Assessment Of Knowledge And Practice Of Nurses Regarding Care Of Children Undergoing Radio Therapy

At Khartoum Center For Radiation Therapy And Nuclear Medicine- November 2014

Thesis submitted in partial fulfillment for the requirement of the Msc degree in pediatric nursing

by : Rabab Mohammed Adam Mohammed

Supervisor: Dr: Faiza Ali Nasor Taha

2015
Dedication

- To my father
- To my sisters and brothers
- To my entire teachers through my learning journey
Acknowledgment

My gratitude shall be submitted first to “Allah” who always help and care for me.

I feel always indebted to “Allah” the most kind and merciful.

I would like to express my hearted thanks and profound gratitude to my supervisor

Dr. Faiza Ali Nasor for her continuous encouragement, her patience generous help, endless support and continuous efforts and valuable advices during the continuation of the study.

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# LIST OF ABBREVIATIONS

<table>
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<tr>
<td>LMICS</td>
<td>Low-Meddle Income Countries</td>
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<td>NCD</td>
<td>Non Communicable Disease</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>IR</td>
<td>Ionizing Radiation</td>
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<td>Non Ionizing Radiation</td>
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<tr>
<td>UV</td>
<td>Ultra Voilet</td>
</tr>
<tr>
<td>SRS</td>
<td>Stereotactic Radiotherapy</td>
</tr>
<tr>
<td>IMRT</td>
<td>Intensity Modulated Radiation therapy</td>
</tr>
<tr>
<td>HDR</td>
<td>High Does Rate</td>
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<tr>
<td>CBC</td>
<td>Complete blood count</td>
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<tr>
<td>RFT</td>
<td>Renal Function Test</td>
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<td>LFT</td>
<td>Liver Function Test</td>
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Abstract

Radiation therapy is an important therapy for cancers in children. This type of therapy is used either alone or combined with surgery, chemotherapy and newer biological therapies in the curative or palliative treatment of cancer. Radiation therapy also has a palliative role for metastatic and locally recurrent disease.1 Radiation oncology services are provided 7 days a week, with staff accessible, as required by the service.

Radiation oncology services are included in a range of strategies designed to optimize cancer service delivery in Queensland.

**GENERAL OBJECTIVE:**
To study knowledge and practice of nurses regarding children undergoing radiotherapy in order to improve policies regarding nursing in such unit

**MATERIALS AND METHODS:**
The data were collected using questionnaire filled from participants which are nurses working for a period of more than one year, they are 40 and also using observation to 40 practitioner before and after radiotherapy at Khartoum center for radiation therapy and nuclear medicine.

**RESULTS:**
Study showed that nurses knowledge regarding radiotherapy side effects 74.3% which is considered as good, management of side effect is 27.1% which is considered as poor, nursing performance showed that 90.9% which considered as acceptable practice.

**CONCLUSION:**
Nurses have more practice than knowledge so need more training courses.
ملخص الدراسة

الخلفية:

يستخدم العلاج الإشعاعي الطاقة العالية والأشعة السينية أو جسيمات لقتل الخلايا السرطانية. قد يكون مصدر الإشعاع خارجي (أي من خارج الجسم) وتأتي من الحزم والأشعة السينية التي تهدف إلى قتل الخلايا السرطانية أو يكون مصدر اشعاع خاص (أي من داخل الجسم) ويأتي من زرع الأشعة النشطة.

الهدف من العلاج الإشعاعي الخارجي والداخلي على حد سواء هو قتل الخلايا السرطانية مع الحد من الاضرار التي لحقت الخلايا الطبيعية السليمة حول الورم، معظم الخلايا السليمة التي تضررت من الإشعاع يمكن إصلاح نفسها بسرعة.

الهدف العام:

تهدف هذه الدراسة لمعرفة وممارسة الممرضات بشأن الأطفال الذين يخضعون للعلاج بالأشعة.

منهجية البحث:

استخدام المنهج الوصفي للرسالة، ثم جمع البيانات باستخدام الاستبان، ونحن الممرضات اللاتي عملن لمدة أكثر من سنة وهمن 40 وأيضاً باستخدام الملاحظة مشاركة قبل وبعد العلاج الإشعاعي في مركز الخرطوم للعلاج الإشعاعي والطب النووي.

النتائج:

أظهرت الدراسة أن معرفة الممرضات فيما يتعلق بالإشعاع أخرى الجلدية للعلاج الإشعاعي 74.3% والتي تعتبر جيدة، ومعالجة الأثر الجانبية 27.1% والتي تعتبر فقيرة، وداء الممرضات 90.9% والتي تعتبر ممارسة ممتازة.

