Analysis of Risk Factor for Cancer and its Determinants among the Population of Bangladesh

A dissertation Submitted to the Department of Pharmacy, East West University In Conformity with the Requirements for the Degree of Bachelor of Pharmacy

SUBMITTED BY

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CERTIFICATE

This is to certify that the thesis "Analysis of Risk Factor for Cancer and its Determinants among the Population of Bangladesh" submitted to the Department of Pharmacy, East West University, Mohakhali, Dhaka in partial fulfillment to the requirements for the degree of Bachelor of Pharmacy (B.Pharm) was carried out by Md. Farshad Rafique (2007-1-70-020) and that no part of the thesis has been submitted for any other degree. I also certify that all the sources of information availed of this connection is duly acknowledge.

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Acknowledgement

I would like to thank Almighty Allah for guiding me through each step in my endeavor for education and I want to thank my parents and everybody whoever helped me by suggesting and came to realize the significance of the conducted Research.

This research paper is the outcome of many individual's hardship and co-operation through out the last year. First of all I would like to record my gratitude to my supervisor Farjana Khatun, Lecturer, Department of Pharmacy, East West University for her continuous support in the Research Program. Her perpetual energy and willingness to help me performing my research work smoothly has taken her to a greater place in my core. I was always privileged with her prompt, professional and worth full suggestions.

I am grateful to Dr. Chowdhury Faiz Hossain, Dean, Faculty of Science & Engineering, East West University for supporting my project.

I would also like to thank Sufia Islam, Ph.D, Associate Professor & Chairperson, Department of Pharmacy, East West University for supporting my project and encouraging me to do this project.

Finally again I would like to thank almighty Allah for completing this research without any complication.

This research paper is dedicated to my parents

ABSTRACT

Cancer is a abnormal mass of tissue, the growth exceed and uncordinant that of normal tissue. The cancer situation in Bangladesh is extremely alarming. In 2002, survivors per 1,000 people were below 2. The survey was conducted among the in-patients and out-patients. In this study an attempt has been made to present a descriptive view of risk factors for cancer in Bangladesh, and it is discussed in relation to age, sex, demographic and composition, occupation of the population, discussed about most common harmful habit, and correlated the harmful habit with cancer types. People living in highly industrialized and mobile tower containing communities with increased environmental risk factors are likely to have a higher probability to develop cancers. The most prevalent cancer in female is breast cancer 5.81% and in case of male the most common cancer is lung cancer 18.13%. In case of female harmful habit betel leaves causes breast cancer 5.32%. In case of male harmful habit smoking causes lung cancer 18.13%. Other cancer were found such as blood cancer 17.07%, gastrointestinal cancer 14.90%, genitourinary cancer 6.04%, neurological cancer 11.88%. This research paper helps for the analysis of risk factors for cancer and its determinants among the population of Bangladesh.

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INTRODUCTION

1. Introduction

1.1 Cancer

Cancer is a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumors and neoplasm. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. This process is referred to as metastasis. Metastases are the major cause of death from cancer.(1)

Cancer imposed a heavy burden on the public health and poses a challenge to science. While the century-long trend of increasing cancer mortality in this country was reversed in the mid-1990s, cancer remains the second leading cause of death.(2)

Cancer is a leading cause of death worldwide and accounted for 7.6 million deaths (around 13% of all deaths) in 2008. The main types of cancer are:

- Lung Cancer (1.4 million deaths)
- Stomach Cancer (740 000 deaths)
- Liver Cancer (700 000 deaths)
- Colorectal Cancer (610 000 deaths)
- Breast Cancer (460 000 deaths).

About 70% of all cancer deaths occurred in low- and middle-income countries. Deaths from cancer worldwide are projected to continue to rise to over 11 million in 2030.(3)

Cancer poses serious health problems both in developed and developing countries. The prevention and control of cancer in developing countries deserve urgent attention since the disease is expected to double in these countries in the next 20 to 25 years. The problem of cancer in Bangladesh is a particularly acute because of poverty, illiteracy, and other diseases associated with poor nutrition and lack of basic knowledge of people about health matters. (4)

1.2 Causes of Cancer

Cancer occurs when a genetic mutation causes old or damaged cells to continue to divide and multiply uncontrollably. The underlying cause of this varies depending on the specific type of cancer. In many cases, the underlying cause of cancer is not known.

Some causes of cancer include inherited genes that increase susceptibility to cancer.

Environmental factors, including exposure to certain chemicals, such as those found in pollution and tobacco. Tobacco smoking is the major cause of lung cancer. About 85 percent of lung cancer cases are caused by smoking. This cancer causes death to about 35 percent of all cancer patients in developed countries and about 21 percent of all cancer patients among men in Bangladesh. Tobacco chewing is an important cause of oral cancer and account for about 13 percent of all cancers in Bangladesh. Most people of the country generally use tobacco products such as raw tobacco leaf, Jarda, Kimam, etc with betel leaf, betel nut, slaked lime and catechu that are responsible for oral cancer.

Use of Gul and Khaini are responsible for cancers of gum and cheek. Use of snuff may cause nasal cancer as well. Bad oral hygiene and poor dental care are also responsible for cancer of oral cavity.

Use of tobacco is not only responsible for causing cancers of the lung and oral cavity, but is also responsible for causing cancers of the larynx, pharynx, esophagus, pancreas, kidney and bladder.

Cervical cancer, the most common cancer-affecting women of Bangladesh is probably due to repeated childbirth resulting in lacerations of the cervix and cervicitis. This cancer can be minimised by limiting the number of children. Early sex life, early marriage, multiple sexual partners, venereal disease, Herpes virus, human papilloma virus, low socio-economic status, and poor personal hygiene are also associated with higher incidence of cervical cancer. Prostitutes have very high risk of cervix cancer.

The practice of circumcision greatly reduces the risk of penile cancer in males and to some extent of cervical cancer in female partners.

Breast cancer is the second commonest cancer among women of Bangladesh. Nulliparous women, daughters of breast cancer patients, and those who do not breast-feed their babies and indulge in high-fat diet suffer more from breast cancer.

Cancer of oral cavity, larynx, oesophagus, and particularly of liver occur more frequently among heavy drinkers of alcohol, especially when accompanied by smoking and chewing of tobacco. Hepatitis B virus is also responsible for liver cancer against which a successful vaccine has been developed and is in use. Aflatoxins produced by the fungus developed in most carbohydrate foods in hot, humid climates are highly carcinogenic for the liver.

High fatty food may cause certain cancers such as breast, colo-rectum, uterus and prostate cancer. High fibrous food, on the other hand, helps reduce the risk of colon cancer and foods rich in vitamins A, C, E for cancers of larynx and lung.(5)

1.3 Risk factors for cancer

Cancer is a group of more than 100 different diseases, each with their own set of risk factors. The risk of developing cancer increases as age along with gender, race and personal and family medical history, are risk factors for cancer. Other risk factors are largely related to lifestyle choices, while certain infections, occupational exposures and some environmental factors can also be related to developing cancer. Triggering agents include chemicals such as those found in cigarette smoke, other forms of smoke, asbestos dust, exhaust fumes, and many industrial chemicals. Some viruses can also trigger the cancerous growth of cells, as can x-rays and radioactivity. On the basis of strength of evidence in the scientific literature, we distinguish below between known and possible risk factors by site.

1.3.1 Oral Cavity & Pharynx

1.3.1.1 Mouth: Tobacco and alcohol usage accounts for most mouth cancers. Another risk factor is a diet low in fruits and vegetables and possible risk factors are poor tooth development and oral hygiene, trauma due to ill-fitting dentures or jagged teeth, use of mouthwashes with high alcohol content, and iron-deficiency anemia. (2)

1.3.2 Digestive System

1.3.2.1 Colorectal: Risk factors are personal or family history of colorectal polyps or inflammatory bowel disease, certain rare hereditary conditions, and a diet high in fat and/or low in fiber, fruits and vegetables. Possible risk factors are physical inactivity, alcohol consumption, obesity, and smoking. Risk may be reduced by estrogen replacement therapy, non-steriodal anti-inflammatory drugs (e.g. aspirin, ibuprofen), dietary calcium and vitamin D.

1.3.2.2 Pancreas: Risk factors are cigarette smoking and possibly alcohol, coffee, or tea consumption, diabetes, chronic pancreatitis, cirrhosis, allergies, diet high in meat or butter fat.

1.3.2.3 Stomach: Risk factors are dietary nitrites (in pickled, salted, and smoked foods), pernicious anemia, and diet low in fruits and vegetables. Possible risk factors are infection with Helicobacter pylori, high doses of ionizing radiation, cigarette smoking, and genetic factors.

1.3.2.4 Liver: Risk factors are chronic infection with hepatitis B or C virus, cirrhosis of the liver (chronic liver injury, usually due to alcohol abuse), aflatoxin ingestion (produced by a common mold that invades poorly stored peanuts and other foods), and occupational exposure to thorium dioxide or vinyl chloride. Possible risk factors are use of steroids, smoking, and some inherited metabolic diseases(e.g. hemochromatosis).

1.3.2.5 Esophagus: The most important risk factors are tobacco use (cigarettes, cigars, pipes), and excessive alcohol use along with the syndrome, Barrett's esophagus. Possible

risk factors are obesity, inadequate diet, poor nutrition, decreased levels of certain nutrients (carotene, ascorbic acid, riboflavin, niacin, thiamin, zinc, magnesium, and selenium), and insufficient consumption of fruits and vegetables.

1.3.2.6 Gallbladder: The most important risk factor is gallstones; factors related to stone formation are increasing age, being female, being pregnant, certain ethnicity, obesity, use of estrogen-containing drugs and high fat and caloric intake.

1.3.3Respiratory System

1.3.3.1 Lung: Tobacco smoking is responsible for nearly 90% of all lung cancers. Other contributing risk factors are smoking cigars or pipes and environmental tobacco smoke (second-hand smoke). High doses of ionizing radiation, residential radon exposure and occupational exposure to mustard gas, chloromethyl ethers, inorganic arsenic, chromium, nickel, vinyl chloride, radon, asbestos or byproducts of fossil fuel are also thought to increase risk. Possible risk factors are air pollution and insufficient consumption of fruits and vegetables.

1.3.3.2 Larynx : Most cases are caused by cigarette smoking. Other risk factors are alcohol and occupational exposure to asbestos or mustard gas.

1.3.4 Skin

1.3.4.1 Melanoma: risk factors are excessive exposure to ultraviolet radiation (sunlight), fair skin, history of severe sunburns, personal or family history of melanoma, multiple moles or atypical moles (colored skin spots), giant congenital moles, xeroderma pigment sum (a rare hereditary disease), personal history of melanoma, and reduced immune function due to organ transplants or HIV infection. Melanoma occurs almost exclusively among whites.

