NURSES' KNOWLEDGE, ATTITUDE AND COMPLIANCE WITH INTERVENTION GUIDELINES FOR PATIENTS' WITH CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING AT KENYATTA NATIONAL HOSPITAL

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H56/38746/2020

A **RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE CONFERMENT OF MASTER OF SCIENCE IN NURSING (ONCOLOGY) DEGREE OF THE UNIVERSITY** OF **NAIROBI**

DECEMBER 2022

DECLARATION

I, Ruth Brandina Chiwanda, hereby declare that this study titled, ' Nurses' knowledge, attitude and compliance with intervention guidelines for Patients with Chemotherapy-Induced nausea and vomiting at Kenyatta National Hospital is my original work and has not been submitted in any other institution for the purpose of obtaining a degree or any other academic award.

Signature.....Chiwanda..... Date.....5/12/2022

H56/38746/2020

SUPERVISORS' CERTIFICATE OF APPROVAL

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We the undersigned certify that this study is submitted with our approval as supervisors:

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DEDICATION

I dedicate this work to patients fighting cancer and their families.

ACKNOWLEDGEMENT

I thank God for this far He has brought me. To my family, thank you for your continued support, prayers and encouragement.

I also wish to acknowledge my supervisor Dr. Lilian Omondi& Dr. Mirriam Wagoro for their continued support and guidance when I was carrying out this study, I sincerely appreciate. My sincere gratitude to Kenyatta National hospital Management for allowing to conduct the study at the hospital. Many thanks to nurses working in oncology department for taking part in this study despite their busy work schedule.

To the Malawi Government, I sincerely appreciate you for funding my studies and granting me study leave for 2 years.

OPERATIONAL DEFINITIONS

Attitude- A positive or negative reaction or views of the nurse towards compliance with interventional guidelines for patients with chemotherapy-induced nausea and vomiting. In this study, attitude is determined by the nurse's willingness to intervene and comply with nausea and vomiting guidelines.

Chemotherapy-drugs that are used to treat cancer, shrink tumors and control spread of cancer cells.

Chemotherapy-induced nausea and vomiting- nausea and vomiting that occurs after administration of chemotherapy to patients by either route, intravenous, oral. Chemotherapy induced nausea and vomiting usually starts within 24 hours post administration up to 5 days. A complete medical and surgical history helps in diagnosing the condition. Both patient reports and nurses' observations are important in determining the patterns.

Compliance: Adhering to requirements, standards and regulations. In this study, the required standards are the guidelines stipulated for management patients with chemotherapy-induced nausea and vomiting.

Guidelines- Any standard information that contains recommendations for clinical practice prescribed by an authority or institution. In this study, guidelines refer to recommendations to follow in assessment, diagnosis, prophylaxis and treatment of chemotherapy induced nausea and vomiting. National Cancer Comprehensive Network, American Society of Clinical Guidelines are some of the notable guidelines for chemotherapy induced nausea and vomiting.

Interventions- An action/procedure taken to improve the nursing problems/needs that nurses identify in caring for patients.

Knowledge- Familiarity/understanding/comprehension of intervention guidelines for chemotherapy induced nausea and vomiting**.**

Monitoring- consistent evaluation of patients' well-being through examination. This can include hemodynamic monitoring, observing if a patient is still vomiting.

Nausea- Diffuse sensation of abdominal discomfort, perceived as an urge to vomit.

LIST OF ABBREVIATIONS AND ACRONYMS

ASCO……American Society of Clinical Guidelines

CINV……..Chemotherapy Induced Nausea and Vomiting

CTC…….Cancer Treatment Center

KNH…… Kenyatta National Hospital

MASCC……...Multinational Association of Supportive Care in Cancer

NCCN……..National Comprehensive Cancer Network

SPSS…… Statistical package for social sciences

SD…….Standard deviation

STATA…… Statistics and data

WHO……World Health Organization

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ABSTRACT

Back Ground: Nausea and vomiting is one of the distressing symptoms that patients receiving chemotherapy face. Majority of patients on chemotherapy experience chemotherapy-Induced nausea and vomiting that have debilitating effects on patients' health if not treated. Although antiemetic drugs and interventions guidelines are available in health care, there are many inconsistencies between nursing practice and what the guidelines recommend. This leads to under treatment of the symptoms and affects patients' complete relief of symptoms.

Broad Objective: The aim of this study was to establish nurses' knowledge, attitude and compliance with intervention guidelines for patients with chemotherapy induced nausea and vomiting.

Methodology: A descriptive cross sectional study was conducted among nurses' working at Cancer Treatment Center and Oncology wards at Kenyatta National Hospital. A calculated sample size of 73 nurses was drawn using stratified random sampling method and data were collected for a period of 4 weeks using self –administered questionnaires. STATA version 14 was used for entry of research data and analysis. Descriptive statistics were presented in text and frequency tables. Measurement of association between independent and dependent variables was ascertained using chi-square analysis and linear regression analysis.

Results: Nurses working in oncology wards and Cancer Treatment Centre demonstrated moderate level of knowledge with mean knowledge score of 75.93%, SD 8.60. Only half of the nurses demonstrated positive attitude (50.70%) while 84.5% responded compliance with intervention guidelines. The most cited challenges were unavailability of drugs, guidelines and lack of time for patient follow up. There was a strong association between knowledge and level of compliance (P-value=0.000), (Cramer's V= 0.4687) and a weak association between attitude and level of compliance (P-value=0.024), (Cramer's V= 0.2685). **Conclusion:** Trainings and seminars are recommended for nurses to update their knowledge on management of chemotherapy-induced nausea and vomiting.

CHAPTER ONE. INTRODUCTION

1.1Background

Chemotherapy –Induced nausea and vomiting still remains a problem affecting 40-80% of patients on chemotherapy treatment (Cope, 2021). It is defined as an emesis and sensational feeling of vomiting that follows the administration of chemotherapy drugs (Tilleman, 2018). According to Gupta et.al 2021, up to 40% of patients experience the symptoms during chemotherapy administration. A study done by (Mange, 2017), to evaluate efficacy of chemotherapy induced nausea and vomiting control in pediatric patients at Kenyatta National Hospital reported that 46.6% of patients had peak emesis on the first day of receiving chemotherapy and eventually a gradual reduction of emesis on follow up days.

Chemotherapy-induced nausea and vomiting occur within 24 hours up to 120 hours after chemotherapy administration. Other studies have demonstrated that 36% of patients experience nausea and vomiting in the first 24 hours post-administration of chemotherapy while 59% of patients experience the symptoms in 2-5 days after chemotherapy administration (Majem, 2021, Zhou, 2019). Patients' risk factors for developing chemotherapy induced nausea and vomiting symptoms include age below 50 years, being female, alcohol use and motion sickness (Tan et.al, 2020). Chemotherapy drugs are classified according to the probability of nausea and vomiting that they cause; very high, high, moderate, low and minimal emetogenic drugs (Majem et.al, 2021).

Chemotherapy-induced nausea and vomiting (CINV) has negative effects on a patient's health if it is not controlled. Persistent vomiting can lead to electrolyte imbalance, dehydration, and affect oral nutrition intake while nausea affects patient appetite thereby reducing the amount of food intake required to maintain adequate nutrition (Cope, 2021, Tilleman, 2018). Chemotherapy-induced nausea and vomiting is the reason for frequent hospital visits among cancer patients. It prolongs the period of hospitalization to stabilize the patient hence increasing the cost of treatment.

The recommended international guidelines for cancer care include American Society of Clinical Oncology (ASCO), Multinational Association of Supportive Care in Cancer (MASCC) and National Cancer Comprehensive Network (NCCN). For example, National Cancer Comprehensive Network guidelines recommend that before administration of chemotherapy

drugs, patients must be assessed for risk factors (both patient and drug related) and monitor whether antiemetic drugs the patient received are able to relieve nausea and vomiting completely. Intervention guidelines help to uplift standards of care in management of chemotherapy induced nausea and vomiting. However many studies have recorded non-compliance in oncology clinics on the use of antiemetics and this affected relief of nausea and vomiting symptoms in patients (Aapro, 2022; Mohammadzadeh et.al, 2021). In a study done by (Aapro, 2021), only 23% of patients enrolled in the study received antiemetic drugs in accordance with recommended guidelines. This concurred with findings from a study by (Sun et.al 2021) where only 21.5% of patients used antiemetic regimens according to recommended guidelines.

Reasons for non-adherence were physician-prescribing preference, lack of awareness on guidelines and lack of patient assessment among others. Therefore, adequate knowledge among nurses is crucial because it helps them to comply with intervention guidelines and improve patient outcomes (Aapro, 2021, Cope, 2021).

1.2 Problem Statement

Empirical evidence indicates that approximately 80% of patients undergoing chemotherapy treatment for cancer experience nausea and vomiting which cause them a lot of distress (Cope, 2021, Tilleman, 2018). Chemotherapy induced nausea and vomiting has immediate and long-term impacts that can compromise patients' health status and response to cancer treatment. However, there is suboptimal use for anti-emetic drugs recommended for CINV leading to incomplete relief of patients' nausea and vomiting symptoms (Aapro, 2022, Badarudin et.al, 2022).

It is equally a challenge to health workers as complications from untreated nausea and vomiting requires hospital admission thereby increasing workload. Some patients experience persistence of the symptoms despite receiving consistent CINV prophylaxis (Smit et.al, 2021, Tilleman 2018). Lack of guideline awareness, lack of training, lack of patient assessment and education have been cited as some of the reasons to non -compliance with antiemetic guidelines (Aapro, 2022, Cope 2021). This was confirmed by studies that found discrepancies between guidelines, practice patterns and underutilization of some drugs in patients receiving highly emetogenic chemotherapy (Aapro et.al, 2022, Sun, 2021).

