

**Factors Associated with Documentation of Fluid Intake and Output in Post-Operative
Patients at Mansa General Hospital.**

By

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A Dissertation submitted in partial fulfillment of the requirement for the Degree of Masters of
Science in Nursing at the University of Zambia

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DECLARATION

I Mwila Brian Chrispine declare that this Dissertation represents my own work and that all the sources I have quoted have been indicated and acknowledged by means of complete reference. I further declare that this Dissertation has not previously been submitted for a Degree or Diploma or other qualifications at this or other university. It has been prepared in accordance with the guidelines for Master Degree in Nursing Sciences Dissertations of the University of Zambia.

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Date

Candidate

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CERTIFICATE OF APPROVAL

The University of Zambia approves this Dissertation on Factors Associated with Documentation of Fluid Intake and Output in Post-Operative Patients at Mansa General Hospital in a partial fulfillment of the Master Degree in Nursing Sciences.

Examiner`s I Signature..... Date.....

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Examiner`s III Signature..... Date.....

CERTIFICATE OF COMPLETION OF DISSERTATION

I **Dr Catherine M Ngoma**, having supervised and read this dissertation is satisfied that this is the original work of the author whose name it is being presented. I confirm that the work has been completed satisfactorily and approved for final submission.

Signed

Date

Supervisor

Signed.....

Date.....

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DEDICATION

I dedicate this study to my wife Catherine L. Mwila and our lovely children for being the driving force behind this study.

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My heartfelt gratitude goes to Dr Catherine M. Ngoma my supervisor for the tireless efforts rendered to me for this study to be successfully completed.

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ABSTRACT

Introduction: Ensuring patients are adequately hydrated is an essential part of nursing care but the performance assessment and nursing audit reports demonstrated a gap in the documentation of the post-operative patients fluid balance charts at Mansa General Hospital (MGH). The main objective of the study was to evaluate factors affecting documentation of intake and output on the fluid balance charts in post-operative patients at MGH.

Methods: This was a hospital based descriptive cross-sectional study with a quantitative approach conducted at Mansa General Hospital. Following the approval of the research by ERES Converge, data was collected from a total sample of 53 nurses and midwives working in four surgical wards. To check for completeness of the documentation of the intake and output charts, a checklist was developed and a total of 319 intake and output charts of post-operative patients admitted to surgical wards between January and June 2015.

Analysis of data was done using STATA version 13.0 for windows. Frequency tables, cross tabulations and percentages were used to present the simple descriptive statistics. Pearson chi-square test was used to test associations between documentation of intake and output on fluid balance charts and several key independent variables expected to influence the dependent variable. A semi-structured interview schedule and audit tool were used for data collection, Pearson's chi-squared test was used to assess the relationship among variables.

Results: The Pearson chi-square test was 3.3673 while the p-value was 0.408 indicating a non-statistically significant relationship. The results showed that service of 5 years and above, high knowledge on documentation and working in the maternity ward were associated with documenting fluid intake and output ($P < 0.01$, $P < 0.02$ and $P < 0.04$ respectively) at 5%.

The findings show that 59% of the patients charts had the patients name, 89% had the patients age and sex respectively. Eighty three percent (83%) of the fluid balance charts had names of the ward recorded on them, 86% had a date of admission, 7% percent had a bed number and 44% had a patient's diagnosis indicated. Most (97%) of the patients fluid balance charts had the name of the fluid administered, 94% had time of commencement, amount of fluid given (96%) and output indicated. The other parameters indicated on the fluid balance charts included the nurses and midwives shift balance (21%) flow rate (5%) and the doctor's name (6%).

Conclusions: The findings indicates a gap in the documentation of fluid intake and output among post-operative patients at Mansa General Hospital. Long period of service and high levels of knowledge significantly increase the probability of documentation.

Recommendations: Refresher courses targeting all nurses and midwives, with a special focus on the importance of documentation of intake and output should be introduced. Management should advocate for increased number of nurses and midwives on the staff establishment, because an increased patient to staff ratio leads to heavy workload for nurses and midwives. Reducing the patient to health staff ratio may reduce the stress and fatigue on the part of nurses. Thus, leading to improvement in the documentation of fluid intake and output.

Keywords: Post-operative patients, intake and output, fluid balance chart, Nurse and Midwife

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LIST OF ABBREVIATIONS

CSO	Central Statistical Office
DHO	District Health Office
IVF	Intravenous infusion
MGH	Mansa General Hospital
MOH	Ministry of Health
PHO	Provincial Health Office
WHO	World Health Organization
UNZA	University of Zambia
ZDHS	Zambia Demographic Health Survey

CHAPTER ONE

1. Introduction

Nursing documentation is defined as a record of nursing care that is planned and given to individual patients and clients by qualified nurses or by other caregivers under the direction of a qualified nurse (Urquhart et al., 2011). Documentation of a patient's fluid intake and output is a critical element of nursing care. In healthy persons, fluid balance is when the amount of intake is equal to the amount of output. On one hand, fluid intake is the amount of fluid that comes into the body orally or by intravenous infusion. On the other hand, fluid output is the amount of fluid that leaves the body by means of urine, sweat, respiration and stools (Scales and Pilsworth, 2012:53). Thus, important changes in fluid and electrolyte physiology have an implication for metabolic reaction to injury. This is in addition to well-known metabolic responses. Moreover; salt (NaCl) and water are retained avidly in the first few days, called 'the sodium retention phase of injury'. In the same way, convalescence and recovery are heralded by a return of the capacity to excrete any salt and water overload acquired during the earlier phase. Patients are, therefore, extremely susceptible to errors in fluid prescription early after injury or surgery (Lobo et al. 2012).

Fluid balance plays an important role in the management of a post-operative patient. This makes the collection and accurate assessment of fluid balance data to be of great importance. Mostly, fluid balance data is collected during physical assessment, monitoring activities and recordkeeping. Accurate assessment of this fluid balance data forms an essential part of the baseline patient information. Consequently, this baseline patient information, guides medical and nursing interventions aimed at achieving physiological stability in a patient.

Moreover, one of the core competencies of the nurse is to comprehensively document nursing care activities using appropriate tools and formats to facilitate continuity of care given (GNC, professional regulatory framework, page 5). Scales and Pilsworth (2011:57) provide guidance for best practice in fluid balance: this includes assessment of the patient, informing the doctor or shift leader about deterioration in the patient's health status, handover of the fluid balance to the next shift, as well as accurate calculation and recording. Thus, recordkeeping is an important component of the scope of practice of professional nurses, as described in the regulations relating to the scope of practice of persons who are registered or enrolled under the Nursing and Midwifery Act of 1997. For this reason, the GNC professional code of

conduct has defined failure to document or poorly document care, as one of the offenses falling under negligence.

1.1 statement of the problem

Documenting a patient’s fluid intake and output is of great importance in understanding the patient’s clinical status. In post-operative patients, normal fluid balance control mechanisms are disrupted, leading to altered homeostasis and increased risk of fluid excess or deficit in the patient. Documentation of fluid intake and output is among the key responsibilities of the nurse. (Mooney, 2010:12-16). The General Nursing Council (GNC) recognizes the importance of documentation of nursing care as one of the key indicator of profession practice (The GNC Zambia, Registered Nurse Curriculum, 2010). Although literature and best nursing practice emphasize the requirement of complete, correct and accurate fluid balance monitoring in patients, gaps in documentation of fluid intake and output still exists (Diacon, 2012). At Mansa General Hospital the performance assessment and nursing audit reports for 2014 has repeatedly demonstrated poor adherence to corrected documentation of intake and output on post-operative patients by nurses. Table 1 below illustrates the feedback from the provincial Medical Office performance assessment and nursing audit teams for Mansa General Hospital for the 2014.

Table 1. Mansa Provincial Medical office performance assessment 2014-2015 and nursing audit 2015 reports for Mansa General Hospital

2014	Report	Remarks
First quarter	1 out of 5	Nursing Officer to reorient nurses on documentation of nursing care
Second quarter	2 out of 5	Nursing Officer to reorient nurses on documentation of nursing care
Third quarter	2 out of 5	Nursing Officer to reorient nurses on documentation of nursing care
Fourth quarter	3 out of 5	Nursing Officer to reorient nurses on documentation of nursing care

A number of studies have shown that, inaccurate fluid balance monitoring results in incorrect conclusions. Diacon in her study entitled documentation of intake and output in critically ill patient quoted Johnson and Monk house (2009) who noted that poor management of the replacement of fluids and electrolytes is due to inaccuracies in monitoring and recording. She further went on to quote Reid et al. (2011) who reported that reasons for inaccuracy in fluid balance assessment to be: a deficit in knowledge, a heavy workload, a lack of personal responsibility, lengthy of service, availability of stationery, in-service training and supervision. Nonetheless, these studies were conducted outside Zambia.

At Mansa general Hospital no study has ever been conducted in order to establish the possible causes of this inadequate intake and output documentation. It is therefore imperative that a study be undertaken to evaluate the factor affecting documentation of fluid intake and output. The findings of the study will inform policy with regards to improving both the quality of documentation and nursing care.

1.2 Research questions

Why is fluid intake and output documentation not done correctly by nurses at Mansa general Hospital?

