

CHRISTIAN SERVICE UNIVERSITY COLLEGE, KUMASI.

DEPARTMENT OF NURSING

TOPIC: KNOWLEDGE ON CHILDHOOD LEUKEMIA AMONG THE NURSING STAFF  
OF THE PAEDIATRIC WARDS OF KOMFO ANOKYE TEACHING HOSPITAL.

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## DECLARATION

We hereby declare that this submission is our own work towards the Degree and that, to the best of our knowledge, it contains no materials previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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## SUPERVISOR'S DECLARATION

I hereby declare that preparation and presentation of this project was supervised in accordance with the guidelines on the supervision of project work laid down by Christian Service University College.

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## **DEDICATION**

We dedicate this work to all children with leukemia.

## **ACKNOWLEDGEMENT**

It has been by God's grace that this project work has come out; we therefore give God all the praise and gratitude.

Many people have assisted us in diverse ways to prepare this project report, but space will not permit us to list the names of all of them. However, special mention should be made to the following important personality.

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## **ABSTRACT**

This study was undertaken to evaluate the knowledge on childhood leukaemia among the nursing staff of the paediatric wards of KomfoAnokye Teaching Hospital. The study was descriptive study. Structured questionnaire with both open and close ended questions were used. The results obtained were subjected to simple statistical analysis and interpreted into, simple percentages pie charts and bar charts. Systematic random sampling was used in selecting 100 respondents. Out of the 100 respondents, 77% of the respondents have knowledge on childhood leukaemia, the remaining 23% said they don't. Regarding, causes of childhood leukaemia, 69% of the respondents attributed it to medical, 18% did not know the causes, 9% gave socio-economic as the causes whereas only 4% said both medical and socio-economic as the causes. For the types of childhood leukaemia, 63% of the respondents were not able to give correct answers while 37% gave the correct types of the disease. For clinical manifestation of childhood leukaemia, 72% of the respondents knew about the clinical manifestation whereas 28% of the respondents did not know about it. Also concerning the treatment, 60% of the total respondents gave the treatment of childhood leukaemia as chemotherapy, 13% said bone marrow transplant is used to treat this disease and 5% said both chemotherapy and bone marrow transplant are used to treat this condition, other treatment was 7% and 15% ticked unknown. At the end of the survey, majority of the respondents had adequate knowledge on childhood leukaemia with a percentage of 77%, as well as (69%) of the respondents stated medical as the causes of the disease. The respondents' knowledge on the types of was lacking corresponding to 63% of the respondents and 37% have adequate knowledge on the causes of the disease It is therefore recommended that, workshops and in-depth service training sessions on childhood leukaemia should be organized for nursing staff of the paediatric wards of KATH.

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## **ABBREVIATIONS**

**ALL** – Acute Lymphocytic Leukemia

**AML** - Acute MyelogenousLeukemia

**CLL** - Chronic Lymphocytic Leukemia

**CML** – Chronic MyelogenousLeukemia

**KATH** – KomfoAnokye Teaching Hospital

**KBTH** – Korle-bu Teaching Hospital

**NCI** - National Cancer Institute

**WHO** - World Health Organization

## CHAPTER ONE

### 1.1 BACKGROUND OF STUDY

Global Programme on Evidence for Health Policy Discussion by World Health Organization states that, in 2000, approximately 256,000 children and adults around the world developed a form of leukemia, and 209,000 died from it. This represents about 3% of the almost seven million deaths due to cancer that year, and about 0.35% of all deaths from any cause. Of the sixteen separate sites the body compared, leukemia was the 12th most common class of neoplastic disease, and the 11th most common cause of cancer-related death. In 2010, globally, approximately 281,500 people died of leukemia (*Lozaro R. et al 2010*). In 2012 leukemia developed in 352,000 people globally and caused 265,000 deaths (*WHO world cancer report, 2014*)

Among children with some form of cancer, about a one third has leukemia, most commonly acute lymphoblastic leukemia (*The Leukemia & Lymphoma Society 2009*). Leukemia is the second most common form of cancer in infants (under the age of 12 months) and the most common form of cancer in older children, also boys are somewhat more likely to develop leukemia than girls, and white American children are almost twice as likely to develop leukemia than black American children (*James G. Gurney et al, 1999*).

A survey of childhood malignancies at the Korle-Bu Hospital by *Welbeck and Hesse (1998)* showed increasing incidence of paediatric malignancies. It is expected that as countries in the sub region approach middle income status, malignancies will become a leading cause of death as has occurred in some countries. A total of 252 cases of childhood malignant tumours were retrieved and leukemia accounted for 6.7% of the cases. Leukemias were the fourth commonest tumour and occurred most commonly in the 5-9 years age group (*R. K. Gyasi and Y. Tettey 2007*). Although specific types of childhood cancer are uncommon, collectively they

represent an important public health problem, and therefore determining the knowledge of nursing staff in KATH is an essential part of addressing childhood leukaemia.

## **1.2. Problem statement**

Leukaemia, cancer of the blood causes is not yet fully known, and a cure is by no means certain. Despite huge medical advances, leukaemia remains a most devastating disease. A report of an analysis of autopsy records over a 10year (1991-2000) period in the Department of Pathology, Korle Bu Teaching Hospital (KBTH), showed that in children, the leading causes of cancer deaths are malignancies of the haematopoietic system, followed by brain, kidney, eyes, liver and bone tumours. There is a need for focused research on childhood leukemia as data (2008 leukemia cases recorded were 8, in 2012 out of 126 of childhood cancer cases recorded, leukemia was 42) from KATH oncology unit indicates that childhood leukemia reported has increase over the years. Much attention has not been given to childhood cancers and leukemia to be specific. Hence, it is unlikely that nurses will have adequate knowledge of it.

Apart from burkitt lymphoma, leukemia is the second most reported type of cancers at the komfoAnokye Teaching hospital paediatric oncology unit and most common causes of death among children with cancers. These are the reasons why, the researchers want to research into the subject matter.

## **1.3. Justification of the study**

Komfo Anokye Teaching Hospital is one of the two childhood cancer treatment sites in the country serving the whole of the northern and middle belts of the country. Childhood cancers are managed in the Paediatric Oncology Unit of KATH which also caters for several other children with various other conditions. With early diagnosis and proper management

childhood leukemia can be fully treated. With good care the quality of life of those whose diseases cannot be treated can be given comfortable and reasonable quality of life. There is therefore a need to research into the knowledge of childhood leukemia among nursing staff on the paediatric wards of KATH.

#### **1.4 Research Questions**

In line to remain focus and thoroughly achieve the set objectives, the following research questions have been raised and addressed throughout the study.

1. What are the nurses' knowledge on the causes of childhood leukaemia?
2. What are the nurses' knowledge on the types of childhood leukaemia?
3. What are the nurses' knowledge on the clinical manifestations of childhood leukaemia?
4. What is the knowledge of the Paediatric wards nurses on the treatment of childhood leukaemia?

#### **1.5 Research Objectives**

##### **1.5.1 Main objectives**

The study is to evaluate the knowledge on childhood leukemia's among the Nursing staff of the child health directorate of the Komfo Anokye teaching hospital.

##### **1.5.2. Specific objectives**

- ) To determine the nurses' knowledge on the cause of childhood leukaemia.
- ) To determine the nurses' knowledge on the types of childhood leukaemia.
- ) To determine the nurses' knowledge on the clinical manifestations of childhood leukaemia.
- ) To determine the nurses' knowledge on the treatment of childhood leukaemia.

## **1.6 Hypothesis**

The research stated hypothesis for the study “Do the Nursing staff of the child health directorate of the Komfo Anokye Teaching Hospital have knowledge on childhood leukaemia?”

## **1.7 Limitations of the study**

Funding is the number one challenge as a researching student. Time is also another limitation as the researcher would be combining working, schooling and the study.