الخلاصة:

يجب على الممرضات الحصول على المزيد من المعرفة فيما يتعلق بمعالجة الأثار الجانبية وذلك من خلال الدورات التدريبية.
CHAPTER ONE
INTRODUCTION
JUSTIFICATION
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INTRODUCTION:

Parents and children state that they need more support, information, and engagement with the healthcare team to maintain overall health during complicated cancer treatment schedule. Multiple studies conclude that parents and children identify respectful and relational communication with providers as increasing satisfaction with their experience. The communication process between parents of radiation oncology therapy children and the hospital staff nurses is an interpersonal relationship that can include a great deal of uncertainty. This project examines the nurse’s role in communicating with these parents in a family centered manner, increasing parental knowledge, and reducing their anxiety about the radiation therapy schedule. The ultimate goal of this project is to formulate a collaboration model for an inter departmental family-centered communication policy/structure. Cancer is the second leading cause of death in children, second only to accidents (American Cancer Society, 2014; Hoyert & Xu, 2012). Family life disruptions include long treatment plans, multiple surgical procedures, isolation from the general public due to immune suppression, and disconnected communication processes between many hospital departments (Costelloa, Patak, & Pritchard, 2010). These families experience additional stress with daily hospital visits, native language differences, and fear of their child’s possible reactions to the treatments (Tomlinson, Peden-McAlpine, & Sherman, 2012). The emotional impact of the process and treatment options for the parents can be overwhelming (Franck, Winter, & Oulton, 2007). The parents receive an enormous amount of information in a short amount of time (surgery, scans, chemotherapy, and the radiation therapy plan) and are expected to make the best (1).
Sudan, is the country in Africa, is experiencing a growing cancer problem, but little is presently known on tumor patterns, cancer epidemiology and ethnic or environmental cancer risk factors. review here the current status of knowledge, summarizing data from local and international publications as well as primary information from the only two cancer hospitals of the country, both located in central Sudan (Khartoum and Wad Medani). We provide frequencies reported for cancers detected in children and summarize studies on specific cancer types, as well as information on risk factors that most likely impact on tumor pattern(2).
JUSTIFICATION:

so that this study will be conducted to find out how the knowledge and practice of professional nurses regarding the care of child with radiotherapy, its seen that there is a lack of studies conducted on this important topic. for these above mentioned reason I select the project to assess the nurses' knowledge and practice regarding radiotherapy and side effect

OBJECTIVE:

GENERAL OBJECTIVE:

to study knowledge and practice of nurses care regarding children undergoing radiotherapy in order to improve policies regarding nursing in such unit

SPECIFIC OBJECTIVE:

1- To measure the knowledge of nurses regarding care of children undergoing radiotherapy
2- To identify the nurses practice regarding children treatment with radiotherapy
3- To assess the knowledge of nurses regarding nutritional care of children with radiotherapy
LITERATURE REVIEW:

More than 160,000 children worldwide are diagnosed with cancer annually, resulting in about 90,000 deaths, and the majority of these deaths occur in low- and middle-income countries (LMICs) (3-4). Over the past two to three decades, advances in molecular diagnosis and oncological treatments have greatly improved overall survival rates in children with cancer (83%) in high income countries (HICs), where adequate hospital infrastructure, continuous professional training, and up-to-date resources are readily available (5). The large majority of cases of childhood cancer occur in LMICs where late diagnosis and limited access to appropriate management and effective therapy have resulted in survival rates of 20% or less (6-7). Even more discouraging is that the gap in survival rates continues to widen as curative therapies and national pediatric oncology strategies are developed by health-care professionals in HICs, but not implemented in LMICs (8). The problems caring for children with cancer in LMICs are being addressed with growing interest by international medical organizations due to recent shifts in pediatric global health care emphasis (9-10). Improved prevention and treatment of childhood communicable diseases permits increased efforts in other areas as evidenced by initiatives from the NCD (Non communicable Diseases) Alliance and World Health Organization (WHO) According to the NCD Alliance (2014),“NCDs, including cancer, are a major cause of preventable mortality, morbidity and disability amongst children in LMICs. Many of these children die prematurely because of late diagnosis and/or lack of access to appropriate treatment; those fortunate to survive, often experience significant hardship and disability as a result of living with a chronic health condition that is not optimally managed” (11-12). Many strategies have been offered to improve the survival rate of children with cancer in LMICs, including community awareness efforts, adapted protocol-driven care, and improved interdisciplinary care in local settings (13). The need for competent pediatric oncology nurses is one aspect of care that is universally acknowledged.
as essential to al l such strategies, The development of baseline standards for pediatric oncology nursing care in LMICs described in this article lays(14)

Radiation is energy that is radiated or transmitted in the form of waves or particles. According to their frequency and energy, electromagnetic waves can be classified as either “ionizing radiation (IR) or non ionizing radiation (NIR). Ionizing radiation has enough energy to remove electrons from atoms, thus creating ions. Its properties can be used for the production of energy, diagnosis and treatment of disease, agricultural and manufacturing processes.