1.3. Objectives

1.3.1 General objectives

To evaluate the factors associated with poor documentation of intake and output on post-operative patients by nurses at Mansa General Hospital.

1.3.2 Specific objectives

The following are the specific objectives for this study:

- To examine fluid balance charts in order to identify gaps in documentation
- To determine whether the availability of stationery affects documentation of intake and output
- To find out whether staff shortage affects documentation of intake and output
- To establish whether the nurse's level of knowledge and professional qualification affects documentation of intake and output
- To find out whether the nurses' length of service affects documentation of intake and output

- To identify the characteristics of nurses involved in documentation of fluid intake and output in post-operative patients

1.4 Null hypothesis

There is no association between the documentation of fluid intake and output on the fluid balance chart and the nurses, level of knowledge, length of service and qualification.

1.5 Justification

Documentation of a patient's fluid balance to prevent dehydration or over hydration is a relatively simple task, but fluid balance documentation is notorious for being inadequately or inaccurately completed. Effective management of post-operative patients requires accurate assessment of their fluid balance status. Inaccurate documentation of intake and output can have far-reaching consequences with respect to on-going patient assessment and clinical management. It is therefore essential that nurses and midwives taking care of post-operative and critically ill patients, implement appropriate fluid intake and output, and accurate calculation and correct recording. This will facilitate the deliverance of safe, quality patient care. For this reason, it is necessary to determine the current clinical practices of nurses relating to fluid balance monitoring and to discover the quality of documentation of fluid balance in post-operative patients at Mansa general hospital.

From studies that have been found and reviewed, most of the researchers from United Kingdom, United States of America, China, South Africa and others had conducted numbers of studies on the Intake and Output chart. At Mansa General Hospital the Provincial Medical Office performance assessment report has consistently shown that documentation of nursing care including fluid balance monitoring was not done correctly. However, there is limited documentation or published studies done in Zambia on intake and output recording. To address this knowledge gap, this study aims to examine the factors affecting documentation of intake and output on the fluid balance charts at Mansa general hospital in Zambia.

The results from this study will help nurses and midwives take appropriate interventions to promote documentation of intake and output at the institution and subsequently improve documentation of intake and output. In turn, recommendations will also be made on how best to improve the documentation, nursing practice supervision, quality improvement programs, in-service training, evidence based practice and further research (Al-Kandari and Thomas, 2009). As a result, the clients will benefit in that timely and accurate input and output will

help detect and facilitate implementation of corrective measures early to improve patient outcomes. The study will also provide the researcher with evidence to make recommendations for corrective interventions.

1.6 Conceptual framework

LoBiondo-Wood and Haber (2010:57) define a theoretical framework as a guide to how the different concepts in research are structured. For instance, attribution theory, as applied to health care management, is a way of assessing the successes and failures of a health care system or program. In Patrick Palmieri and Lori Peterson's "To Err is Human: Building a Safer Health Care System" (2009), attribution theory is described as one possible health care management theory that can be used to create a safer environment for patients. Although not fully developed as a health care management theory, the authors suggest that attribution theory can be used as a conceptual framework to foster a positive and safe work environment for both health care workers and patients. Attribution theory assumes health care management can be improved by understanding that error in health care can sometimes occur. By understanding where these feelings arise, health care managers can learn to foster a positive work environment that will improve employee response to errors in health care. By learning to recognize these mistakes as simply "human" errors, health care workers can learn to focus on continuing to provide a positive environment for patient recovery rather than focusing on what they have not done successfully. This study uses the attribution theory by Heider Fritz (1958). In his theory, Heider F. (1958) believed that people observe, analyze, and explain behaviors with explanations. Further, he defined Attribution as the process by which individuals explain the causes of behavior and events. Although people have different kinds of explanations for the events of human behaviors, Heider found that it is very useful to group explanations into two categories; i.e. Internal (personal) and external (situational) attributions (Hewstone, Fincham and Jaspars, 1983).

When an internal attribution is made, the cause of the given behavior is assigned to the individual's characteristics such as ability, personality, mood, efforts, attitudes, or disposition. On the other hand, when an external attribution is made, the cause of the given behavior is assigned to the situation in which the behavior was seen such as the task, other people, or lack (Lilienfeld, 2010). Therefore, the attribution theory was adopted in this study as it illustrated how different factors could be grouped in internal attributions such as length of service, professional qualification and external attributions such as availability of stationery, work overload and lack of supervision (Diacon 2012).

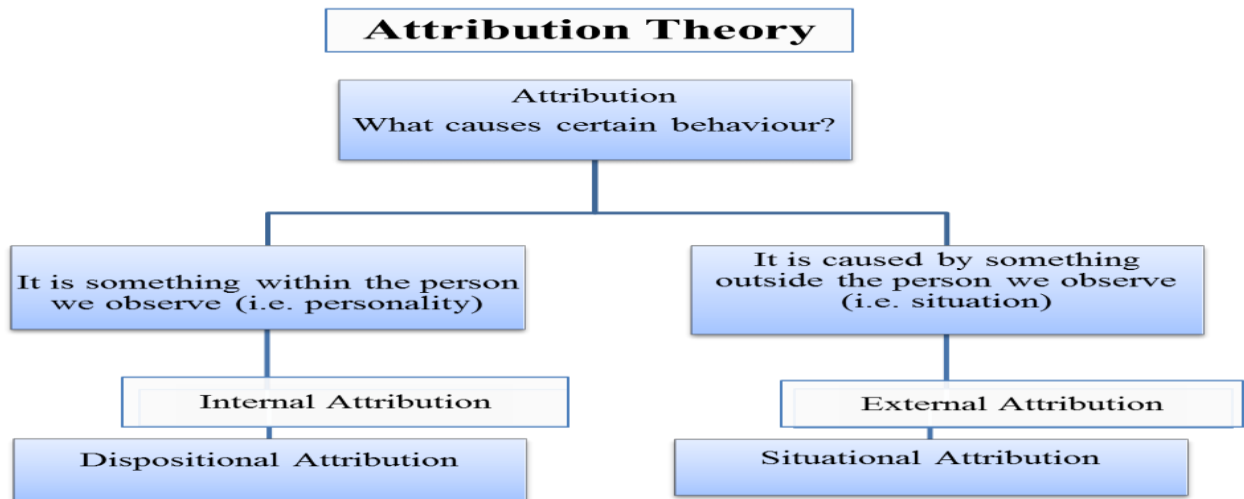


Figure 1. Attribution Theory by Heider Fritz (1958)

Source: Heider Fritz (1958)

There are several factors that may influence documentation of fluid intake and output by nurses. These are illustrated in the conceptual framework below (Figure 2).

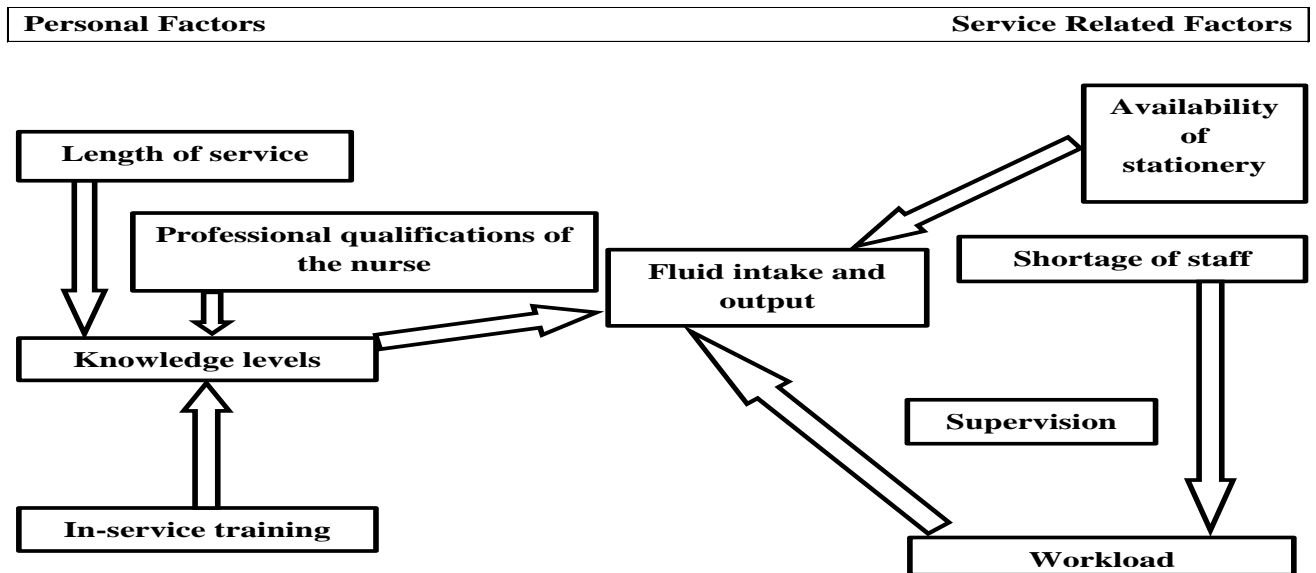


Figure 2. Diagrammatic representation of the Theoretical framework as applied to this study

1.6.1 Conceptual definitions

Correct: Always following the same pattern or style without changing (Oxford advanced learner's dictionary, 2007)

Accuracy: the state of being exact or correct; the ability to do something skillfully without making mistakes (Oxford advanced learners dictionary, 2014)

Fluid balance chart: is the observation sheet used to record intake and out put on patients on intravenous infusion.