Nurses therefore need to have adequate knowledge to identify the correct cause of nausea and vomiting and collaborate with physicians to prescribe the right treatment. The role nurses play in care of patients on chemotherapy treatment cannot be underestimated because as primary caregivers in a hospital setting, nurses utilize the best evidence from research, guidelines and adopt best practices in CINV to improve patients' outcomes (Clark-Snow, 2017, Dieleseger, 2019).

Currently there is no published data on nursing practice on chemotherapy-induced nausea and vomiting at Kenyatta National Hospital. Therefore, this study aimed at providing a baseline for improving nursing practice, updating guidelines and standard operating procedures and guide future researchers on a similar subject.

1.3 Justification of the study

Compliance with intervention guidelines is still a challenge at Kenyatta National Hospital. A study done by (Mange, 2017) among pediatric patients at Kenyatta National Hospital revealed poor management of acute and delayed emesis. Low complete response rate on follow up of patients after chemotherapy and poor compliance with local and international guidelines recommendations to CINV were some of the notable key findings.

This study was among pioneer studies in adult oncology wards and Cancer Treatment Center at Kenyatta National Hospital to establish the nurses' knowledge, attitude and compliance with interventions guidelines. The study revealed gaps that contribute to poor control of the symptoms, in order to improve patient outcomes.

1.4 Significance of the study

This baseline study aimed to establish knowledge, attitude and compliance with interventional guidelines for patients with chemotherapy-induced nausea and vomiting at Kenyatta National Hospital. The study findings highlighted gaps in patient care and the need to intensify Continuing Professional Development courses among nurses working in designated areas where chemotherapy is administered. Further research can build on findings from this study.

1.5 Research Questions

1. What is the knowledge level of nurses regarding chemotherapy-induced nausea and vomiting at Kenyatta National Hospital?
2. What is the nurses' attitude towards chemotherapy-induced nausea and vomiting at Kenyatta National Hospital?
3. How is nurses' compliance with chemotherapy-induced nausea and vomiting guidelines at Kenyatta National hospital?
4. What are the challenges associated with the current practice in the management of chemotherapy-induced nausea and vomiting at Kenyatta National Hospital?

1.6 Research Objectives

1.6.1. Broad Objective

To establish nurses' knowledge, attitude, and compliance with intervention guidelines for patients with chemotherapy induced nausea and vomiting among nurses at Kenyatta National Hospital.

1.6.2. Specific Objectives

1. To establish knowledge level of chemotherapy induced nausea and vomiting among nurses at Kenyatta National Hospital.
2. To assess the attitude of nurses towards chemotherapy-induced nausea and vomiting at Kenyatta National Hospital.
3. To evaluate nurses' compliance with intervention guidelines on chemotherapy induced nausea and vomiting at Kenyatta National Hospital.
4. To describe challenges associated with the current practice in the management of chemotherapy induced nausea and vomiting at Kenyatta National Hospital.

1.7 Theoretical Framework

The theory of health belief model can be used to explain the phenomena of nurses' compliance to interventions guidelines. Developed in the 1950s by social scientists in the United States of America (USA), this theory explains why people do not adhere to prevention and screening procedures for early detection of disease. It is also used to describe patients' reaction to symptoms and willingness to follow medical advice (https://sphweb.bumc.bu.edu).

The following factors influence compliance to medical treatment and are described below. Health motivation, Perceived susceptibility to disease, perceived seriousness, cost of treatment and benefits, perceived barriers, cues to action and persons' level of confidence in his or her ability to successfully perform a behavior.

In regards to compliance with intervention guidelines, nurses' beliefs about patients' susceptibility to chemotherapy-induced nausea and vomiting, their perception on the severity and impact of CINV on patients life and the benefits of administering antiemetic drugs influence their readiness to comply with intervention guidelines on CINV management. Other factors that may affect nurses' decision to comply with intervention guidelines on CINV is whether they have been trained or not and they are confident to successfully intervene when they encounter a patient with CINV (George, 2014).

To increase compliance, continuous professional development courses, guidelines and standard operating procedures should be made available to nurses to update their knowledge. Barriers to guideline compliance should also be looked into.

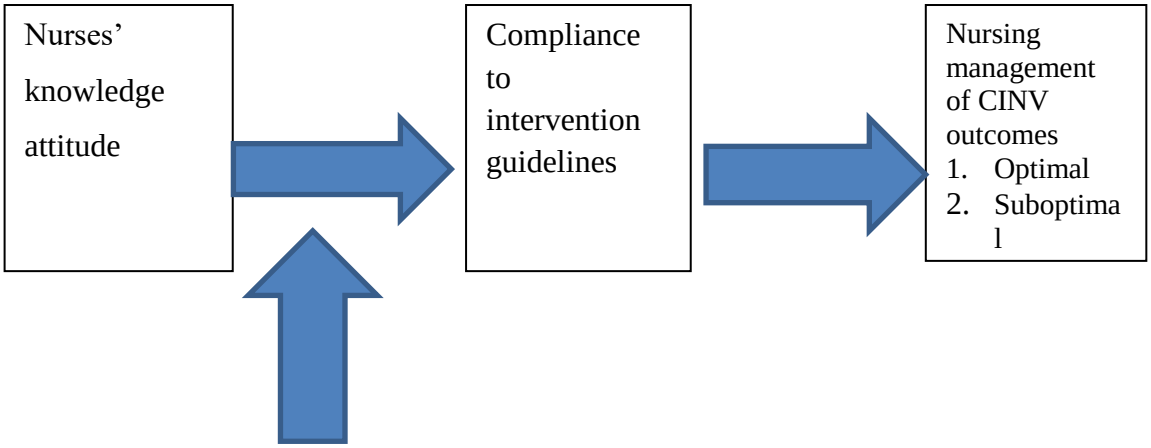
1.8 Study Variables

In this study, independent variables were nurses' knowledge and attitude. These variables were found to have an association with compliance with intervention guidelines on management of chemotherapy –induced nausea and vomiting which was the dependent variable. Challenges and barriers did not have a significant association with compliance. The outcome variable was nursing management outcomes of CINV management (optimal or sub-optimal).

These variables were assessed using a likert scale and the scores were measured against total scores on that section and expressed as a percentage. The scores were graded using Bloom's cut off point which indicates a score of >60% as poor level of knowledge, a score of 60%-79% as moderate level of knowledge and a score above 80-100% good level of knowledge (as cited by Abdullahi et.al, 2016).

1.9 Conceptual Framework

Independent variables Dependent variables Outcome variables



Intervening variables

- Unavailability of antiemetic drugs
- Unavailability of guidelines
- Prescribing anti-emeticdrugs was always physicians' role
- Lack of time for patient follow up

CHAPTER TWO. LITERATURE REVIEW

2.1Chemotherapy-Induced Nausea and Vomiting

Chemotherapy-induced nausea and vomiting is defined as emesis and an impulse to vomit that occurs following administration of chemotherapy drugs (Cope, 2021, Tilleman, 2018).chemotherapy induced nausea and vomiting is classified according to the patterns of nausea and vomiting as described below. Acute nausea and vomiting can happen within a few minutes to 24hours following chemotherapy administration and is associated with highly emetogenic chemotherapy and other chemotherapy drugs administered in high doses. Delayed nausea and vomiting occurs more than 24 hours lasting up to 5 days after chemotherapy administration. Anticipatory nausea and vomiting which is thought to be a psychological reaction, happens before a new cycle of chemotherapy in people who previously received chemotherapy. Breakthrough nausea and vomiting can occur despite the use of antiemetic medications, necessitating antiemetic intervention while refractory nausea and vomiting develops after ineffective use of antiemetics during the last cycle.

2.2 Prevalence of Chemotherapy Induced Nausea and Vomiting and Treatment Modalities

Chemotherapy induced nausea and vomiting still remains a challenge to patients on chemotherapy. Approximately, 80% of patients develop the symptoms while undergoing chemotherapy treatment. Patients receiving highly emetogenic chemotherapy (HEC) and moderate emetogenic chemotherapy (MEC) drugs have a higher probability of developing the symptoms than patients receiving low and minimal emetogenic drugs (Kenya chemo safe program, 2018). A prospective cohort study done in 2018 by the CINV study group of Japan explored the actual status of patients scheduled to undergo HEC and MEC the first time. The acute phase of nausea was shown to be the worst whereas delayed nausea and vomiting was more common in patients taking highly emetogenic chemotherapy according to the findings (HEC) (Naito et.al, 2021).

Prophylactic antiemetic medications are recommended to be given to patients at least thirty minutes before chemotherapy to counter occurrence of the symptoms. Key factors to be considered when prescribing prophylactic antiemetic drugs are; emetogenicity of chemotherapy drug administered, patient risk factors and patients receiving a combination of drugs and anxiety.

According to National Comprehensive Cancer Network antiemetic harmonized guidelines for Sub Saharan Africa (2020), patients are supposed to receive the following recommended drugs depending on risk classification. For high emetic risk chemotherapy drugs, it is recommended that patients receive olanzapine, palonosetron and dexamethasone. For moderate emetic risk chemotherapy drugs, the recommended combination of antiemetic is any available serotonin receptor blocker available and dexamethasone. Olanzapine should be added when there are additional risk factors. For low emetic risk, patients are given either dexamethasone or metoclopramide or prochlorperazine or any serotonin receptor blocker. No routine antiemetic prophylaxis is recommended for drugs that are in the minimal emetic risk category.

2.3 Knowledge of Chemotherapy-Induced Nausea and Vomiting

Nurses are supposed to have knowledge on risk factors (both patient related and drug related) as well as classify nausea and vomiting according to their duration. They are also supposed to be conversant with the drugs that are recommended for nausea and vomiting, when to administer them and the guidelines / standard operating procedure used.

A study was done where nurses were quizzed on their knowledge of antiemetic recommendations. While a greater number of nurses demonstrated knowledge of the recommendations, antiemetic adherence was low, especially during the delayed phase after highly emetogenic chemotherapy (Cope, 2021, Naito 2020). This shows a gap in knowledge of risk factors thereby affecting education of patients on the duration of antiemetic drugs following highly emetogenic drugs.

