression and disease impact. They also examined care desires and their related factors in recently diagnosed oral cavity cancer patients. The main results showed that patients had moderate-to-severe levels of anxiety, depression and disease impact and high overall care desires in five areas, with the highest level in the “physical and daily living” area. Factors related to overall need and each unmet domain were identified. Overall care needs were predicted by anxiety, depression, cancer stage, performance status and age. Among the three categories of psychological distress, anxiety contributed the majority to predicting three areas of care needs. The results strongly suggested the need for systematic assessment and future longitudinal research.

Erin et al. (2012) studied correlates of cancer-specific stressors in children with cancer and their parents. Results revealed that mother and father self-reports were positively correlated, but mothers reported higher levels of stressors than fathers. Child and parent reports of children’s stressors were positively associated, but parents rated physical effects as more stressful while children rated role-functioning stressors as more stressful. Stressors of parents and children found positively associated with general perceived stress and posttraumatic stress symptoms.

Donovan et al. (2012) studied knowledge about depression and anxiety as they relate to pain in adult cancer patients. They reviewed the etiology and frequency of pain before summarizing the existing information about the relationship of depression and anxiety to pain in
adult cancer patients. They then provided an overview of the etiology, prevalence, methods of assessment, and management of depression and anxiety of adult cancer patients. Examples of studies conducted with cancer patients with pain and palliative care patients discussed when relevant. They concluded with future directions for addressing depression and anxiety in cancer patients with pain.

1.6.2 Review of stress, anxiety and liver cancer

Matsushita et al. (2005) studied the relationship between psychological characteristics and clinical factors of digestive cancer patients. Advanced-phase group were showed significantly higher anxiety and depression mean scores than early and middle phase group. Examination day showed a significant effect on depression; depression improved from before surgery to before discharge, and after 6 months discharge, but no significant effect on anxiety. As for the relationship between psychological trends and clinical factors, anxiety in the ‘middle age’ and ‘chemotherapy’ groups was more severe than in the ‘elderly’ and ‘no chemotherapy’ groups. These results suggested that we pay careful attention to cancer patients undergoing surgery, especially young patients who are regularly at risk of anxiety and depression.

Fu-Ling et al. (2005) investigated the impact of comorbid anxiety and depression (CAD) on quality of life (QOL) and cellular immunity changes in patients with digestive tract cancers. Subjective support was improved slightly in passive coping group, but social support, objective support, and utilization of support reduced, especially utilization of support with significance. Physical function, role function, fatigue, sleeplessness and constipation had significant changes among different groups, and passive coping group was in poor quality of life. It revealed that global health-related quality of life were positively associated with active coping;
comorbid anxiety and depression was negatively correlated with quality of life, active coping. Besides, the step-wise regression analysis suggested that utilization of support; active coping, fatigue, sleeplessness and depression were significant factors contributing to quality of life.

Shun et al. (2005) studied longitudinal, correlational study and they identified (1) changes in fatigue, symptom distress, anxiety and depression in cancer patients, and (2) factors predicting changes in fatigue across the four time points. The results indicated that the pattern of fatigue in trans-arterial chemoembolization during the first week is similar to fatigue in patients receiving chemotherapy and fatigue is related to several factors.

Patel et al. (2006) were studied the impact of age on rising or dying from liver cancer. Actuarial life-table analyses were make using age-stratified mortality rates for primary liver cancers, and for all other causes combined, obtained from population-based databases from the United States. Mortality from primary liver cancers increases with age and peaks at thirty-seven per one lack persons at ages 85-90 yr. On the other hand, mortality from other causes rises even more with age. Therefore, the relative proportion of deaths from primary liver cancer is maximal at 1.34% of all deaths at age 50 yr. Eighty percent of the maximal potential benefit of lifetime screening from age 45 yr is achieved by age 77 yr, and 90% by age 82 yr.

Goetzmann et al. (2006) investigated the psychosocial health of transplant candidates and their need for psychosocial counseling. Liver transplant patients showed significant relationship in the levels of quality of life and psychological health compared with the community normal samples. Liver transplant patients showed significantly higher levels of anxiety, but lower levels of spirituality. Approximately half of the patients expressed a need for psychosocial counseling. Advanced diseases patients
reported a lower need. Age and the personality-related “sense of coherence” correlated negatively with need for counseling. On the waiting list, psychosocial parameters and functions remained largely stable; the need for counseling decreased significantly.