A Nurse: is a person who has completed a programme of basic nursing education and is authorized by the general Nursing Council of Zambia to practice nursing in Zambia (GNC regulatory frame work, 2001: 58).

Post-operative care: The care provided for the surgical patient after surgery, it includes conducting post-operative assessment during the immediate, intermediate and extended stages (Lewis, 2004).

1.6.2 Operational definitions

Documentation: In this study, documentation will include fluid balance charts.

Length of service: The time in months or years that a nurse of midwife has been working from the time he/she qualified.

Correct documentation: In this study, correct documentation will mean including all the necessary details on the fluid balance chart are filled in

Ward of operation: In this study, ward mean ward where the participants will be drawn

Knowledge: Explaining and demonstrating why and how fluid intake and output chart is filled in

1.7 Variables

A variable is a characteristic or attribute of a person or object that varies within the population under study such as age, height, and presence (Dempsey. and Dempsey, 2000). The many variables for this study are the dependent and independent variables.

1.7.1 Dependent variable

This is a response, behaviour or outcome that the researcher wants to predict or explain (Burns and Grove, 2007). In this study, the identified dependent variable is documentation of intake and output.

1.7.2 Independent variables

This is a stimulus or activity that is manipulated or varied by the researcher to create an effect on the dependent variable. It is also called an intervention, treatment, or experimental variable (Burns and Grove, 2007). The identified independent variables are; availability of stationary, Staffing levels, workload, and knowledge on documentation on the fluid balance chart by nurses, supervision and fresher courses.

Table 2. Variables cut off points and indicators

VARIABLE TYPE	CUT OFF POINT	INDICATOR	QUESTION NUMBER
Dependent Variable			
➤ Fluid intake and output	Correctly done (15 out of 15)	Done correctly if all the details are filled in and balances done correctly	1-12
	Not done correctly (Less than 15)	Some details on the Fluid balance charts not filled in correctly or skipped	
Independent variable			
➤ Availability of stationery	Available	Fluid balance charts are available in the ward	1
	Not available	Not available on the ward	
➤ Staffing	No shortage	1 Registered Nurse (RN) to 6 patients or 1 Enrolled Nurse (EN) to 4 patients	1
	Shortage	1 RN to more than 6 patients or 1 EN to more than 4 patients	

➤ Workload	Heavy	Working with more than the recommended number of patient for the qualification	1
	Light	Working with more than the recommended number of patient for the qualification	
➤ Length of service	0-1 year	Has been working for less than one year	1
	1-2years	Has been working for one year and some months just before clocking two year	
	2-3 years	Has been working for two years and some months just before clocking three years	
	3-4 years	Has been working for three years and some months just before clocking four years	
	5 years and above	Has been working for five years and above	
➤ Knowledge	High	Know and shows the correct way of documenting intake and output on the fluid balance chart	1-2
	Low	Does not know or fails to show the correct way of documenting intake and output on the fluid balance chart	
➤ Supervision	Done	Supervision of intake and output documentation done per shift	1
	Not done	Supervisions of fluid intake and output documentation not done per shift	

CHAPTER TWO

2.0 Literature review

2.1 Introduction

In this chapter, literature on intake and output documentation is presented. The purpose of undertaking a literature review was to determine previously unstudied areas, and how this unique research project could be developed to expand knowledge and to contribute to the development of the practice (Burns and Grove, 2007:135-136). A thorough, computerized search utilizing databases, including CINAHL was done to identify journal articles that have been published within the last five years, 2010-2015. Unfortunately, not much has been published about this topic in this time frame. The search terms utilized in the search included “intake and output,” “fluid balance,” “fluid intake-output measures and documentation. The articles chosen and reviewed focused on intake and output, the importance of fluid balance charting, the barriers to their accuracy and full completion, audit of intake and output, causes of inaccurate recording, role of the nurse in documentation of intake and output and interventional studies in recording of intake and output charts

2.2 Importance of Maintaining Fluid intake and output balance

A fluid balance chart is often called a ‘fluid intake and output chart’ or sometimes just ‘fluid chart’ (UK, Nursing and Midwifery Council, 2002). It is used to record all fluid intake and fluid out-put over a 24-hour period. The amounts may be totalled and the balance calculated at 24.00 hours (midnight), or at 06.00 or 08.00 hours. Sometimes the amounts are totalled twice in every 24 hours (i.e. every 12 hours). Fluid intake includes oral, naso-gastric, via a gastrostomy feeding tube, and infusions given intra-venously, subcutaneously and rectally. Fluid output from urine, vomit, and aspirate from a nasogastric tube, diarrhoea, fluid from a stoma or wound drain are all recorded. (Bennett, 2010).

Documenting a patient’s fluid intake and output to prevent dehydration or over-hydration is a relatively simple task, but fluid balance recording is notorious for being inadequately or inaccurately completed (Bennett, 2010). This statement shows the significance of fluid balance monitoring. According to the general Nursing Council of Zambia (2007), record keeping is an integral part of nursing care, not something to be “fitted in” where circumstances allow. It is the responsibility of the nurse caring for a patient to ensure observations and fluid balance are recorded in a timely manner, with any abnormal findings

documented and reported to the nurse in charge (Scales and Pilsworth, 2008). This quote by scale and Pilsworth illustrates it is the responsibility of the nurse to monitor fluid intake and output. Smith and Roberts (2011) indicated that all fluid intake and output, whatever the source, must be documented using quantifiable amounts. This means it is important to know how many millilitres of fluid are in an intravenous medication, a glass of water or a cup of tea. The use of shorthand is not an acceptable practice. This demonstrates the importance of quantifying the fluid intake and output. Therefore, frequent recording and clear documentation of fluid balance chart data, that is, hourly or every two hours is of great importance.

Scales and Pilsworth (2008) identified three elements to assessing fluid balance and hydration status and these include: Clinical assessment, review of fluid balance charts and review of blood chemistry. The fluid balance comprises the intake of fluids over a 24-hour period and the output of fluids over 24 hours by the patient. The difference between the volumes is calculated to provide the 24-hour fluid balance (Scales & Pilsworth, 2008:53). Monitoring the patient's fluid balance is of great importance in understanding and managing a patient's clinical status. Therefore, accurate fluid balance monitoring plays an essential role in patient care management (Elliot et al., 2007:440,445-446).

2.3 Reasons for gaps in fluid balance charts

Reid (2004) carried out a study which aimed at establishing possible causes of inaccurate and incomplete fluid balance documentation. This study audited the completion of fluid balance charts on different wards. The results showed that the major reasons fluid balance charts were not completed appropriately were: staff shortages, lack of training, non-availability of stationery and Nurses' attitude and lack of time.

2.4 Role of the nurse in documentation

Hector (2010) of Stellenbosch University in South Africa, conducted a study whose purpose was to retrospectively analyse nursing documentation in the intensive care units of an academic hospital in the Western Cape. The objectives set for her study were to: establish whether the assessment of the patients were adequate, diagnoses were based on the assessment, nursing care plans were based on the diagnoses, nursing care plans were implemented and whether they showed evidence of continuous evaluation.

A retrospective exploratory- descriptive research design with a quantitative approach was applied. This was done so as to audit objectively the status of nursing documentation of patients who were admitted to the ICU's of an academic hospital in the Western Cape in the first 48 hours of admission. A stratified sample was drawn consisting of 151 files and data was collected using a pretested audit instrument. The data analysis process included statistical associations between variables using the Chi-square test on a 95% confidence level. The findings of the study showed that the nursing documentation in the intensive unit is inadequate with the following total mean scores: Assessment-62.6%, nursing diagnosis-53.1%, nursing care plans-37.1%, implementation-72.6% and evaluation-40.5%.

In the end, the author concluded that; nursing documentation of patients admitted to an ICU was inadequate during the first 48 hours of admission. Equally, poor documentation threatened the safety of patients and demanded urgent improvement. Her recommendations to improve the documentation included, nursing practice supervision, quality improvement programmes, in-service training, and evidence based practice and further research.

2.6 Accuracy of Intake and Output Chart

To avoid the consequences of fluid imbalance in the post-operative patient, accurate documentation of intake and output is essential. Several studies have questioned the accuracy with which fluid therapy is monitored and fluid balance is calculated. Johnson and Monkhouse (2009:291) noted that poor management of the replacement of fluids and electrolytes is due to inaccuracies in monitoring and recording.

Diacon conducted a study in 2010 entitled 'Fluid balance monitoring in critically ill patients'. The aim of the study was to describe the perspectives and practices of registered nurses in critical care units with regard to fluid balance monitoring. The audit revealed that 90 % of the sampled fluid balance records were inaccurate (tolerated deviation 0-10ml) and 79% were inaccurate if a deviation of 50ml would be tolerated. Furthermore, the inaccuracy in calculation was larger in patients who received diuretics. The results showed that registered nurses considered fluid balance monitoring as an important part of patient nursing care and were aware that inaccuracy can pose a risk to the patient. Also, the nurses felt responsible for performing fluid balance monitoring. In addition, the nurses gave recommendations for the practice (Diacon, 2010).