Non ionizing radiation (NIR) is general term for that part of the electromagnetic spectrum which has photon energies too weak to break atomic bonds. It includes ultraviolet (UV) radiation, visible light, infrared radiation, electric and magnetic fields with diverse applications in communication, industry and medicine.(15)

Radiation therapy is an important therapy for cancers in children. This type of therapy is used either alone or combined with surgery, chemotherapy and newer biological therapies in the curative or palliative treatment of cancer. Radiation therapy also has a palliative role for metastatic and locally recurrent disease.(16) Radiation oncology services are provided 7 days a week, with staff accessible, as required by the service. Radiation oncology services are included in a range of strategies designed to optimize cancer service delivery in Queensland.

Strategies include integration of delivery and performance across the continuum of care including supportive care and palliative care. Radiation oncology services provide a range of treatment services in accordance with standardized, evidence-based guidelines and protocols as appropriate. Where standardized radiation therapy protocols do not exist, or patients are not eligible for clinical trials, it is expected the service will have mechanisms in place for planning, monitoring and
reviewing the standard of care provided to these patients. In addition, radiation oncology services for children provide:
• age- and family-appropriate facilities
• a highly coordinated, multidisciplinary and patient-focused approach to treatment
• supporting infrastructure, including information management, scientific, biomedical and technical services
• documented referral pathways for complications associated with radiation therapy
• access to children’s rehabilitation and psychosocial support services (including psychology / psychiatry, social work and welfare)
• access to appropriate children’s allied health professional specialties, particularly occupational therapy

Radiation therapy is used:
Alone, as the only treatment
Before surgery to shrink the tumor
During surgery to protect the area around the tumor
After surgery to destroy any remaining cancer cells
With chemotherapy which makes the cancer cells more sensitive to radiation treatment
• After chemotherapy to kill remaining cancer cells
• To control symptoms such as pain or bleeding

Types of Radiation Therapy:
A-External Radiation Therapy:
External radiation therapy uses a machine called a linear accelerator to direct beams of high energy X-rays at tumor. The machine can change positions so the beams may enter the body from any angle. by changing the angle of the beams the
Radiation doctor is able to match the shape of the tumor and spare as many healthy cells as possible. External radiation treatments do not make radioactive they may go about their normal daily activities they may have close physical contact with people without worrying that they might expose them to radiation.

Types of External Radiation Therapy

1- Stereotactic Radio surgery (SRS)

Stereotactic radio surgery (SRS) aims a precise and intense dose of radiation at a targeted area. SRS is used in place of surgery for some brain tumors. SRS can treat tumors in parts of the brain where surgery is not recommended or possible. SRS differs from other types of radiation because it can be aimed at a small area of tumor tissue without harming the normal brain tissue around the tumor. Many beams of radiation are focused on the tumor from different directions so a high dose of radiation can be safely given in one treatment session.

2- Intensity Modulated Radiation Therapy (IMRT)

Intensity modulated radiation therapy (IMRT) uses a computer to combine precise images of the tumor with a special linear accelerator to vary the angle, shape and intensity of the radiation beams to different parts of the tumor or treatment area. The precision of IMRT delivers the maximum dose of radiation to the tumor while sparing normal tissue around the tumor. IMRT is used to treat areas such as the brain, head, neck, lungs and prostate.

3- No-exit Dose Proton Beam Therapy

Proton radiation therapy uses energy from the protons of atoms to destroy cancer cells. Cyclotron produces these high-energy protons. The beam of proton radiation can be aimed at a tumor very precisely and can be concentrated on a tumor with little harm to the surrounding normal tissues. Other types of radiation do some harm to normal tissues as they enter and exit the tumor area. Proton radiation has an
entering dose but no exit dose of radiation so the nearby normal cells are protected (19)

**B - Internal Radiation — Brachy therapy**

Internal radiation therapy or brachytherapy means that the radiation source is placed inside the body. These implants hold the source of the radiation and can be thin wires, plastic tubes, capsules or seeds. Brachytherapy or implants can be used with many types of cancer. With high dose rate (HDR) brachytherapy, a special machine inserts the radioactive substance into the tumor and delivers a high dose of radiation rapidly. The machine also removes the radioactive substance in the treatment room. Usually, patients need several daily doses to attain proper treatment levels. This type of brachytherapy can usually be done on an outpatient basis. Brachytherapy can sometimes require a short hospital stay of one to three days. This type of brachytherapy can make you radioactive for a short period of time and there are special precautions that must be taken. The doctor or nurse will make sure the patient understands the type of treatment he will have and what he can and cannot do (20)

**Radiation Treatment Team:**

Radiation oncology treatment team is made up of many different healthcare professionals. Each has special training and experience in treating the type of cancer with radiation therapy. Treatment team will work with them to be sure they get the most effective radiation treatment possible. The same team members will treat them throughout therapy. They will get to know them. They will find that they are interested in as a whole person and not just in the disease. Treatment team members work and talk with each other all the time to check the progress and make certain they get the best possible care. Any member of treatment team is available to answer questions.
The healthcare professional’s team:

1- Radiation oncologist
doctors who specialize in using radiation to treat cancer. They work with them and with other cancer doctors to develop the treatment plan. The radiation oncologist leads the radiation treatment team and decides which type of radiation and equipment will best treat the type of cancer. Throughout the treatment, the radiation oncologist continues to monitor the progress.