Ha et al. (2010) conducted a study on long phrase hepatitis B virus infection is a major risk factor in pathogenesis of chronic liver diseases. The hepatitis B virus determined proteins, hepatitis B virus virus X protein and preventions, appear to contribute importantly to the pathogenesis of hepatocellular carcinoma. Hepatitis B virus and hepatitis C virus can harm cellular molecules, proteins and deoxyribonucleic acid during chronic infection. hepatitis B virus and hepatitis C virus are related with oxidative stress. Constant alcohol use is another important factor for oxidative stress in the liver. Earlier studies noticed that curcumin, silymarin, green tea and vitamins C and E antioxidants treatment can protect deoxyribonucleic acid from harm and control liver pathogenesis-related cascades. This review summarized the associations between oxidative stress and liver pathogenesis and focusing upon hepatitis B virus and alcohol.

1.6.3 Review of stress, anxiety and lung cancer

Benedict (1989) investigated physical, psychological and interactional features of lung cancer related with suffering. The following were reported to be the sources of most suffering: disability, pain, anxiety, changed daily activities and fatigue. There were no statistically significant differences reported sufferings among groups treated with surgery, chemotherapy or radiation. There was significant difference between groups with known metastatic disease and no known metastatic disease in the amount of suffering associated with the psychological aspects.

Penelope and Richard (2000) evaluated self-reported depression rates in patients with permanent lung cancer and to explore demographic,
clinical and quality-of-life (QOL) factors associated with depression. Female were showed higher rate than men in respect to depression. Multivariate analysis showed that functional injury was very important risk factor. Depression was increased on the injury scale. Pretreatment physical symptom burden, fatigue and clinician-rated performance status were also independent predictors.

Mary (2000) examined symptoms in adults with lung cancer. The results revealed that although major steps were made in understanding symptoms associated with lung cancer, further progress is needed to decrease the morbidity associated with uncontrolled symptoms.

Ellen et al. (2001) studied the relationships between quality of life (QOL), dyspnea in patients with lung cancer, trait anxiety and body consciousness. Socio demographic and stage, cell type and performance status cancer-related variables were evaluated. Women showed high dyspnea than men as well as older patients reported high more severe dyspnea than younger patients. There was no difference in dyspnea based on cancer stage, cell type, or performance status. Pain and anxiety scores were higher in patients with high dyspnea. Dyspnea was more severe in patients taking opioid analgesics when compared to non-opioids or no pain medications. No significant relationship was found between dyspnea, anxiety and private body consciousness.

Misthos et al. (2005) conducted a prospective analysis in order to investigate through lipid peroxidation metabolites the generation of oxygen free radicals after one-lung ventilation (OLV). Results revealed that one-lung ventilation groups were compared to all other groups. The level of oxidative stress was related to one-lung ventilation period. The removal of cancer-associated parenchyma led to malondialdehyde (MDA) level decrease postoperatively especially after pneumonectomy.
Carlsen et al. (2005) studied psychosocial aspects of lung cancer patients. The studies showed that on average one out of four lung cancer patients experience periods of depression or other psychosocial problems. Persons who are not offered treatment for their lung cancer showed high depression or other psychosocial problems than offered treatment for lung cancer. Small-cell lung cancer patients showed high depression and other psychological factors than non small-cell lung cancer patients. The degree of depression can be reduced by psychosocial interventions.

Turner et al. (2007) studied elderly patients being treated with palliative radiotherapy for lung cancer with younger patients. Psychological distress and anxiety were measured before and after treatment by HADS and a concerns checklist. There was insignificance difference were found in depression and anxiety scores after treatment. Younger patients showed more distress than the older group but it was not statistically significant. Concerns about the illness and symptoms were more possible to have been addressed by care team than were concerns about family and the future or psychosocial issues. All ages’ patients have similar concerns and levels of anxiety and depression at the same time as getting palliative radiotherapy for lung cancer.

Hansen and Sawatzky (2008) studied a comprehensive overview of stress in lung cancer patients within the situation of normal physiologic, path-physiologic, behavioral and experiential perspectives of the human response to illness model. Results revealed that lung cancer patients experience psychological and biologic stressors from a delayed cancer diagnosis, symptom management issues and social stigmatization of their illness. These stressors may reason a physiologic stress response, exacerbate the disease route and decrease the patient’s quality of life.
Rolke et al. (2008) studied health related quality of life (HRQL), mood disorders and coping abilities of primary lung cancer patients. Results showed that fatigue and painful mouth were more marked in small cell lung cancer (SCLC) than in non small cell lung cancer (NSCLC). Anxiety and depression scores on HADS were significantly not associated with European organization for research and treatment of cancer (EORTC) function scores. A reduced coping ability according to socioeconomic status was only weakly associated with anxiety and depression. These scores were poorer than that recorded in selected European organization for research and treatment of cancer (EORTC) databases from chemotherapy and radiotherapy studies.