1.3.4.2 Non-melanoma: risk factors are ultraviolet radiation (sunlight), fair skin, high doses of ionizing radiation, occupational exposure to arsenic, polycyclic hydrocarbons (coal tars, pitches, asphalt, creosote, soot, lubricating and cutting oils) and rare hereditary

diseases such as multiple basal cell carcinoma syndrome, xeroderma pigmentosum, and albinism. Possible risk factors are burn scars, chronic infections, and photosensitizers in tanning aids, cosmetics, and medicines.

1.3.5 Breast

For women, risk factors are family history (especially mother or sister) of breast cancer, personal history of breast, ovarian, or endometrial cancer, susceptibility genes (BRCA-1, BRCA-2), some forms of benign breast disease (atypical hyperplasia), higher education and socioeconomic status, menstruation at an early age, late menopause, never bearing children, first child born after age 30, high doses of ionizing radiation, long term use of post-menopause estrogens and progestins, obesity after menopause, and excessive alcohol consumption.

Possible risk factors are dietary fat and physical inactivity. For men, risk factors include increasing age, family history, radiation exposure, and having high levels of estrogen due to inherited gene mutations or treatments. Possible risk factors include gynecomastia and obesity.

1.3.6 Reproductive Organs

1.3.6.1 Prostate : Risk factors are some types of prostatic hyperplasia and a family history, especially a father or brother. Possible risk factors are a diet high in animal fat, obesity, hormonal factors, a sexually transmitted agent, smoking, alcohol, and physical inactivity. Black males have much higher prostate cancer rates than white males.

1.3.6.2 Endometrium : High cumulative exposure to estrogens including never bearing children or bearing few children, menstruation beginning at an early age, failure to menstruate, late menopause, estrogen replacement therapy are major risk factors.

Also, use of tamoxifen, infertility, obesity, diabetes, hypertension, gallbladder disease, and Stein-Leventhal syndrome are known risk factors. Possible risk factors are dietary fat and hereditary non-polyposis colon cancer.

1.3.6.3 Ovary : Risk factors are personal history of breast cancer, family history of breast or ovarian cancer, susceptibility genes (BRCA-1, BRCA-2), never bearing children, and hereditary non-polyposis colon cancer. A possible risk factor is dietary fat. Risk may be reduced by tubal ligation and hysterectomy.

1.3.6.4 Cervix : Risk factors are infection with human papilloma viruses (HPV), early age at first sexual intercourse, many sexual partners or partners who have had many sexual partners, multiple births, long-term oral contraceptive use, and cigarette smoking. Possible risk factors are certain vitamin deficiencies and hormonal factors.

1.3.7 Urinary System

1.3.7.1 Bladder: The most important risk factor is cigarette smoking; other risk factors are occupational exposure to benzidine and 2-naphthylamine and occupations in the dye, leather or rubber industry. Possible risk factors are heavy coffee consumption, bladder infection with schistosoma haematobium (a parasitic flatworm), treatment with chlornaphazine or cyclophosphamide (anti-cancer drugs), long-term use of pain killers containing phenacetin, urinary tract infections or low urine flow, dietary factors, tobacco use other than cigarettes, and genetic factors.

1.3.7.2 Kidney : Cigarette smoking is the most important risk factor; others are obesity, abuse of analgesics (especially phenacetin-containing pain relievers), and occupational exposure to arsenic.Possible risk factors are regular use of prescription diuretics and increased meat consumption.

1.3.8 Lymphoma/Leukemia/Multiple Myeloma

1.3.8.1 Non-Hodgkin: Risk factors are reduced immune function due to organ transplants or Lymphoma infection with HIV, Epstein-Barr or human T-cell leukemia/lymphoma virus.Possible risk factors are occupational exposure to pesticides, herbicides, or organic solvents.

1.3.8.2 Hodgkin: Risk factors are infectious mononucleosis and Epstein-Barr virus infection.

1.3.8.3 Lymphoma: Possible risk factors are family history of Hodgkin lymphoma especially among siblings and genetic factors.

1.3.8.4 Leukemia: Risk factors are family history, high doses of ionizing radiation, alkylating drugs used to treat cancer and other diseases, human T-cell leukemia/ lymphoma virus I infection, Down=s syndrome or other genetic abnormalities, and occupational exposure to benzene. Possible risk factors are exposure to electromagnetic fields, pesticides, smoking, and several immune-related diseases.

1.3.8.5 Multiple myeloma: High dose of ionizing radiation is a risk factor. Possible risk factors are repeated infections, allergic conditions, autoimmune disease, genetic factors, cigarette smoking, farming, and occupational exposure to benzene.

1.3.9 Other

1.3.9.1 Brain: Risk factors are genetic factors, certain rare inherited syndromes such as neurofibromatosis, being a parent or sibling of a child with brain cancer, high doses of ionizing radiation, and occupational exposure to certain aromatic hydrocarbon compounds, bis-chloromethyl ether, vinyl chloride, and acrylonitrile.

Possible risk factors are exposure to electromagnetic fields, exposure to farm animals and pets, severe head trauma, loud noise, and N-nitroso compounds in the diet, cigarettes, and alcohol.

1.3.9.2 Thyroid: Risk factors are high doses of ionizing radiation and goiter.(6)

1.4 Cancer in Children

Cancer is rare in childhood (an estimated 9,510 cases occur in the United States each year), but it is still a leading cause of death in this age group in developed countries. Acute leukemia is the most common form of cancer for children in most countries,

especially in early childhood. In tropical Africa, lymphomas are more common. Brain tumors generally account for one-fifth to one-fourth of childhood cancers. Carcinomas, the common epithelial cancers of adults, are rare in children. Sarcomas of bones and soft tissue are much more common, accounting for more than 10 percent of cancers, compared with less than 2 percent in adults. Hereditary cancer syndromes account for the occurrence of several types of childhood cancer (especially retinoblastoma and Wilms tumor). A few environmental exposures have been identified as risk factors, mostly related to infectious agents. These are responsible for the frequency of Kaposi sarcoma and Burkitt lymphoma in Africa, for example.

There has been an increase in the incidence of childhood cancer in the United States and in Europe since the 1970s, although this may have ceased since the 1990s. However, this has been accompanied by great improvements in the treatment of childhood cancers, with resultant benefits in terms of survival. Mortality from cancer in childhood is therefore falling in the developed world. (7)

1.5 Types and Classification

There are two main types of cancer:

- Primary cancer is the first type of cancer that develops, or the original cancerous tumor in the body.
- Secondary cancer (metastatic cancer) is caused by a primary cancer that has begun in one tissue or organ of the body and spread to another site. For example, primary lung cancer or breast cancer can spread to the brain, causing secondary brain cancer. Cancer can metastasize by growing directly into nearby tissues and organs or by spreading through the circulatory system or lymphatic system to other areas of the body.

Classification of cancer determines appropriate treatment and helps determine the prognosis. Cancer develops progressively from an alteration in a cell's genetic structure. This change (mutation) results in cells with uncontrolled growth patterns. Cancer classification is made according to the site of origin of the malignant cells; the histology, or cell analysis (called grading); and the extent of the disease (known as staging).

This classification describes the type of tissue in which the cancer cells begin to develop.

Some common examples of site of origin classification:

- Adenocarcinoma–originates in glandular tissue
- Blastoma–originates in embryonic tissue of organs
- Carcinoma–originates in epithelial tissue (i.e., tissue that lines organs and tubes)
- Leukemia–originates in tissues that form blood cells
- Lymphoma–originates in lymphatic tissue
- Myeloma–originates in bone marrow
- Sarcoma–originates in connective or supportive tissue (e.g., bone, cartilage, muscle) (8)

1.6 Mechanism of Cancer Development

Cellular responses to DNA damage constitute one of the most important fields in cancer biology. Damage to cellular DNA causes cancer. There are various types of DNA lesion that can occur, a variety of different repair mechanisms exist. In addition to directly repairing DNA breaks or adducts, cells respond to DNA damage by halting cell-cycle progression or by undergoing programmed cell death.

Normal cells divide, mature and die. Cancer develops when abnormal cells in the body do not follow this progression. Cancer begins with damage to one or more genes in a single cell. This damage can cause the cell to divide incorrectly and to produce abnormal cells. If the body's immune system does not repair or destroy these abnormal cells, then the newer cells can become even more abnormal, eventually producing cancer cells. Cancer cells also divide more rapidly than do normal cells and usually do not function normally.

Eventually, cancer cells may begin to pile on top of nearby cells, forming a mass of tissue called a tumor. The process by which a normal cell becomes a cancerous tumor usually takes years.

The term "stage" describes the extent or severity of a person's cancer. During early stages of cancer, a person may have only one small, cancerous tumor. More advanced stages may involve a larger tumor, the spread of cancer to lymph nodes, or the spread of cancer to other parts of the body (metastasis). (9)

Cancer is fundamentally a disease of failure of regulation of tissue growth. In order for a normal cell to transform into a cancer cell, the genes which regulate cell growth and differentiation must be altered.(10) The affected genes are divided into two broad categories. Oncogenes are genes which promote cell growth and reproduction. Tumor suppressor genes are genes which inhibit cell division and survival. Malignant transformation can occur through the formation of novel oncogenes, the inappropriate over-expression of normal oncogenes, or by the under-expression or disabling of tumor suppressor genes. Typically, changes in *many* genes are required to transform a normal cell into a cancer cell.(11)

Genetic changes can occur at different levels and by different mechanisms. The gain or loss of an entire chromosome can occur through errors in mitosis. More common are mutations, which are changes in the nucleotide sequence of genomic DNA.(12) Some environments make errors more likely to arise and propagate. Such environments can include the presence of disruptive substances called carcinogens, repeated physical injury, heat, ionising radiation, or hypoxia.(13)

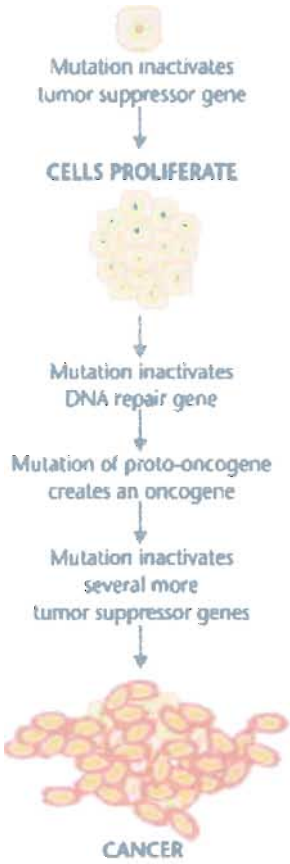

Figure 1.1: Pathophysiology of cancer

1.6.1 Tumor Grading

Grading involves examining tumor cells that have been obtained through biopsy under a microscope. The abnormality of the cells determines the grade of the cancer. Increasing abnormality increases the grade, from 1–4. Cells that are well differentiated closely resemble mature, specialized cells. Cells that are undifferentiated are highly abnormal, that is, immature and primitive.