2- Radiation oncology nurse –
nurse with special training in the care and treatment of patients with cancer. She can turn to the nurse with any question or concern they may have. Thenurse will talk with patients about radiation treatment and help manage any symptoms or side effects. Remember, that nurse is the person they should call whenever a question arises.

3- Radiation therapist –
A licensed therapist with specialty training in the fields of radiation physics, biology, radiation safety and computer-aided biophysics. The therapist sets up the daily radiation treatment, positions, and delivers the prescribed dose of radiation.

4- Radiation physicist –
a scientist who helps plan the technical part of the treatment. Radiation physicist decides the best shape and angles for the treatment beams. They make sure the equipment works as planned and delivers the right amount of radiation.

5- Dosimetrist –
a specialist who calculates and plans the doses of radiation therapy.

6- Safety and Quality Assurance
department of radiation oncology is a safe, secure environment. All of our equipment is maintained in top condition according to guidelines set forth by the Massachusetts department of public health and the joint commission of
accreditation of health care organizations. In addition, our radiation therapists check the calibrations of the equipment on a daily basis. Our machines are fully shielded so that significant radiation can reach only a specific area necessary for the treatment of the cancer. Lead blocks or shutters protect the healthy tissue. These are custom made to fit the targeted tumor. The treatment plan is reviewed by a team of radiation oncologists. They constantly check status and review plan throughout the course of therapy. There are several checks and measures at each of the visits to confirm that the proper area of the body is being treated and treatment is going as planned (21)

**Side Effect of Radiation:**

**Acute side effect:**

Occur because of damage to stem cells in rapidly dividing mucosa, e.g., pharynx, small bowel, usually begin 7-10 days after the start, and subside 2-3 weeks after treatment (22)

**Chronic side effect:**

Occur because of damage to stem cells in slowly dividing tissues often permanent, irreversible may need surgical correction, fistulas, strictures

Side-Effect of Radiotherapy:

Fatigue, anorexia, stomatitis, xerostomia
Alopecia, skin reaction, nausea and vomiting, esophagitis and dysphagia
Diarrhea, cystitis, bone marrow depression (23)

**MANAGING Side effect:**

The goal of radiation therapy is to destroy cancer cells, but radiation therapy can also injure or destroy normal cells. This can cause some side effects. The radiation doctor will explain any possible side effects before treatment begins. Early or acute side effects from radiation therapy can be treated and usually go away a few weeks
after the treatment end, fatigue, loss of appetite and skin irritations are examples of acute side effects.

late or long-term side effects may take months or years to develop and can be permanent. for example, high doses of radiation can cause permanent hair loss and damage to the skin in the treatment area. they should always tell treatment team about any symptoms or side effects. radiation nurse will give specific information on how to manage those side effects.

**Recommended Skin Care during Radiation Treatment**

Skin reactions are common during radiation therapy. Please follow this skin care.

**Instructions while patient are receiving radiation treatment to:**

1. wash skin in the treatment area with warm water and an unscented, moisturizing soap once a day. be gentle. do not scrub. pat the skin dry.
2. moisturizer may be used 2 to 3 times a day (morning, midday and at bedtime).
3. do not use anything else on the skin in the treatment area. for example, after-shave lotion, perfume or makeup.
4. *only use an electric razor in the treatment area.*
5. *wear loose clothing to avoid friction or tightness in the treatment area.*
6. *wear clothes made from soft fabrics like cotton.*
7. *protect skin from the sun.*
8. *wear a wide-brimmed hat.*
9. *apply sunscreen to skin before go outside.*

**Nutrition:**

may notice changes in appetite during radiation treatment. It is very important that eat well to help lessen the side effects of cancer therapy. Eat foods that are high in protein and calories to maintain weight and strength. they should always check with doctor or nurse before taking vitamins or other supplements. a consult with a nutritionist is available and in some cases required.
Fatigue:
It is normal to feel tired during the treatment. Low energy can be a side effect of treatment. The body is working very hard to heal and repair itself. Be sure to get plenty of sleep at night. Talk to nurse or doctor if they are fatigued. If they are working full-time, may have to adjust the schedule to part-time or do some work from home. Let family members and friends help with daily chores. Sometimes, light exercise, like walking, can help to feel less tired. Ask the doctor or nurse about starting an exercise program.

Hair Loss:
Radiation therapy can cause hair loss (also called alopecia) in the area of the body that is being treated. Many patients find that their hair grows back several months after treatments stop. The new hair may be different in color and texture. Whether or not, hair grows back depends on the type and dose of radiation they receive and the area of the body that was treated.