## **1.8 Definitions of terms/operational definitions of terms**

Leukemia: Leukemia is cancer that usually begins in the bone marrow and results in high numbers of abnormal white blood cells.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Overview of Childhood Leukemia

Childhood is the age span ranging from birth to adolescence. In developmental psychology, childhood is divided up into the developmental stages of toddlerhood (learning to walk), early childhood (play age), middle childhood (school age), and adolescence (puberty through post-puberty). The term childhood is non-specific and can imply a varying range of years in human development. (National Association for the Education of Young Children),

Leukemia was first described by anatomist and surgeon Alfred-Armand-Louis-Marie Velpeau in 1827. A fuller description was given by pathologist Rudolf Virchow in 1845. Observing an abnormally large number of white blood cells in a blood sample from a patient, Virchow called the condition Leukämie in German, which he formed from the two Greek words leukos, meaning "white", and haima, meaning "blood". Around ten years after Virchow's findings, pathologist Franz Ernst Christian Neumann found that one deceased leukemia patient's bone marrow was colored "dirty green-yellow" as opposed to the normal red. This finding allowed Neumann to conclude that a bone marrow problem was responsible for the abnormal blood of leukemia patients.

Leukemia is a group of cancers that usually begins in the bone marrow and results in high numbers of abnormal white blood cells (Merriam-Webster Dictionary). These white blood cells are not fully developed and are called blasts or leukemia cells. The high number of white blood cells is apparent when a blood sample is viewed under a microscope. Frequently, these extra white blood cells are immature or dysfunctional. The excessive number of cells can also interfere with the level of other cells, causing a harmful imbalance in the blood count. (National Cancer Institute, 2014).

Some leukemia patients do not have high white blood cell counts visible during a regular blood count. This less-common condition is called Aleukemia. The bone marrow still contains cancerous white blood cells which disrupt the normal production of blood cells, but they remain in the marrow instead of entering the bloodstream, where they would be visible in a blood test. For an Aleukemic patient, the white blood cell counts in the bloodstream can be normal or low. (*American Cancer Society (2010)*). People with a family history of leukemia are also at higher risk. (*Hutter, JJ 2010*)

Leukemias belong to a broader group of tumors which affect the blood, bone marrow, and lymphoid system, known as tumors of the hematopoietic and lymphoid tissues. (*Vardiman et al, 2009*)

World Cancer Report 2014, the success of treatment depends on the type of leukemia and the age of the person. Outcomes have improved in the developed world. The average five-year survival rate is 57% in the United States. In children under 15, the five-year survival is greater than 60 to 85%, depending on the type of leukemia. In people with acute leukemia who are cancer-free after five years, the cancer is unlikely to return. (*World Health Organization, 2014*).

Clinically and pathologically, leukemia is subdivided into a variety of large groups. The first division is between its acute and chronic forms:

Acute leukemia is characterized by a rapid increase in the number of immature blood cells. Crowding due to such cells makes the bone marrow unable to produce healthy blood cells. Immediate treatment is required in acute leukemia due to the rapid progression and accumulation of the malignant cells, which then spill over into the bloodstream and spread to other organs of the body. Acute forms of leukemia are the most common forms of leukemia in children. (*National Cancer Institute, 2014*)

Chronic leukemia is characterized by the excessive buildup of relatively mature, but still abnormal, white blood cells. Typically taking months or years to progress, the cells are produced at a much higher rate than normal, resulting in many abnormal white blood cells. Whereas acute leukemia must be treated immediately, chronic forms are sometimes monitored for some time before treatment to ensure maximum effectiveness of therapy. Chronic leukemia mostly occurs in older people, but can theoretically occur in any age group. (*National Cancer Institute, 2014*)

Additionally, the diseases are subdivided according to which kind of blood cell is affected. This split divides leukemias into lymphoblastic or lymphocytic leukemias and myeloid or myelogenous leukemias:

In lymphoblastic or lymphocytic leukemias, the cancerous change takes place in a type of marrow cell that normally goes on to form lymphocytes, which are infection-fighting immune system cells. Most lymphocytic leukemias involve a specific subtype of lymphocyte, the B cell.

In myeloid or myelogenous leukemias, the cancerous change takes place in a type of marrow cell that normally goes on to form red blood cells, some other types of white cells, and platelets.

Combining these two classifications provides a total of four main categories. Within each of these four main categories, there are typically several subcategories. Finally, some rarer types are usually considered to be outside of this classification scheme.

Acute lymphoblastic leukemia (ALL) is the most common type of leukemia in young children. This disease also affects adults, especially those ages 65 and older. Standard treatments involve chemotherapy and radiotherapy. The survival rates vary by age: 85% in children and 50% in adults (*Jameson et al, 2005*).



Chronic lymphocytic leukemia (CLL) most often affects adults over the age of 55. It sometimes occurs in younger adults, but it almost never affects children. Two-thirds of affected people are men. The five-year survival rate is 75%. It is incurable, but there are many effective treatments. (National Cancer Institute, 2014)

Acute myelogenous leukemia (AML) occurs more commonly in adults than in children, and more commonly in men than women. AML is treated with chemotherapy. The five-year survival rate is 40%. Chronic myelogenous leukemia (CML) occurs mainly in adults; a very small number of children also develop this disease. The five-year survival rate is 90%. (Colvin G. A., Elfenbein G. J. 2003).

### **Signs and symptoms**

Damage to the bone marrow, by way of displacing the normal bone marrow cells with higher numbers of immature white blood cells, results in a lack of blood platelets, which are important in the blood clotting process. This means people with leukemia may easily become bruised, bleed excessively, or develop pinpoint bleeds (petechiae).

White blood cells, which are involved in fighting pathogens, may be suppressed or dysfunctional. This could cause the patient's immune system to be unable to fight off a simple infection or to start attacking other body cells. Because leukemia prevents the immune system from working normally, some patients experience frequent infection, ranging from infected tonsils, sores in the mouth, or diarrhea to life-threatening pneumonia or opportunistic infections.

Finally, the red blood cell deficiency leads to anemia, which may cause dyspnea and pallor. Some patients experience other symptoms, such as feeling sick, having fevers, chills, night sweats, feeling fatigued and other flu-like symptoms. Some patients experience nausea or a feeling of fullness due to an enlarged liver and spleen; this can result in unintentional weight

loss. Blasts affected by the disease may come together and become swollen in the liver or in the lymph nodes causing pain and leading to nausea. (*Columbia Electronic Encyclopedia, 2011*)

If the leukemic cells invade the central nervous system, then neurological symptoms (notably headaches) can occur. Uncommon neurological symptoms like migraines, seizures, or coma can occur as a result of brain stem pressure. All symptoms associated with leukemia can be attributed to other diseases. Consequently, leukemia is always diagnosed through medical tests.

## **Causes**

There is no single known cause for any of the different types of leukemia. The few known causes, which are not generally factors within the control of the average person, account for relatively few cases. The cause for most cases of leukemia is unknown. (*Ross JA, Kasum CM, 2002*)

Leukemia, like other cancers, results from mutations in the DNA. Certain mutations can trigger leukemia by activating oncogenes or deactivating tumor suppressor genes, and thereby disrupting the regulation of cell death, differentiation or division. These mutations may occur spontaneously or as a result of exposure to radiation or carcinogenic substances. (*Wiernik, Peter H. (2001)*).

Among adults, the known causes are natural and artificial ionizing radiation, a few viruses such as human T-lymphotropic virus, and some chemicals, notably benzene and alkylating chemotherapy agents for previous malignancies. Use of tobacco is associated with a small increase in the risk of developing acute myeloid leukemia in adults.