Grade 1 Cells slightly abnormal and well differentiated

Grade 2 Cells more abnormal and moderately differentiated

Grade 3 Cells very abnormal and poorly differentiated

Grade 4 Cells immature and undifferentiated. (14)

1.7 Role of Genes in Cancer Development

The following types of genes contribute to cancer:

- Tumor suppressor genes are protective genes. Normally, they suppress (limit) cell growth by monitoring the rate at which cells divide into new cells, repairing mismatched DNA (a cause of mutations), and controlling cell death. When a tumor suppressor gene is mutated (due to heredity or environmental factors), cells continue to grow and can eventually form a tumor. *BRCA1*, *BRCA2*, and *p53* are examples of tumor suppressor genes. In fact, nearly 50% of all cancers involve a missing or damaged *p53* gene.
- Oncogenes turn a healthy cell into a cancerous one. *HER2* common oncogenes.
- DNA repair genes fix any mistakes made when DNA is replicated (copied). Mistakes that aren't fixed become mutations, which may eventually lead to cancer, especially if the mutation occurs in a tumor suppressor gene or oncogene.

Cancer develops when several genes in a cell become mutated in a way that overrides the checks and balances of the cell. However, many cancers cannot be tied to a specific gene, and some genes may interact in unpredictable ways with other genes or factors in the environment to cause cancer. In the future, doctors hope to learn more about the role of genetic changes in the development of cancer, which may lead to improved cancer treatment and prevention strategies. (15)

1.8 Stages of Cancer

A cancer's stage is based on the primary tumor's size and location in the body and whether it has spread to other areas of the body. A number of different staging systems are used to classify tumors. The TNM system is one of the most widely used staging systems. This system has been accepted by the International Union Against Cancer (UICC) and

the American Joint Committee on Cancer (AJCC). Most medical facilities use the TNM system as their main method for cancer reporting.

The TNM system is based on the extent of the tumor (**T**), the extent of spread to the lymph nodes (**N**), and the presence of distant metastasis (**M**). A number is added to each letter to indicate the size or extent of the primary tumor and the extent of cancer spread.

Table 1.1: Primary tumor

TX	Primary tumor cannot be evaluated
T0	No evidence of primary tumor
Tis	Carcinoma in situ (CIS; abnormal cells are present but have not spread to neighboring tissue; although not cancer, CIS may become cancer and is sometimes called preinvasive cancer)
T1, T2, T3, T4	Size and/or extent of the primary tumor

Table 1.2: Regional lymph nodes

NX	Regional lymph nodes cannot be evaluated
N0	No regional lymph node involvement
N1, N2, N3	Involvement of regional lymph nodes (number of lymph nodes and/or extent of spread)

Table 1.3: Distant metastasis

MX	Distant metastasis cannot be evaluated
M0	No distant metastasis
M1	Distant metastasis is present

For example, breast cancer classified as T3 N2 M0 refers to a large tumor that has spread outside the breast to nearby lymph nodes but not to other parts of the body. Prostate cancer T2 N0 M0 means that the tumor is located only in the prostate and has not spread to the lymph nodes or any other part of the body.

For many cancers, TNM combinations correspond to one of five stages. Criteria for stages differ for different types of cancer. For example, bladder cancer T3 N0 M0 is stage III, whereas colon cancer T3 N0 M0 is stage II. (16)

Table 1.4: Stage and definition

Stage	**Definition**
Stage 0	Carcinoma in situ.
Stage I, Stage II, and Stage III	Higher numbers indicate more extensive disease: Larger tumor size and/or spread of the cancer beyond the organ in which it first developed to nearby lymph nodes and/or organs adjacent to the location of the primary tumor.
Stage IV	The cancer has spread to another organ(s).

1.9 The symptoms of cancer

Symptoms of cancer vary depending on the specific type of cancer, its location, its stage of advancement, and other factors. For many cancers, there are no early symptoms. In some cases, symptoms do not appear until cancer has grown to an advanced stage and spread (metastasized) to other organs and tissues.

Although cancers differ greatly, there are a few cancer symptoms that are commonly experienced by most cancer patients. Identify mesothelioma symptoms and varying types of mesothelioma.

These most common cancer symptoms include:

- **Persistent Fatigue** is one of the most commonly experienced cancer symptoms. It is usually more common when the cancer is advanced, but still occurs in the early stages.
- **Pain** is normally present when the cancer has progressed. However, it can be indicative early on of some cancers, such as bone cancers.
- **Fever:** Most cancer patients experience a fever at some point. It may be due to the disease affecting their immune system, the cancer itself, or a response to treatment. Fever normally occurs as the cancer progresses.
- **Unintentional Weight loss**: Losing 10 or more pounds without dieting or intending to lose weight can be one of the first symptoms experienced with cancer.
- **Changes to the Skin** such as jaundice, darkening of the skin, abnormal hair growth, reddening, and skin itchiness can indicate certain types of cancers.

Therefore taking all the above cancer signs into consideration, roughly cancer symptoms can be categorized into three groups:

- **Local symptoms**: unusual lumps or swelling (tumor), hemorrhage (bleeding), pain and/or ulceration. Compression of surrounding tissues may cause symptoms such as jaundice.

- **Symptoms of metastasis** (spreading): enlarged lymph nodes, cough and hemoptysis, hepatomegaly (enlarged liver), bone pain, fracture of affected bones and neurological symptoms. Although advanced cancer may cause pain, it is often not the first symptom.

- **Systemic symptoms**: weight loss, poor appetite and cachexia (wasting), excessive sweating (night sweats), anemia and specific paraneoplastic phenomena, i.e. specific conditions that are due to an active cancer, such as thrombosis or hormonal changes.

There are over one hundred different types of cancer. They are all unique with their own symptoms. Each cancer affects the body in a different way. Every single item in the above list can be caused by a variety of conditions. The following are symptoms that may occur in some most common cancer types:

- **Breast**: A lump or thickening of the breast; discharge from the nipple; change in the skin of the breast; a feeling of heat; or enlarged lymph nodes under the arm

- **Bladder**: Blood in the urine, pain or burning upon urination; frequent urination; or cloudy urine

- **Bone**: Pain in the bone or swelling around the affected site; fractures in bones; weakness, fatigue; weight loss; repeated infections; nausea, vomiting, constipation, problems with urination; weakness or numbness in the legs; bumps and bruises that persist

- **Brain:** Dizziness; drowsiness; abnormal eye movements or changes in vision; weakness, loss of feeling in arms or legs or difficulties in walking; fits or convulsions; changes in personality, memory or speech; headaches that tend to be

worse in the morning and ease during the day, that may be accompanied by nausea or vomiting

- **Colorectal:** Rectal bleeding (red blood in stools or black stools); abdominal cramps; constipation alternating with diarrhea; weight loss; loss of appetite; weakness; pallid complexion

- **Kidney:** Blood in urine; dull ache or pain in the back or side; lump in kidney area, sometimes accompanied by high blood pressure or abnormality in red blood cell count

- **Lung:** Wheezing, persistent cough for months; blood-streaked sputum; persistent ache in chest; congestion in lungs; enlarged lymph nodes in the neck

- **Leukemia:** Weakness, paleness; fever and flu-like symptoms; bruising and prolonged bleeding; enlarged lymph nodes, spleen, liver; pain in bones and joints; frequent infections; weight loss; night sweats

- **Ovarian:** Abdominal swelling; in rare cases, abnormal vaginal bleeding; digestive discomfort

- **Oral:** A lump in the mouth, ulceration of the lip, tongue or inside of the mouth that does not heal within a couple of weeks; dentures that no longer fit well; oral pain, bleeding, foul breath, loose teeth, and changes in speech

- **Prostate:** Urination difficulties due to blockage of the urethra; bladder retains urine, creating frequent feelings of urgency to urinate, especially at night; bladder not emptying completely; burning or painful urination; bloody urine; tenderness over the bladder; and dull ache in the pelvis or back

- **Pancreatic:** Upper abdominal pain and unexplained weight loss; pain near the center of the back; intolerance of fatty foods; yellowing of the skin; abdominal masses; enlargement of liver and spleen

- **Stomach**: Indigestion or heartburn; discomfort or pain in the abdomen; nausea and vomiting; diarrhea or constipation; bloating after meals; loss of appetite; weakness and fatigue; bleeding - vomiting blood or blood in the stool

- **Uterine:** Abnormal vaginal bleeding, a watery bloody discharge in postmenopausal women; a painful urination; pain during intercourse; pain in pelvic area. (17)

1.10 Cancer Screening and Detection

Screening for cancer is examination (or testing) of people for early stages in the development of cancer even though they have no symptoms. Scientists have studied patterns of cancer in the population to learn which people are more likely to get certain types of cancer. They have also studied what things around us and what things we do in our lives may cause cancer. This information sometimes helps doctors recommend who should be screened for certain types of cancer, what types of screening tests people should have, and how often these tests should be done. Not all screening tests are helpful, and most have risks.

If your doctor suggests certain cancer screening tests as part of your health care plan, this does not mean he or she thinks you have cancer. Screening tests are done when you have no symptoms. Since decisions about screening can be difficult, you may want to discuss them with your doctor and ask questions about the potential benefits and risks of screening tests and whether they have been proven to decrease the risk of dying from cancer.(18)

1.11 Prevention of cancer

Doctors cannot always explain why one person gets cancer and another does not. However, scientists have studied general patterns of cancer in the population to learn what things around us and what things we do in our lives may increase our chance of developing cancer.

Anything that increases a person's chance of developing a disease is called a risk factor; anything that decreases a person's chance of developing a disease is called a protective factor. Some of the risk factors for cancer can be avoided, but many cannot. For example, although you can choose to quit smoking, you cannot choose which genes you have inherited from your parents. Both smoking and inheriting specific genes could be considered risk factors for certain kinds of cancer, but only smoking can be avoided. Prevention means avoiding the risk factors and increasing the protective factors that can be controlled so that the chance of developing cancer decreases.

Although many risk factors can be avoided, it is important to keep in mind that avoiding risk factors does not guarantee that you will not get cancer. Also, most people with a particular risk factor for cancer do not actually get the disease. Some people are more sensitive than others to factors that can cause cancer. Talk to your doctor about methods of preventing cancer that might be effective for you.

Prevention of cancer At present, about one-third of the cancers affecting people can be prevented; one third can be cured, and palliation is possible for the rest. Recent data from developed countries show that there has been a decline in all cancer deaths except lung cancer. Early diagnosis, improved treatment, and appropriate change in life style have led to this development. Rise of total cancer deaths is due to consumption of tobacco.

Prevention of cancer may be primary or secondary. Primary prevention indicates steps to be taken before the development of the disease, for which one must know the causes of cancer, must take measures to avoid them and must make appropriate changes in ones lifestyle.