Sharon and Hoda (2010) examined associations between self-disclosure, perceived partner disclosure, protective buffering support communication, intimacy (global and cancer-specific) and global distress among patients coping with either head and neck or lung cancer and their partners. Results revealed that both patients and their partners showed global and cancer-specific intimacy fully mediated associations between self- and perceived partner disclosure and distress; global intimacy partially mediated the association between protective buffering and distress. Evidence for moderated mediation was found; specifically, lower levels of distress were reported as a function of global and self-disclosure, perceived partner disclosure and protective buffering support communication, but these relations were stronger for partners than for patients.

Buchanan et al. (2010) examined symptoms, performance status of lung cancer patients, their supportive care needs and their perception of family’s/ friends’ anxiety. Results showed that perceived familial and self-rated personal anxiety both increased as function declined. Increased perceived worry was associated with increased dyspnoea, cough and
haemoptysis (physical symptoms), low self-esteem and feeling lack of worth. Perception of increased worry did not influence whether patients felt able to share their feelings.

Zoe et al. (2012) investigated the correlations between nutritional status, systemic inflammation and psychological distress in cancer patients. The predictive significance of the recorded parameters was also assessed. Glasgow prognostic score (GPS) and mini nutritional assessment (MNA) was significant by univariate analysis. In multivariate analysis, both mini nutritional assessment (MNA) and prognostic score (GPS) retained their significance.

Alacacioglu et al. (2012) investigated the levels of anxiety, depression and quality of life of non small cell lung cancer (NSCLC) patients receiving chemotherapy. 46.5% of the non small cell lung cancer patients were determined as depressive. Depressive patients were significantly higher than non depressive patients excluding the dyspnea, constipation, diarrhea, appetite loss and financial problems. Besides, physical, cognitive, role, emotional and social function scales and global quality of life scores of the depressive patients were significantly lower than that of the non depressive patients.

Oscar et al. (2013) evaluated the association of depression and anxiety on health related quality of life, treatment adherence and prognosis in non-small cell lung cancer patients. A total of 82 patients were included in their study for evaluated the association of depression and anxiety on health related quality of life, treatment adherence and prognosis in non-small cell lung cancer patients. At the early assessment, depression and anxiety were found in 32.9 and 34.1 % of patients, respectively. Depression was related with feminine gender and poor performance status. Depression and anxiety showed relationship with health related quality of life.
Depressive patients showed middle overall survival of 6.8 months, whereas that for non-depressed patients was 14 months. The fifty five percent depressive patients had poor treatment adherence versus forty-two percent of patients without depression.

1.6.4 Review of stress, anxiety and pulmonary TB

Kuha et al. (1985) studied the social and psychic background factors of twenty to forty-five yr old tuberculosis patients, using psychological tests and psychiatric interviews. Social class variable was shown to correlate significantly to the projective test variables. No such correlation was found between the social group variable and those obtained in the psychiatric interview or the multimodality personality investigation (MMPI) test. Subjects in the lower social classes were measured more anxious. It was assumed that the background factors characteristic of lower social classes would contribute to the unfamiliar test situation, causing reactions disturbing the test performance.

Meghnani et al. (1988) studied depression in hospitalized patients of pulmonary tuberculosis and role of anti depressants. Pulmonary tuberculosis patients were divided into two groups, matched for sex, age, economic status and severity of the disease. Eighty seven point seven percent of the study group and forty-eight point three percent of the control group showed development in their depressive ratings. Thirteen point three of study group and fifty-one point seven of the control group patients showed no development or became poorer in their depressive ratings.

Pirozynski et al. (1989) studied the significance of psychopathologic reactions and developments in patients with pulmonary TB. The analysis were based on the 20-year experience of a psychiatric unit specialized in presence such patients. The importance of a close cooperation phthisiologist-psychiatrist in individualizing the therapy choice of
psychotropic and tuberculosis drugs and avoidance of their possible incompatibilities is underlined. Given the mobility of the mental patients in the actual mental health care system and the development of some psycho-behavioral risks, such as cooperation is also necessary in the prophylactic and rehabilitation programmes as part of population health care delivery.