According to a study by Dielenseger, et.al (2019), few nurses were aware of international guidelines. The uptake of institutional guidelines, which appeared to be the most often used, was 47%. It is not surprising that discrepancies identified were underutilization between antiemetic use and guidelines recommendations. Antiemetic drugs were given according to physician preference. Knowledge empowers nurses to do right interventions in order to meet patient needs. They advocate for better treatment for their patients when they work in collaboration with physicians and other members of multidisciplinary team.

2.4 Attitude of Nurses towards Chemotherapy-Induced Nausea and Vomiting

Nurses' attitudes and perceptions influence their approach towards management of chemotherapy-induced nausea and vomiting. Despite the introduction of antiemetic treatment recommendations, research suggests that some patients are still receiving inadequate antiemetic medication and they do not achieve complete relief from nausea and vomiting symptoms (Aapro, 2022, Naito, 2020). On the intensity of nausea and vomiting symptoms, there is a perceptual difference between nurses and their patients. This has an impact on the approach to CINV symptoms management (Carnio et.al, 2018, Duracinsky, 2018). Poor attitudes towards CINV also affect the supportive care that nurses ought to give to patients receiving cancer treatment. For example, not only do patients with anticipatory chemotherapy-induced nausea need drug intervention but also counseling on how to deal with nausea and vomiting symptoms (Kus, 2021, Hunter et.al 2020).

2.5 Compliance with interventional guidelines

Nurses form part of the multidisciplinary team in caring for patients on chemotherapy treatment. Nurses play a prevention role by administering antiemetic drugs prescribed by physicians following the recommended guidelines. They give education and instructions to patients on how to take antiemetic medications at home and other self-care activities. Nurses do primary assessment on patients before chemotherapy, identify patient risk factors, classify chemotherapy emetic risk and collect baseline data of patients (Cope, 2021). They continue with their observations during chemotherapy sessions, administer breakthrough antiemetic drugs, provide supportive care to patients' and document in patient files.

On compliance with intervention guidelines on nausea and vomiting among nurses, studies have shown level of non-compliance, which affected relief of nausea and vomiting symptoms in patients. A study done by (Mange, 2017) revealed lack of compliance to antiemetic guidelines at Kenyatta National Hospital. In a study done by (Aapro, 2021), only 23% of patients enrolled in the study received antiemetic medications in accordance with recommended guidelines. This concurred with findings from a study by (Sun et.al 2021) where only 21.5% of patients used antiemetic regimens according to recommended guidelines

2.6 Challenges associated with current practice

Nurses face many challenges in their practice. A study indicated that antiemetic medications were administered by nurses in accordance with physician wishes despite having knowledge of guidelines and recommendations (Dielenseger, et.al, 2019, Naito, 2020). This emanates from problems with multidisciplinary collaboration and directly affects patients' relief from nausea and vomiting symptoms.

Follow up of patients when they are discharged can be a challenge in management of patients with chemotherapy-induced nausea and vomiting. Although Beauchamin, et.al (2021) recommended telephone follow up interviews to be feasible, their study had only 30 participants and hence cannot be generalized. However, considering the health care delivery system in Kenya, referral systems can be the best method to follow up patients with chemotherapy induced nausea and vomiting after discharge from hospital.

Issues of lack of knowledge appeared in some studies but the results were not congruent. While some studies found nurses' knowledge to be good some found it to be poor and had an impact on patient care. Considering the differences in context, this study is yet to establish if the level of knowledge has an impact on current practice in the management of chemotherapy- induced nausea and vomiting in a Kenyan setting.

SUMMARY

Chemotherapy induced nausea and vomiting is the frequent reported symptom by patients and has debilitating effects on patients' health if left untreated. Nurses are an important profession in the multidisciplinary care of patients on chemotherapy. Their roles include prevention, patient education, initial assessment and stabilizing patients. Lack of awareness on guidelines, lack of patient follow up are some of the challenges that nurses face in practice.

CHAPTER3. MATERIALS AND METHODS

3.1 Study Location

The study was carried out at Kenyatta National Hospital (KNH). KNH is located on the upper hill along hospital road around 3.5 Kilometers from Nairobi business center. KNH is a level six national referral hospital that also serves as a teaching hospital for the University of Nairobi. KNH is an 1800 bed capacity hospital with 50 wards and 22 outpatient clinics. KNH receives oncology patients from all counties in Kenya. It is the national referral teaching and research hospital and the practices here should be better than the smaller hospitals. Findings here may give an overall picture of compliance. It is also expected that most of the highly trained nurses are found in KNH (Kenya and other East African countries and it offers specialized care services for cancer. This makes it a good site for the study since it is a major referral hospital and offers chemotherapy treatment (Wakaba et.al, 2014).

The following wards under Cancer Treatment Center department were included in the study; GFC-clinic (outpatient chemotherapy clinic), GFD- ward (short stay ward for adults receiving chemotherapy for days), gynecology-oncology ward 1B and medical-oncology ward 8C and pediatric ward 1E. These wards were chosen because they admit cancer patients who receive chemotherapy drugs in these wards.

3.2 Research Design

A descriptive cross-sectional study was adopted. The aim was to establish the prevalence of knowledge, attitude and compliance to intervention guidelines for patients with chemotherapy-induced nausea and vomiting among nurses at Kenyatta National Hospital.

3.3 Target population

The study targeted nurses working in oncology wards and outpatient chemotherapy clinic at Kenyatta National Hospital.

3.3.1 Inclusion Criteria

The study included:

- Nurses who were working in Cancer Treatment Center and Oncology wards (1B, 1E&8C).

- Nurses willing to participate and signed a written consent to participate in the study.

3.3.2 Exclusion Criteria

Nurses who were off duty

3.4 Sample size determination

The sample size was obtained using sample size calculator for prevalent studies formula with finite population correction (Daniel, 1999).

$$\mathbf{n} = \frac{NZ^2P\ (1-P)}{d^2(N-1)+Z^2P(1-P)} = \frac{NZ^2P\ (1-P)}{d^2(N-1)+Z^2P(1-P)}$$

In this case:

n= sample size with finite population correction

N= Population size (Estimated population size i.e number of nurses working in CTC and oncology wards was 90 as of 21/4/22)

Z= Level of confidence (the standard normal deviation at the required confidence level = 1.96)

P= Expected level of compliance. Since P is unknown, (no previous studies) we expect the level of compliance to be at 50%. Thus P=0.5

d= level of precision set at 5%. (thus d=0.05)

Therefore: $\mathrm{n} = \frac{90*1.96^2*0.5*0.5}{(0.05^2*89)+(1.96^2*0.5*0.5)} \mathrm{n} = \frac{90*1.96^2*0.5*0.5}{(0.05^2*89)+(1.96^2*0.5*0.5)}$

n= 73.071, rounded off to 73

3.4.1 Sample size distribution in various wards

Table 1. Sample size distribution in various wards

WARD	**TOTAL NUMBER OF NURSES IN EACH WARD**	**SELECTED SAMPLE (N/90)* 73**
1B (Gynae-Oncology Ward)	17	14
1E (Pediatric Oncology Ward)	19	16
CTC (Cancer Treatment Center) -GFC-Clinic -GFD-Ward	29	23
8C (Medical-Oncology ward)	25	20
Total	**90**	**73**

3.5 Recruitment and Sampling Procedure

Stratified random sampling was used to ensure each ward had equal proportions represented in the population sample. To arrive at the required number of participants in each ward, a total number of nurses in each ward was divided by the total population of nurses in all oncology wards and CTC multiplied by the estimated sample size of 73. In the respective wards, respondents were randomly selected until the required sample size of 73 was achieved. Participation was voluntary and declining to participate did not have any consequences on their practice. Nurses were informed of the study through ward in charges and an approval letter was put on the notice board of the wards. Nurses were given an information sheet about the study to read then they were allowed to ask questions. If they agree to participate in the study, they were given consent forms to sign.

3.6 Study Instruments and data collection methods

Data was collected using a self-administered questionnaire designed by the investigator. The contents were taken from a checklist tool that was adopted from National Cancer Comprehensive Network Guidelines (NCCN). The questionnaire contained five sections namely; Social and demographic data, Knowledge on chemotherapy induced nausea and vomiting, attitude towards management of CINV, level of compliance to intervention guidelines and challenges associated with current practice in management of CINV. Knowledge was measured on a three point likert scale as explained in section 4.2. Level of compliance was measured on a two point likert scale while attitude and challenges were measured on a five point likert scale. Knowledge and attitude scores were added independently and expressed as percentages while compliance was calculated as an average score of the total points. Challenges were looked at based on the majority of participants that agreed with the listed challenge.

3.7 Validity

The study tool measured knowledge, attitude and compliance to intervention guidelines for patients with chemotherapy induced nausea and vomiting. Challenges associated with current practice in management of chemotherapy induced nausea and vomiting were also looked into. Questions on knowledge, attitude and compliance were formulated using the National Cancer Comprehensive Network Guidelines on chemotherapy induced nausea and vomiting. Challenges were identified from previous studies during literature review. The study tool had a set of formulated questions with Yes or no answers and a 5-point Likert scale (strongly agree, Agree, neutral, disagree and strongly disagree). The questions were formulated using simple English and widely known medical terminologies for participants to understand easily. Internal validity was ensured by distributing the questionnaires during day shifts and participants were given questionnaires with similar questions to ensure uniformity. Research supervisors reviewed the research proposal and the KNH-UON ethics review committee approved it. An external examiner to ensure the study validity also reviewed the research project.

3.8 Reliability

Pretesting of the questionnaire was done to ensure its reliability. The pretesting exercise took place in the Cancer Treatment Center. The sample population was 10% of the calculated sample size for the study. Pretested questionnaires were not included as part of the study data. Areas inconsistent with the study objectives were removed and the total time to administer the questionnaire was adequate (20-30 minutes).