Secondary prevention of cancer involves early detection of the disease through increased awareness achieved by imparting knowledge of early signs and symptoms of cancer, by screening through promotion of self-examination of breast and mouth, by periodic check-ups, eg X-ray of chest, mammography, and by other special examinations.(19)

1.12 Treatment of cancer

Treatment of cancer begins with seeking regular medical care throughout your life. Regular medical care allows a health care professional to best provide early screening tests, such as mammography, Pap smears, digital rectal exams, and fecal occult blood tests. Regular medical care also provides an opportunity for your health care professional to evaluate symptoms and your risks of developing cancer, and promptly order diagnostic testing. These measures may increase the chances of detecting cancer in its earliest, most curable stage.

The goal of treatment of cancer is to permanently cure the cancer or to bring about a complete remission of the disease. Remission means that there is no longer any sign of the disease in the body, although it may recur or relapse later.

Cancer treatment plans use a multifaceted approach that is individualized to the type of cancer and stage of advancement; your age, medical history, and coexisting diseases or conditions; and other factors.

Treatment for cancer is often best planned and delivered by a team of specialists in cancer care. These specialists generally include medical oncologists, radiation oncologists, surgical oncologists, and registered nurses who specialize in cancer care.

Cancer treatment may include some combination of the following:

- Chemotherapy
- Dietary counseling to help people with cancer maintain their strength and nutritional status
- Pain medications
- Palliative care to improve the overall quality of life for families and patients with serious diseases
- Participation in a clinical trial to test promising new therapies and treatments for cancer

- Physical therapy to help strengthen the body, increase alertness, reduce fatigue, and improve functional ability during and after cancer treatment
- Radiation therapy
- Regular follow-up care to monitor your treatment and progress and to address any problems or complications promptly
- Surgery to remove a cancerous tumor or to treat complications of cancer, such as an intestinal obstruction

1.13 Types of treatment

1.13.1 Surgery

Surgery is therapy to remove the cancerous tumor; the surgeon may also remove some of the surrounding tissue and lymph nodes near the tumor. Sometimes surgery is done on an outpatient basis, or the patient may have to stay in the hospital.

1.13.2 Radiation therapy

Radiation therapy (also called radiotherapy) uses high-energy rays to kill cancer cells. For some types of cancer, radiation therapy may be used instead of surgery as the primary treatment. Radiation therapy also may be given before surgery (neoadjuvant therapy) to shrink a tumor so that it is easier to remove. In other cases, radiation therapy is given after surgery (adjuvant therapy) to destroy any cancer cells that may remain in the area. Radiation also may be used alone, or along with other types of treatment, to relieve pain or other problems if the tumor cannot be removed.

1.13.3 Chemotherapy

Chemotherapy is the use of drugs to kill cancer cells. The doctor may use one drug or a combination of drugs. Example: Paclitaxel a solvent-free chemotherapy drug that may help reduce side effects normally associated with other solvent-based treatments, as well as to allow for higher drug dosages.

1.13.4 Hormone therapy

Hormone therapy is used against certain cancers that depend on hormones for their growth. Hormone therapy keeps cancer cells from getting or using the hormones they need. This treatment may include the use of drugs that stop the production of certain hormones or that change the way they work.

1.13.5 Regional perfusion therapy

Perfusion therapy is a new treatment that involves administering chemotherapy directly to the organ or area affected by cancer. Perfusion is used most commonly in treating sarcoma and melanoma in the limbs, colorectal cancer, liver cancer, and cancers of the pleura. The treatment has been shown to be more effective for certain cancers than traditional chemotherapy, while avoiding many of chemotherapy's side-effects.

1.13.6 Biological therapy

Biological therapy (also called immunotherapy) helps the body's natural ability (immune system) to fight disease or protects the body from some of the side effects of cancer treatment. Monoclonal antibodies, interferon, interleukin-2 and cancer vaccines are some types of biological therapy.

1.13.7 Stem cell transplantation

Stem cell transplantation (SCT) may also be used in cancer treatment. The transplant may be autologous (the person's own cells that were saved earlier), allogeneic (cells donated by another person), or syngeneic (cells donated by an identical twin).(17)

1.14 Cancer Drug Information

1.14.1 Drugs for multiple types of cancer

Zoledronic Acid: The main function of is to treat hypercalcemia (high calcium levels), a symptom related to numerous types of cancer, including: breast cancer, lung cancer, head and neck cancer, kidney cancer, and secondary bone cancer.

Docetaxel: is a cancer medicine that slows the growth and spreading of cancer cells in the body. It fights cancerous cells by attacking their supporting structure (or "skeleton"), interfering with their ability to multiply and indicated for treatment of five different types of cancer: breast cancer, non-small cell lung cancer, prostate cancer, gastric cancer, and certain forms of head and neck cancer.

1.14.2 Brain cancer drugs

Temozolomide: is used primarily in the treatment of certain types of astrocytoma brain tumors (which begin in star-shaped glial cells in the brain or spinal cord called astrocytes).

1.14.3 Breast cancer drugs

Docetaxe: is a cancer medicine that slows the growth and spreading of cancer cells in the body. It fights cancerous cells by attacking their supporting structure (or "skeleton"), interfering with their ability to multiply.

Fulvestrant: administered via injection, is a hormonal therapy indicated for metastatic breast cancer treatment. As an antineoplastic drugfights tumor development in breast cancer patients by blocking the tumor's ability to use estrogen in promoting growth. Since many breast cancer tumors grow in response to estrogen, the ability for the drug to block estrogen allows it to slow tumor growth and aid other cancer treatments.

1.14.4 Colorectal cancer drugs

Bevacizumab: working in combination with chemotherapy, is an innovative drug used to treat metastatic colorectal cancer as well as non-small cell lung cancer.

1.14.5 Lung cancer drugs

Pemetrexed: as part of a group of medications known as antineoplastics, is indicated for the treatment of locally advanced or metastatic non-small cell lung cancer (NSCLC) in patients who have previously undergone chemotherapy treatment.(20)

1.15 Complementary treatments

Some complementary treatments may help some people to better deal with cancer and its treatments. These treatments, sometimes referred to as alternative therapies, are used in conjunction with traditional medical treatments. Complementary treatments are not meant to substitute for full medical care. (21)

Complementary treatments may include:

1.15.1 Acupuncture:

Acupuncture, a complementary and alternative therapy used in cancer management, (22,23) has been used clinically to manage cancer-related symptoms, treat side effects induced by chemotherapy or radiation therapy, boost blood cell count, and enhance lymphocyte and natural killer (NK) cell activity. In cancer treatment, its primary use is symptom management; commonly treated symptoms are cancer pain, (24) chemotherapy-induced nausea and vomiting, (25,26) and other symptoms that affect a patient's quality of life, including weight loss, anxiety, depression, insomnia, poor appetite, and gastrointestinal symptoms (constipation and diarrhea).(27,28) Acupuncture is generally accepted by children aged 10 years and older.(29)

1.15.2Massage therapy:

A treatment in which the soft tissues of the body are rubbed, tapped, and stroked. Massage therapy may help people relax, relieve stress and pain, lower blood pressure, and improve circulation. It is being studied in the treatment of cancer symptoms such as lack of energy, pain, swelling, and depression.(30)

1.15.3 Yoga:

An ancient system of practices used to balance the mind and body through exercise, meditation (focusing thoughts), and control of breathing and emotions. Yoga is being studied as a way to relieve stress and treat sleep problems in cancer patients.(31)

1.15.4 Hospice care

In cases where cancer has progressed to an advanced stage and has become unresponsive to treatment, the goal of treatment shifts away from curing the disease and focuses on treating the person. The goal of hospice care is to help people in their last phases of an incurable disease to live as fully and comfortably as possible. Hospice care involves medically controlling pain and other symptoms while providing psychological and spiritual support as well as services to support the patient's family.(32)

1.1 Cancer situation in Bangladesh

No reliable statistical data about cancer are available for most developing countries in general, and Bangladesh in particular. In the light of the statistics available from the World Health Organization, cancer incidence, prevalence and mortality can be estimated approximately as 2,00,000, 8,00,000 and 1,50,000 respectively for the 130 million people of Bangladesh. Based on the World Health Statistics, new cancer cases in Bangladesh have been estimated at 167 per 1,00,000 populations. Cancer has been appearing as an important public health problem in Bangladesh. Due to the lack of reporting system and under-diagnosis of cancer, the real situation is unknown yet.

Population-based data on cancer are sparse. A recent WHO study estimated that there are 49,000 oral cancer, 71,000 laryngeal cancer and 196,000 lung cancer cases in Bangladesh among those aged 30 years or above in Bangladesh (as of 2004).

The same study observed that 3.6% of the admissions in medical college hospitals for the same age group are due to these three cancers. A WHO supported hospital-based registry in the National Institute of Cancer Research and Hospital indicates that lung cancer in men (30%), cervical (26%) and breast cancer (23%) in women are the leading cancers in Bangladesh. These three cancers constitute 37% of all cancers irrespective sexes.

The GLOBOCAN study (1998) reported that rates of deaths from respiratory tract (trachea, lung and bronchus) cancers are highest in Bangladesh compared to Sri Lanka, India, Afghanistan, Bhutan, Nepal, Pakistan.

In response, the national cancer control plan has been developed in collaboration with WHO Bangladesh. Population-based cancer registry has also been established with technical assistance from WHO to facilitate evidence-based policies and programmes to combat cancers. (33)

According to the Bangladesh Cancer Society, more than one million people have been suffering from cancer at present. In Bangladesh, each year, approximately 0.3 million people receive a cancer diagnosis and over 0.2 million die of the disease. The good news is that a major portion of cancers are potentially preventable. (34)

1.18 Common cancers in Bangladesh

Common cancers in Bangladesh Based on the data available from the Radiotherapy Department of the DHAKA MEDICAL COLLEGE AND HOSPITAL, common cancers in males and females can be figured out as shown in table.(35)

Table 1.5: Relative percentage of common cancers in Bangladesh

Male		**Female**	
Lung	21	Cervix	24
Larynx	13	Breast	17
Oral cavity	12	Oral cavity	13
Leukaemia/Lymphoma	8	Ovary	6
Pharynx	6	Leukaemia/Lymphoma	5
Oesophagus	5	Oesophagus	4
Others	35	Others	31

Source Based on 21,238 cancer (male 14,222 and female 7,076) treated at the Radiotherapy Department of Dhaka Medical College Hospital during the period of 1985-92.

Table 1.6: Prevalent cancers in Bangladesh and their risk factors.