2.7 Causes of inaccuracy in fluid balance assessment

In South Africa, Reid et al. (2004:36-40), paid attention to the reasons for inaccuracy in fluid balance assessment, reporting these to be: a deficit in knowledge, a heavy workload and a lack of personal responsibility. A significant shortage of nurses in South Africa, and in the critical care environment as described by Scribante and Bhagwanjee (2007:1315), increases an already heavy workload for nurses, which may impact on accurate fluid balance monitoring in the South African critical care setting. This study looked at the possible causes of inaccuracy in fluid balance documentation. However, we cannot begin looking at this at Mansa general hospital since no study has ever been conducted to review documentation of the fluid balance.

In a study by Howard (2010) nurses were given pre- and post-implementation questionnaires on their perception of fluid balance charts before the intervention was implemented and after seeing the results (missed mL of fluids per patient) for the day after the intervention was implemented. A total of 11 nurses participated in the study questionnaires. Before and after the implementation, all 11 nurses stated that they rely heavily on fluid balance charts to make clinical decisions for their patients also citing that fluid balance charts are very important in the proper care of patients. All 11 of the nurses who participated checked off that doctors almost always, if not always, look at fluid balance charts when making clinical decisions for their patients. In the “Pre-Intervention Questionnaire however, 9 nurses checked that the accuracy of fluid balance charts as they are currently completed are mostly not accurate or were neutral on their perception on the accuracy of fluid balance charts. All 11 nurses checked the “Neutral” box or lower when asked about how often intake was recorded; 1 nurse checked “”Intake is Never Recorded,” 8 nurses checked “Intake is Mostly Not Recorded,” and 2 nurses checked that they were “Neutral” about the topic of intake recording. When asked about the effectiveness of the fluid balance charts as they are completed now, 7 nurses checked that they are “mostly not effective” and 4 nurses checked that they are “not effective at all.” In the “Post-Intervention Questionnaire,” the nurses were shown the average milliliters that were missed on the intake and output charts for the patients and were asked to answer the same questions from the “Pre-Intervention Questionnaire” as if intake were recorded via nursing and dietary collaboration. The results showed that all 11 nurses believed that intake would be “Mostly Recorded” (n=8) or “Always Recorded” (n=3). The perception of accuracy of the fluid balance charts also increased with a majority (n=9) checking that fluid balance charts would be “Mostly Accurate” and two nurses checking that

they would be “Very Accurate.” There was also an increase in the nursing confidence in their effectiveness in lineation with the accuracy of the fluid balance charts with

In a 2006 study by Kalisch concerning areas of frequently missed nursing care across the profession, accurate documentation of patients’ intake and output was named as one of the leading issues. It cites trays being taken away from patients’ room before nursing staff was able to document what was consumed, lack of systematic recording methods regarding water pitcher refills, as well as bathroom usage without nursing staff present.

McGloin (2015) states that staff shortages, lack of staff training, and limited time as barriers to accurately recording intake and output. These missed documentations can have serious repercussions regarding patients’ health such as overlooked signs and symptoms of kidney disorders, heart failure, urinary tract infections, or perhaps even dehydration. Correct documentation of intake and output helps serve physicians and nursing staff as an ongoing indicator of illness progression or recovery (Meiner, 2002).

A qualitative study by Bonfield (2014) on the perceived factors that influence accurate fluid balance chart completion in acutely unwell medical inpatients in South Africa revealed five key themes namely: individual insight making time to do it, knowledge and training, making it easier to be accurate and competing ward activities. All participants identified Fluid Balance Chart (FBC) completion as an integral part of patient care, and that for FBCs to be effective they needed to be completed accurately and in full. All but one of the participants identified that FBC completion was currently inaccurate. Participants identified there needs to be change in current practice to facilitate an improvement in FBC completion.

In another study that was conducted by Tang and Lee (2010), they found that inaccurate of intake and output calculation is due to lack of education and inconsistency of poor documentation in the chart. They conducted the survey on 25 surgical trainees including 12 at Specialty Training level and 13 at Foundation Year level, to calculate the total input and output of 13 fluid balance charts. From the study, they concluded that clinical experience does not influence the correct calculation of the total input and output values.

2.8 Solutions to improve accuracy of fluid balance monitoring

Solutions to improve the accuracy of fluid balance monitoring and recording have been mentioned by Reid et al. (2004:36-40) who suggest that fluid balance-focused training,

information notes at the patient bedside, a “user friendly” fluid balance sheet and the requirement of the signature of the responsible nurse be included in usual nursing practice.

Smith et al. (2008:28-29) advise simplifying the recording charts to reduce the workload of the nurses. Further research by this team showed that regular auditing of fluid balance monitoring practices improves nursing practice with regard to fluid balance monitoring (Smith et al., 2008:28-29). The outcome of these changes could lead to better patient care and consequently support best practice in nursing.

2.9 Conclusion

Under this, the literature review, chapter various studies on intake and output were reviewed. Specifically, much of the studies reviewed had the following as their primary focus: significance of fluid balance, audit of intake and output, causes of inaccurate recording, role of the nurse in documentation of intake and output and interventional studies in recording of intake and output charts.

Improved documentation of intake and output is cardinal. This is evident given significant improvement in the documentation of intake and out observed after interventions were put in place. Further, users also approved the new formats as a result of the interventions. Thus, intervening can lead to an improvement in documentation of intake and output. Equally, the quality of documentation of nursing care is important. However, the reviewed literature shows that documentation of nursing care was not adequate. This begs an answer to the question; what are the factors associated with documentation of intake and output in post-operative patients? This question is also true for Zambia health institutions.

Therefore, given that these studies did not specifically look at intake and output in post-operative patients, a knowledge gap on this subject matter exists. In Zambia, particularly Mansa general hospital no such studies have been conducted to audit the documentation of intake and output. As a result, it is hard to determine with any certainty the quality of fluid balance documentation. This calls for the need to conduct the study to audit the documentation of fluid balance or intake and output documentation.

CHAPTER THREE

3.0 Methodology

3.1. Research design

According to Polit and Beck (2006:509), a research design is the complete strategy implemented to address the research question, including all details needed to strengthen the integrity of the study. In order to evaluate the factors affecting the documentation of fluid intake and output by nurses and midwives at Mansa General Hospital, a descriptive cross-sectional design with a quantitative approach was used to answer the research questions. The research questions, as stated in Chapter one (1) was: What are the characteristics of nurses and midwives involved in documentation of fluid intake and output? And why is fluid intake and output in post-operative patients not documented correctly at Mansa general hospital?

This study was descriptive in nature. A descriptive design is useful in obtaining particulars of the situation and lead to the forming of a concept or the recognizing of possibilities for improvement (Burns & Grove, 2007:240). Descriptive study helped the researcher to inquire what, where, when and how (Babbie, 2007:89-90) about the factors affecting the documentation of intake and output by nurses. The study used the cross sectional design because it involved collection of data at point in time (Polit and Beck, 2006: 183). The factors affecting the documentation of intake and output by nurses and midwives were captured during one data collection period. A quantitative approach was chosen for this study to obtain insight into the practices of nurses and midwives with regard to fluid balance in post-operative patients because the research design spelt out strategies the researcher adopted to develop accurate and interpretable information (Polit and Beck, 2006: 167).

3.3. Research setting

This is the physical location and condition in which data collection takes place in a study. The study was conducted at Mansa General Hospital in Luapula Province in Zambia. Mansa General Hospital is situated in Mansa District. Mansa District is the provincial headquarters of Luapula Province, bordering with Katanga Province of the Democratic Republic of Congo to the Southwest, Samfya district to the East, Milenge District to the South and Mwense District to the North.

Mansa General Hospital is the only level II hospital in Luapula Province, also providing level 1 services to Mansa, Milenge, Samfya and Mwense Districts, including Kaputa in Northern

Province and Psychiatric services. It has a bed capacity of 404, (101 cots and 303 beds) and offers Medical, Surgical, Gynecological/Obstetrics and Pediatrics services. It also provides laboratory, radiological, ultra sound, orthopedics, physiotherapy and dental services. Other services include Ophthalmologic services. In addition, the hospital offers CTC, TB/HIV /STI/ART prevention care and treatment services. Finally, the hospital houses the Regional Blood Bank Building, which is directly under the Provincial Health Office with support from Zambia National Blood Transfusion Services. The hospital also has a training school for Registered Nurses. On average the hospital attends to 471 surgical patients with major surgery who are usually on intravenous infusion per quarter of the year (Mansa General Hospital Annual report 2014).

The hospital receives referrals from all districts in the province and also receives cases from Kaputa and Luwingu districts in Northern Province. The study was conducted in four wards in at Mansa General Hospital. Theses wards were; female and male surgical, maternity and gyneacology wards. These wards were purposefully selected because this was where post-operative patient were nursed.

3.4. Study population

The population is a group of participants with shared particulars. All the participants who met the inclusion criteria stipulated in this proposal were form the population (Burns & Grove, 2007:40). For the purpose of this study the research population (N) comprises the nurses and midwives working in the four (4) surgical wards (Male and female surgical wards, gyneacology and maternity wards) at Mansa General Hospital. Post-operative patient's fluid balance charts of patients admitted to Mansa General Hospital between January 2015 and 31 April 2015. Table 4. Show the total population of admissions per month over a 3 month period (January-March, 2015) in surgical and maternity wards at Mansa General Hospital who met the selection criteria.