Cohort and case-control studies have linked exposure to some petrochemicals and hair dyes to the development of some forms of leukemia. Diet has very limited or no effect, although

eating more vegetables may confer a small protective benefit. (Ross JA, Kasum CM, 2002) Viruses have also been linked to some forms of leukemia. For example human T-lymphotropic virus (HTLV-1) causes adult T-cell leukemia. (Leonard and Barry, 1998)

Some people have a genetic predisposition towards developing leukemia. This predisposition is demonstrated by family histories and twin studies. The affected people may have a single gene or multiple genes in common. In some cases, families tend to develop the same kinds of leukemia as other members; in other families, affected people may develop different forms of leukemia or related blood cancers. (Wiernik, Peter H. 2001)

In addition to these genetic issues, people with chromosomal abnormalities or certain other genetic conditions have a greater risk of leukemia. For example, people with Down syndrome have a significantly increased risk of developing forms of acute leukemia (especially acute myeloid leukemia), and Fanconi anemia is a risk factor for developing acute myeloid leukemia. Mutation in SPRED1 gene has been associated with a predisposition to childhood leukemia. (Pasmant E, Ballerini P et al, 2009)

Whether non-ionizing radiation causes leukemia has been studied for several decades. The International Agency for Research on Cancer expert working group undertook a detailed review of all data on static and extremely low frequency electromagnetic energy, which occurs naturally and in association with the generation, transmission, and use of electrical power. They concluded that there is limited evidence that high levels of ELF magnetic (but not electric) fields might cause some cases of childhood leukemia. No evidence for a relationship to leukemia or another form of malignancy in adults has been demonstrated. (World Health Organisation. 2002) The World Health Organization concludes that ELF exposure, if later proven to be causative, would account for just 100 to 2400 cases worldwide each year, representing 0.2 to 4.9% of the total incidence of childhood leukemia for that year (about 0.03 to 0.9% of all leukemias). (World Health Organisation. 2009)

A few cases of maternal-fetal transmission (a baby acquires leukemia because its mother had leukemia during the pregnancy) have been reported. According to a study conducted at the Center for Research in Epidemiology and Population Health in France, children born to mothers who use fertility drugs to induce ovulation are more than twice as likely to develop leukemia during their childhoods as other children. (*Rudant, Jérémie et al, 2012*)

## **Diagnosis**

According to American Cancer Society, diagnostic procedures include:

A bone-marrow aspiration and biopsy; marrow may be removed by aspiration or a needle biopsy.

A complete blood count, which is a measurement of size, number, and maturity of different blood cells in blood.

Blood tests may include blood chemistry, evaluation of liver and kidney functions, and genetic studies. Blood chemistry tests can be used to determine the degree of liver and kidney damage or the effects of chemotherapy on the patient. When concerns arise about other damage due to leukemia, doctors may use an X-ray, MRI, or ultrasound. These can potentially view leukemia's effects on such body parts as bones (X-ray), the brain (MRI), or the kidneys, spleen, and liver (ultrasound). Finally, CT scans are rarely used to check lymph nodes in the chest.

A lymph-node biopsy; lymph node tissue is surgically removed to examine under a microscope, to look for cancerous cells.

A spinal tap: a special needle is placed into the lower back into the spinal canal, which is the area around the spinal cord. Cerebral spinal fluid is fluid that bathes the child's brain and spinal cord. A small amount of cerebral spinal fluid is sent for testing to determine if leukemia cells are present.

Despite the use of these methods to diagnose whether or not a patient has leukemia, many people have not been diagnosed because many of the symptoms are vague, non-specific, and can refer to other diseases. For this reason, the American Cancer Society estimates that at least one-fifth of the people with leukemia have not yet been diagnosed. (*American Cancer Society 2010*)

## **Treatment**

Most forms of leukemia are treated with pharmaceutical medication, typically combined into a multi-drug chemotherapy regimen. Some are also treated with radiation therapy. In some cases, a bone marrow transplant is effective.

Management of ALL focuses on control of bone marrow and systemic (whole-body) disease. Additionally, treatment must prevent leukemic cells from spreading to other sites, particularly the central nervous system (CNS) e.g. monthly lumbar punctures. In general, ALL treatment is divided into several phases:

Induction chemotherapy to bring about bone marrow remission. For children with low-risk ALL, standard therapy usually consists of three drugs (prednisone, L-asparaginase, and vincristine) for the first month of treatment. Consolidation therapy or intensification therapy to eliminate any remaining leukemia cells. There are many different approaches to consolidation, but it is typically a high-dose, multi-drug treatment that is undertaken for a few months. Patients with low- to average-risk ALL receive therapy with antimetabolite drugs such as methotrexate and 6-mercaptopurine (6-MP). High-risk patients receive higher drug doses of these drugs, plus additional drugs. CNS prophylaxis (preventive therapy) to stop the cancer from spreading to the brain and nervous system in high-risk patients. Standard prophylaxis may include radiation of the head and/or drugs delivered directly into the spine.

Maintenance treatments with chemotherapeutic drugs to prevent disease recurrence once remission has been achieved. Maintenance therapy usually involves lower drug doses, and may continue for up to three years.

Alternatively, allogeneic bone marrow transplantation may be appropriate for high-risk or relapsed patients. (*Hoffbrand AV, Moss PAH et al 2006*)

Hematologists base CLL treatment on both the stage and symptoms of the individual patient. A large group of CLL patients have low-grade disease, which does not benefit from treatment. Individuals with CLL-related complications or more advanced disease often benefit from treatment. In general, the indications for treatment are: Falling hemoglobin or platelet count, progression to a later stage of disease, painful disease-related overgrowth of lymph nodes or spleen and an increase in the rate of lymphocyte production. (*National Cancer Institute 2007*)

CLL is probably incurable by present treatments. The primary chemotherapeutic plan is combination chemotherapy with chlorambucil or cyclophosphamide, plus a corticosteroid such as prednisone or prednisolone. The use of a corticosteroid has the additional benefit of suppressing some related autoimmune diseases, such as immunohemolytic anemia or immune-mediated thrombocytopenia. In resistant cases, single-agent treatments with nucleoside drugs such as fludarabine, pentostatin, or cladribine may be successful. Younger patients may consider allogeneic or autologous bone marrow transplantation. (*Gribben JG 2008*)

Many different anti-cancer drugs are effective for the treatment of AML. Treatments vary somewhat according to the age of the patient and according to the specific subtype of AML. Overall, the strategy is to control bone marrow and systemic (whole-body) disease, while offering specific treatment for the central nervous system (CNS), if involved.

In general, most oncologists rely on combinations of drugs for the initial, induction phase of chemotherapy. Such combination chemotherapy usually offers the benefits of early remission and a lower risk of disease resistance. Consolidation and maintenance treatments are intended to prevent disease recurrence. Consolidation treatment often entails a repetition of induction chemotherapy or the intensification chemotherapy with additional drugs. By contrast, maintenance treatment involves drug doses that are lower than those administered during the induction phase. (*American Cancer Society 2012*)

There are many possible treatments for CML, in a more advanced, uncontrolled state, when the patient cannot tolerate imatinib, or if the patient wishes to attempt a permanent cure, then allogeneic bone marrow transplantation may be performed. This procedure involves high-dose chemotherapy and radiation followed by infusion of bone marrow from a compatible donor. Approximately 30% of patients die from this procedure. (*Fausel C 2007*)

All blood cells come from blood stem cells. Although some blood stem cells are in the blood, most are in the bone marrow.

### **Watchful Waiting**

Doctor may suggest watchful waiting if diagnosed with chronic lymphocytic leukaemia (CLL) but with no symptoms. Watchful waiting means delaying treatment until symptoms occur. The purpose is to avoid the side effects of treatment as long as possible. People worry that waiting to start treatment may reduce the chance to control leukaemia before it gets worse. Having regular check-ups reduces this risk.

### **Chemotherapy**

Most people with leukaemia are treated with chemotherapy. Chemotherapy uses drugs to kill leukaemia cells. Several drugs are used for leukaemia, and they may be given in different

ways. The drugs used for leukaemia may be given through a thin needle directly into a vein (intravenously) and as pills and liquids that you swallow. The drugs enter the bloodstream and can kill leukaemia cells almost all over the body.