Sites	Risk factors
Lung, Larynx	Tobacco smoking
Oral cavity	Tobacco chewing
Pharynx	Air pollution and chemicals: Asbestos (Lung)
Oesophagus	Poor dental care and oral hygiene (oral cavity
Pancreas	Excessive intake of red chilli (oesophagus)
Kidney, Bladder	Early sex, early marriage, multiple sex partners, multiple pregnancy and low socio-economic status, poor personal hygiene, venereal diseases
Cervix	HSV-2, HPV, Uncircumcised male partner, nulliparous
Breast	Daughters of breast cancer patients, less breast feeding, high fatty food, alcohol drinking (tobacco smoking)
Liver	HBV
Stomach	High fatty food
Colon-rectum	Low fibrous food, low Vitamin A,C,E, and Selenium, Zinc in food
Penis	Uncircumcised male organ

1.17 Cancer risk: The probability of developing cancer before age 65. (36)

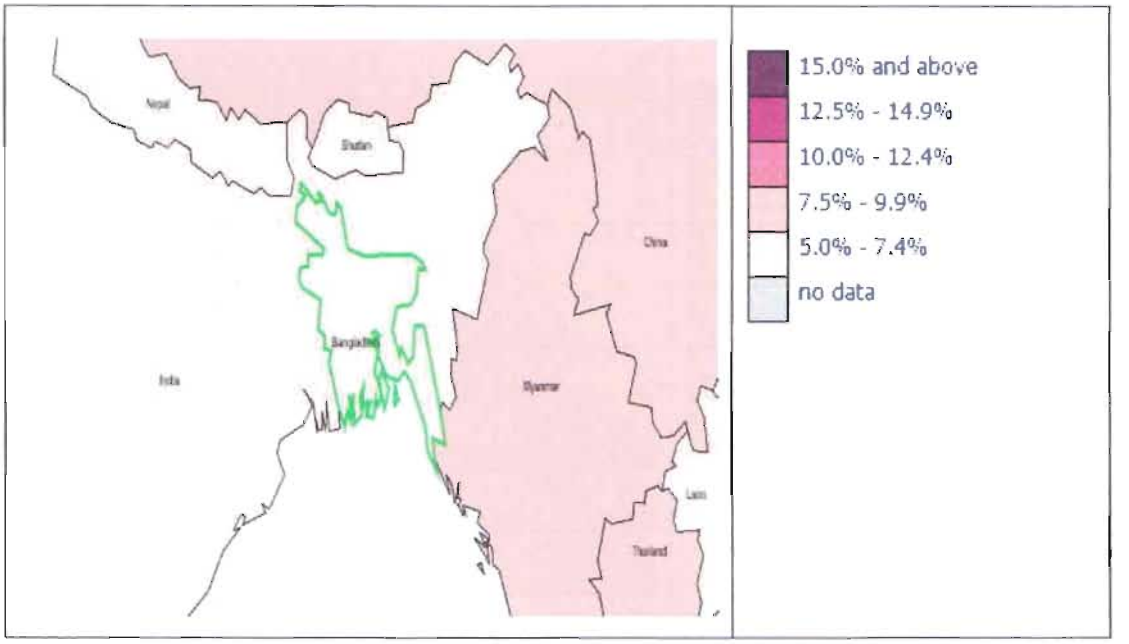

Figure 1.2: Cancer risk

1.18 The Most Common Cancers - Male (2002). (36)

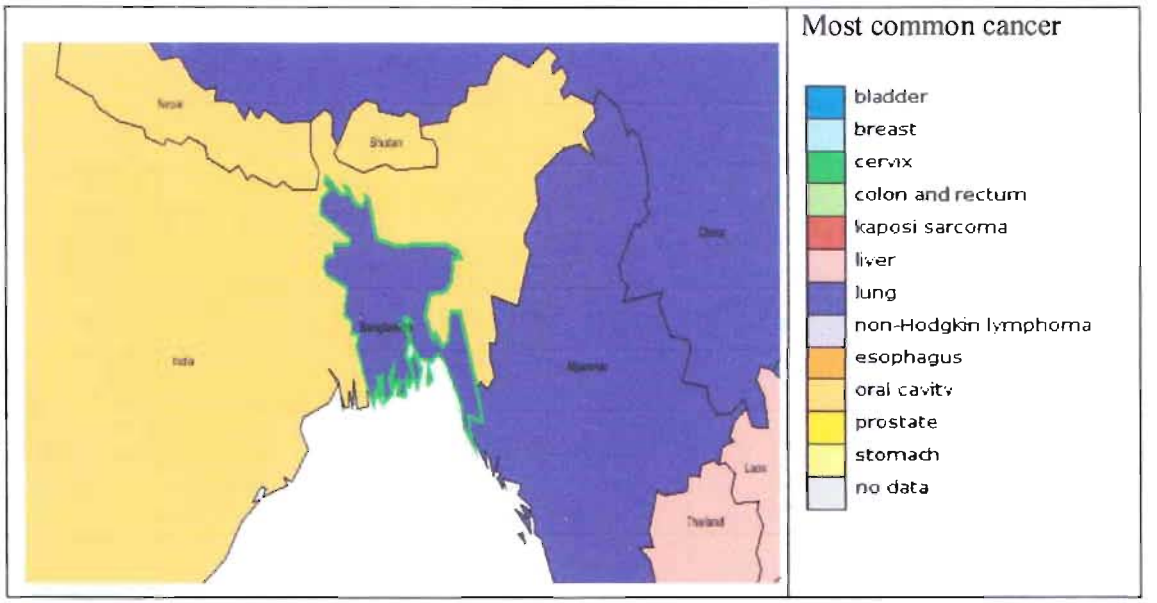

Figure 1.3: The most common cancers in male

1.19.1 The Most Common Cancers - Female (2002). (36)

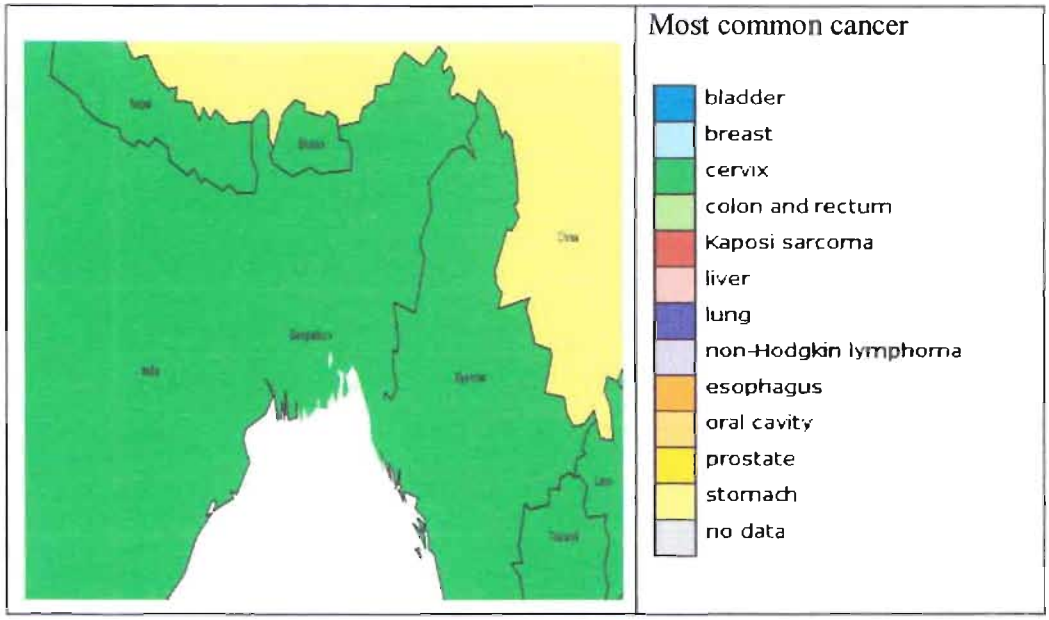

Figure 1.4 : The most common tumor in female.