Managing side effects:
Anorexia:
- Eat small, frequent meals
- Change diet and environment
- Stimulate appetite
- Eat nutritious and high protein snacks
- Avoid fatty or greasy foods
- Take nutritional supplements

Stomatitis:
- Avoid irritants—alcohol, tobacco, spicy, acid foods or hot drinks
- Eat soft or liquid diet
- mouth care with saline or water frequently

**Xerostomia:**
- moisten foods
- make foods easier to eat
- avoid dry foods
- soak foods in coffee, milk or warm drinks
- mouth care with saline frequently

**Alopecia:**
- gently brush and comb, infrequently shampoo
- avoid the use of hair coloring and chemical
- give psychological support for change of body image
- give advice for using wig if necessary

**Skin Reactions:**
prevent increasing irritation and avoid scratch
not to use any perfumed soap, ointments or deodorant
use baby powder or maize starch
wear loose-cloths and cotton made rather synthetic materials
open to fresh air but not direct to sunlight
teach patients about skin care—skin emulsion cream for dry, and pain management and antibiotic spray for moist desquamation

**Nausea and Vomiting:**
- eat small, frequent meals
- eat salty foods, add salt in foods
- drink clear or cool beverages
- avoid overly sweet, greasy or high fat foods
- rest with the head elevated after eating
- mouth care
- take antiemetic medications if necessary

**Esophagitis and Dysphagia:**
- eat high-calorie, high-protein diet
- drink plenty of liquids
- eat soft and liquid foods
- blenderlize solid foods

**Diarrhea:**
- drink plenty of fluids to avoid dehydration
- avoid milk or dairy products
- avoid foods high in fiber
- avoid high fat, spicy, and gas forming foods
- electrolyte replacement—potassium

**Cystitis:**
- urine examination
- drink plenty of fluid
- observe infectious signs—fever, difficulty ofvoiding
- avoid moisture in the area treated
- take antibiotic as prescribed

**Bone Marrow Suppression:**
- examine blood counts weekly
- observe signs and symptoms of bleeding, anemia,
- and infection
- teach patients to look for these signs
- transfuse blood components as necessary
- give health education on nutritious food

A study of the survival rates of all subtypes in the sample of 800 patients led to the formation of a new system. This was tested on two independent subsets of 200 of the original cases and found to be reproducible and predictive of outcome by univariate analysis. Multivariate analysis of the 343 patients classified according to the new system indicated that a survival model including pathologic classification and known prognostic factors of primary site, clinical group and tumor size was significantly better at predicting survival rather than model with only the known prognostic factors.
CHAPTER tow
Methodology
Methodology:
1-study design: descriptive, cross sectional hospital based study
2-study area:
Borg alamal for radiation therapy and nuclear medicine in Khartoum
study time: study started from first September to 30th of November
Studypopulation:
Nurses working in children radiotherapy units
Sample size: 40Includes all nurses working in hospital

SAMPLING TECHNIQUE:
Total coverage the available sample during study period

DATA COLLECTION TECHNIQUE:
By the administer questionnaire and observation check list

DATACOLLECTION TOOLS:
Data was collected by using structured designed interview composed of
15 multiple choice questions with choices and all answers are correct to monitoring
the knowledge and knowledge of practice of nurses and observation check list
designed for monitoring the practice of nurses regarding the management of
radiotherapy side effects.

STUDY VARIABLE:
Qualification, experience, training courses, knowledge and practice.

ETHICAL CONSIDERATIONS:
The research was respect the right of participants, treat data with confidentiality.
Letter was sent from alribat university – faculty of nursing to the hospital.
Permission from head manager, head department of nursing and nurses working in word was obtained.

**ANALYSIS:**

Computer package of statistical science (SPSS) version 16 was used to analyze data after the questionnaire is coded as follows:

A person who answers (more than 75%) is considered as have good knowledge.
A person who answers (50-75%) is considered as have fair knowledge.
A person who answers (less than 50%) is considered as have poor knowledge.

Check list is coded as follows:
40 participant were observed during their practice, a person who did 50% or more of steps is considered as an acceptable practice.
A person who did less than 50% of steps is considered as not acceptable practice.
CHAPTER three

RESULTS
Correlation between knowledge and experience are 100% which is consider good knowledge. Correlation between knowledge and training course are 17.5% which is consider fair knowledge. Correlation between knowledge and practice are 98.5% which is consider good practice.

Nurses knowledge and practice are good, but there are little training courses and I think that related to little chance of training in hospital.
CHAPTER four

DISCUSSION
DISCUSSION:

Over all study most of participant are female and account 97.5%, most qualification of participant are diploma and account about 85%, the mean of distribution of nurses according to their qualification are 33.3% so there is bad and needs to develop our certificate. Most experience period of participant are 5-10 years and account about 62.2%, the mean of distribution of nurses according to their experience period are 33.3%. Their are little of nurses receive training courses and account about 17.5% and the mean of them are 2.5% so needs more training courses.