3.9 Data Management and Analysis

Questionnaires were kept under a safe lock drawer to restrict access from people who were not investigators and non-participants. In addition, questionnaires were screened for completeness, coded themed and computerized. After the completion of raw data, questionnaires were professionally disposed to reduce unethical use of data. Data analysis was done using STATA version 14 at 95% confidence interval and a statistical significance P value of 0.05. Data was analyzed using both descriptive and inferential statistics. Continuous variables were summarized into mean, median and standard deviation while categorical data was presented as proportions. Bivariate analysis was using chi square analysis while multivariate analysis was done using linear regression analysis.

3.10 Assumptions

The assumption was that every nurse working oncology wards was knowledgeable on the subject matter and practiced in accordance with interventional guidelines.

Second assumption was that knowledge and attitude have a direct effect on the level of compliance to intervention guidelines and in turn affects patients' symptom control.

3.11 Methods of Controlling Confounders

To control confounders in this study, a homogenous sample was chosen (nurses working in clinics and wards where chemotherapy is given). Homogeneity enhances interpretability of relationships in the study. This study used statistical analysis to remove extraneous variables that could have affected study results.

3.12 Quality Assurance

Quality assurance was ensured by screening of participants to ensure the sample contained only eligible participants. The data collection tool contained five sections, four of which were formulated in relation to the study objectives and addressed the subject of study. The research questionnaire had an option of not sure/neutral where applicable in order not to force participants to give false information when they do not know.

3.13 Ethical Considerations

Participation in the study was voluntary and those willing to participate were given all the preliminary information before signing a written consent. Investigator and assistant researchers respected participants' rights for refusing to enroll in the study. No repercussions followed refusal or withdrawal from the study after signing consent.

All nurses working in CTC and oncology wards had equal chances of participating in the study. Participants were assured of confidentiality and anonymity throughout the data collection process and no participant names were written on the questionnaire. The study had no direct harm to the nurses but had some inconveniences with time for patient care since it was done during work hours. To minimize this conflict, questionnaires were distributed during lunch hour and afternoon when the wards were assumed to be least busy. The KNH/UON ethical review board approved the study proposal and approval to undertake the study at Kenyatta National Hospital was approved by KNH medical research department. Authority to conduct the study was obtained from the Ministry of Science and Technology.

There were no personal benefits for participating in the study. The benefits aimed at improving nursing practice and management of patients at Kenyatta National Hospital.

3.14 Study results/Dissemination plan

An executive summary of the research report was sent to KNH/UON ERC and CTC department. Copies of the research project were sent to KNH resource center and University of Nairobi library for future reference.

CHAPTER 4. RESULTS

This study was conducted among nurses working at Cancer Treatment Center and Oncology wards at Kenyatta National Hospital. A sample of 73 nurses was selected from the wards using stratified random sampling. Out of 73 questionnaires, 2 questionnaires had missing details so they were left out during data entry reducing the sample size to 71. The aim of this study was to establish nurses' knowledge, attitude and compliance with intervention guidelines for patients with chemotherapy-induced nausea and vomiting.

The sequence of results in this section is according to the study objectives.

4.1 Demographic data of respondents

Age

Age of the respondents was categorized into four groups (Table 2). Majority of respondents came from the age groups of 30-39 years and 40-49 years, (28.17%) respectively. The mean for age was 40.13 with a standard deviation 10.65. Minimum age was 25 years while maximum age was 55 years.

Sex

Male respondents were n19 (26.76%) while female respondents were n52 (73.24%). See Table 2

Professional qualifications

On professional qualifications, majority of the respondents had diploma in nursing 60.56% (See table 2).

Table 2. Age, Sex & Professional Qualifications of Respondents

Variable	Categories	Frequency	Percentage
Age	20-29 years	14	19.72
	30-39 years	20	28.17
	40-49 years	20	28.17
	50-59 years	17	23.94
Total		71	100
Gender	Male	19	26.76
	Female	52	73.24
Total		71	100
Professional qualifications	Diploma	43	60.56
	Higher diploma	13	18.31
	Bachelor's degree	14	19.72
	Master's degree	1	1.41
Total		71	100

Years of experience

These were years that the respondent had accumulated working as a nurse from the time they qualified. Majority of respondents were in the group of 11-15 years n26 (36.62%) followed by those with 6-10 years n17 (23.94%). Mean for years of experience was 11.16% with standard

deviation of 6.01. Respondents had minimum years of experience of 1/2years and maximum years of experience of 25 years. For years of working in oncology/CTC, the minimum number of years was 1/2 years while the maximum number of years was 18 years. Mean for number of years worked in oncology ward/CTC was 4.13years with a standard deviation of 4.32.The range of years of experience in oncology /CTC was 1-17 (see table 3).

Table 3. Work Experience

Variable	**Categories**	**Frequency**	**Percentage**
Years of experience	0-1 year	1	1.41
	2-5 years	14	19.72
	6-10 years	17	23.94
	11-15 years	26	36.62
	16-20 years	8	11.27
	>20 years	5	7.04
Total		71	100
Work experience in Oncology ward/CTC	1-5 years	58	81.69
	6-10 years	4	5.63
	>10 years	9	12.68
Total		71	100

Training in oncology nursing

On whether the nurses had training as oncology nurses post basic qualifications, only 22.54% (n16) of the participants had further training post basic qualification while 77.46% (n55) of the participants only had a basic nursing qualification. Actual years of completing oncology nurse training by the participants ranged from 2017-2022.

Regarding on job training on symptom management / management of chemotherapy- induced nausea and vomiting, 61.97% (n44) of the participants did not have on job training in symptom management while 38.03% (n27) of the participants had on job training in symptom management. The duration of their training varied from hours to one week.

Relationship between demographic data and compliance

The relationship between demographic data and compliance was measured using chi-square analysis at significance level of 0.05. There was no significant association between demographic data and level compliance.

4.2. Nurses Level of Knowledge

Assessment on level of knowledge had 11 items with total marks of 22. The responses were graded as 2 for Yes response, 1for False and zero for not sure. The scores were graded using blooms' cut off point which indicates a score of less than 60% as poor level of knowledge, a score of 60%-79% as moderate level of knowledge and a score above 80-100% good level of knowledge (as cited in Abdullahi et.al, 2016). Below is table 4A displaying responses of nurses' to questions on knowledge of chemotherapy-induced nausea and vomiting.

Table 4A. Nurses responses to knowledge questions

Question Statement	Not Sure (n) (%)	False (n) (%)	True (n) (%)
Chemotherapy-induced nausea and vomiting is the most distressing symptoms in patients receiving chemotherapy	0	n2 (2.82)	n69(97.18)
Approximately 80% of patients develop chemotherapy induced nausea and vomiting in the course of receiving chemotherapy.	n5 (7.04)	n10(14.08)	n56(78.87)
Untreated chemotherapy –induced nausea and vomiting can negatively affect patients' health.	0	n2(2.82)	n69(97.18)
Intervention guidelines are important in management of chemotherapy induced nausea and vomiting.	n4(5.63)	n1(1.41)	n66(92.96)
Assessment is an important step in management of chemotherapy-induced nausea and vomiting.	n1(1.41)	n1(1.41)	n69(97.18)
Patient risk factors form an important baseline data in management of chemotherapy induced nausea and vomiting.	n7(9.86)	n4(5.63)	n60 (84.51)
Patterns of chemotherapy-induced nausea are not important in determining treatment.	n13(18.31)	n48(67.61)	n10 (14.08)
When considering treatment of chemotherapy induced nausea and vomiting only emetogenicity risk of drugs should be considered.	n15(21.13)	n37(52.11)	n19(26.76)
Antiemetic drugs need to be administered when nausea and vomiting episodes occur in the course of chemotherapy administration.	n4(5.63)	n26(36.62)	n41(57.75)
There are other causes of nausea and vomiting in cancer patients apart from chemotherapy.	0	n5 (7.04)	n66(92.96)
Continuation of antiemetic medications is not important after completion of chemotherapy.	n3(4.35)	n49(69.57)	n19(26.09)

Key: n- frequency, %-Percentage

Fifty five percent (n 39) of the respondents demonstrated moderate level of knowledge while 38% (n27) had good level of knowledge. Only 7.04% (n5) of the respondents demonstrated poor level of knowledge. The mean mark of knowledge among the respondents was 75.93% with a standard deviation of 8.60. Below is a frequency table 4B displaying knowledge scores of the respondents.

Table 4B. Knowledge of Chemotherapy-induced nausea and vomiting

Knowledge scores	
Scores (%)	Number of respondents
50	2
54.55	3
63.64	2
68.18	4
72.73	17
77.27	16
81.82	18
86.36	8
90.91	1
Total	71
Mean score	75.93
Variance	74.00
std. deviation	8.60

4.3 Nurses' Attitude

The attitude section had 10 points where nurses were supposed to respond using a 5 point likert scale (strongly disagree1, disagree 2, neutral3, agree 4 and strongly agree5). However, for easy grading, the responses were regrouped into three (positive, negative and neutral). Any response indicating positive attitude was given a score of 2, poor attitude was given a score of 1 while a response of neutral was given a score of zero. The mark for positive attitude was 12 out 20 (60%) according to bloom's cut off point (as cited in Abdullahi et.al, 2016). Any score of less than 60% indicated a negative attitude. Below is table 5A displaying nurses' responses to attitude questions.