1.20 Five-year cancer survivors as a proportion of the nation's population(2002, survivors per 1,000 people). (36)

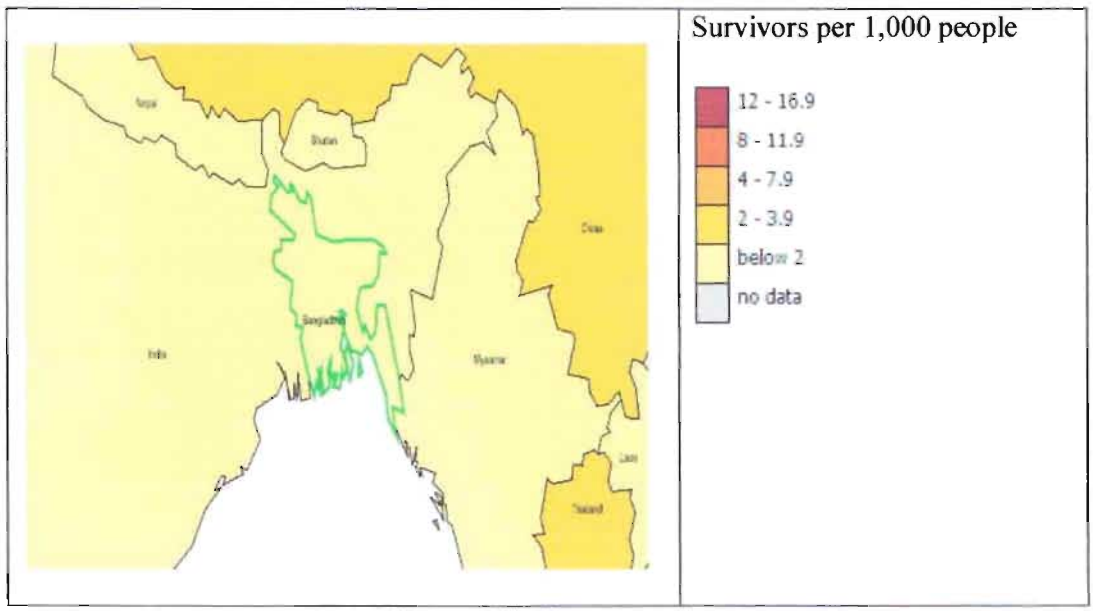

Figure 1.5: Cancer survivors

1.21 Lung Cancer Incidence - Male (2002, age-standardized rate per 100,000. (36)

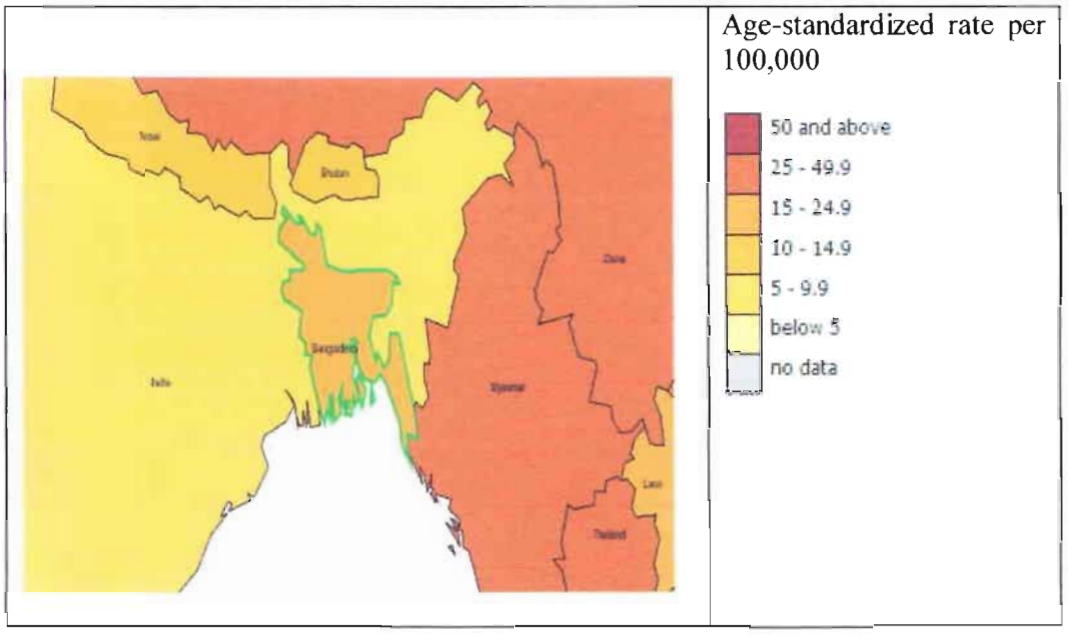

Figure 1.6 : Lung cancer incidence in male

1.22 Smoking among men: Percentage who smoke cigarettes (2005 or latest available data). (36)

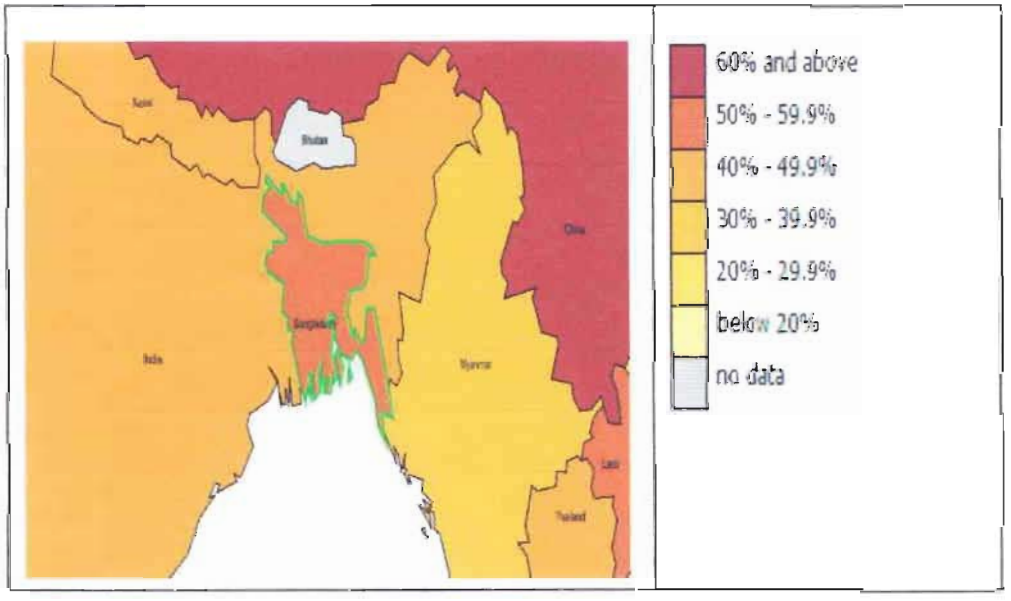

Figure 1.7 : Percentage who smoke cigarettes

CHAPTER:02

METHODOLOGY

2.1 Objective

The cancer situation in Bangladesh is extremely alarming which is evident from some basic facts and figures. According to conservative estimate, presently there are over 1 million registered cancer patients in Bangladesh. Every year another additional 200,000 people are diagnosed with cancer. More than 50% of the affected people's lives are slowly but surely being snuffed out due to the cancer not being diagnosed on time and due to lack of proper treatment.

This research was conducted to identify cancer-related risk factors and its determinants among the general population of Bangladesh.

The main objective of this study is -

1. To identify the most common cancer in Bangladesh.

2. To determine socio-demographic variables age, gender, occupational status, education level, area of living, sources of information about cancer.

3. To identify various environmental factor like chemical substances (industrial), radiation (mobile tower), sun rays and exposure to the carcinogen agents

4. To identify lifestyle related risk factors for cancer like alcohol consumption, alcoholic beverages, tobacco smoking, betel leaves and nut.

2.2 Study Protocol

The study protocol consisted of the following steps:

a) Designing a questionnaire for survey
b) Selection of study area
c) Survey work
d) Data compilation
e) Data analysis
f) Result and discussion

2.3 Research Design and Methods

This is a survey based study where some cancer patients of different gender, location, occupation were needed as volunteers. A questioner was made to complete this survey.

2.4 Study Area

The study was conducted at National Institute of Cancer Research and Hospital Mohakhali, Dhaka-1212. The research study was carried out by maintaining the national laws and regulations of the country and "WMA declaration on Helsinki-Ethical Principles for Medical Research Involving Human Subjects, amended, October 2008.'

2.5 Survey Method

All the information was collected by taking interview of the patients and also observing diagnostic reports and prescriptions from patients over three month. The data was taken mostly from in-patients. The reliability of the test report is also assessed by observing the prescribers and institutional details in case of out-patients. Data was analyzed using Microsoft Excel 2007. Data were collected prospectively from 94 patients from July 2011 to November 2011.

CHAPTER : 03

RESULT & DISCUSSION

3.1 Distribution of Gender

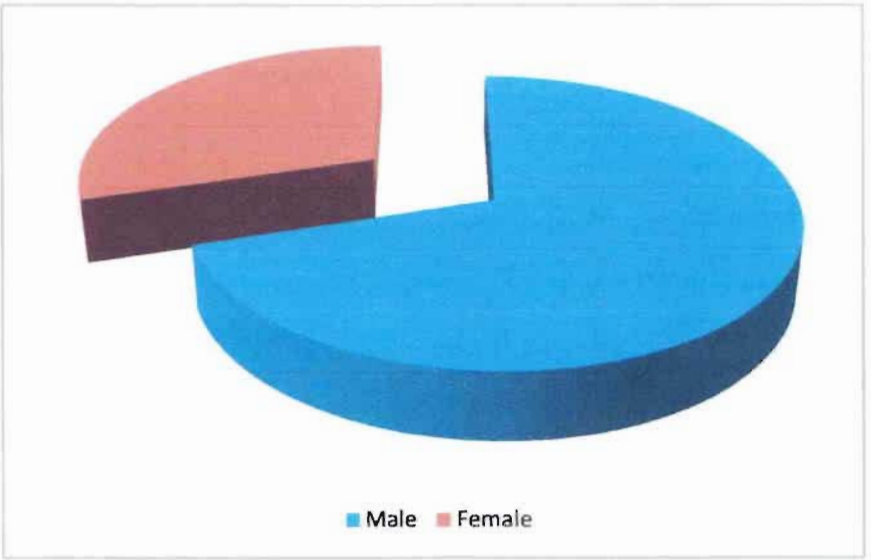

Figure 3.1: Percentage of male and female

In this study, data were collected from 94 patients among them 70.21% were male and 29.78% were female.

3.2 Distribution of Age

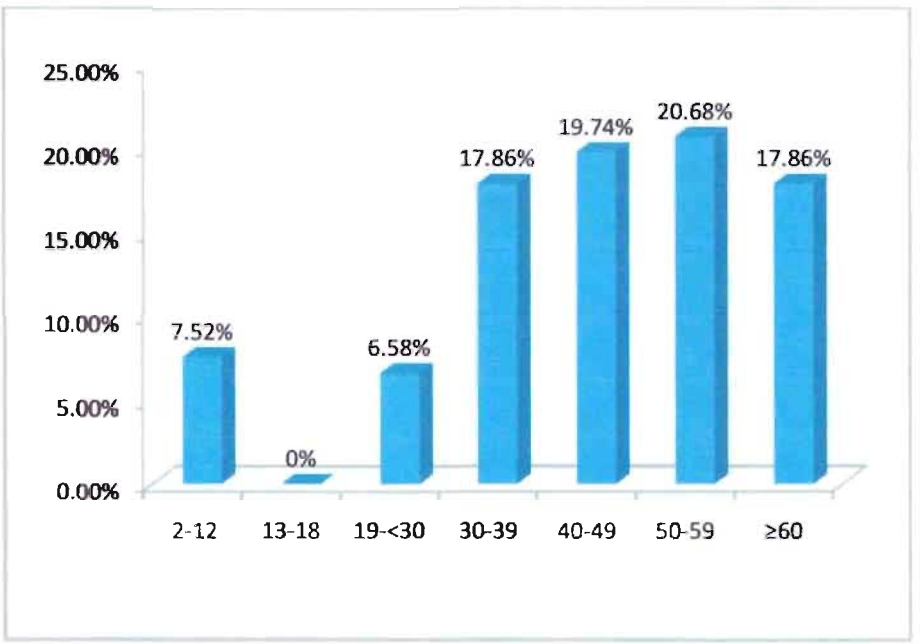

Figure 3.2: Percentage of patients age range

Among 94 volunteers, 17.86% patients were found between the ages of 30-39 years. 19.74% volunteers were found between 40-49 and 20.86% were found between 50-59 and above 60 17.86% patients were found.

3.3 Distribution of Harmful Habit

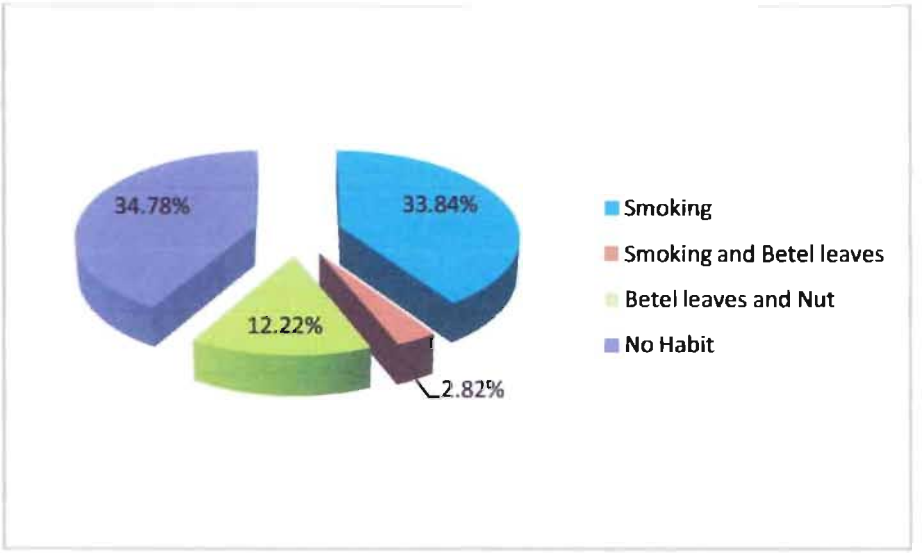

Figure 3.3: Distribution of Harmful Habit

It was found by this study that among 94 patients 40% harmful habit were smoking, 2.82% were smoking and betel leaves, 12.22% patients harmful habit were betel leaves and nut, 34.78% patients had no harmful habit.