3.4.1. Target population

The target population for this study was nurses and midwives working in the four (4) surgical wards at Mansa General Hospital that is; female surgical, gyneacology, maternity and male surgical wards. It also included fluid balance charts of post-operative patients admitted to Mansa general hospital between January and June 2014.

3.5. Sampling method

3.5.1 Selection of the Respondents

Sampling is a process of selecting a number of individuals from the target population in such a way that the individuals in the sample represent as nearly as possible the characteristics of the entire target population (Dempsey and Dempsey, 2001). First and foremost, four surgical wards at Mansa district Hospital where surgical patients are admitted were purposefully selected.

The respondents were conveniently selected since the entire nurse and midwives working in the surgical ward were given a questionnaire this ensured that each eligible individual in the population had a greater than zero opportunity to be selected for the sample. The advantage of this sampling method is that it increases the extent to which the sample represents the target population. The disadvantage of this method is that it can only take place in an accessible population.

3.5.2 Selection of fluid balance charts

The fluid balance charts of patients who were admitted to Mansa General Hospital between January and June 2015 were selected and audited for completeness, correctness and accuracy of data on fluid balance charts. The charts of patients who met the selection criteria were selected using simple random sampling. Bed numbers of all the patients were put in a box then selected at random for patients who stayed in the ward for more than two days and aged 18 years and above to avoid bias and the five wards were chosen using purposeful sampling.

Inclusion criteria for the patient fluid balance charts

The following criteria were used to select the sample:

- Fluid balance charts of post-operative patients on IV fluids and admitted to the ward for at least 12 hours.

Exclusion criteria for the patient files

- Fluid balance charts of post-operative patients who were not IV fluids and admitted to the ward for less than 12 hours

Inclusion criteria for the nurses

The following criteria were used to select the nurses for the sample:

- All Nurses and midwives who were working in a surgical ward at Mansa General Hospital who consented to participate in the study.

Exclusion criteria for the patient files

- Nurses and midwives not working in surgical wards at Mansa General Hospital and those who did not give consent to participate in the study

3.6. Sample size

A sample is a subset of the population selected for a study (Burns and Grove 2007). The sample size comprised of 471 fluid balance charts of patients (in-patients) from the four wards i.e. female surgical, gynecology maternity and male surgical wards. A total sample of 53 nurses and midwives was drawn from the four surgical wards.

3.6.1 Sample for nurses

The sample size was calculated using Open Epi formula as indicated below.

Table 3 Nurses and midwives in surgical wards of Mansa General Hospital

	Male Surgical	Female Surgical	Gynea	Maternity
Registered nurses/Midwives	5	6	4	6
Enrolled Nurses/Midwives	8	9	6	9
Subtotal	13	15	10	15
Grand Total	53			

Sample Size for Frequency in a population

Population size (for the finite population correction or fpc) (<i>N</i>):	53
Hypothesized % frequency for outcome factor in the population (<i>p</i>):	75%+/-5
Confidence Limit as % of 100 (absolute +/- %) (<i>d</i>):	1%
Design effect (For cluster survey-DEFF):	1
Sample size for 99% confidence level	53

Equation: **Sample size $n = [DEFF*Np(1-p)] / [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$**

Results from Open Epi, Version 2.3.1, open source calculator--SSPropor

Table 4 Surgical Patients Admitted between January and March 2015

Month	Male Surgical	Female Surgical	Gynea	Maternity
January	33	37	29	42
February	47	41	25	62
March	36	44	27	50
Subtotal	116	118	81	156
Total				471

Source: Mansa General Hospital quarterly report

The following formula was used to calculate the sample size for this study.

Sample Size for Frequency in a population

Population size (for the finite population correction or fpc) (N): 471
 Hypothesized % frequency for outcome factor in the population (p): 75% +/- 5
 Confidence Limit as % of 100 (absolute +/- %) (d): 1%
 Design effect (For cluster survey-DEFF): 1
 Sample size for 95% confidence level 318

Equation: **Sample size $n = [DEFF*Np(1-p)] / [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$**

Results from Open Epi, Version 2.3.1, open source calculator--SSPropor

3.7. Data collection tool

3.7.1 Questionnaire

The researcher utilized a questionnaire to collect data from the respondents (See annexure A). The research instrument was adapted from validated research instrument on documentation of intake and output charts. The questionnaire included information on service related factors such as, availability of stationery, staff shortage and workload. It also included personal factors like; knowledge on fluid balancing and length of service for the respondents and fresher course on intake and output.

3.7.1.1 Validity of the data collecting tool

Validity is the extent to which the instrument actually reflects or measures what it is supposed to measure (Burns & Grove, 2003:45). Content validity was secured by literature, a statistician and research methodologist. The content of the audit instrument is substantiated by the scientific nursing process. The instrument was validated by experts in nursing, research methodology and a statistician

3.7.1.2 Reliability of the data collecting tool

Reliability is concerned with how consistently the measurement technique measures a variable or concept (Burns & Grove, 2003:45). The consistency of the audit instrument was assured through experts in nursing science. A pilot study was conducted to establish uniformity in the instrument. In addition, the feasibility of the study will also was also tested through the pilot study.

3.7.2 Checklist

An observation checklist (Appendix B) was developed for auditing of fluid intake and output charts. The checklist comprised biological data of the respondent, information on patient intake and output such as time of commencement of the drip, the amount to be administered, the flow rate of the drip, type of fluid administered and if the output was documented. The checklist was used to audit the fluid balance charts

3.8 Data collection technique

3.8.1 Questionnaire

A self-administered questionnaire was used to collect data directly from the respondents. The self-administered questionnaires were distributed by the researcher. The researcher arranged a meeting with the respondents and explained the purpose of the study to them. The respondents were asked to complete the questionnaires and the completed questionnaires were collected by the Researcher on the agreed upon date.

3.8.2 Observational checklist

The researcher used a structured checklists to obtain data from the patients' fluid balance charts. This observation technique permitted the researcher to note whether there were gaps in documentation the patients' fluid balance charts.

3.9. Pretest

Pretest of the data collection tool was done to find out if the questions in the data collection tool were clear and straight forward and the methodology was doable. Each file (study unit) drawn by the researcher was allocated a number. The files that were used in the pilot study were excluded from the main study. A pilot study was done to test the instrument for any inaccuracies and ambiguity. In addition, the pilot study eliminated failing to obtain data that the researcher has planned for the study. The pilot study enabled the researcher to refine the instrument and be assured of the feasibility of the study.

3.10. Ethical consideration

The ethical clearance to conduct the study was obtained from ERES Converge in Lusaka before the actual study was done. Written permission to conduct the study was obtained from the Medical superintendent and principal nursing officer (Head of nursing) Mansa General Hospital to audit the fluid balance chart of patients. In addition, a written informed consent was obtained from each nurse and midwife who participated in the study. The respondents were given sufficient information about the study before they signed the consent form. Every respondent had a choice either to take part in the study or to refuse to participate. To ensure confidentiality, privacy and anonymity each fluid balance chart drawn by the researcher was allocated a serial number as well as the respondents' questionnaires. Only the researcher had access to data obtained for this study. No known or expected harm was implied or caused to the respondents in the study.

CHAPTER FOUR

4.0 Data analysis and presentation of findings

4.1 Introduction

Chapter four (4) describes the analysis of data and presentation of the findings. The data was collected from the nurses and midwives working at Mansa general hospital. An observation checklist was used for auditing of fluid intake and output charts. The information presented in this chapter includes various attributes of the respondents such as length of service, service related factors and Knowledge on documentation and its value among others as well as the patients biographic data.

4.2 Data analysis

Analysis of data was done using STATA version 13.0 for windows. Frequency tables, cross tabulations and percentages were used to present the simple descriptive statistics. Pearson chi-square test was used to test associations between the binary variable indicating whether documentation is done all the time or not and several key independent variables expected to influence the dependent variable. The confidence interval was set at 95% implying a 5% level of significance. Furthermore, a logistic regression was employed for the purpose of establishing causality with the aid of margins, adjusted predicated probabilities, to establish which independent variables were more likely to influence documentation among nurses.

4.3 Presentation of findings

4.3.1 Section A: Demographic characteristics of the nurses and midwives

Section A of the self-administered questionnaire elicited information on the Nurses and midwives demographic characteristics and these are presented in table 5 below. Table 5: Nurse and midwives demographic characteristics and service related factors (n=53)

Variable	Frequency	Percent
Qualification		
Certified Mid-wife	8	15%
Enrolled Nurse	15	28%
Enrolled Mid-wife	19	36%
Registered Nurse	8	15%
Registered Midwife	3	6%

Total	53	100%
Length of service		
0-1 year	7	13%
1-2 years	9	17%
3-4 years	14	26%
5 years and above	23	43%
Total	53	100%
Stationary		
Available	8	15%
Not available	45	85%
Total	53	100%
Staff shortage		
Yes	43	81%
No	10	19%
Total	53	100%
Workload		
Not Heavy	7	13%
Heavy	46	87%
Total	53	100%
Supervision		
Yes	43	81%
No	10	19%
Total	53	100%

Source: Authors' analysis (2015)

In terms of qualifications, majority of the respondents (36%) in the sample were enrolled mid-wives (Table 5). These were followed by enrolled nurses (28%) with registered mid-wives as the least (6%). Forty three percent (43%) of the nurses and midwives in the sample had served for 5 years. Eighty five (85%) of the respondents in the sample indicated that stationery was available in the wards at Mansa General Hospital. Majority (81%) of the respondents stated that there was staff shortage in the Wards at Mansa General Hospital. The same was true for work load as 88% of the respondents, indicated that the work load was heavy. Nevertheless, most (81%) of the respondents indicated fluid balance chart documentation was supervised.