Vinogradov et al. (1991) examined the mental status and personality traits of newly diagnosed pulmonary TB patients. The clinical and psychodiagnostic examination revealed the following general types of a response to the disease: depressive reaction, isolation from the people around, negative attitude to treatment, social adaptation impairment, neglect of the generally accepted behavior patterns and schizoid personality traits. Pulmonary TB patients were manifested by a number of symptom complexes: hypochondriac (13.6%), anxiety-depressive (18.4%) and paranoid (9.1%). These mental disorders sternly affected the patients and made treatment of the basic disease more difficult. A long-term traditional treatment aggravated depression and hysterical and schizoid personality traits. The mental status and the types of response were shown to differ from the same reactions in somatic patients with other abnormalities.

Cohen & Williamson (1991) studied stress and infectious disease in humans. Considerable facts were found for relationship between stress and increased illness behavior. Challenging evidence was found between stress and infectious pathology. Isolates, introverts and persons lacking social skills may also be at increased risk for both illness behaviors and pathology. Psychological model of how stress influence illness, start and progression of infectious and behaviors were projected.

Wang (1998) examined the quality of life of patients with pulmonary tuberculosis. Significant differences were found between the two pulmonary tuberculosis and control groups. There were significant
association among the total mark of short-form 36 (SF-36) and the marks of the above 8 subdivisions in patients with pulmonary tuberculosis. The factors affecting the marks of short-form 36 (SF-36) of the patients were focus size of infection, counts of white blood cells, complications and duration of disease.

Pecyna (2000) studied somatic and psychic symptoms in patients with pulmonary tuberculosis complicated and non-complicated with neurotic anxiety reactions were studied. Comparative analyses showed that patients with tuberculosis complicated by neurotic anxiety reactions have markedly lower psychic and somatic immunity, probably delaying the achievement of negative sputum in the foreseen period of time. The importance of basic psychotherapy in the phthisiology and psychophysiological biofeedback were emphasized.

Ismail et al. (2001) studied anxiety and depression co-morbidity and the influence of these co-morbid conditions on disability for three clinical groups of pulmonary tuberculosis and chronic obstructive pulmonary disease (COPD). The presence of depression and anxiety was assessed by composite international diagnostic interview (CIDI). Low stage clinical groups of pulmonary tuberculosis patients were showed lower anxiety and depression than sever stage clinical groups. Patients with psychiatric comorbidity had higher disability scores than the group without psychiatric comorbidity.

Dowson et al. (2001) investigate the use of the hospital anxiety and depression scale (HADS) with recuperating chronic obstructive pulmonary disease (COPD) patients. Clinically significant anxiety was indicated in thirty-nine patients and depression in twenty-two. Anxiety and total scores (anxiety& depression) on HADS were decreased between admission and discharge. Most of the patients were showed normal or mild
psychopathology range during discharge. More severe chronic obstructive pulmonary disease associated with higher HADS anxiety and depression scores. Patients with a previous history of anxiety and depression were showed higher scores on HADS. Females were showed higher anxiety than males.

Rogacheva (2002) examined social aspects in tuberculosis among mental patients. The results were compared with those obtained in 154 control patients with pulmonary tuberculosis without mental disorders. Males fell ill with tuberculosis in the prime of their life whereas females did at their old age. Males with mental disorders were more susceptible to tuberculosis than mentally healthy patients and females with mental disorders were much less susceptible to tuberculosis than mentally healthy patients. Reproductive age women of reproductive age were the least level to tuberculosis particularly in the presence of mental disorders. They recommend the causes of female resistance to tuberculosis infection and the exact features of the hormonal background in women having mental disorders and whether estrogens may be used in the therapy of tuberculosis.

Rie et al. (2004) studied anxiety and depression in patients with chronic obstructive pulmonary disease. Results suggested that treatment of concurrent psychiatric disorder leads to development in the physical as well as the psychological state of the patient. Panic anxiety as well as generalized anxiety in chronic obstructive pulmonary disease patients was most carefully treated with newer antidepressants. Depression was treated with antidepressants according to usual clinical guidelines. There was a need for further intervention studies to determine the overall result of antidepressants in the treatment of anxiety and depression in this group of patients.
Chandrashekar (2005) studied patients suffered from tuberculosis were reported depression, psychosis, anxiety, isolation from family, increased alcohol consumption, increased smoking. Their study showed forty-six percent of psychiatric morbidity, majority were depressive disorders followed by anxiety disorders. One patient had hypomania and another one had mania. There were statistical significance between depressive disorders and duration of illness, duration of stay, anxiety disorders, treatment, different educational groups and tuberculosis patients with complications.