Table 5A. Nurses Responses to Questions on Attitude

Question Statement	**(SD) 1**	**(D) 2**	**(N) 3**	**(A) 4**	**(SA) 5**
Patients receiving chemotherapy need assessment before chemotherapy session.	n1(1.41)	0	0	n13(18.31)	n57(80.28)
Chemotherapy emetogenic risk is the only reliable factor to consider when prescribing antiemetic drugs for chemotherapy-induced nausea and vomiting.	n13(18.57)	n27(38.57)	n17(24.29)	n9(12.86)	n4(5.71)
Patients reported nausea and vomiting is important in determining the patterns of CINV.	n3(4.29)	n4(5.71)	n7(10.00)	n36(50.00)	n21(30.00)
Patients may exaggerate the severity of nausea and vomiting as such nurses' observations are paramount to determine the severity of CINV.	n17(23.94)	n14(19.72)	0	n31(43.66)	n9(12.68)
One dose of antiemetic drugs is enough throughout the chemotherapy session.	n36(50.70)	n28(38.82)	n2(2.82)	n(5.63)	n2(2.82)
Antiemetic should be given as a routine dose round clock until the risk period is over.	n9(12.86)	n6(8.57)	n8(11.43)	n14(20.00)	n33(47.14)
Depending on the severity of chemotherapy-induced nausea and vomiting, patients may receive a combination of drugs recommended by antiemetic guidelines to control nausea and vomiting.	n5(7.14)	n3(4.29)	n6(8.57)	n16(22.86)	n41(57.14)
The role of nurses is to administer antiemetic drugs which the physician has prescribed for the patient.	n13(18.31)	n10(14.08)	n8(11.27)	n25(35.21)	n15(21.13)
Patients require constant observation during chemotherapy sessions to evaluate the effectiveness of antiemetic drugs given.	n7(9.86)	0	n5(7.04)	n16(22.54)	n43(60.56)
Once given antiemetic drugs before chemotherapy, patient evaluation is not required.	n46(64.79)	n16(22.54)	n2(2.82)	0	n7(9.86)

Key: SD (Strongly Disagree) D (Disagree) N (Neutral) A (Agree) SA (Strongly Agree)

Approximately, 50.70% (36) of the nurses had a positive attitude towards management of chemotherapy-induced nausea and vomiting while 49.29% (n35) had a negative attitude. Below is table 5B displaying attitude scores for the respondents.

Table 5B. Attitude towards management of chemotherapy-induced nausea and vomiting

Attitude scores	
Scores	**Number of respondents**
5	1
6	1
7	8
8	5
9	5
10	3
11	12
12	10
13	8
14	3
15	2
16	8
17	2
18	3
Total	71
Mean score	11.63
Variance	10.69
std.dev	3.27

4.4. Compliance with interventional guidelines

Compliance section contained key points that are supposed to be followed when managing a patient at risk of chemotherapy- induced nausea and vomiting. This section contained 8 points that had Yes or No responses. A response of Yes indicated compliance, was given a score of one

while a response of No indicated non-compliance and was given a score of Zero. Below is table 6A showing responses of nurses to compliance questions;

Table 6A. Nurses responses to compliance questions

Compliance with Interventional Guidelines	**Percentage**	
Question Statement	No	Yes
Prevention of acute emesis starts before chemotherapy and lasts for the first 24 hours.	n20 (28.17)	n51(71.83)
Patients should be given a continuation of prophylactic treatment for 2-4 days after completion of chemotherapy	n17(23.94)	n54(76.06)
Adjuvant antiemetics such as lorazepam are given to patients with anticipatory induced nausea and vomiting to reduce anxiety.	n25(35.21)	n46(64.79)
Patients on chemotherapy are given an H2 blocker (cimetidine) or a proton pump inhibitor (omeprazole)to prevent dyspepsia.	n15(21.13)	n56(78.87)
When a patient experiences breakthrough nausea and vomiting, emetic risk is re-evaluated , disease status, concurrent illness and medications to ascertain the best regimen is administered for the emetic risk.	n12(16.90)	n59(83.10)
Other interventions such as music therapy, television, muscle relaxation are used to help minimize chemotherapy-induced nausea and vomiting.	n33(46.48)	n38(53.52)
Patients are given education on dietary considerations to minimize chemotherapy induced nausea and vomiting	n8(11.27)	n63(88.73)
Details of episodes of nausea and vomiting, management and evaluation during the current session of chemotherapy are documented in patients' files.	n6(9.45)	n65(91.55)

Nurses' were more compliant on documenting patient details on episodes of nausea, vomiting and evaluation on current sessions of chemotherapy 91.55% (n65) and patient education on dietary considerations to minimize chemotherapy-induced nausea and vomiting 88.73% (n63). On the other hand, 46.48% (n33) showed non-compliance on use of other interventions to minimize chemotherapy-induced nausea and vomiting. Non-compliance was spotted also on use of adjuvant antiemetics such as lorazepam that are given to patients with anticipatory induced nausea and vomiting to reduce anxiety.

Compliance scores were calculated out of 8. The pass mark was 5 out of 8 which represented a 60% mark in accordance with blooms' cut off point. So far, 84.5% of the respondents were compliant with the guidelines. This is displayed in table 6B below;

Table 6B. Compliance to Interventional Guidelines

Compliance scores	
Scores	Frequency
1	1
3	3
4	7
5	14
6	12
7	20
8	14
Total	71
Mean score	6.08
Variance	2.42
std. deviation	1.56

4.5. Challenges associated with current practice in the management of chemotherapy induced nausea and vomiting

This section contained common challenges that nurses encounter when managing patients with chemotherapy induced nausea and vomiting. The challenges were taken from previous studies during review of literature. Six challenges were listed with 5 points responses where participants were supposed to tick. Two points could agree with the listed point, other two points disagreed and the other option was for those who were neutral. Frequently cited challenges were un-availability of guidelines 53.52% (n38), prescribing antiemetic drugs was always physicians' role 47.89% (n33), limited time for patient follow up 49.29% (n35) and availability of antiemetic drugs 78.88% (n56).

Table.7Challenges and Barriers

Challenges/ Barriers	**Percentage (Number of nurses)**				
Question Statement	**(SA) 1**	**(A) 2**	**(N) 3**	**(D) 4**	**(SD) 5**
Antiemetic guidelines are not available for reference on management of chemotherapy - induced nausea and vomiting.	n10(14.08)	n19(26.76)	n9(12.68)	n15(21.13)	n18(25.35)
Prescribing antiemetic drugs is always physicians' role.	n16(23.94)	n15(21.13)	n2(2.82)	n21(29.58)	n16(22.54)
Nursing staff are always reluctant to administer antiemetic drugs to patients.	n3(4.23)	0	n4(5.63)	n14(19.72)	n50 (70.42)
Nurses lack knowledge on chemotherapy-induced nausea and vomiting	0	n6(8.45)	n5(7.04)	n23(32.39)	n37(52.11)
There is no time to follow up patients due to increased nurse patient ratio	n12(16.90)	n12(16.90)	n11(15.49)	n16(22.54)	n20 (28.17)
Not all recommended antiemetic drugs are available for use.	n22(30.99)	n28(39.44)	n6(8.45)	n6(8.45)	n8(11.27)

4.6. Relationship between nurses' compliance with their knowledge, attitude and challenges/barriers

In this study, it was established that nurses' compliance with intervention guidelines was influenced by their knowledge (p value 0.000). Although attitude seemed to have an influence on compliance, the strength of association was weak (p value 0.021). Challenges and barriers had no effect on level of compliance.

Table 8A. Chi-square Results

		Compliance		P-value	Cramer's V
		Compliance	No compliance		
Level of knowledge	Below the mean	13	31	0.000	0.469
	Above the mean	21	6		
Attitude	Negative	12	23	0.021	0.268
	Positive	22	14		

The degree to which change in level of knowledge and attitude affected change in the dependent variable was estimated using linear regression using overall scores obtained in each section. Below is table 8B showing the variables in the regression.

Table 8B. Linear Regression Results

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value
	B	Std. Error	Beta		
(Constant)	-1.709	1.388		-1.231	.222
Attitude scores	.067	.050	.141	1.350	.182
Knowledge scores	.092	.019	.511	4.896	.000
Dependent Variable: Compliance scores					

Based on the model above, since the p-value for the constant coefficient is greater than 0.05 (That is p-value=0.222>0.05), then it is not significant. Similarly, the coefficient of attitude scores is not significant because p-value=0.182. Therefore, attitude scores have minimum effect on compliance.

Knowledge score is significant because p-value<0.001. This means that Knowledge has a significant effect on compliance. This means that, if knowledge score increases by 1 %, the compliance score increases by 0.092. However, 0.092 out of a total score of 8 is 1.13 %. Therefore, if knowledge level increases by 1 %, then compliance increases by 1.13 %.

CHAPTER 5. DISCUSSION

Research shows chemotherapy-induced nausea and vomiting still remains a problem affecting patients on chemotherapy treatment (Cope, 2021). Complete relief of patient symptoms remains a challenge for nurses who play a big role in management of nausea and vomiting symptoms. Research has shown that nurses' knowledge and attitude influence compliance with interventional guidelines for chemotherapy-induced nausea and vomiting, which remains a key factor in management of the condition. Therefore, this study was done as a baseline to establish nurses' knowledge, attitude and compliance with interventional guidelines for chemotherapy induced nausea and vomiting at Kenyatta National Hospital.

5.1. Chemotherapy –Induced nausea and vomiting and treatment modalities

In this study, 98% of the participants acknowledged CINV to be a common symptom among patients receiving chemotherapy. These findings are consistent with those of Mange (2017) who reported that 46.6% of pediatric patients had peak emesis on the first day of receiving chemotherapy then eventually a gradual decrease on the following days. Cope (2021) also reported that an approximate of 40-80% of patients develop nausea and vomiting symptoms while on chemotherapy.

On treatment modalities, chemotherapy poses a risk of inducing nausea and vomiting to patients undergoing this treatment modality. This risk however is categorized into highly emetogenic, moderate emetogenic and low and minimal emetogenic drugs. According to Kenya safe program (2018), patients receiving highly emetogenic chemotherapy and moderate emetogenic chemotherapy have a higher probability of developing nausea and vomiting symptoms than patients receiving low and minimal emetogenic drugs. This study found out that only 47% of nurses could correctly categorize risk of developing nausea and vomiting based on the type of chemotherapy drugs that patients receive. This has an impact on management of patient symptoms because classifying risk according to chemotherapy drugs forms part of nurses' assessment data and is crucial in making decisions on the type of antiemetic drugs that are suitable for the patient according to NCCN guidelines.