4.3.2 Section B: Knowledge on documentation

Section B of the self-administered questionnaire elicited information on the respondents' knowledge about documentation of intake and output charts. The data from this section is presented in table 6 below.

Table 6: Knowledge on documentation (n=53)

Variable	Frequency	Percent
Documentation of intake and output		
No	3	6%
Some times	43	81%
All the time	7	13%
Total	53	100%
Balance fluid chart at the end of the shift		
Yes	32	60%
No	21	40%
Total	53	100%
Attendance of a fresher course		
Yes	0	
No	53	100%
Total	53	100%
Fresher course helpful in improving documentation		
Yes	53	100%
No	0	
Total	53	100%
Documentation is significant		
Yes	53	100%
No	0	
Total	53	100%
Knowledge on documentation		
Low	12	23%
High	41	77%
Total	53	100%

Source: Authors' analysis (2015)

As indicated in table 6, the findings show that documentation of intake and output was only done sometimes as indicated by the 81% of the respondents, 60% of the respondents indicated that balancing the fluid chart at the end of the shift. Surprisingly, none of the nurses

and midwives had ever attended a fresher course. All the nurses and midwives in this study strongly agreed that a fresher course was helpful in improving documentation.

4.3.3 Section C: Intake and output documentation

Data from the patients fluid balance charts obtained by use of a checklist is presented in table 7 below.

Table 7: Intake and Output Documentation Patients Biographical Data (n=319)

Patient particular	Frequency	Percent (%)
Name	305	96%
Age	284	89%
Sex	283	89%
Ward	264	83%
Date	275	86%
Bed	22	7%
Diagnosis	139	44%
Fluid	310	97%
Commencement	299	94%
Amount	307	96%
Output	190	60%
Shift	67	21%
Balance	179	56%
Flow	17	5%
Doctor	18	6%
Total	319	

Source: Authors' analysis (2015)

Table 7 shows patients' biographical data and other information on fluid intake and output filled in on the fluid balance charts. The findings show that 96% of the patients charts had the patients name, 89% had the patients age and sex respectively. Eighty three percent (83%) of the fluid balance charts had name of the ward recorded on them, 86% had a date of admission, 7% percent had a bed number and 44% had a patient's diagnosis indicated. Most (97%) of the patients fluid balance charts had the name of the fluid administered, 94% had time of commencement, amount of fluid given (96%) and output indicated. The other

parameters indicated on the fluid balance charts included the nurses and midwives shift balance (21%) flow rate (5%) and the doctor's name (6%).

4.3.3 Section D: Associations between the dependent and independent variables

Associations between documentation of intake and output charts (dependent variable) and length of service and qualifications of the nurses and midwives were sought as indicated below (Table 8 and 9).

Table 8 indicates associations between the documentation of fluid intake and output and the respondents' length of service. The Chi squares analysis shows no significant association between the documentation of fluid intake and output and the respondents' length of service (Chi-square test = 6.8353; p – value = 0.077). Therefore this finding seems to reject the first null hypothesis of this study.

Table 8: Association between the documentation of fluid intake and output and the respondents' length of service (n=53)

Documentation of fluid intake and output	Length of service				Total	P value
	0-1 year	1-2 years	3-4 years	5 years and above		
No	6(86%)	9(100%)	14(100%)	17(74%)	46 (87%)	0.077
Yes	1(14%)	0	0	6(26%)	7 (13%)	
Total	7(100%)	9(100%)	14(100%)	23(100%)	53 (100%)	

Chi-square test = 6.8353

Source: Authors' analysis (2015)

With regard to documentation of fluid balance charts and the qualification of the health staff, no association was found. Pearson chi-square test was 3.3673 while the p-value was 0.408 indicating a non-statistically significant relationship (Table 9).

Table 9: Association between document of fluid intake and output and qualifications of the respondent (n=53)

Documentation of fluid intake and output	Qualification of the health personnel					Total	p-value
	Certified Midwife	Enrolled Nurse	Enrolled Midwife	Registered Nurse	Registered Midwife		
No	6(75%)	13(87%)	17(89%)	8(100%)	2(67%)	46(87%)	0.408
Yes	2(25%)	2(13%)	2(11%)	0(0%)	1(33%)	7(13%)	
Total	8(100%)	15(100%)	19(100%)	8(100%)	3(100%)	53(100%)	

Chi-square test = 3.3673

Source: Authors' analysis (2015)

4.4 Logistic regression analysis and adjusted predicted probabilities

In order to identify the characteristics of nurses involved in documentation of fluid intake and output in post-operative patients, a simple logistic regression was run using a binary variable for documentation of fluid intake and output. This variable was defined as equal to 1 if documentation is done all the time, zero (0) otherwise. Considering the limited variability in the explanatory variables, margins were calculated after estimating the binary logistic regression.

The results in Table 10 are for adjusted predictions. With adjusted predictions, values for each of the independent variables in the model are specified and the probability of the event occurring for an individual with those values is computed. Due to the limited variability in the responses for the explanatory variables, a normal logistic regression yields no significant relationship between the dependent and explanatory variables. Seventeen observations are also dropped because of the limited variability. The remaining 26 observations are not enough for the logistic regression to behave as it ought. Therefore, one remedy for such a case that was used was the computation of margins immediately after running the logistic regression. These margins are mean probabilities. They represent the average probabilities of documenting the fluid intake and output as associated with each explanatory variable at respective levels of significance, 1%, 5% and 10%. And these are the results presented.

Table 10: Margins-Average Adjusted Predictions (APPs)

	Margin	Standard Error	Z	P> Z 	[95% Confidence Interval]	
Length of service						
0-1 year	0.18	0.17	1.06	0.29	-0.16	0.52
5 and above	0.24	0.10	2.55	0.01	0.06	0.43
Knowledge on documentation						
Low	0.29	0.18	1.64	0.10	-0.06	0.64
High	0.21	0.09	2.26	0.02	0.03	0.39
Nurse qualification						
Certified Mid-Wife	0.34	0.20	1.71	0.09	-0.05	0.72
Enrolled Nurse	0.17	0.11	1.56	0.12	-0.04	0.39
Enrolled Mid-wife	0.23	0.15	1.58	0.11	-0.06	0.52
Ward Name						
Maternity	0.26	0.13	2.03	0.04	0.01	0.52
Female Surgical	0.25	0.17	1.49	0.14	-0.08	0.58
Male Surgical	0.15	0.15	1.05	0.30	-0.13	0.44

Source: Authors' analysis (2015)

Table 10 shows the results of the computed margins. The numbers reported in the margin column are average predicted probabilities. The results show that service of 5 years and above, high knowledge on documentation, certified mid-wives and nurses working in the maternity ward are independent variables associated with significant average probabilities of documenting fluid intake and output ($P < 0.5$) at 5% except for certified mid-wives with $P=0.09$. For example, the average probability of documenting the fluid intake and output would be 0.24 (24%) if all nurses in the sample were treated as if they had for 5 years and above. In the same way, 0.21 (21%) would be the average probability of documenting the fluid intake and output if all nurses in the sample were treated as if they had high knowledge on documentation, respectively. With regard to nurse qualification and ward of operation 0.34 (34%) and 0.26 (26%) would be the average probabilities of documenting the fluid intake and output if all nurses in the sample were treated as if they were all certified mid-wives and worked in maternity wards, accordingly.

Figure 3: Adjusted Predictions of significant covariates (A and B) and some interaction terms(CandD).