Ensiyeh et al. (2008) evaluated the efficacy of vitamin E-selenium supplementation on oxidative stress in newly diagnosed patients treated for pulmonary TB. Malondialdehyde levels were significantly reduced in the intervention group, while there was minimal reduction in the control group. The mean plasma level of total antioxidants was increased significantly in both the intervention and the control groups.

Georgios et al. (2008) assessed anxiety and depression in a pulmonary disease hospital. A total of forty-nine point two of the sample had moderate or severe depression and twenty-six point five had anxiety. Women had higher depression and anxiety scores than men. Depression was positively associated with anxiety, age and time from diagnosis. Patients with chronic obstructive pulmonary disease and bronchial asthma had higher depression scores than patients with tuberculosis.

Husain et al. (2008) studied the depression, anxiety and illness perceptions in patients suffering from tuberculosis in Pakistan. Out of 108 patients, 50 were depressed and 51 had anxiety. Raised depression and anxiety scores were associated with an increase in the number of symptoms reported, more serious perceived consequences and less control over their illness.
Streltsov et al. (2009) studied psycho-emotional changes in patients with pulmonary TB during therapy using psychological and neuropsychological methods. Therapy for pulmonary tuberculosis in patients was complicated by their negative psycho-emotional state frequently deteriorated by long inpatient stay. Enhancing the efficiency of rehabilitative measures in phthisiology requires active optimization of the patients’ mental state. This problem can be solved by a package of correction measures involving psychological correction with reflex therapeutic normalization of the functional state of the cortical regions of the central nervous system in patients with pulmonary tuberculosis. A noticeable psycho-emotional improvement was reliably detected 5 months after complex correction psychological and neuropsychological accompaniments of standard chemotherapy study.

Mordyk et al. (2009) was studied the impact of disease and treatment on the mental status of patients with infiltrative pulmonary tuberculosis. Anxiety and personality disorders before chemotherapy were ascertained to be a response to first diagnosed tuberculosis and forced long-term in the inpatient setting. The development of adverse reactions caused by antituberculous agents during therapy was accompanied by impairments in psychological adaptation processes, the preservation and worsening of anxiety and personality disorders.

Aamir (2010) studied co-morbid anxiety and depression among pulmonary tuberculosis patients. The require to recognize and manage psychiatric co-morbidity in tuberculosis (TB) patients in primary care settings in order to improve adherence to the treatment was now well documented. Pulmonary TB patients were evaluated for the frequency of anxiety and depression and continuation of treatment. Forty seven TB patients had severe/ moderate level of anxiety and depression according to
HADS. Fourteen TB patients with co-morbid anxiety and depression showed multi drug-resistance.

Argiro et al. (2013) studied relationship between psychiatric disorders and tuberculosis. Studies reported high prevalence rates of depression. As well as specific psychological reactions and disease perceptions and reviews indicating psychiatric complications as adverse effects of anti-TB medication were included. Data about factors affecting medication non-adherence among TB patients suggested that better management of depression, could improve the adherence rates, serving as a framework for the effective control of tuberculosis.

Athanasios (2013) investigated possible changes in levels of anxiety and depression among patients enrolled in a pulmonary rehabilitation program, along with the role of disease severity in these changes. Their study contained eighty male and twenty female patients. Mean age was 64.1 whereas mean education level was 11.3 years. Eleven patients suffered from mild, sixteen moderate, forty-seven from severe and twenty-seven from very chronic obstructive pulmonary disease. Significant decreases in anxiety and depression rates were observed. A statistically significant decrease in anxiety and depression was showed at all stages of chronic obstructive pulmonary disease.

1.6.5 Review of stress, anxiety and extra-pulmonary TB

Thao et al. (2001) investigated the influence of a large number of factors known to be associated with oxidative stress. Results suggested that no influence of age, diabetes or iron overload on oxidative markers and plasma and erythrocyte antioxidant systems was detected in these haemodialysis patients. The friendship between iron overload and oxidative status were related to the lower level of plasma ascorbate in haemodialysis patients. In addition, significant inverse correlations were observed
between duration of dialysis treatment and plasma level α-tocopherol and ubiquinol.