The overall knowledge of nurses in this study regarding radiotherapy side effects are 74.5% so acceptable knowledge, nurses knowledge regarding management of complication are 27.1% indicated that the participants had poor knowledge so needs more knowledge. Nursing care of children under going radiotherapy is 90.9% it consider excellent, nursing assessment and practice is 96.6% which is consider excellent, so that nurses practice is better than knowledge may be due to long experience period, nurses practice regarding skin care and nutrition are 90.9% which consider excellent.
CHAPTER five

Conclusion

Recommendation

References

Appendix
Conclusion:

Based on the finding of the present study, it was concluded that:-

The specific objectives of this study regarding nurses care of children under going radiation therapy was achieved.
RECOMMENDATIONS:

Based on the study finding and conclusion, the following recommendations are required to be implemented:

1. Continues education programs for nurses should be established by ministry of health and head manager of Khartoum hospital to discuss nursing care for radiotherapy in advance and comprehensive manner.
2. Develop guidelines and protocols for nurses practice by head manager of Khartoum hospital in management of radiotherapy side effects.
3. To conduct further studies to assess nurses knowledge and practice in management of radiotherapy in other health setting in Sudan and apply their recommendations into practice.
REFERENCES


21–23. Loeffler, MD chief, radiation oncology, Massachusetts general hospital 2007


24–world health organization training package for the health sector on line available from www.epa.gov/radiation/understand/index.html

accessed december 2009

APPENDIX
QUESIONAIRE AND CHECK LIST

Ribat University
Graduate college
Master science in pediatric nursing
Questionnaire about nurse’s knowledge and practice regarding children
under going radiotherapy
In Khartoum center for radiation therapy and nuclear medicine-November 2014

Serial number ( )
1-sex……
2-Qualification of participant:-
a-Postgraduate ( )
b-Baccalaureate ( )
c- Diploma ( )
d-other ( )
3-Experience period on nursing ( )
4-Experience period oncology center ( )
5-do you have any training course/s before? Yes( ) NO ( )
6-do you have any training course/s on oncology
   Yes( ) NO( )
Put (T) in front of correct answer and (F) in front of wrong answer
1-the following is type of radio therapy:-
a-stereotactic ( )
b-intensity modulated ( )
c-no-exit dose proton beam ( )
d-brachy therapy ( )
2-use of radiotherapy include:-
a-alone as the only treatment ( )
b-before surgery to shrink tumor ( )
c-after surgery to destroy any remaining cancer cell ( )
d-after chemotherapy ( )

3-gastrointestinal complication include:

a-nausea and vomiting ( )
b-diarrhea ( )
c-constipation ( )
d-stomatits ( )

4-management of nausea and vomiting include

a- Usage of antiemetic before and after radiotherapy ( )
b-tell the patient not to eat 1-2 hours before and after radiotherapy ( )
c-tell the patient to eat foods at room temperature ( )
d-all of the above ( )

5-in management of diarrhea the nurse should:

a-instruct the patient to take low fiber, high protein foods ( )
b-maintain skin integrity (perineal care) ( )
c-maintain fluids and electrolyte status ( )
d-administer anti diarrheal agents as ordered ( )

6-which of following is correct regarding skin care:

a-wash skin in the treatment area with warm water an unscented moisturizing soap, don’t scrub, and keep the skin dry ( )
b-do not use anything else on the skin in the treatment area. For example, after shave lotion, perfume or makeup ( )
c-wear loose clothing to avoid friction or tightness in the treatment area ( )
d-all of the above ( )

7-about management of fatigue the nurse should:

a-instruct the patient to get plenty of sleep at night ( )
b-talk to nurse or doctor if they are fatigue ( )
c-let family members and friends help with daily activity ( )
d-all of the above ( )

8-for management of alopecia the nurse should:
a-advice patient to gently brush and comb, infrequently shampoo (    )
b-avoid the use of hair coloring and chemical (    )
c-give psychological support for change of body image (    )
d-give advice to parent later on hair can growth (    )
9-in management of stomatitis:-
a-eat soft or liquid diet (    )
b-mouth care with saline or water frequently (    )
c-treated by topical antifungal and analgesics (    )
d-give anti fungal (    )
10-in management of xerostomia the nurse should:-
a-moisten foods (    )
b-make foods easier to eat (    )
c-soak foods in coffee, milk or warm drinks (    )
d-mouth care with saline frequently (    )
11-about skin reactions the nurse should:-
a-prevent increasing irritation and avoid scratch() 
b-not to use any perfumed soap, ointment or deodorant() 
c-use baby powder (    )
d-teach patients about skin care—skin emulsion cream for dry, and pain management and antibiotic spray for moist (    )
12-about esophagitis and dysphagia
a-eat high-calorie, high-protein diet (    )
b-drink plenty of liquids (    )
c-eat soft and liquid foods (    )
d-all of the above (    )
13-in management of cystitis the nurse should:-
a-check urine examination (    )
b-instruct the patient to drink plenty of fluid (    )
c-observe infectious signs(fever, difficulty of voiding) (    )
d-avoid moisture in the area treated and take antibiotic as prescribed