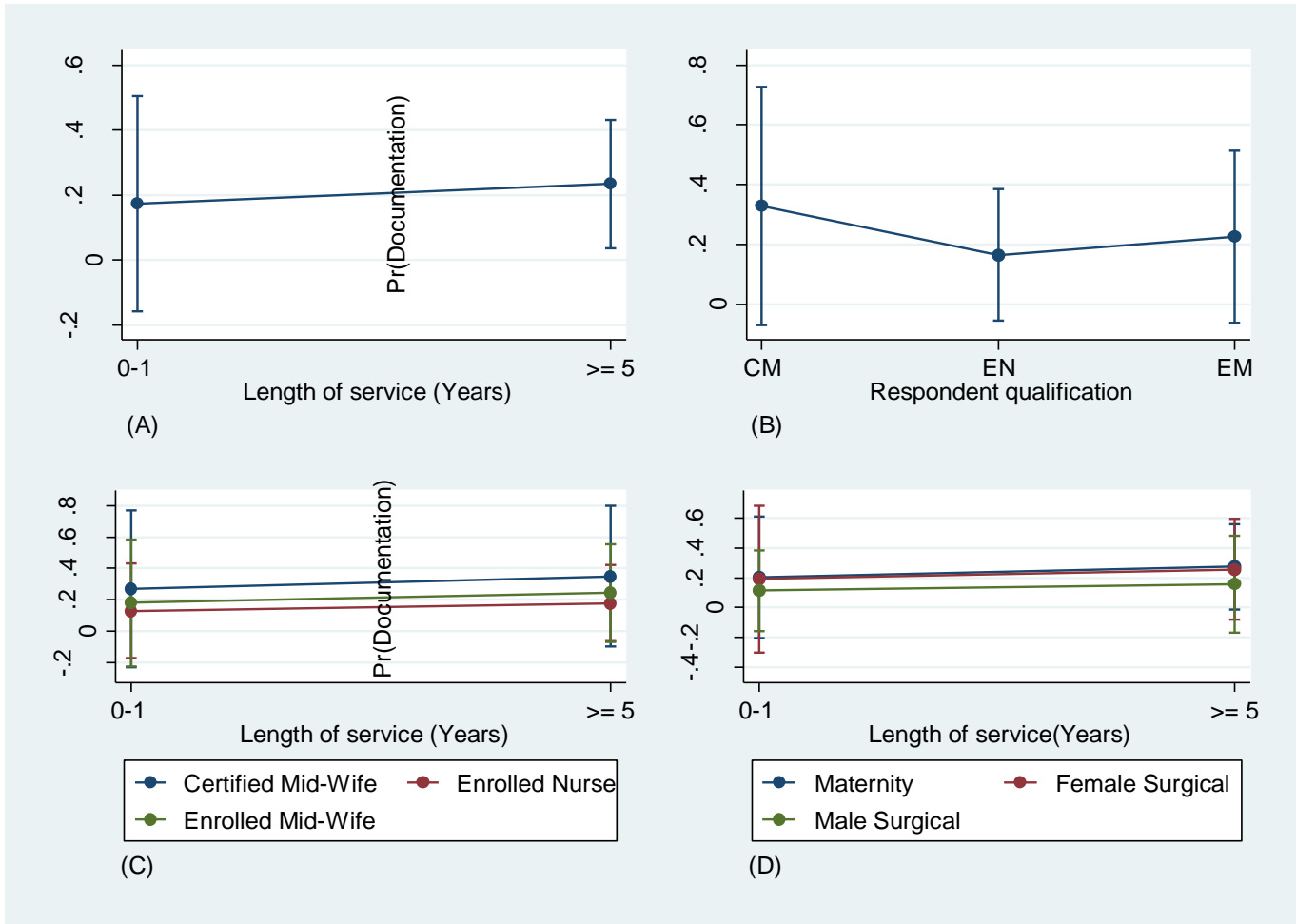


Figure 3 presents a graphic view of margins in Table 10 and interactions between the length of service with the qualification and ward of operation. Figure 3(A) shows the probability of documentation responds to variation in the length of service. Similarly, figure 3(B) shows the relationship with regard to the qualification of health personnel while figures 3(C) and (D) show the interactions between the length of service with the qualification of nurses and ward, respectively.

The margins-plot show a more linear relationship between the length of service and the probability of documentation (Figure 3A). A similar pattern can be deduced from Figure 3(B) where the probability of documentation is greater for higher qualifications. This is evident given the low probability of documentation for enrolled nurses compared to certified and enrolled mid-wives. The interaction between the length of service and nurse qualification shows that the probability of documentation increases with higher qualification and length of service (Figure 3C). This pattern is also demonstrated by the interaction between the length of service and ward of operation.

4.5 Summary

Majority of the respondents (36%) in the sample were enrolled mid-wives (Table 5). These were followed by enrolled nurses (28%) with registered mid-wives as the least (6%). Forty three percent (43%) of the nurses and midwives in the sample had served for 5 years. Eighty five (85%) of the respondents in the sample indicated that stationery was available in the wards at Mansa General Hospital. Majority (81%) of the respondents state that there was staff shortage in the Wards at Mansa General Hospital. The same was true for work load as 88% of the respondents, indicated that the work load was heavy. Nevertheless, most (81%) of the respondents indicated fluid balance chart documentation was supervised. The findings show that documentation of intake and output was only done sometimes as indicated by the 81% of the respondents, 60% of the respondents indicated that balancing the fluid chart at the end of the shift. Surprisingly, none of the nurses and midwives had ever attended a fresher course. All the nurses and midwives in this study strongly agreed that a fresher course was helpful in improving documentation. However, slightly over three quarters (77%) of the study sample in the current had high knowledge on documentation.

The findings show that 96% of the patients charts had the patients name, 89% had the patients age and sex respectively. Eighty three percent (83%) of the fluid balance charts had name of the ward recorded on them, 86% had a date of admission, 7% percent had a bed

number and 44% had a patient's diagnosis indicated. Most (97%) of the patients fluid balance charts had the name of the fluid administered, 94% had time of commencement, amount of fluid given (96%) and output indicated. The other parameters indicated on the fluid balance charts included the nurses and midwives shift balance (21%) flow rate (5%) and the doctor's name (6%).

The Chi squares analysis shows no significant association between the documentation of fluid intake and output and the respondents' length of service (Chi-square test = 6.8353; p – value = 0.077). There was also no association found between documentation of fluid balance charts and the qualification of the health staff. Pearson chi-square test was 3.3673 while the p-value was 0.408 indicating a non-statistically significant relationship (Table 9).

CHAPTER FIVE

5 Discussion of findings

5.1 Introduction

Identifying and understanding the factors underlying the documentation of fluid intake and output at Mansa District Hospital cannot be overemphasized. Chapter 4 therefore sheds more light on the results obtained from analysis the patient biographical and nurses' data by discussion the consequent implication of the results for the field of nursing as a whole sub topically.

5.2 Characteristics of the sample

The first objective of the study was to identify the characteristics of nurses involved in documentation of fluid intake and output in post-operative patients. The findings revealed that 36% of the respondents were enrolled mid-wives (Table 5). There are more enrolled midwives in the study sample because enrolled nurses and midwives account for the majority of the nurses at Mansa General Hospital Staff establishment. Forty three percent (43%) of the respondents had served for 5 years and above. This could be attributed to the fact that enrolled midwifery in Zambia is a post basic qualification and most (36%) of the respondents were enrolled midwives who had served initially as enrolled nurses and later as enrolled midwives.

5.3 Discussion of study variables

5.3.1 Factors influencing documentation

Documentation on the intake and output chart could be influenced by many factors. To find out whether the availability of stationery, staff shortage, nurse's knowledge, affects documentation of intake and output, the respondents were asked to state whether the above mentioned factors could be barriers to intake and output documentation.

5.3.1.1 Availability of stationary

The current study demonstrates that the availability of stationery in the wards at Mansa General Hospital was not a big problem as indicated by 85% of the respondents in the sample. Availability of stationery could influence fluid balance chart documentation in that the chart may not be available all the time in the wards for the nurses and midwives to use.

5.3.1. 2 Staffing levels

A large percentage (81%) of the respondents reported that there was staff shortage at their Health Institution. A qualitative study conducted by Kalisch (2006) showed that there were many missed aspects of nursing care including accurate documentation of patient intake and output. The article cited many barriers to quality charting and one of them was having too few staff in health institutions. Similar findings have been reported by Kalengo (2002) in a study conducted at the University Teaching hospital in Lusaka.

5.3.1.3 Workload

Eighty-eight percent (88%) of the respondents stated that they had a heavy work load. This could be attributed to nursing staff shortages within the Zambian Health care system. The MOH is operating at roughly 50% of the workforce that is needed to deliver comprehensive health services. Compared to many of its neighbors, Zambia has one of the lowest densities of professional health workers. The current ratio of one doctor for every 17,589 people far exceeds the WHO-recommended ratio of 1:5,000, as does the nursing ratio of 1:1,864 (WHO-recommendation is 1:700). (Zambia Human Resources for Health Strategic Plan (2006-2010), Ministry of Health, p. 6.). These findings are supported by Scribante and Bhagwanjee (2007) who reported that heavy workload for nurses' impact on accurate fluid balance monitoring in the South African critical care setting.

5.3.1.4 Supervision of staff

Most (81%) of the nurses and midwives indicated that fluid balance chart documentation was supervised. This finding suggests that nurse managers at Mansa General Hospital are supervising the nurses; therefore they must be commended for doing their work and encouraged to continue the good works.

5.3.1.5 Knowledge about documentation of intake and output among nurses and midwives

Knowledge about documentation of intake and output can influence documentation. The findings showed that documentation of intake and output was only done sometimes as indicated by the 81% of the respondents. This could be due to the nurses and midwives heavy workload and staff shortages in the clinical areas. This finding is in line with Kalengo (2002) findings in a study conducted at the University Teaching hospital which reported an average practice of fluid balance chart documentation. This finding is contrary to the study by Jasmine et al.(2012) carried out in Iran on Knowledge and Practice of Tabriz Teaching

Hospitals' Nurses Regarding Nursing Documentation which showed good quality information.