However, many drugs given directly into a vein or taken by mouth can't pass through the tightly packed blood vessel walls found in the brain and spinal cord. If leukaemia affects the brain or spinal cord, the drugs may be given through a needle into the fluid that fills the spaces in and around the brain and spinal cord. This method is known as intrathecal chemotherapy, and it's given in two ways:

Into the spinal fluid: The doctor may inject drugs into the spinal fluid. Injections into the spinal fluid can be painful.

Under the scalp: The surgeon may place a device known as an Ommaya reservoir under the scalp during surgery. The doctor injects drugs into the device. This method usually doesn't hurt. The doctor may suggest this method when many doses of intrathecal chemotherapy are planned.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing leukaemia cells, but the drugs can also harm normal cells that divide rapidly:

Blood cells: When drugs lower the levels of healthy blood cells, patients are more likely to get infections, bruise or bleed easily, and feel very weak and tired. Health care team check for low levels of blood cells and may stop the chemotherapy for a while, reduce the dose of the drug, or give a blood transfusion. Medications are also given that help the body to make new blood cells.

Cells in hair roots: Chemotherapy may cause hair loss. If you lose your hair, it will grow back after treatment, but the colour and texture may be changed.



Cells that line the digestive tract: Chemotherapy can cause a poor appetite, nausea and vomiting, diarrhoea, or mouth blisters. Your health care team can give you medicines and suggest other ways to help with these problems.

### **Targeted Therapy**

Targeted therapies are drugs that can block the growth of leukaemia cells. For example, a targeted therapy may block the action of an abnormal protein that causes leukaemia cells to grow. Several targeted therapies are used for leukaemia. The type of targeted therapy depends on the type of leukaemia:

### **Radiation Therapy**

Some people with leukaemia receive radiation therapy along with chemotherapy. A large machine will aim high-energy rays at your body to kill cancer cells. The machine may be aimed at the brain or other parts of the body where leukaemia cells have been found or, the machine may be aimed at the whole body. Radiation therapy for the brain or other areas is usually given 5 days a week for several weeks. Radiation therapy for the whole body is given once or twice a day for a few days, usually before a stem cell transplant. Side effects depend mainly on how much radiation is given and the part of your body that is treated. Radiation therapy aimed at the brain may cause you to feel tired or to lose hair from your head. However, some side effects, such as memory loss or other problems, may be permanent. It's common for skin in the treated area to become red, dry, and itchy. After treatment is over, the skin will slowly heal.

## **Nutrition**

Eating well is important before, during, and after treatment for leukaemia. The right amount of calories is needed to maintain a good weight and enough protein to keep up strength. Eating well may help feel better and have more energy. Patients must eat lots of vegetables and fruits.

## **Stem Cell Transplant**

Some people with leukaemia receive a stem cell transplant. This treatment is done after radiation therapy aimed at the whole body, a large dose of chemotherapy, or both. Radiation therapy and chemotherapy will destroy both leukaemia cells and normal blood stem cells in the bone marrow. To replace the normal blood stem cells that are destroyed by radiation therapy and chemotherapy, you'll receive healthy blood stem cells through a vein. It's like getting a blood transfusion. The transplanted stem cells will move to the bone marrow and make new blood cells.

## **Follow-up Care**

After treatment for leukaemia, regular check-ups are needed. For example, someone with acute leukaemia may need a check-up every month for the first year after treatment, and someone with chronic leukaemia may need a check-up every six months. Check-ups help ensure that any changes in health are noted and treated if needed. Leukaemia may come back after treatment. The doctor will check for the return of leukaemia. Check-ups also help detect health problems that can result from cancer treatment. Check-ups may include a physical exam, blood tests, and bone marrow tests. A male patient needs to be followed up to 3 years and 2 years for female patients.

## 2.2 Related research

Significant research into the causes, prevalence, diagnosis, treatment, and prognosis of leukemia are being performed.

Treatment through gene therapy is currently being pursued. One such approach used genetically modified T cells to attack cancer cells. In 2011, a year after treatment, two of the three patients with advanced chronic lymphocytic leukemia were reported to be cancer-free (*Jaslow, Ryan et al 2011*) and in 2013, three of five subjects who had acute lymphocytic leukemia were reported to be in remission for five months to two years. (*Coghlan, Andy et al 2013*) Identifying stem cells that cause different types of leukaemia is also being researched. (*Shapira T, Pereg D et al 2008*)

The American Cancer Society employs a staff of full-time researchers who relentlessly pursue the answers that help us understand how to prevent, detect, and treat cancer, including childhood cancer. The Society's Surveillance and Health Services Research Program in 2014 produced an important and [detailed report](#) summarizing the progress made and challenges ahead in fighting childhood and adolescent cancers (**Patrick Brown, MD**, at **Johns Hopkins University** in Baltimore and **Kevin Shannon, MD**, at the University of California at San Francisco). At this time, there are no special tests advised to help find leukemia early. The best way to find the disease early is for the parents to call the doctor right away. Careful, regular medical checkups are important for children who have been treated with chemotherapy (chemo) or radiation therapy for an earlier cancer, children who have certain genetic conditions (such as Li-Freemen syndrome or Down syndrome), and children who have had organ transplants. These children are at greater risk for certain types of leukemia. Childhood leukemia is often found because a child has symptoms that prompt a visit to the doctor. (**George Marcoullis, MD, PhD** Associate Professor of Medicine, New York Medical College).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Study Population**

The research will specifically use nurses who are presently stationed at the child health directorate. A sample size of one hundred was used for the study.

#### **3.2 Study design**

The study will use a cross sectional prospective covering a period (from February, 2016 to March, 2016).

#### **3.3 Sampling and sampling techniques**

The sampling method used was probability sampling and the sampling technique used was the simple random sampling. A total of one hundred health workers were sampled as the respondent for the study.

#### **3.4 Techniques, Instruments for data collection and analysis**

There will be much reliance on primary data. A structured open ended and closed ended questionnaire will be used to collect raw data from the sampled population. The computer as well as some application software such as the Statistical Package for Social Sciences (SPSS). For a good presentation and better understanding of the analyzed data, MS Excel will also be used.

#### **3.5 Ethical considerations**

With the help of the university authorities, a consent form will be sent to the Director of Nursing Services, Human Resource Director and Directors of the paediatric wards in the

## **STUDY SITE**

The research was conducted at child health directorate at Komfo Anokye Teaching Hospital. Komfo Anokye Teaching Hospital is located in the Ashanti Region capital of Ghana. The study covers nurses at the child health directorate of Komfo Anokye Teaching Hospital in the Ashanti Region. This area was chosen because of its population and so it is taken to be a representative of the whole Ashanti Region. It is the second largest hospital in Ghana. It is the main referral hospital for the Ashanti, Brong Ahafo, Northern, Upper East and Upper West regions of Ghana.

Child health directorate consist of paediatric wards B5, B4, C5, MBU, PICU, PEU respectively.

### **3.5 ETHICAL Considerations**

With the help of the university authorities, a consent form will be sent to the Director of Nursing Services, Human Resource Directorate and Directors of the paediatric wards in the Komfo Anokye Teaching Hospital in order that the researchers will be accepted and given the due cooperation. It will also be explained to the participants and their consent sought. The researchers will also make sure that questions and personal attitude do not flout upon anyone's fundamental human rights and cultural beliefs.

Names of participants will not be captured in order to protect their identity.

Data captured will be used exclusively for the purpose of this study.

The study will be registered with KATH Research and Development.

Ethical clearance will be sought from KNUST.

### **3.6 Validity and Reliability**

The research instrument was submitted to our supervisor for content validity. Corrections were made before the questionnaire was administered. Pretest was used to ascertain the research reliability of the instrument, by administering questionnaire to 10 respondents who were not part of the sample for study.