5.2. Knowledge of Chemotherapy-Induced Nausea and Vomiting

The mean mark for knowledge among nurses' in this study was 75.93% indicating moderate level of knowledge. This is consistent with the findings of Cope (2021) and Naito (2020) who reported that although greater number of nurses demonstrated knowledge of the recommendations although antiemetic adherence was low, especially during the delayed phase after highly emetogenic chemotherapy (Cope, 2021, Naito 2020). The standard for optimal management of chemotherapy-induced nausea and vomiting is a good level of knowledge (80-100%) according to the blooms cut off point (as cited in Abdullahi et.al, 2016). In this study, 55% (n 39) of the nurses demonstrated moderate level of knowledge while only 38% (n27) had good level of knowledge. We concur with Qadire and Alkhalaile (2018) recommendations that there should be an educational intervention to make improvements in nurses' knowledge.

5.3. Attitude of nurses towards chemotherapy-induced nausea and vomiting

Poor attitudes towards management of chemotherapy-induced nausea and vomiting affect the supportive care given to patients undergoing chemotherapy treatment (Kus, 2021, Hunter et.al 2020). In this study, it is established that only 50.70% of the participants had a positive attitude towards management of CINV. Few nurses (34%) displayed a positive attitude on patients exaggerating symptoms and using nurses' observations to determine severity of the symptoms. For a nurse to make good clinical judgment, patient reports of nausea and vomiting symptoms should also be included. Failure to include patient reported nausea and symptoms affects decision making on the right prescription of antiemetic drugs that a patient is supposed to receive. This concurs with Aapro (2022) and Naito (2020) who reported that despite the introduction of antiemetic treatment recommendations, some patients are still receiving inadequate antiemetic medication and they do not achieve complete relief from nausea and vomiting symptoms. Another reason could be the perceptual difference in view of the symptoms between nurses and patients. While patients view the symptoms as severe, nurses reviewed the same symptoms as mild hence no need to use them in decision-making (Carnio et.al, 2018, Duracinsky, 2018).

Another area where many participants did not demonstrate a positive attitude was on the role of a nurse in prescription. Only 25% of the participants were able to recognize that the role of a nurse in management of chemotherapy-induced nausea and vomiting goes beyond administering drugs

prescribed by the physician. This enables the nurses in commencing timely interventions when nausea and vomiting occur. The scope of practice for nurses in Kenya for registered nurses allows nurses to prescribe selected drugs and administer any other prescribed medication to clients /patients as per the guidelines.

5.4. Compliance with interventional guidelines

Compliance means following laid down procedures in managing patients with chemotherapy-induced nausea and vomiting. Majority of the nurses showed compliance with intervention guidelines (84.5%). This is differs with the findings that stated that not more than 25% of patients received antiemetic drugs as recommended by guidelines despite nurses demonstrating knowledge of the guidelines (Aapro, 2021 & Sun et.al 2021). However, results from this study were based on self-reported compliance.

5.5. Challenges associated with current practice

Frequently cited challenges were unavailability of guidelines 53.52% (n38), prescribing antiemetic drugs was always physicians' role 47.89% (n33), limited time for patient follow up 49.29% (n35) and unavailability of antiemetic drugs 78.88% (n56). This is consistent with the findings of Dielenseger, et.al, (2019) and Naito, (2020) who indicated that antiemetic medications were administered by nurses in accordance with physician wishes despite having knowledge of guidelines and recommendations.

5.6. Association between Knowledge, Attitude and compliance

Knowledge of guidelines on chemotherapy-induced nausea had an impact on compliance with intervention guidelines (P value-0.000). Linear regression model showed that as the level of knowledge increased, compliance also increased and the vice versa is true as explain by other study findings below. Mange (2017) reported that lack of knowledge of antiemetic guidelines led to poor compliance with nausea and vomiting guidelines though the study did not state whether the guidelines were available or not. Lack of knowledge on guidelines also led to underutilization of some antiemetic drugs thereby affecting compliance (Aapro, 2021). On the other hand, there was a weak association between attitude and compliance.

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion and recommendations

This research found out that nurses' in oncology wards and Cancer Treatment Centre (CTC) had moderate level of knowledge on management of chemotherapy induced nausea and vomiting. Regarding attitude, only half of the nurses demonstrated a positive attitude towards management of chemotherapy induced-nausea and vomiting. Majority of the nurses demonstrated compliance with intervention guidelines. The most cited challenges by nurses in this study were that antiemetic guidelines were not available, prescribing antiemetic drugs was always physicians' role, limited time for patient follow up and unavailability of antiemetic drugs.

Following the above findings, the researcher recommends that management of chemotherapy-induced nausea and vomiting is important as it improves patient quality of life and adherence to chemotherapy treatment. Continuous Professional Development seminars and post basic training in oncology nursing are important in optimal management of patient symptoms. While post –basic training helps nurses to further their career in oncology nursing and research, and Continuous Professional Development seminars help to keep nurses abreast with new information in nursing and medical practice.

Registered nurses should be empowered to prescribe and administer medications as stipulated by the Scope of Practice for Kenyan Nurses. This will help to commence timely interventions for patients in emergencies. Hospital policy needs to support nurses to practice what is within their scope and guidelines. Nurses' should also be encouraged to participate in research on chemotherapy induced nausea and vomiting and other symptom management. Guidelines should be made available in the units and nurses need to be oriented on them.

On cited challenges like unavailability of antiemetic drugs and limited time for patient follow up due to increased nurse/patient ratio, management needs to lobby for more human resources and drugs. Oncology wards and CTC need to have an adequate number of staff to attend to patients' needs.

Lastly, further studies need to involve hospital directors, head of oncology department and pharmacy since they have an influence in affairs of patient care in the Oncology department.

Further studies need to be done to establish if a patient's assessment of CINV differs from that of the nurses.

6.2. Study Limitations

This study relied on self-reported data from nurses working in oncology wards and CTC which can rarely be independently verified.

Since the study was done in one hospital, the sample size was small such that the data was not normally distributed.

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Appendix 1. Informed consent

Principal Investigator: Ruth Brandina Chiwanda

Name of Institution: University of Nairobi

Department of Nursing

Supervisors: Dr. L. Omondi

Dr. M. Wagoro

Title of the study: Nurses' Knowledge, Attitude and Compliance with Interventions Guidelines for Patients with Chemotherapy-Induced Nausea and Vomiting.

This informed consent has two parts:

- Information sheet (to share information of the study with you)
- Certificate of consent (for you to sign if you agree to participate)

PART 1: Information Sheet

Introduction

I am Ruth Chiwanda, a masters' student at University of Nairobi Department of Nursing. I am doing research on Nurses Knowledge, Attitude and Compliance with Interventions Guidelines for Patients with Chemotherapy-Induced Nausea and Vomiting at Kenyatta National Hospital. In this research, nurses are supposed to respond to the questions that have been compiled in a questionnaire regarding nursing management of patients with chemotherapy-induced nausea and vomiting at cancer treatment centers and oncology wards. You have to make an independent decision to participate in the study and you are free to ask for clarification where the questions are not clear.

Purpose

Studies show that approximately 80% of patients on chemotherapy experience nausea and vomiting. Managing chemotherapy induced nausea and vomiting has been challenging despite the development of different antiemetics and guidelines. There has been suboptimal control of nausea

and vomiting in patients with chemotherapy-induced nausea and vomiting. Non-compliance to guidelines, lack of knowledge and poor attitudes have been cited as some of the causes. In this study, we would like to establish nurses' knowledge, attitude and compliance to interventional guidelines for patients with chemotherapy-induced nausea and vomiting. This information will help to improve management of patients with chemotherapy induced nausea and vomiting.

Selection of participants

The study targets nurses working in Cancer Treatment Center and Oncology wards at Kenyatta National Hospital. Your knowledge and expertise will help us in improving the management of patients with chemotherapy-induced nausea and vomiting.

Risk and Discomforts

This study is likely to consume your time for work or break while you are responding to the questionnaire. Therefore, you are given a period of a shift (8hours) to respond in your free time. The questions are not for academic assessment or competence to you, it is about how you manage patients with chemotherapy-induced nausea and vomiting and how best we can improve the practice. The questionnaires will not bear names of respondents and all responses will be kept confidential.

Benefits: Gaps identified by the study will help to reveal the need to intensify continuous professional development among nurses working in designated areas in order to effectively manage chemotherapy –induced nausea and vomiting in patients. It will also help in bringing a common understanding between nurses' and hospital management so that other barriers to effective patient management of patients with chemotherapy induced nausea and vomiting can be addressed. Study results will not be shared with individual participants upon completion of the study, instead an executive summary of the results will be shared in respective study wards for reference.

Reimbursements

There will be neither incentives nor payments for nurses participating in the study.

Confidentiality

Data that will be collected will be handled in a confidential manner. To ensure your privacy, the questionnaire will not bear any respondents name. Questionnaires will be allocated a number that is known to the investigator for privacy purposes. All duly-filled questionnaires shall be kept under lock and key, accessible only to the investigator and research assistant.

Sharing of Research Findings

A compiled copy of the research findings will be shared with the Department of Nursing at University of Nairobi for academic purposes. An executive summary of the dissertation will be shared with the study wards and KNH-UoN ERC.

Right to refuse or withdraw

Participation in this study is voluntary and your decision to participate or not to participate will not affect you in any way. You have a right to refuse to join the study and also to withdraw from the study at any stage without any consequences or reasons expected.

Who to contact

All questions and clarifications can be directed to the principal investigator, supervisors or Kenyatta National Hospital/University of Nairobi ethics review board through the contacts available in the certificate of consent. This can be done during the study period and after the study period.