Mehra & Kaushal (2009) studied functional genomics reveals extended roles of the mycobacterium tuberculosis stress response factor. They showing both strains to diamide, rapidly cleaned it away and post-diamide stress culturing. Analysis of the effects of $\sigma^H$ induction in this experiment revealed a massive temporal programming of the mycobacterium tuberculosis transcriptome. Immediately after the induction of $\sigma^H$, genes belonging to the useful categories “virulence /detoxification” and “regulatory proteins” were induced in large numbers.

Gupta et al. (2010) studied mycobacterium tuberculosis and different physiological stress and growth conditions. The relative expression was also checked under acid stress, nutrient starvation and hypoxia conditions. They showed differential relative expression of the genes during different stages of growth and under stress. These results showed that the genes perform distinct roles during cell growth and cell survival under different physiological stresses, and were consistent with the genes being differentially regulated.

Chawla et al. (2012) studied mycobacterium tuberculosis regulates stress response to modulate survival and distribution in vivo. Expression analysis showed that oxidative stress repressed and induced antioxidants in mycobacterium tuberculosis. Mycobacterium tuberculosis showed increased resistance to oxidative stress in vitro and enhanced survival inside the macrophages. Findings suggested that systematically calibrates the activation of oxidative stress response in mycobacterium tuberculosis to maintain redox balance and to modulate virulence.
1.6.5 Review of stress, anxiety active TB

Todd (2002) examined relationships between social anxiety and negative outcomes as well as positive psychological functioning. All college students were divided on positive psychological functioning of positive subjective experiences, curiosity and appetitive motivations. Social interaction anxiety established unique relationships with positive psychological domains after controlling for shared variance with social observation anxiety (e.g., eating in public and public speaking) and neuroticism. Social interaction anxiety showed unique difference in positive subjective experiences, curiosity and appetitive motivations domains after separately controlling for social observation anxiety and neuroticism. On the other hand, social observation anxiety showed near-zero relationships with positive subjective experiences, curiosity and appetitive motivations domains, and neuroticism predicted positive subjective experiences, and to a lesser degree, curiosity. These data showed the unique relationship between social interaction anxiety and positive psychological functioning.

Jorawar (2004) evaluated the health related quality of life in tuberculosis patients during treatment at 0 week, 4 week and 8 week. It was observed that there was perceptible increased in the health related quality of life score at 4 week and 8 week in all categories of tuberculosis patients. It was also noticed that increased in health related quality of life score in intensive phase with sputum negative patients.

Marra et al. (2004) studied quality of life of active TB patients using focus groups and individual interviews. The mean age was 46.2 years of active TB patients and out of all patients sixty-two percent were male. Four themes were emerged from the focus groups and interviews. The first described issues related to the diagnosis of tuberculosis and sub-themes
were known as symptoms, health care provision and emotional impact. The second topic discussed TB medication factors and the sub-themes known were adverse effects, ease of administration and adherence. The third theme describes social support and functioning issues for the individuals with active TB. The fourth theme describes behavior modification and TB knowledge individuals with active TB.

Aaron et al. (2004) studied tuberculosis (TB) increased in HIV-infected patients living in Africa and Asia. Population of Africa and Asia having multiple resistances to anti-tuberculosis drugs were also a matter of anxiety. HIV-induced immune-suppression modifies the clinical presentation of TB, resulting in atypical signs and symptoms, and more frequent extra-pulmonary dissemination. The treatment of TB was very difficult to manage in HIV-infected patients.

Chand et al. (2004) studied socioeconomic impact of tuberculosis on patients and their families from the costs incurred by patients in rural and urban areas. In their study, total two hundred tuberculosis patients were consisted, 80 of whom were females. Both rural and urban female patients faced refusal by their families (8%). Twelve percent of school children stopped their studies; further 7% took up employment to support their family.

Unalan (2008) evaluated quality of life (QOL) in active and inactive tuberculosis and search relations between quality of life and state-trait anxiety level. Tuberculosis affects general health perception, bodily sense, psychological health, mental wellbeing and functionality of physical and social roles. The scores of control group were showed higher than patient groups in respect to general health perception, bodily sense, psychological health, mental happiness, physical and social roles. Quality of life scores in physical and social functionality dimensions of inactive cases were higher
than active cases. It was determined that average scores for males were higher than those for females in active cases. A insignificant difference was found between the patients and the control groups from the scores of state-trait anxiety. The score of state-trait anxiety were showed higher in active female cases who are divorced or widows, in active female cases and inactive cases who live in rural areas. There was a significant positive association between the score of state-trait anxiety and quality of life except emotional roles. Inactive patients showed insignificant relationship between the score of state-trait anxiety and general health perception, vitality, limitations of emotional role and the field of mental health.