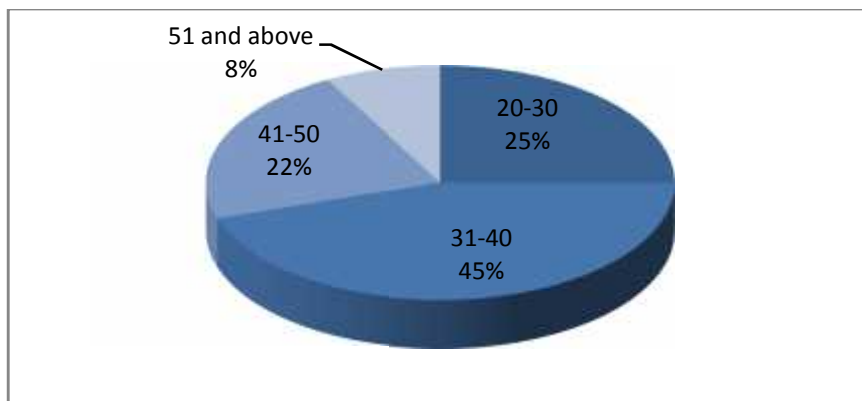
## CHAPTER FOUR

### PRESENTATION AND ANALYSIS OF RESULTS

#### 4.1 Background Characteristics of Respondents

##### Age distribution of respondents

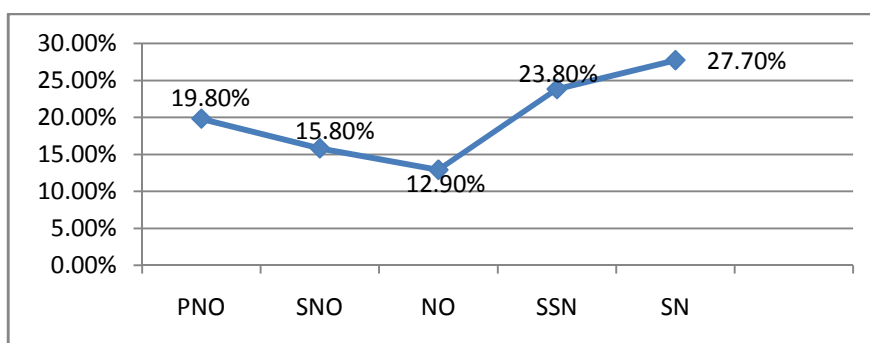
The study shows that out of 100 respondents, 25% were between the ages of 20-30, 45% were between the ages of 31-40, while 22% were between the ages of 41-50 and 8% were between ages 51 and above



**Figure 4.1** Age distribution of respondents

##### Rank of respondents.

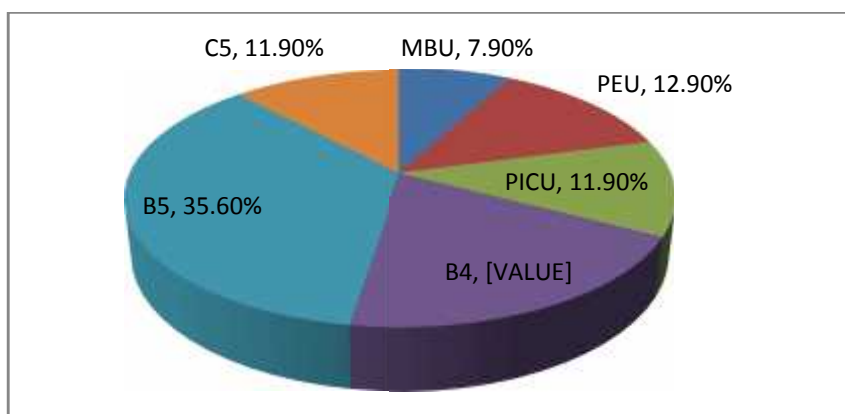
The study shows that out of 100 respondents, 19.8% were principal nursing officers, 15.8% were senior nursing officers, 12.9% were nursing officers working, 23.8% were senior staff nurses, and 27.7% were student nurses.



**Figure 4.2 Rank of respondents.**

**Present ward of respondents**

The study shows that out of 100 respondents, 7.9% were presently working at MBU, 12.9% were working at PEU, 11.9% were working in PICU, 19,8% were working at B4, 35.6% were working B5 whiles 11.9% were working at C5.

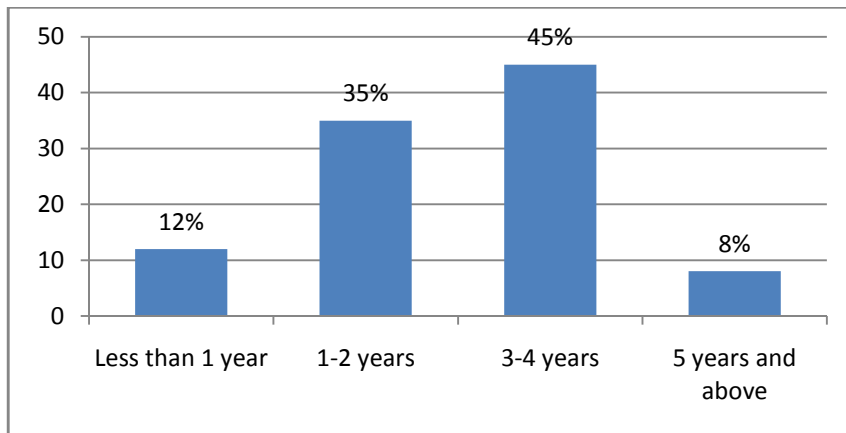


**Figure 4.3 present ward of respondents**

**Number of years worked in child health**

The study shows that out of 100 respondents, majority 45% of the respondents have worked at the ward between 3-4years, 35% have worked at the ward for 1-2 years, while 12 % have worked at the ward for less than 1 year and 8% have worked for 5 years and above.

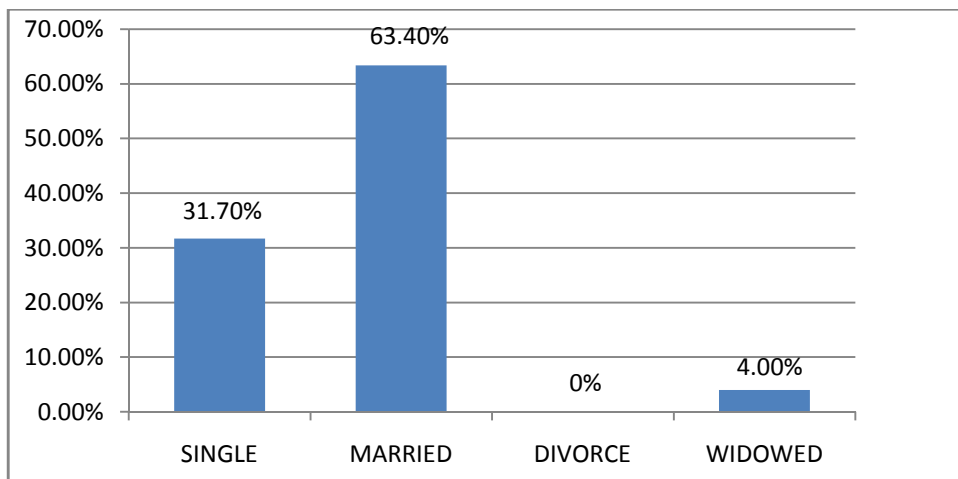




**Figure 4.4 Number of years worked in child health**

#### **Respondent's marital status**

The study shows that, out of the 100 respondents' majority (63.4%) of the respondents were married, 31.7% were single whilst (4.0%) were widowed.