14-in nursing care of bone marrow suppression the nurse should:

a-check blood counts weekly

b-observe signs and symptoms of bleeding, anemia, infection and

*teach patients to look for these signs (*)

c-manage patient during transfusion (*)

d-give health education on nutrition (*)

15-in nursing care of anorexia the nurse should:

a-teach the patient to eat small, frequent meals (*)

b-change diet and environment, stimulate appetite (*)

c-eat nutritious and high protein snacks (*)

d-avoid fatty or greasy foods (*)
Questionnaire about nurse’s knowledge and practice regarding children under going radiotherapy

In Khartoum center for radiation therapy and nuclear medicine—November 2014

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>Done</th>
<th>Note done</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-patient assessment and Review of laboratory results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a-complete physical assessment and concentrate hydration status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b-patient concerns about treatment including side effects, present understanding, learning needs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c-assess level of patient understanding and knowledge of radiotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d-make sure that patient has written information specific to his/her treatment</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>d-review all blood values ensuring they are within recognize limits(CBC,RFT,LFT)</td>
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<tr>
<td>e-check patient allergy status, and ensure patient wears an allergy bands as necessary</td>
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<td></td>
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<tr>
<td>f-ask about present of complication in previous dose and assess effectiveness of interventions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2-assessment for risk of complications:-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a-obstructive process such as lymph edema</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b-check patient allergy status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c-premedication given on time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d-emergency facilities available</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e-assess for signs and symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-patient education:-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-before radiotherapy:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a-List the side effect and their treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b-Instruct the patient to avoid excessive shampooing and conditioner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c-Caution patient that exposure to sunlight (UV light) can cause a severe sunburn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d-not to eat or drink 1-2 hours before and after radiotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-after radiotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a-Encourage adequate fluid intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b-Reassurance that treatment related fatigue does not mean the cancer is worse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c-Maintain nutritional status by balance diet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d-Avoid foods that are irritating to the oral</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESULTS

**TABLE (1) DISTRIBUTIONS OF NURSES ACCORDING TO THEIR QUALIFICATION**  
**N=40**

<table>
<thead>
<tr>
<th>QUALIFICATION</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baccalaureate</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>Diploma</td>
<td>34</td>
<td>85%</td>
</tr>
<tr>
<td>Nursing certificate</td>
<td>1</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**TABLE (2) DISTRIBUTIONS OF NURSES ACCORDING TO THEIR EXPERIENCE PERIOD**  
**N=40**

<table>
<thead>
<tr>
<th>EXPERIENCE</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years</td>
<td>12</td>
<td>30%</td>
</tr>
<tr>
<td>5-10 years</td>
<td>25</td>
<td>62.5%</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Mean=33.3%

**TABLE (3) DISTRIBUTIONS OF NURSES ACCORDING TO TRAINING COURSES**  
**N=40**

<table>
<thead>
<tr>
<th>TRAINING COURSES</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive training course</td>
<td>7</td>
<td>17.5%</td>
</tr>
<tr>
<td>Not receive training course</td>
<td>23</td>
<td>82.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Mean=2.5%
### TABLE (4) NURSES KNOWLEDGE REGARDING RADIOTHERAPY SIDE EFFECTS  
**N=40**

<table>
<thead>
<tr>
<th>SIDE EFFECT</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nausea and vomiting</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td>Constipation</td>
<td>28</td>
<td>70%</td>
</tr>
<tr>
<td>Stomatitis</td>
<td>12</td>
<td>30%</td>
</tr>
</tbody>
</table>

Mean=74.5%

### TABLE (5) NURSES KNOWLEDGE REGARDING MANAGEMENT OF COMPLICATION  
**N=40**

<table>
<thead>
<tr>
<th>NUM BER</th>
<th>MANAGEMENT OF COMPLICATION</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In management of nausea and vomiting the nurse should instruct the patient to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-use age of antiemetic before and after</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>b-not to eat 1-2 hours before and after</td>
<td>31</td>
<td>77.5%</td>
</tr>
<tr>
<td></td>
<td>c-eat food at room temperature</td>
<td>35</td>
<td>87.5%</td>
</tr>
<tr>
<td></td>
<td>d-all of the above</td>
<td>27</td>
<td>67.5%</td>
</tr>
<tr>
<td>2</td>
<td>In management of diarrhea the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-instruct the patient to take low fiber, high protein foods</td>
<td>33</td>
<td>82.5%</td>
</tr>
<tr>
<td></td>
<td>b-maintain skin integrity(perineal care)</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>c-maintain fluids and electrolyte status</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>d-administer anti diarrheal agents as ordered</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>In management of fatigue the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-be sure to get plenty of sleep at night</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>In management of alopecia the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a- advice patient to gently brush and comb, infrequently shampoo</td>
<td>36</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>b- avoid the use of hair coloring and chemical</td>
<td>36</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>c- give psychological support for change of body image</td>
<td>40</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>d- give advice to parent later on hair can growth</td>
<td>36</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>In management of stomatitis the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a- instruct the patient to eat soft or liquid diet</td>
<td>29</td>
<td>72.5%</td>
<td></td>
</tr>
<tr>
<td>b- mouth care with saline or water frequently</td>
<td>40</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>c- treated by topical antifungal and analgesics</td>
<td>28</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>d- give anti fungal</td>
<td>36</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>In management of xerostomia the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a- instruct the patient to eat moisten foods</td>
<td>23</td>
<td>57.5%</td>
<td></td>
</tr>
<tr>
<td>b- make foods easier to eat</td>
<td>40</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>c- soak foods in coffee, milk or warm drinks</td>
<td>38</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>d- mouth care with saline frequently</td>
<td>40</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>In management of esophagitis and dysphagia the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a- instruct the patient to eat high-calorie, high-protein diet</td>
<td>38</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>b- drink plenty of liquids</td>
<td>38</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>c- eat soft and liquid foods</td>
<td>36</td>
<td>90%</td>
<td></td>
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</tbody>
</table>
### TABLE (6) NURSING CARE