Certificate of Consent

Study Title: Nurses' Knowledge, Attitude and Compliance with Intervention Guidelines for Patients with Chemotherapy Induced Nausea and Vomiting at Kenyatta National Hospital.

Institution: Department of Nursing

University of Nairobi

P.O Box 30197-00100

Nairobi

Kenya.

Investigator: Ruth BrandinaChiwanda

Mobile Tel: 0795978006

Supervisors:

1st Supervisor- Dr. L. Omondi- Lecture, Department of Nursing

University of Nairobi

Tel:0720 861317

2nd Supervisor- Dr. Mirriam. C.A. Wagoro- Senior Lecture, Department of Nursing

University of Nairobi

Tel: 0722 737356

Ethical Approval Board:

Kenyatta National Hospital/ University of Nairobi Ethical and Research Committee

P.O Box 20723-00100

Nairobi

Tel: 2726300/2716450 Ext 44102

Certificate of Consent

I give consent to participate in the research study which will involve responding to the questionnaire on Nurses Knowledge, Attitude and Compliance with Intervention Guidelines for Patients with Chemotherapy-induced Nausea and Vomiting at Kenyatta National Hospital. I have read the information, I have had opportunities to ask questions and they have been answered to my satisfaction therefore, I consent voluntarily to participate in this study.

Signature of Participant---------- Date……..

I confirm that I have clearly explained to the participant the nature of the study and the contents of this form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator Signature……. Date……

Appendix 2. Research Questionnaire

Date……Code……..

Directions :

Before filling in this questionnaire, make sure you have read, understood and signed the attached consent form.

Do not write your name in any of the pages of this questionnaire.

Read carefully the instructions given at the beginning of each section before answering the questions.

Answer all questions

SECTION A: SOCIAL AND DEMOGRAPHIC DATA

In this section, you are required to fill in your demographic data. Please circle the appropriate option and write on the provided spaces if your answer is not on the given options.

1. AGE
   a. 20-29 years
   b. 30-39 years
   c. 40-49 years
   d. 50-59 years
   2. GENDER
   a. Male
   b. Female
   3. PROFESSIONAL QUALIFICATIONS
   a. Diploma in nursing
   b. Higher diploma in nursing
   c. Bachelors in nursing
   d. Master's degree in nursing
   e. Specialization certificate

f. Other …….

4. YEARS OF EXPERIENCE

a. 0-1 year

b. 2-5 years

c. 6-10 years

d. 11-15 years

e. Other……...

5. How long have you worked as a nurse in the oncology ward/ CTC?

……years.

6. Have you trained as an oncology nurse?

a. Yes

b. No

7. If yes (in 6 above) please indicate the year you completed your oncology nursing training. Year…….

8. Have you had any training on symptom management/ chemotherapy induced nausea and vomiting since you started working in oncology/ CTC?

a. Yes

b. No

9. If years indicate how long the training took.

……

SECTION B. **Knowledge on Chemotherapy-Induced Nausea and Vomiting**

This section contains true and false statements. Please tick in the appropriate box according to your observation.

True: 2 points False: 1 point Not sure: 0

	Question Statement	True	False	Not Sure
1.	Chemotherapy-induced nausea and vomiting is the most distressing symptoms in patients receiving chemotherapy			
2.	Approximately 80% of patients develop chemotherapy induced nausea and vomiting in the course of receiving chemotherapy.			
3.	Untreated chemotherapy –induced nausea and vomiting can negatively affect patients' health.			
4.	Intervention guidelines are important in management of chemotherapy induced nausea and vomiting.			
5	Assessment is an important step in management of chemotherapy-induced nausea and vomiting.			
6	Patient risk factors form an important baseline data in management of chemotherapy induced nausea and vomiting.			
7	Patterns of chemotherapy-induced nausea are not important in determining treatment.			
8	When considering treatment of chemotherapy induced nausea and vomiting only emetogenicity risk of drugs should be considered.			
9	Antiemetic drugs need to be administered when nausea and vomiting episodes occur in the course of chemotherapy administration.			
10	There are other causes of nausea and vomiting in cancer patients apart from chemotherapy.			
11	Continuation of antiemetic medications is not important after completion of chemotherapy.			

SECTION C. Attitude towards Management of Chemotherapy-Induced Nausea and Vomiting

Indicate to what extent you personally agree or disagree with the following questions using a five point Likert scale.

1. **Strongly disagree (SD) 2. Disagree (D) 3.Neither agree or disagree (N) 4.Agree**
   5. **Strongly Agree**

No	Question Statement	(SD) 1	(D) 2	(N) 3	(A) 4	(SA) 5
1.	Patients receiving chemotherapy need assessment before chemotherapy session.					
2	Chemotherapy emetogenic risk is the only reliable factor to consider when prescribing antiemetic drugs for chemotherapy-induced nausea and vomiting.					
3.	Patients reported nausea and vomiting is important in determining the patterns of chemotherapy induced-nausea and vomiting.					
4.	Patients may exaggerate the severity of nausea and vomiting as such nurses' observations are paramount to determine the severity of chemotherapy –induced nausea and vomiting.					
5.	One dose of antiemetic drugs is enough throughout the chemotherapy session.					
6.	Antiemetic should be given as a routine dose round clock until the risk period is over.					
7.	Depending on the severity of chemotherapy-induced nausea and vomiting, patients may receive a combination of drugs recommended by antiemetic guidelines to control nausea and vomiting.					
8.	The role of nurses is to administer antiemetic drugs which the physician has prescribed for the patient.					
9.	Patients require constant observation during chemotherapy sessions to evaluate the effectiveness of antiemetic drugs given.					
10.	Once given antiemetic drugs before chemotherapy, patient evaluation is not required.					

SECTION D. Compliance with Intervention Guidelines on Chemotherapy-Induced Nausea and Vomiting

This section contains YES or NO questions. Please tick in the appropriate box.

NO	Question Statement	Yes	No
1.	Prevention of acute emesis starts before chemotherapy and lasts for the first 24 hours.		
2.	Patients should be given a continuation of prophylactic treatment for 2-4 days after completion of chemotherapy.		
3.	Adjuvant antiemetics such as lorazepam are given to patients with anticipatory induced nausea and vomiting to reduce anxiety.		
4.	Patients on chemotherapy are given an H2 blocker (cimetidine) or a proton pump inhibitor (omeprazole)to prevent dyspepsia.		
5.	When a patient experiences breakthrough nausea and vomiting, emetic risk is re-evaluated , disease status, concurrent illness and medications to ascertain the best regimen is administered for the emetic risk.		
6.	Other interventions such as music therapy, television, muscle relaxation are used to help minimize chemotherapy-induced nausea and vomiting.		
7.	Patients are given education on dietary considerations to minimize chemotherapy induced nausea and vomiting		
8.	Details of episodes of nausea and vomiting, management and evaluation during the current session of chemotherapy are documented in patients' files.		

SECTION E. Challenges associated with current practice in management of chemotherapy-induced nausea and vomiting.

Indicate to what extent you agree or disagree with the following factors that are challenges with current practice in management of chemotherapy-induced nausea and vomiting using a five-point Likert scale.

1. **Strongly Agree (SA)**
2. **Agree (A)**
3. **Neither Agree or Disagree (N)**
4. **Disagree**
5. **Strongly Disagree**

NO	Question Statement	(SA) 1	(A) 2	(N) 3	(D) 4	(SA) 5
1	Antiemetic guidelines are not available for reference on management of chemotherapy -induced nausea and vomiting.					
2.	Prescribing antiemetic drugs is always physicians' role.					
3.	Nursing staff are always reluctant to administer antiemetic drugs to patients.					
4.	Nurses lack knowledge on chemotherapy-induced nausea and vomiting					
5.	There is no time to follow up patients due to increased nurse patient ratio					
6.	Not all recommended antiemetic drugs are available for use.					

Appendix 3. Standard Practice Checklist Tool on Chemotherapy –Induced Nausea and Vomiting

Competence	Components	Score
Identify patient risk factors for chemotherapy induced nausea and vomiting.	-Age below 50 -Sex (female) -previous history of chemotherapy induced nausea and vomiting. -History of alcohol use -Motion sickness -History of motion sickness during pregnancy	
Categorize patients' patterns of nausea and vomiting into the following;	-Acute nausea; onset of emesis within a few minutes to several hours after chemotherapy is administered. Usually peaking in the first 4-6 hours. -Delayed; onset of emesis more than 24 hours after chemotherapy is administered. -Anticipatory; onset of emesis prior to chemotherapy administration as a conditioned response in patients who have experienced emesis during a previous cycle of chemotherapy -Breakthrough/refractory; emesis despite prophylactic breakthrough medications.	
Classify chemotherapeutic agents into the following risk groups; Explain prevention measures of chemotherapy-induced nausea and vomiting in each identified category.	- Very High emetic risk; ≥ 90% experience emesis (Cisplatin, Darcabazine, Mechlorethamine). -High emetic risk 60%-90%: (carmustine, cyclophosphamide, procarbazine). -Moderate risk 30%-60%: Doxorubicin, 5-fluorouracil. -Low 10%-30%: Bleomycin, Cytarabine, Etoposide, methotrexate, vinblastine. Very low<10%: Vincristine, chlorambucil, busulfan. -when to administer antiemetic medications for : -Acute nausea and vomiting (before chemotherapy administration and continue for the first 24 hours). -Breakthrough nausea and vomiting: use round routine round clock administration of antiemetic dosing. -Delayed emesis: continuation of prophylactic treatment for 2-4 days following completion of chemotherapy. -Anticipatory nausea and vomiting: relaxation, guided imagery, music therapy (behavior interventions). -administer anxiolytics like lorazepam as adjuvant to anti-emetics to decrease anxiety.	