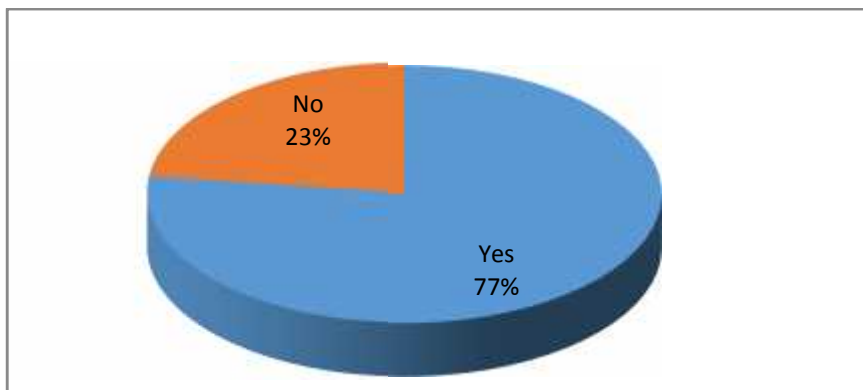


**Figure 4.5 Respondents marital status**

## 4.2 Respondents Responses on childhood leukemia

### Respondents who have knowledge about childhood leukemia

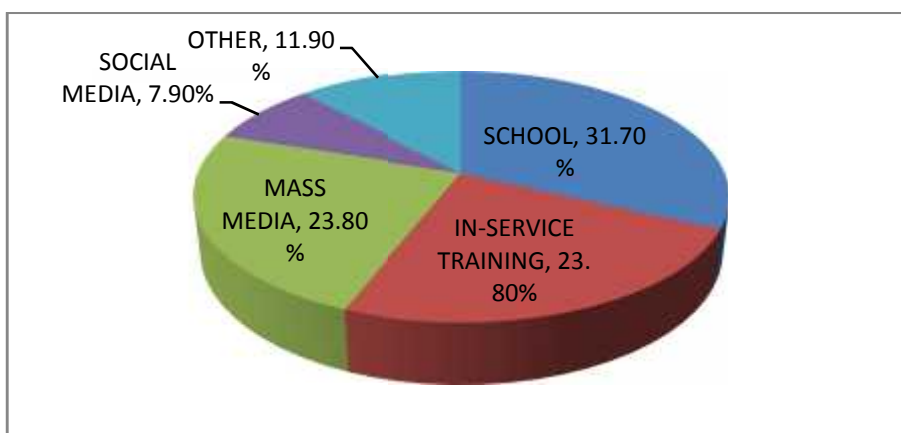
The study indicates that out of the 100 respondents, seventy seven percent (77%) of the total respondents said they have knowledge on childhood leukemia whereas the remaining (23%) respondents said that they don't have knowledge on childhood leukemia.



**Figure 4.6 Respondents who have knowledge about childhood leukemia.**

### Respondents' sources of information

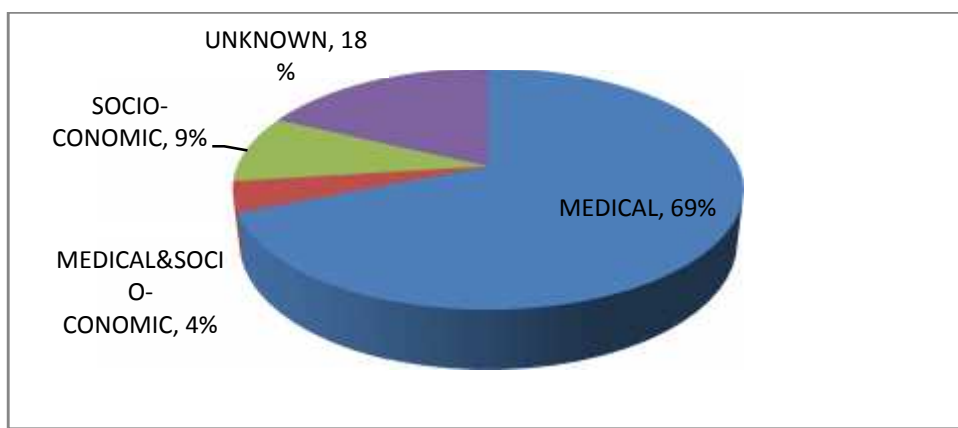
The study shows that out of 100 respondents, 31.7% cited the school as their source of information, 23.8% heard of it at in-service training and the same through mass media and the least source of 5% was through other sources.



**Figure 4.7 Respondents sources of information**

**Respondents' knowledge on the cause of childhood leukemia**

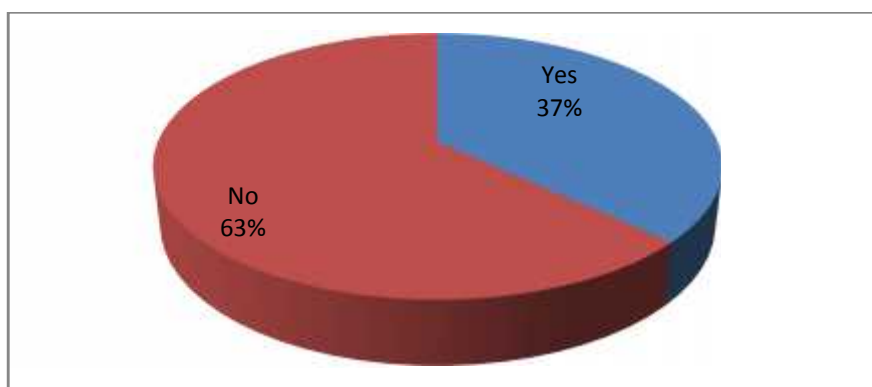
The study shows that out of 100 respondents, 69% of the respondents said the cause of childhood leukemia is medical, 9% attributed the cause to socio economic factors and 4% said it is caused by both socio economic and medical factors. 18% of the respondent said it is unknown. None of the respondent attributed the cause of childhood leukemia to spiritual.



**Figure 4.8 Respondents' knowledge on the cause of childhood leukemia.**

**Respondents' knowledge on the types of leukemia.**

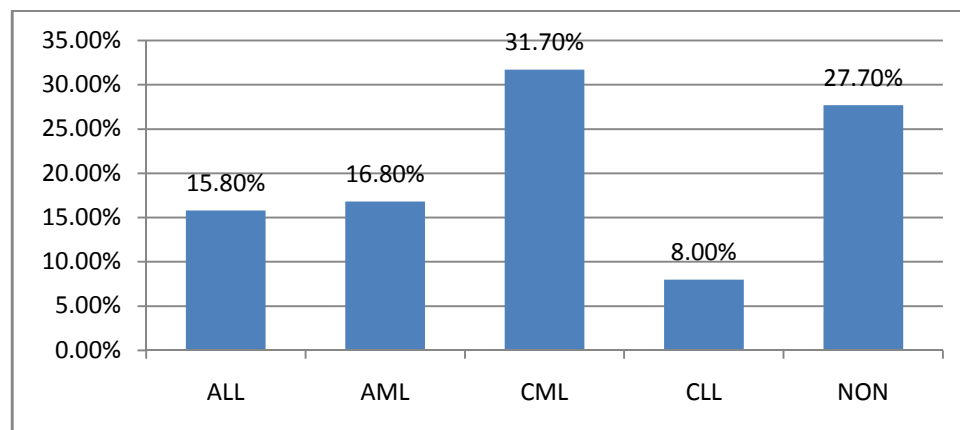
The study shows that out of 100 respondents, majority of the respondents (63%) do not know the types of childhood leukemia and the minority (37%) did know that there are types of the cancer



**Figure 4.9 Respondents' knowledge on the types of leukemia.**

### **Types of leukemia**

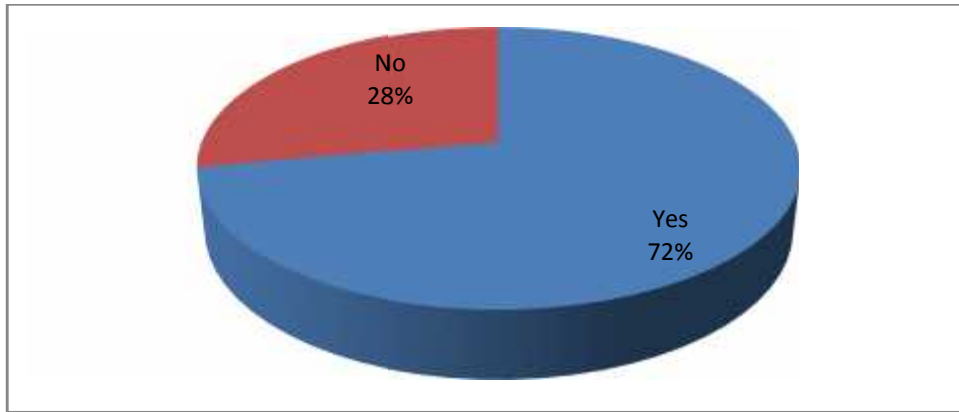
The study shows that out of 100 respondents, 31.7% of the respondents said the type of childhood leukemia they know is chronic myelogenous leukemia, 16.8% stated acute myelogenous leukemia, 15.8% said the types they know is acute lymphoblastic leukemia, 8% stated Chronic lymphocytic leukemia as the type they know and 27.7 % of the respondents did not have any idea on the types of childhood leukemia.