3.4 Distribution of Cancers in Different Region of the Body

Table 1.7: Distribution of cancer in different region of the body

Region	Type of cancer	Number of patient	Percentage
Breast	Breast cancer	08	8.51%
Gastrointestinal (Digestive)	Cancer esophagus	07	14.90%
	Stomach cancer	07	
Genitourinary(Urinal)	Urinary bladder	05	6.42%
	Cancer testis	01	
Genitourinary (Gynecology)	Ovarian cancer	04	6.46%
	Cancer og cervix	01	
	Carcinoma in situ	01	
Hematological/Blood	Acute lymphoblastic leukaimia	03	17.07%
	angio fibroma	01	
	Blood cancer	12	
Musculoskeletal/ Soft tissue	Ewings sarcoma	01	3.23%
	Fibrosarcoma on left foot	02	
Neurological	Brain cancer	09	11.88%
	Retinoblastoma	02	
Respiratory/Lung	Adenocarcinoma	02	18.13%
	Lung cancer	08	
	Piriform fossa	01	
	Cancer Larynx	02	
	Squamous cell carcinoma	04	
Oral cancer	carcinoma in mouth	01	1.10%
Head & Neck	Thyroid cancer	03	3.20%
Hepatobilliary system	Hepatocellular carcinoma	01	1.10%
Intermuscular	Histoma of left shoulder	02	2.13%
Cardiovascular	Chest wall cancer	01	1.10%
Others		05	5.32%

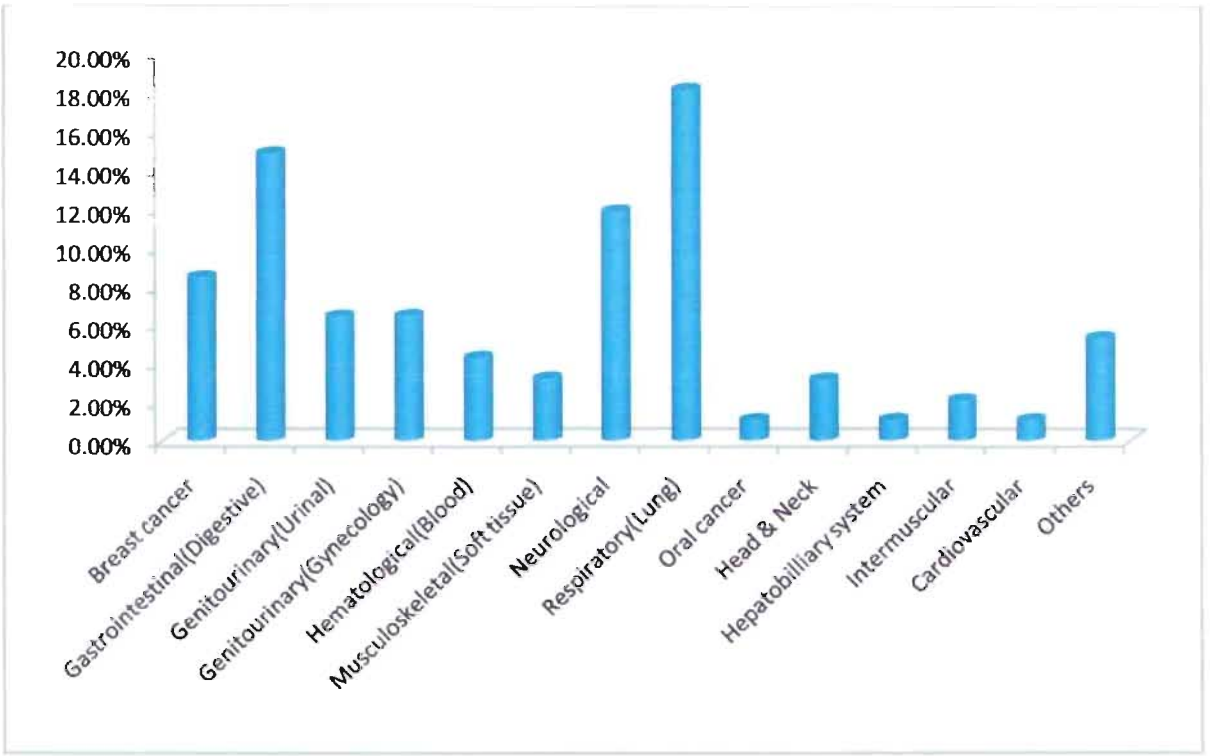

Figure 3.4: Distribution of Cancers in Different Region of the Body

About 30 different types of cancer patients were found and those were classified according to 14 different locations of the body. The most common cancer are:

Respiratory/Lung region: 18.13% cancer patients were found in respiratory/Lung region and this was the highest percentage. Under this region adeno carcoma, lung cancer, piriform fossa, cancer larynx, squamous cell carcinoma types of cancer were found.

Hematological/blood: In hematological/blood region 17.07% cancer patients were found who are suffering from different types of blood related cancer like acute lymphoblastic leukaimia, angio fibroma.

Gastrointestinal (digestive): 14.90% gastrointestinal (digestive) patients were found under this body regions esophagus cancer and stomach cancer ware found.

Breast cancer: During this study 8.51% breast cancer patients were found.

The Genitourinary (Urinal) region: The Genitourinary (Urinal) region patients were 6.42% and under this region urinary bladder, cancer testes were found.

Genitourinary (Gynecology): 6.46% Genitourinary (Gynecology) patients were found and in this regions ovarian cancer, cancer cervix, carcinoma in situ were found.

Musculoskeletal/ Soft tissue: In case of Musculoskeletal/ Soft tissue region 3.23% cancer patients were found and ewings sarcoma, fibro sarcoma on left foot types of cancer were found in here.

The Oral cancer patients were found 1.10% and the cancer type was carcinoma in mouth.

In Head & Neck region 3.20% cancer patients were found and the cancer type was thyroid cancer.

Hepatobilliary system: 1.10% cancer patients were found in hepatobilliary system region and the type of cancer was hepatocellular carcinoma.

Intermuscular region: In Intermuscular region 2.13% cancer patients were found and the cancer type was histoma of left shoulder.

The percentage of cardiovascular region was 1.10% and hare chest wall cancer was found.

3.5 Distribution of Living Area

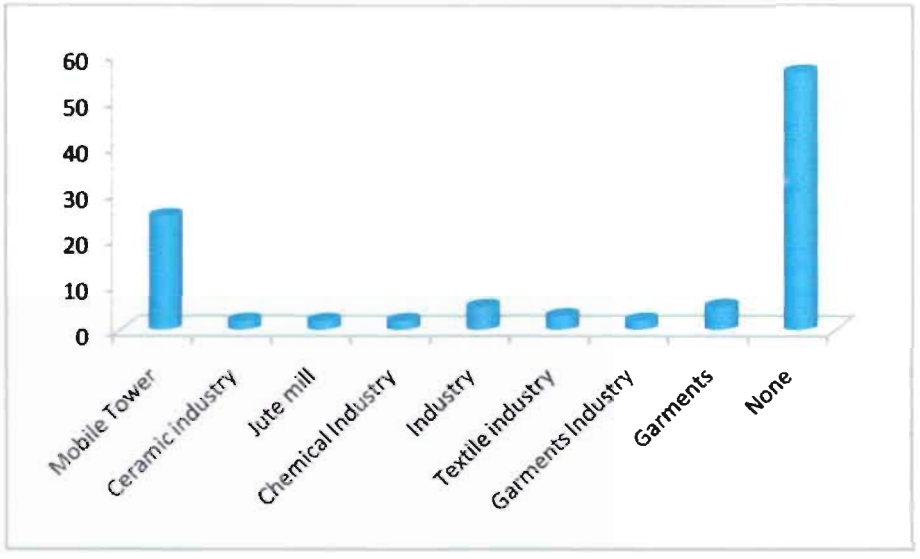

Figure 3.5: Distribution of site of living area

In case of 25.00% patient mobile tower found in their living area and ceramic industry found in case of 2.00% , jite mill found in case of 2.00%, chemical industry found 2.0%, industry found in case of 5.00%, Textile industry found in case of 3.00% .

3.6 Distribution of Occupation

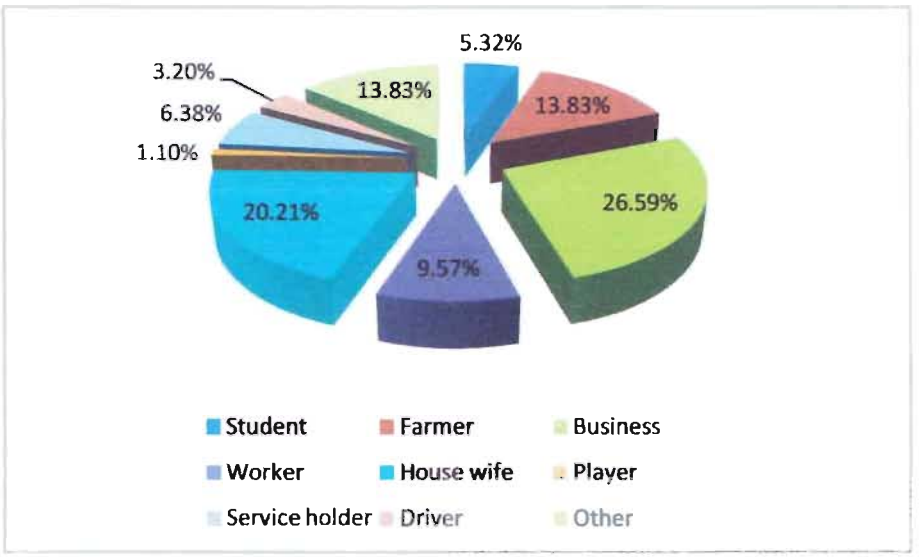

Figure 3.6: Distribution of occupation

Highest 26.59% cancer patient occupation were found business, 5.32% student, 13.83% farmer, 9.57% were worker, 20.21% were house wife, 1.10% were player, 6.38% were service holder, 3.20% were driver and others were found 13.83%.