	-Rule out other causes of emesis in cancer before starting anti-emetic treatment: -Use of opioids to control pain. -Hypercalcemia. -Tumor invasion of the gastrointestinal system. -Constipation. Dehydration. -Uremia	
Pharmacological Management of chemotherapy-induced nausea and vomiting	Serotonin Agents -Ondasetron -Granisetron -palonosetron Corticosteroids -dexamethasone Dopamine antagonists -Olanzapine -Metoclopramide Neuro-kinin1 Receptor Antagonists -Aprepitant	
Evaluation of patients and documentation	-Evaluation of effectiveness of interventions. -Documentation of evaluation findings	

Adapted from National Cancer Comprehensive Network guidelines and Kenyan Ministry of Health Chemo safe program.

Appendix 4. Letter to Ethics Committee

Ruth BrandinaChiwanda
Department of Nursing Sciences
P.O BOX 19676-00200
College of Health Sciences
University of Nairobi

The Chairman,
UON-KNH ERC
P.O. Box 20723-00202
Nairobi.

Dear Sir

RE: ETHICAL REVIEW AND APPROVAL

I am a second year post-graduate nursing student, pursuing a Master of Science in Nursing (Oncology). I write to you to request permission to carry out research on **"Nurses' Knowledge, Attitude and Compliance with Intervention Guidelines for Patients with Chemotherapy-Induced Nausea and Vomiting at Kenyatta National Hospital."** The study will be carried out at cancer treatment center and oncology wards. The results from this study will provide a baseline for improvement in management of patients with chemotherapy-induced nausea and vomiting and improving guidelines in cancer management.

Your kind consideration will be of help to fulfill the award of Masters' Degree in Nursing (Oncology).

I look forward to your comments and suggestions for improvement of the proposed study.

Yours Faithfully,

RUTH BRANDINA CHIWANDA

H56/38746/2020

Appendix 5: Letter to KNH CEO

Ruth BrandinaChiwanda
Department of Nursing Sciences
P.O BOX 19676-00200
College of Health Sciences
University of Nairobi.

The Chief Executive Officer
Kenyatta National Hospital
Nairobi.

Dear Sir,

RE: PERMISSION TO UNDERTAKE STUDY AT KENYATTA NATIONAL HOSPITAL

I am a second year post-graduate nursing student, pursuing a Master of Science in Nursing (Oncology). I am writing to request permission to carry out research on **"Nurses' Knowledge, Attitude and Compliance with Intervention Guidelines for Patients with Chemotherapy-Induced Nausea and Vomiting at Kenyatta National Hospital."** The study targets nurses working at Cancer Treatment Center, Pediatric Oncology ward, 8C (Medical Oncology) and ward 1B (gynae-oncology ward).

This study will be of help to fulfill the requirements for the award of Master's Degree in Nursing (Oncology). In addition, the study will help to improve nursing management of patients with chemotherapy-induced nausea and vomiting and their outcomes.

Please find the attached approval letter from KNH-UON ERC

Thanks for your continuous support

Yours sincerely,

RUTH BRANDINA CHIWANDA
H56/38746/2020

Appendix 6: letter of approval from ERC

UNIVERSITY OF NAIROBI
FACULTY OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

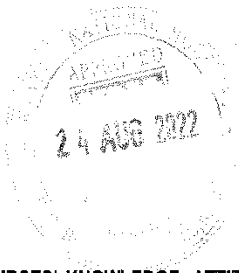
KNH-UON ERC
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/315

24th August, 2022

Ruth Brandina Chiwanda
Reg. No. H56/38746/2020
Dept. of Nursing Sciences
Faculty of Health Sciences
University of Nairobi



Dear Ruth,

RESEARCH PROPOSAL: ESTABLISHING NURSES' KNOWLEDGE, ATTITUDE AND COMPLIANCE TO INTERVENTION GUIDELINES FOR PATIENTS WITH CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING (P374/04/2022)

This is to inform you that KNH-UoN ERC has reviewed and approved your above research proposal. Your application approval number is **P374/04/2022.** The approval period is 24th August 2022 – 23rd August 2023.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by KNH-UoN ERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KNH-UoN ERC 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH-UoN ERC within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to KNH-UoN ERC.

Appendix 7: letter of approval from KNH

KNH/R&P/FORM/01

KENYATTA NATIONAL HOSPITAL
P.O. Box 20723-00202 Nairobi

Tel.: 2726300/2726450/2726565
Research & Programs: Ext. 44705
Fax: 2725272
Email: knhresearch@gmail.com

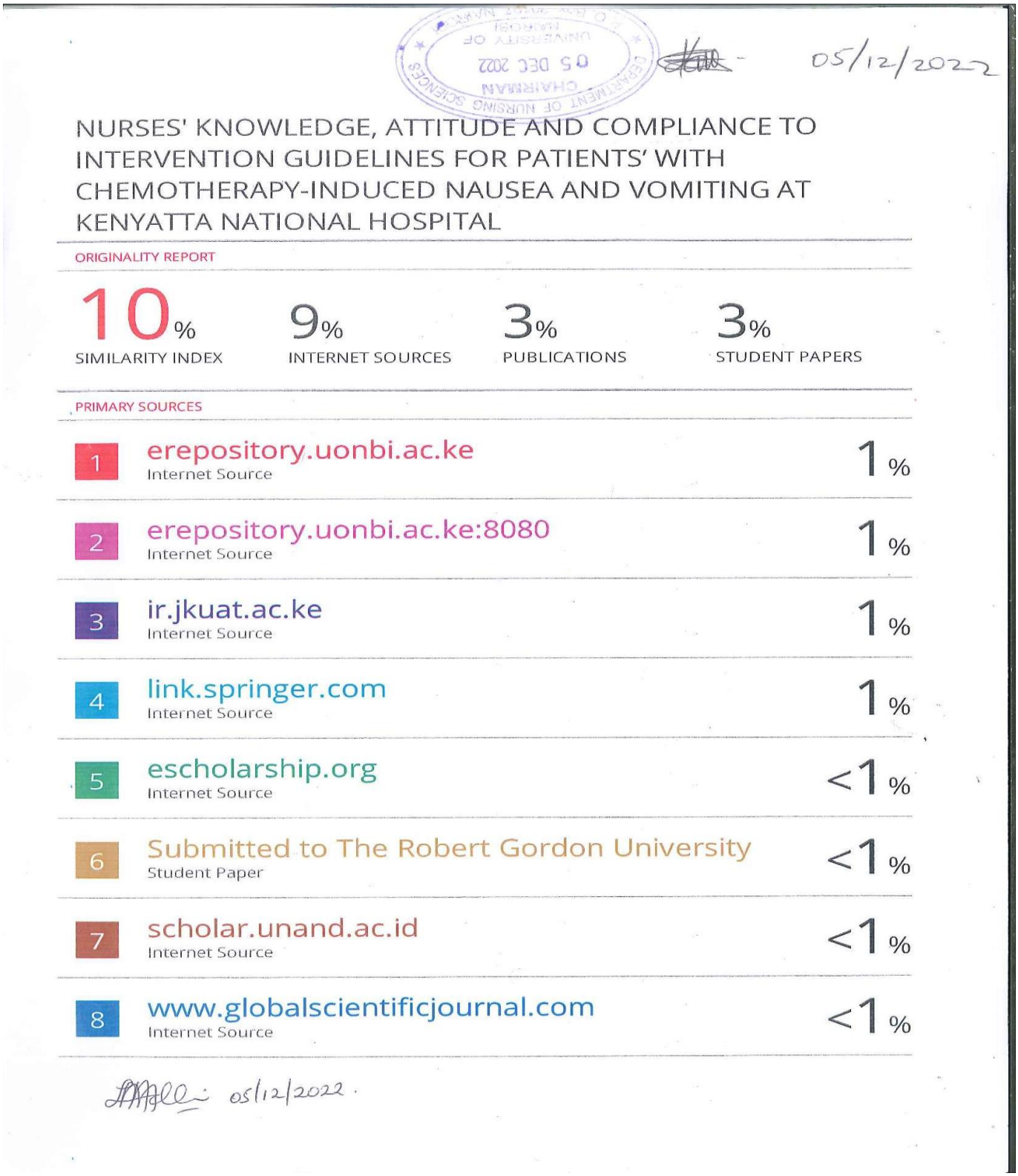
Study Registration Certificate

1. Name of the Principal Investigator/Researcher
   RUTH BRANDINA CHIWANDA
2. Email address: chiwandaruth60@gmail.com Tel No. 0795978006
3. Contact person (if different from PI).....
4. Email address: ..... Tel No. .....
5. Study Title
   ESTABLISHING NURSES' KNOWLEDGE, ATTITUDE AND COMPLIANCE TO INTERVENTIONAL GUIDELINES FOR PATIENTS WITH CHEMOTHERAPY INDUCED NAUSEA AND VOMITING
6. Department where the study will be conducted CANCER TREATMENT CENTRE
   (Please attach copy of Abstract)
7. Endorsed by KNH Head of Department where study will be conducted.
   Name: Dr C Mwangi Signature ..... Date 8/9/22
8. KNH UoN Ethics Research Committee approved study number P374/04/2022
   (Please attach copy of ERC approval)
9. I RUTH BRANDINA CHIWANDA commit to submit a report of my study findings to the Department where the study will be conducted and to the Department of Medical Research.
   Signature Rchiwanda Date 6/09/22
10. Study Registration number (Dept/Number/Year) CTC /156/2020
    (To be completed by Medical Research Department)
11. Research and Program Stamp

KENYATTA NATIONAL HOSPITAL * P.O. Box 20723-00202 NAIROBI * Research & Programs Resource Centre * 08 SEP 2022

All studies conducted at Kenyatta National Hospital **must** be registered with the Department of Medical Research and investigators **must commit** to share results with the hospital.

Appendix 8: PlagiarismReport



05/12/2022

NURSES' KNOWLEDGE, ATTITUDE AND COMPLIANCE TO INTERVENTION GUIDELINES FOR PATIENTS' WITH CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING AT KENYATTA NATIONAL HOSPITAL

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