**Figure 4.10 types of leukemia**

### **Respondents' knowledge on clinical manifestations of childhood leukemia**

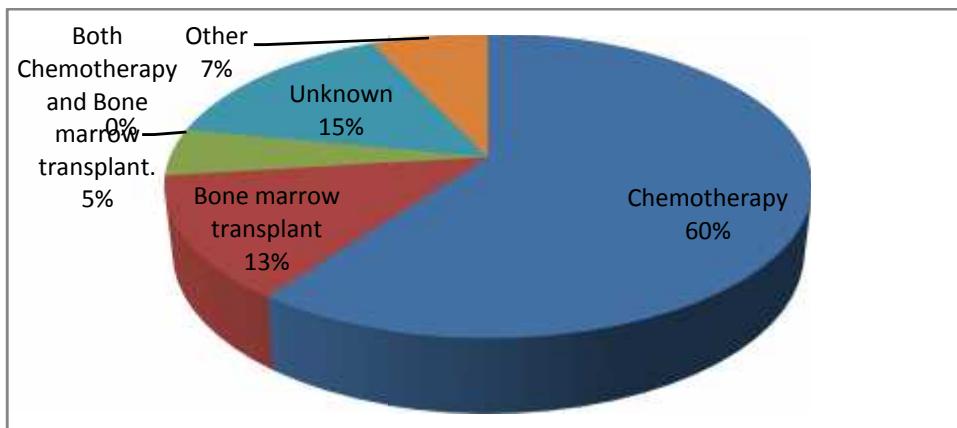
The study shows that out of 100 respondents, 72% of the respondents knew the about the clinical manifestation of childhood leukemia and 28% did not know about them.



**Figure 4.11 Respondents' knowledge on clinical manifestations of childhood leukemia.**

#### **Respondents' knowledge on the treatment of childhood leukemia**

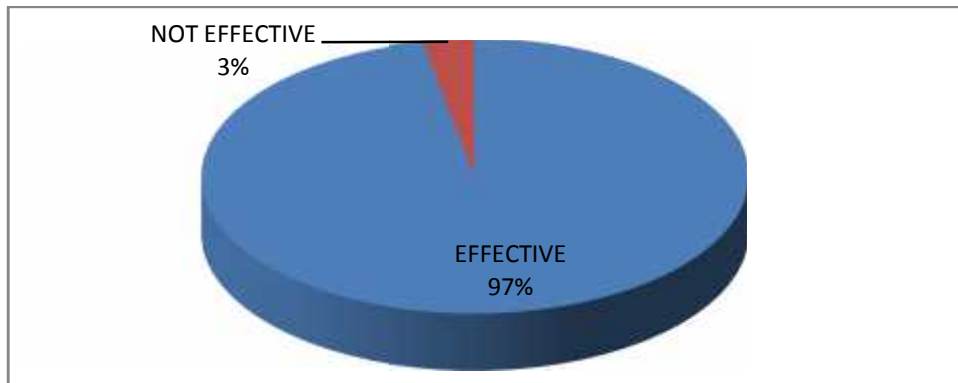
The study shows that out of 100 respondents, Sixty percent 60% of the total respondents gave the treatment of childhood leukemia as chemotherapy, 13% said bone marrow transplant is used to treat this disease and 5% said both chemotherapy and bone marrow transplant are used to treat this condition, other treatment was 7% and 15% ticked unknown.



**Figure 4.12 Respondents' knowledge on the treatment of childhood leukemia.**

#### **Respondents'; knowledge on the effectiveness of psychological treatment of childhood leukemia**

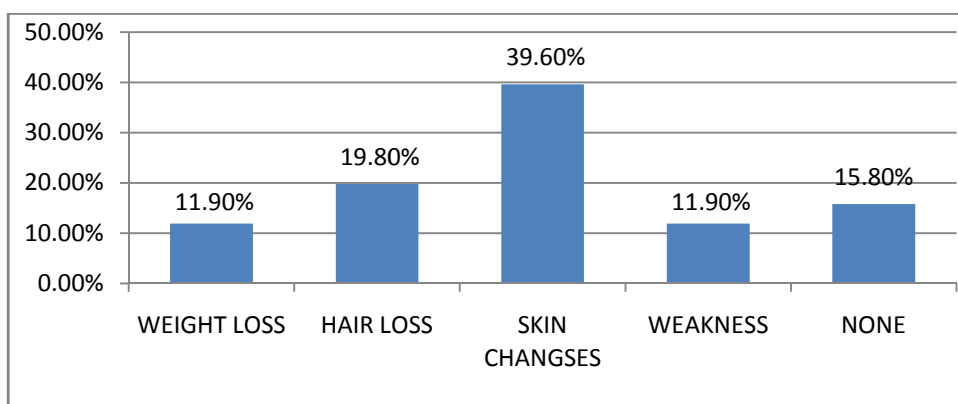
The study shows that out of 100 respondents, 97% of the respondents think the psychological management given to both parents and children with this condition is effective and 3% think it is not.



**Figure 4.13 Respondents'; knowledge on the effectiveness of psychological treatment of childhood leukemia.**

#### **Side effects of cytotoxic**

From the figure above, 39.0% of respondents' skin changes as side effect of cytotoxic, 19.8% said hair loss as side effect of cytotoxic, 11.9% of the respondents said cytotoxic cause's weakness and the remaining 15.8% did not have any idea on the side effect of the cytotoxic drugs.



**Figure 4.14 side effects of cytotoxic**

## **CHAPTER FIVE**

### **DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Discussion of findings**

The study sought to determine the knowledge on childhood leukemia among the nursing staff of the paediatric wards of Komfo Anokye Teaching Hospital. It sought to address the following research questions; do nursing staff on the paediatric wards know about childhood leukemia, what do they know concerning the cause, clinical manifestations and treatment of childhood leukemia?

The study revealed that, out of the 100 respondents (25%) were between the ages of 20-30 while (45%) were between the ages of 31-40, (22%) were between 41-50 years and (8%) of them were 51 years and above. Majority of the respondents (27.7%) were staff nurses, (19.8%) were principal nursing officers, (23.8%) were senior staff nurses, (15.8%) were senior nursing officers and (12.9%) were nursing officers.

B5 ward recorded the highest number (35.6%) of respondent whereas B4 recorded the next higher figure (19.8%), PEU recorded the third highest number (12.9%) of the respondents. PICU and C5 recorded the same value which is (11.9%) each and MBU recorded the least number (7.9%) of the respondents.

Analyses revealed that majority (45%) of the respondents have worked at the ward between 3-4 years while (35%) have worked at the ward for 1-2 years, (12%) had spent less than a year at their current ward and (8%) had been present for 5 years and above. Comparing results of respondents who had worked for less than 2 years (47%) with those who had worked for 3 years and above, the study revealed that even though majority (53%) of the respondents had worked for more than three years at the paediatric unit their knowledge on the childhood leukemia was inadequate.