3.7 Contribution of Life Style Related Habits in Cancers

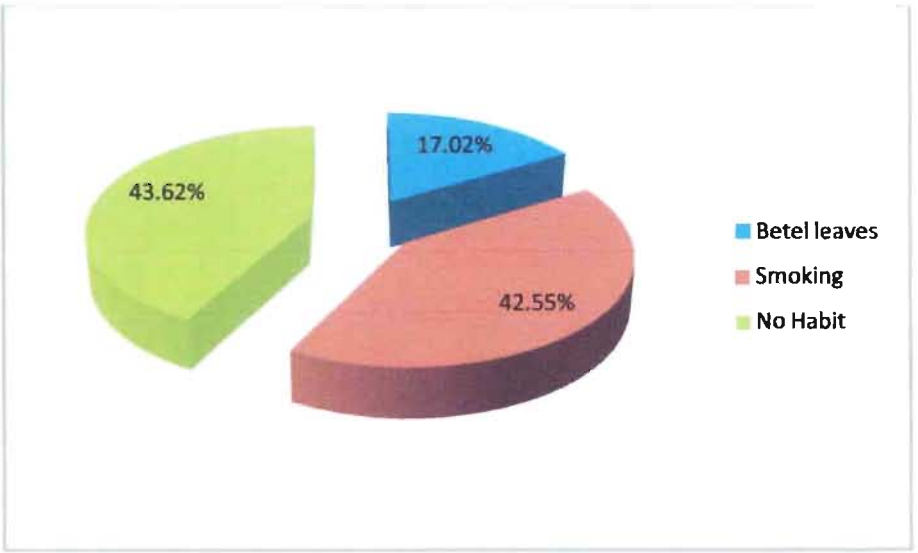

Figure 3.7: Contribution of Life Style Related Habits in Cancers

It was found that 42.55% life style related bad habits were smoking and 17.02% were betel leaves.

3.8 Correlation between cancer and smoking

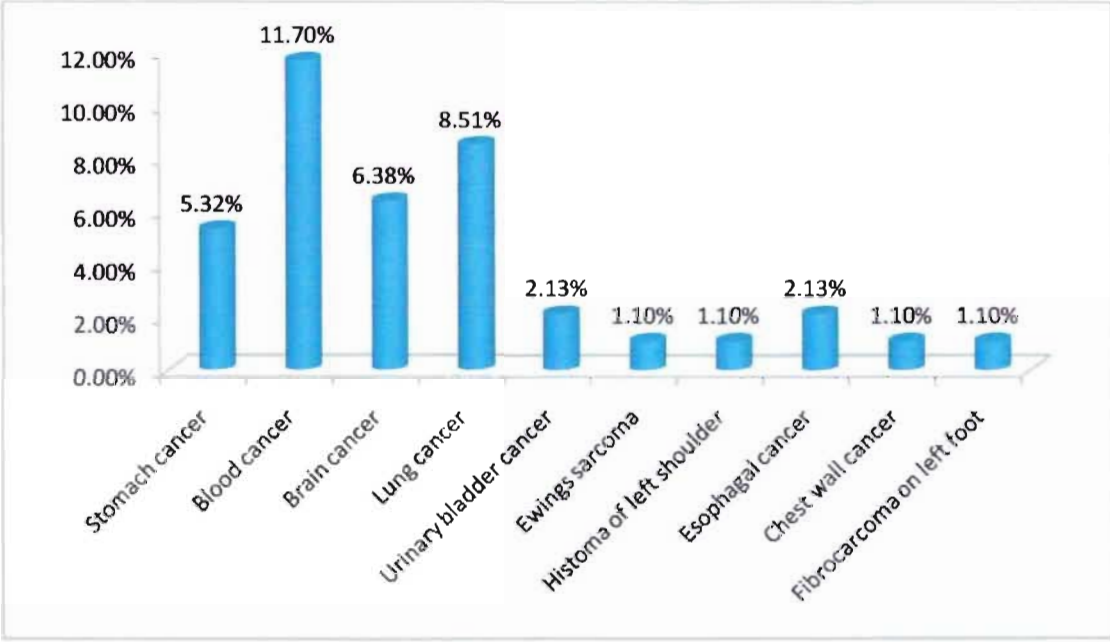

Figure 3.8: Correlation between cancer and smoking.

The present study showed that smoking has most significant contribution in inducing cancer. It was found that lung cancer (about 8.51%) was found in patients who smoke or having the habit of smoking. 5.32% patients who have habit of smoking were responsible for stomach cancer, smoking causes 11.70% blood cancer, 6.38% brain cancer, 8.51% lung cancer, 2.13% urinary bladder cancer, 1.10% of ewings sarcoma, 1.10% patients were causes histoma of left solder, 2.13% of patients were causes esophageal cancer and 1.10% patients were causes fibrocarcoma on left foot.

3.9 Correlation between Betel leaf and cancer

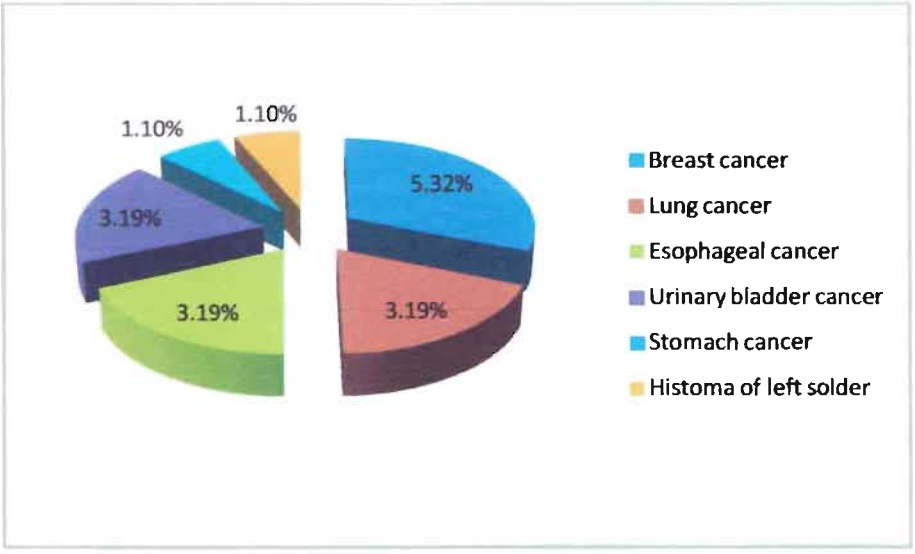

Figure 3.9: Correlation between Betel leaf and cancer

Betel leaves were responsible for breast cancer in case of 5.32% patients. betel leaves causes 3.19% lung cancer, esophageal cancer patients were found 3.19%, urinary bladder cancer patients were found 3.19%, stomach cancer patients were found 1.10%, histoma of left solder patients were found 1.10%.

3.10 Distribution of Education

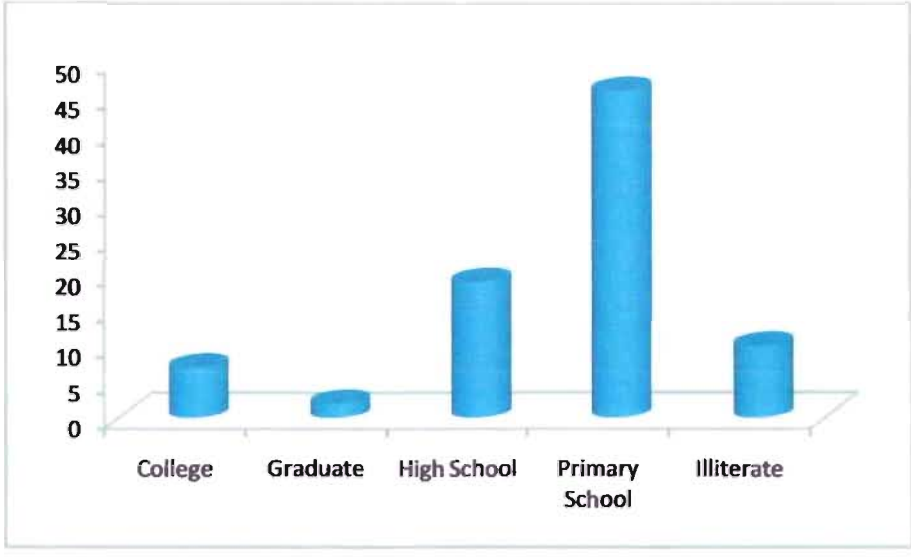

Figure 3.10: Distribution of Education.

In this study college patient were found 6.58%, graduate were found 1.88%, primary school patient were found 17.86%, high school patient were found 43.24% and illiterate patient were found 9.40%.

Chapter : 04
Conclusion

Conclusion

Cancer can lead to life-threatening complications and be fatal, especially if it goes undetected and untreated. Prognosis of cancer varies depending on the type of cancer and the stage of advancement, age, medical history, and coexisting conditions or diseases and other factors. Seeking regular medical care offers the best chances of discovering cancer in its earliest, most curable stage. The higher percentage of cancer cases was found for male as compared to female. The high frequency of Stomach Cancer, Lung Cancer, Blood Cancer, Esophageal cancer etc may be associated with Industrial smoke as well as Cigarette smoking. So, avoiding tobacco may be one of the best health decision to prevent cancer. The present research was a comprehensive study that was conducted to identify cancer correlated risk factors and its determinants in an Bangladeshi general population. However, this study has not been able to establish the linkages and the levels of association between the identified different risk factors and the various cancers reported. There is a need therefore to carry out an in-depth study in Bangladesh.

Chapter : 05

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Appendix

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A Diseases Based Study

Analysis of Risk Factors for Cancer & its Determinants Among The Population of Bangladesh

(A Project Report to Be Submitted in the Department of Pharmacy for the Partial Fulfillment of the Degree of Bachelor of Pharmacy)

Date: **Report no:**

Personal Information-

1. Name _____

2. Age _____

3. Gender: ☐ **Female** **Male**

4. Blood group: _____

5. Weight _____

6. Living area: ☐ City ☐ Town ☐ Rural

7. The side of the living area: Industrial

Chemical area

☐ Tannery area ☐ Others

8. Source of water used daily

9. Any habit that may cause harm to the health

10. Education: ☐ Primary High School

College ☐ Graduate school

11. Occupation: ☐ Student ☐ Business

Service holder Housewife

☐ Others

12. Monthly income

13. If student then guardian's income

Diseases Information:

14. Which type of cancer?

15. Physical problem you may faced

A)..... B)..... C).....

D)..... E).....

16. How long you are faced these

17. How long you know that it is cancer

18. How do you come sure that you are in cancer ☐ By yourself ☐ By doctor

☐ By pharmacist ☐ By diagnosis

19. The stage on cancer

20. Duration of treatment

21. Are you satisfy about your treatment