Guo et al. (2009) assessed the health-related quality of life of tuberculosis patients. The objectives were to better understand the impact of tuberculosis and its treatment on people’s quality of life and to review quality of life instruments used in current tuberculosis research. The results showed that tuberculosis significantly impact on quality of life of patients. The anti-tuberculosis treatments were effected on physical health and mental well-being. After the patients effectively finished treatment and were cured, their quality of life stayed significantly lower than the general population.

Dhuria et al. (2009) studied the impact of tuberculosis on the quality of life and the effect after treatment with DOTS. Tuberculosis patients showed significantly lower mean scores than controls for overall quality of life. Physical and psychological factors were affected by tuberculosis. Women showed significantly better scores than men in physical and environmental areas. All quality of life scores were lowest for category II and significantly lower for the psychological and social areas. The mean scores after treatment were significantly lower than controls for social and environmental areas. The directly observed treatment short course (DOTS)
regimen recovered the quality of life and its domains; however, they remain significantly affected compared to the healthy controls.

Kruijshaar (2010) studied the impact of tuberculosis (TB) and its treatment on patients’ health status. At the time of diagnosis, the scores of all eight short-form 36 (SF-36) dimensions were significantly lower than United Kingdom general population norm scores. At the time of follow-up, scores were improved significantly, except for physical functioning and general health perception, but remained below the United Kingdom norm, except for vitality and mental health. The mean scores of anxiety and depression were high at diagnosis, and anxiety scores remained high at follow-up. Worries most regularly reported concerned patients’ own health (92%) and that of their family (82%).

Bauer et al. (2012) studied impact of tuberculosis (TB) on quantitative measures on self-reported health-related quality of life (HRQOL). Social and behavioural determinants were tested. Active TB patients constantly reported less health-related quality of life than subjects treated for long tuberculosis infection. Still, meaningful improvements in self-reported health-related quality of life throughout active TB treatment were reported by longitudinal studies.

Louw et al. (2012) investigated health related quality of life among TB retreatment and TB-HIV co-infected public primary health care patients. Kruskal-Wallis tests found significant positive effects of being TB-HIV co-infected on the areas of mental health functioning, emotional role, social function and physical role, energy and fatigue, whereas significant negative effects were found on general health, bodily pain and physical function. In multivariable analysis lower psychological distress, higher educational, having fewer chronic conditions and being HIV negative were significantly positively associated with physical health.
component summary and low psychological distress and low poverty being HIV positive were positively significantly associated with mental health component summary.

Sahbettin (2012) investigated deoxyribonucleic acid (DNA) damage along with oxidative status parameters in pulmonary tuberculosis patients. Deoxyribonucleic acid damage was assessed by comet analyze. Total oxidant status and oxidative stress index of pulmonary tuberculosis patients were higher than controls groups. Deoxyribonucleic acid damage of pulmonary tuberculosis patients was associated with total oxidant, antioxidant status and oxidative stress index. Oxidative stress and deoxyribonucleic acid damage were raised in pulmonary tuberculosis patients.

1.7 Problem of the research

The problem of the present study was worded as given below:

A COMPARATIVE STUDY OF STRESS AND ANXIETY BETWEEN CANCER PATIENTS

1.8 Objectives

The following were the objectives of this investigation:

1) To compare stress level of male cancer and tuberculosis patients.
2) To compare stress level of female cancer and tuberculosis patients.
3) To compare stress level of male and female cancer patients.
4) To compare stress level of male and female tuberculosis patients.
5) To compare stress level of cancer and tuberculosis patients.
6) To compare stress level of different stages of cancer patients.
7) To compare stress level of different stages of tuberculosis patients.
8) To study the effect of stages, gender and their interaction on stress level of cancer and tuberculosis patients.

9) To compare stress level of mouth, liver and lung cancer patients.

10) To compare stress level of pulmonary, extra-pulmonary and active tuberculosis patients.

11) To compare stress level of different age-groups of cancer and tuberculosis patients.

12) To compare stress level of different occupational groups of cancer and tuberculosis patients.

13) To compare stress level of different educational groups of cancer and tuberculosis patients.

14) To compare stress level of different socio-economic status of cancer and tuberculosis patients.

15) To compare stress level of different root of transmission groups of cancer and tuberculosis patients.

16) To compare stress level of having different habits of cancer and tuberculosis patients.

17) To compare anxiety level of male cancer and tuberculosis patients.

18) To compare anxiety level of female cancer and tuberculosis patients.