About seventy-seven percent (77%) of the total respondents said they have knowledge on childhood leukemia, whereas the remaining (23%) respondents said they don't have knowledge childhood leukemia. Out of these respondents, (31.7%) had their source of information from school, (23.3%) had their source of information through in-service training and mass media, (11.9%) of the respondents stated other sources as their source of information. And the social media forming the least source (7.9%).

According to Ross JA, Kasum CM, 2002, the causes for most cases of leukemia is unknown. However majority (69%) attributed the cause to only medical factors, (9%) attributed the cause to only socio-economic factors and (4%) attributed the cause to both medical and socio-economic factors. None of the respondent attributed the cause of childhood leukemia to spiritual and only (18%) of the respondents gave a correct response that the cause of childhood leukemia is unknown.

Vardiman, JW; et al (2009) "The 2008 revision of the World Health Organization (WHO) classification of myeloid neoplasms and acute leukemia" states that leukemia can be classified as acute or chronic and depending on the cell it affects it can be classified into four main types, that is Acute Lymphocytic Leukemia, Acute Myelogenous Leukemia, Chronic Lymphocytic Leukemia and Chronic Myelogenous Leukemia. 37 of the respondents knew the types of childhood leukemias and were able to state the types correctly, 63 did not know any of the types. Most of the respondents stated Acute Lymphocytic Leukemia which is the commonest type that affects children. (Leukemia and Lymphoma society 2009).

Regarding the clinical manifestation of childhood leukemia, majority (72%) of the respondents knew about them and was able to give responses such as bleeding excessively, frequent infection, anaemia, seizures, coma and fever. Comparing their responses with literature by Columbia Electronic Encyclopedia, (2011) it could be said that most respondents had knowledge on the clinical manifestation, since 28% did not know about them.



With respect to the treatment of childhood leukemias, The American Cancer Society 2010 stated that most forms of leukemias are treated with pharmaceutical medication, typically combined into a multi-drug chemotherapy regimen,. Alternatively, bone marrow transplantation may be appropriate for high-risk or relapsed patients. (Hoffbrand AV, Moss PAH et al 2006) and (Fausel C 2007) also stated that in some cases of attempting permanent cure of leukemia radiation therapy may be combined with chemotherapy. Relating this information with the study results, (60%) of the total respondents gave the treatment of childhood leukemia as chemotherapy, (13%) said bone marrow transplant is used to treat this condition, (7%) gave radiation as treatment and (15%) said both chemotherapy and bone marrow transplant are used to treat this condition) it could be concluded that knowledge on the treatment of Childhood leukemia was adequate as compared to (5%) of respondents who could not give a correct answer.

The study also shows that (97%) of the respondents think the psychological management to both parents and children with this condition would be effective and (3%) think it is not.

## **5.2 Conclusion**

Based on the findings of the study it can be concluded that majority of the respondents have knowledge on childhood leukemia. Knowledge on the types of childhood leukemia was however lacking as indicated by the responses of the respondents incorrectly stating the types of childhood leukemia compared to those who stated them correctly. Majority of the respondents said the causes of childhood leukemia are medical and majority of the respondents also correctly stated treatments of leukemia, it can be concluded that, there are gaps in knowledge on childhood leukemia.

Regarding the clinical manifestation of childhood leukemia, most of the respondents knew about the clinical manifestations and very few did not know about them.

### **5.3 Recommendation**

Leukemia can change life and the lives of those close to the patient. These changes could be hard to handle. Clients and their parents normally need help in coping with the feelings that a diagnosis of cancer can bring. Concerns about treatments and managing side effects, hospital stays, and medical bills are common.

- ) We therefore recommend that workshops and in-service training sessions on childhoodleukemia should be organized for nursing staff of the paediatric wards of KATH.
- ) The oncology departments should be encouraged to create awareness on childhood leukemia through the media like the newspapers, television, radio etc.
- ) Childhood leukemia's (cancers) should be incorporated into the nursing curriculum of the nursing training schools.

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## **APPENDIX 1**

### **ABBREVIATIONS**

**ALL** – Acute Lymphocytic Leukemia

**AML** - Acute Myelogenous Leukemia

**CLL** - Chronic Lymphocytic Leukemia

**CML** – Chronic Myelogenous Leukemia

**KATH** – Komfo Anokye Teaching Hospital

**KBTH** – Korle-bu Teaching Hospital

**NCI** - National Cancer Institute

**WHO** - World Health Organization

**APPENDIX 2**  
**QUESTIONNAIRE**  
**CHRISTIAN SERVICE UNIVERSITY COLLEGE, KWADASO-KUMASI**  
**DEPARTMENT OF NURSING**  
**QUESTIONNAIRE ON THE EVALUATION OF KNOWLEDGE OF NURSING**  
**STAFF ON CHILDHOOD LEUKEMIAS AT THE CHILD HEALTH**  
**DIRECTORATE OF KOMFO ANOKYE TEACHING HOSPITAL.**

Dear respondent,

We are students of the above mentioned institution undertaking a mandatory research project. Topic; Evaluation of Knowledge of Nursing Staff on Childhood Leukemias at the child health directorate of Komfo Anokye Teaching Hospital. The outcome of this study would aid planning of programmes to update the knowledge and health delivery service rendered by nursing staff to childhood leukemia clients and relatives and help in awareness creation of leukemia in the country.

**Demographic information**

**1 (a) State your actual age. ....**

1 (b) Age

- |                 |                          |
|-----------------|--------------------------|
| a. 20 - 30      | <input type="checkbox"/> |
| b. 31 - 40      | <input type="checkbox"/> |
| c. 41 - 50      | <input type="checkbox"/> |
| d. 50 and above | <input type="checkbox"/> |

2. What is your rank?

- |             |                          |
|-------------|--------------------------|
| a. D.D.N.S. | <input type="checkbox"/> |
|-------------|--------------------------|



- b. P.N.O ☐
- c. S.N.O ☐
- d. NO. ☐
- e. SSN ☐
- f. S.N ☐

g. others .....

3. Which ward have you worked in Child Health Directorate?

- a. MBU ☐
- b. PEU ☐
- c. PICU ☐
- d. B4 ☐
- e. B5 ☐
- f. C5 ☐

4. (a) State the actual years you have worked as a nurse. ....

4 (b) How long have you worked in Child Health?

- a. 1 – 2 years ☐
- b. 3 – 4 years ☐
- c. 5 years ☐

5. What is your marital status? .....

### Knowledge on childhood leukemia

6.

(a) Have you ever heard of leukemia in children?

a. Yes

☐

b. No

☐

(b) Through which medium.

(a) School

(b) In-service training

(c) Mass media

(d) Social media

(e) Others (specify).....

### **Knowledge on causes of childhood leukemia**

7. What are the risk factors for childhood leukemias?

a. Medical

☐

b. Socio-economic

☐

c. Medical/Socio-economic

☐

d. Unknown

☐

### **Knowledge on types of childhood leukemia**

8. Do you know the types of childhood leukemias?

(a) Yes

(b) No

9. State the types

.....  
.....

10. (a) Have you ever nursed a child diagnosed of Leukemia?

a. Yes ☐

b. No ☐

(c) State the actual number. ....

11. Do you know the clinical manifestations of childhood leukemia?

a. Yes ☐

b. No ☐

If yes, please give as many as you can

.....

12. What are the treatments of childhood strategies?

.....  
.....

13. What other supportive treatments do know?

.....  
.....

14. What other non-medical interventions do you know?

.....  
.....

15. In your opinion, is psychological management of childhood leukemia for both parent and children effective?

(a) Yes

(b) No

16. What do you think should be done to create awareness of the existence of childhood leukemia?

.....

.....

.....

17. What is the term used for the use of drugs (cytotoxic) to treat childhood leukemias?

.....

.....

18. What are the side effects of cytotoxics?

.....

.....

.....