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>NURSING CARE</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
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<tbody>
<tr>
<td>1</td>
<td>which of following is correct regarding skin care:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-wash skin in the treatment area with warm water an unscented moisturizing soap, don’t scrub, and keep the skin dry</td>
<td>37</td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td>b-do not use anything else on the skin in the treatment area. For example, after-shave lotion, perfume or makeup</td>
<td>36</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>c-wear loose clothing to avoid friction or tightness in the treatment area</td>
<td>36</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>d-all of the above</td>
<td>32</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>about skin reactions the nurse should:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-prevent increasing irritation and avoid scratch</td>
<td>38</td>
<td>95%</td>
</tr>
<tr>
<td></td>
<td>b-not to use any perfumed soap, ointments or</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td><strong>deodorant</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>c-use baby powder</td>
<td>38</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>d-teach patients about skin care—skin emulsion cream for dry, and pain management and antibiotic spray for moist</td>
<td>36</td>
<td>90%</td>
<td></td>
</tr>
</tbody>
</table>

3 in nursing care of bone marrow suppression the nurse should:

| **a-check blood counts weekly** | 39 | 97.5% |
| **b-observe signs and symptoms of bleeding, anemia, infection and teach patients to look for these signs** | 40 | 100% |
| **c-manage patient during transfusion** | 40 | 100% |
| **d-give health education on nutrition** | 38 | 95% |

4 in nursing care of Anorexia the nurse should:

| **a-teach the patient to Eat small, frequent meals** | 39 | 97.5% |
| **b-change diet and environment, Stimulate appetite** | 25 | 62.5% |
| **c-eat nutritious and high protein snacks** | 33 | 82.5% |
| **d-avoid fatty or greasy foods** | 36 | 90% |

**Mean=1,455/16=90.9%**
<table>
<thead>
<tr>
<th>NUMBER</th>
<th>NURSING ASSESSMENT</th>
<th>FREQUENCY</th>
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<tr>
<td>1</td>
<td>patient assessment and Review of laboratory results</td>
<td></td>
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<tr>
<td></td>
<td>a-complete physical assessment and for the hydration status</td>
<td>37</td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td>b-patient concerns about treatment including side effects, present understanding, learning needs</td>
<td>37</td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td>c-assess level of patient understanding and knowledge of radiotherapy</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>d-make sure that patient has written information specific to his/her treatment</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>e-review all blood values ensuring they are with in recognize limits(CBC,RFT,LFT)</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>f-check patient allergy status, and ensure patient wears an allergy bands as necessary</td>
<td></td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>g-ask about present of complication in previousdose and assess</td>
<td>39</td>
<td>97.5%</td>
</tr>
</tbody>
</table>
effectiveness of interventions
2-assessment for risk of complications:

| a-obstructive process such as lymphedema | 37 | 92.5% |
| b-check patient allergy status | 40 | 100% |
| c-premedication given on time | 38 | 95% |
| d-emergency facilities available | 40 | 100% |
| e-assess for signs and symptoms | 40 | 100% |

Mean=1,160/12=96.6%

**TABLE(8) HEALTH EDUCATION**

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>HEALTH EDUCATION</th>
<th>FREQUENCY</th>
<th>PERCENT</th>
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<tbody>
<tr>
<td>1</td>
<td>Before radiotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a-List the side effect and their treatment</td>
<td>39</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>b-Instruct the patient to avoid excessive shampooing And hair combing and to use mild shampoo and hair Conditioner</td>
<td>37</td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td>c-Caution patient that exposure to sunlight(UV light) Can cause a sever sun burn</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>after radiotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Encourage adequate fluid intake</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>b</td>
<td>Reassurance that treatment related fatigue does not mean the cancer is worse</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>c</td>
<td>Maintain nutritional status by balance diet</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>d</td>
<td>Avoid foods that are irritating to the oral Mucosa and GI tract</td>
<td>40</td>
<td>100%</td>
</tr>
</tbody>
</table>

Mean=690/7=98.5%