19) To compare anxiety level of male and female cancer patients.

20) To compare anxiety level of male and female tuberculosis patients.

21) To compare anxiety level of cancer and tuberculosis patients.

22) To compare anxiety level of different stages of cancer patients.

23) To compare anxiety level of different stages of tuberculosis patients.
24) To study the effect of stages, gender and their interaction on anxiety level of cancer and tuberculosis patients.

25) To compare anxiety level of mouth, liver and lung cancer patients.

26) To compare anxiety level of pulmonary, extra-pulmonary and active tuberculosis patients.

27) To compare anxiety level of different age-groups of cancer and tuberculosis patients.

28) To compare anxiety level of different occupational groups of cancer and tuberculosis patients.

29) To compare anxiety level of different educational groups of cancer and tuberculosis patients.

30) To compare anxiety level of different socioeconomic status of cancer and tuberculosis patients.

31) To compare anxiety level of different root of transmission groups of cancer and tuberculosis patients.

32) To compare anxiety level of having different habits of cancer and tuberculosis patients.

1.9 Hypotheses

The hypotheses were formulated as given below:

1) There will be found no significance difference in stress level of male cancer and tuberculosis patients.

2) There will be found no significance difference in stress level of female cancer and tuberculosis patients.

3) There will be found no significance difference in stress level of male and female cancer patients.
4) There will be found no significance difference in stress level of male and female tuberculosis patients.

5) There will be found no significance difference in stress level of cancer and tuberculosis patients.

6) There will be found no significance difference in stress level of different stages of cancer patients.

7) There will be found no significance difference in stress level of different stages of tuberculosis patients.

8) There will be found no significance effect of stages, gender and their interaction on stress level of cancer and tuberculosis patients.

9) There will be found no significance difference in stress level of mouth, liver and lung cancer patients.

10) There will be found no significance difference in stress level of pulmonary, extra-pulmonary and active tuberculosis patients.

11) There will be found no significance difference in stress level of different age-groups of cancer and tuberculosis patients.

12) There will be found no significance difference in stress level of different occupational groups of cancer and tuberculosis patients.

13) There will be found no significance difference in stress level of different educational groups of cancer and tuberculosis patients.

14) There will be found no significance difference in stress level of different socioeconomic status of cancer and tuberculosis patients.

15) There will be found no significance difference in stress level of different root of transmission groups of cancer and tuberculosis patients.

16) There will be found no significance difference in stress level of having different habits of cancer and tuberculosis patients.
17) There will be found no significance difference in anxiety level of male cancer and tuberculosis patients.

18) There will be found no significance difference in anxiety level of female cancer and tuberculosis patients.

19) There will be found no significance difference in anxiety level of male and female cancer patients.

20) There will be found no significance difference in anxiety level of male and female tuberculosis patients.

21) There will be found no significance difference in anxiety level of cancer and tuberculosis patients.

22) There will be found no significance difference in anxiety level of different stages of cancer patients.

23) There will be found no significance difference in anxiety level of different stages of tuberculosis patients.

24) There will be found no significance effect of stages, gender and their interaction on anxiety level of cancer and tuberculosis patients.

25) There will be found no significance difference in anxiety level of mouth, liver and lung cancer patients.

26) There will be found no significance difference in anxiety level of pulmonary, extra-pulmonary and active tuberculosis patients.

27) There will be found no significance difference in anxiety level of different age-groups of cancer and tuberculosis patients.

28) There will be found no significance difference in anxiety level of different occupational groups of cancer and tuberculosis patients.

29) There will be found no significance difference in anxiety level of different educational groups of cancer and tuberculosis patients.
30) There will be found no significance difference in anxiety level of different socio-economic status of cancer and tuberculosis patients.

31) There will be found no significance difference in anxiety level of different root of transmission groups of cancer and tuberculosis patients.

32) There will be found no significance difference in anxiety level of having different habits of cancer and tuberculosis patients.

1.10 Limitations of the study

The present investigation has following limitations.

1) The present investigation was limited to mouth, liver and lung types of cancer patients.

2) The present study was limited to pulmonary, extra-pulmonary and active tuberculosis patients.

3) The present research was limited to Vidharabha division of Maharashtra state.

4) This study was limited to subject’s age range between 21 to 60 yrs.

5) The present investigation was limited to patients those who have passed minimum class 5th.

6) The present study was limited to cancer and tuberculosis patients of both sex groups.

7) Study was limited to only stress and anxiety dependent variables.