Intake and output record is a key component of routine nursing care and therefore, it should not be omitted because of insufficiencies such as staff shortage or nurses' time limit (General Nursing Council of Zambia, 2010). In this study however, only 60% of the respondents indicated that they balanced the fluid chart at the end of the shift. This result could be attributed to nurses and midwives' negative attitudes to documentation. The finding is congruent with those of Ling et al. (2011) who reported a 63% compliance rate of completeness of documentation of intake and output Chart in study conducted at Sibu Hospital in Malaysia. A study by Malekzadeh et al. (2013) conducted at a teaching hospital located in Mashad in Iran, it was found that only 24.6% of nurses documented the intake and output of fluids. Another study by Jeyapala et al. (2015) at Milton Keynes Hospital in the UK on improving fluid balance monitoring on the ward showed a range of 6-12 charts used daily per ward. Of these 0-45% of them were correctly filled. These finding is far much lower compared to the findings of the current study.

Refreshing knowledge of documentation premise and process is essential to hone nurses and midwives professional technical skills (Tilton and Tilton, 2015). Surprisingly, none of the nurses and midwives in this study had ever attended a fresher course on documentation of intake and output charts and they stated that a fresher course was necessary in order to improve documentation. This notion is supported by Reid, et al. (2004) who stated that in order for intake and output to be more accurate and reliable, proper education of staff must be obtained. Bonfield (2014) identified knowledge and training as a factor influencing documentation of intake and output charts among others.

The current study showed that slightly over three quarters (77%) of the respondents in the current had high knowledge on documentation. The high knowledge levels among nurses could be attributed to the basic nursing training. These findings are in support of those by Kalengo (2015) who conducted a similar study at the University teaching Hospital in Lusaka those the knowledge level among the nurses were lower (60%) compared to the current study.

5.3.2 Intake and output documentation

The third specific objective of this study was to examine fluid balance charts in order to identify gaps in documentation. The audit showed that 59% of the patients' charts had the

patients' name indicated, 89% had the patients' age and sex respectively indicated. Eighty three percent (83%) of the fluid balance charts had name of the ward recorded on them, 86% had a date of admission, 7% percent had a bed number and 44% had a patient's diagnosis indicated. Most (97%) of the patients fluid balance charts had the name of the fluid administered, 94% had time of commencement, amount of fluid given (96%) and output indicated. The parameters that were least indicated on the fluid balance charts included the nurses' shift balance (21%) flow rate (5%) and the doctor's name (6%). The results indicate a gap in documentation of the intake and output charts. There are many repercussions for not having shift balance on the fluid balance chart. Physicians often order continuous fluids for patients that are dehydrated or are at risk for dehydration. However, patients may also have co-morbidities that may make unnecessarily running fluids dangerous such as heart failure or renal diseases. Intake and output is a necessary part of the nursing assessment and there is clearly a gap in care for patients when nursing staff is unable to accurately account for fluids that they consume. These results are similar to other studies conducted elsewhere where deficiencies in documentation has been identified (Yasmine et al., 2012; Kalengo, 2015; Diacon, 2012).

5.3.3 Associations between the dependent and independent variables

In this study, there was association between the documentation of fluid intake and output and the respondents' length of service (Chi-square test = 6.8353; p – value = 0.077). The study has also revealed no associations association between documentation of fluid balance charts and the qualification of the nurses and midwives (Chi-square test=3.3673; p-value=0.408).

In order to identify the characteristics of nurses involved in documentation of fluid intake and output in post-operative patients, a simple logistic regression was run using a binary variable for documentation of fluid intake and output. The findings from the margins calculations following a logistic regression analysis showed that service of 5 years and above, high knowledge on documentation, certified mid-wives and nurses working in the maternity ward are independent variables associated with significant average probabilities of documenting fluid intake and output at 5 and 10%. The average probability of documenting the fluid intake and output would be 0.24 (24%) if all nurses in the sample were treated as if they had for 5 years and above. In the same way, 0.21 (21%) would be the average probability of documenting the fluid intake and output if all nurses in the sample were treated as if they had high knowledge on documentation, respectively. With regard to nurse qualification and ward of operation 0.34 (34%) and 0.26 (26%) would be the average probabilities of documenting

the fluid intake and output if all nurses in the sample were treated as if they were all certified mid-wives and worked in maternity wards, accordingly.

5.4 Application of theory to the research study

The attribution theory was adopted in this study to illustrate how different factors can affect documentation on fluid balance charts. The findings suggest that the internal attribution factor such as length of service and external attributions such as heavy work overload influence fluid balance chart documentation at Manse General Hospital.

5.5 Implications of findings to nursing

5.5.1 Nursing Practice

This study has shown gaps in the documentation of intake and output charts. Elion et al (2007) notes that incomplete documentation may lead to inaccurate fluid balance monitoring results in incorrect conclusions been drawn regarding fluid balance status, furthermore, nursing or medical interventions that are necessary will delay resulting in negative physiological consequences, such as hypotension. There is need to re-emphasize the need for improved and correct documentation at Mansa General Hospital. Nurse Managers should supervise the documentation and punish anyone who does not correctly document intake and output. Failure to document correctly and consistently will compromise the quality of nursing care given to the patients.

5.5.2 Nursing Management

The study suggest that there is shortage of nursing and midwifery staff at the Mansa General hospital which could affect the documentation of intake and output therefore nursing management should through the human resource department lobby for increasing the number of nurses on the staff establishment for the institution. Nursing management should also plan for refresher courses on documentation of intake and output in order to improve documentation of intake and output.

5.5.3 Nursing Education

The findings show that none of the nurses and midwives in this study has attended an in-service course on documentation of intake and output charts. There is need for the hospital in serve department to continue in-service courses on aspects of nursing care such as documentation. Schools of nursing should also continue re-emphasizing the significance of

nursing documentation in the curriculum so that nurses can correctly document nursing care all the time.

5.5.4. Nursing Research

The results suggest gaps in the documentation of intake and output charts; however, this study was only done at Mansa General Hospital. There is need to conduct a larger study country wide to enable generalization of the findings.

5.6 Conclusions

In conclusion, it is apparent that gaps in the documentation of fluid intake and output exist. This is with regard to recording of patient biographical data where not all particulars are recorded on the fluid balance chart all the time. Long period of service, higher qualification and levels of knowledge significantly increase the probability of documentation. This is in addition to the type of ward nurses operate in. Therefore, further coaching of nurses and midwives and encouraging them to work towards better documentation is needed in order to minimize nursing documentation insufficiencies.

5.7 Recommendations

Refresher courses focusing on the importance of documentation should be introduced and all health personnel should be encouraged to take them up. This should target all nurses regardless of the length of service, levels of qualification and ward of operation. There is also need for management to look into the issue of staff shortage which results in heavy workload for the current number of staff. Reducing the patient to health staff ratio may reduce the stress and fatigue on the part of nurses. Thus, leading to improvement in the documentation of fluid intake and output.

5.8 Limitations of the study

The study was conducted at Mansa General Hospital; therefore the finding should be generalized with caution to other settings. In addition, generalization of findings is limited due to the small sample size. The use of purposive sampling which is a non-probability sampling method might be a source of bias. While acknowledging the limitations, the findings do provide insights into the factors influencing documentation of fluid balance charts at Mansa general Hospital.

5.9 Dissemination and utilization of findings

The findings will be disseminated to the relevant stakeholders by sending copies of the dissertation to University of Zambia Library, Medical Library and the Department of Nursing Sciences. Executive summaries of the research study will be sent to the Ministry of Health, Provincial Medical office at Mansa and Mansa general hospital. The researcher will disseminate information to the Nurses and Midwives at Mansa general hospital through ward affairs meetings and other workshops organized by the Hospital managements.

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APPENDIX 1: INFORMATION SHEET FOR THE RESPONDENTS.

Title of Study: Evaluation of Factors associated with Intake and Output documentation on Post-Operative Patients at Mansa General Hospital in Mansa District, Luapula.

Dear Participant,

My name is Mwila B. Chrispine, a student with the University of Zambia, School of Medicine, Department of Nursing Sciences. I am appealing to you to take part in this study whose aim is to **evaluate the factors associated with documentation of intake and output on post-operative patients at Mansa General Hospital in Mansa, Luapula province.**

There are no known or anticipated physical risks, neither is there any direct or monetary gain to you by participating in this research. However, the information you that will be obtained from your chart will help in addressing challenges with documentation of intake and output and subsequently help with the improvement in the quality of nursing care given at Mansa general Hospital.

Your participation in this study is purely voluntary and therefore, you are eligible to withdraw if you are not interested and your action will not affect your acquisition of health services at this centre. Please seek clarification where you do not understand.

All the information that will be obtained from your chart will be treated as strictly confidential. The research information will be disseminated to the relevant authorities and with no direct link to you since anonymity shall be maintained.

APPENDIX 2: INFORMED CONSENT

The purpose of the study has adequately been explained to me and I understand the aim, benefits, risks and confidentiality of the study. I further understand that if I agree to take part in this study, I can withdraw at any time without having to give an explanation and that taking part in this study is purely voluntary.

I _____ (Names)

Consent to participate in this study

Signed; _____ date;

(Participant)

Participant's signature or thumb print

Signed; _____ date; _____

(Witness)

Name _____ of _____ the _____ interviewer;

Signed; _____ date; _____

PERSONS TO CONTACT FOR PROBLEMS

The Head, Department of Nursing Science, School of Medicine P.O. Box 50110,
Lusaka

The Chairperson, ERES Converge IRB, 33 Joseph Mwilwa Road, Rhodes Park,
Lusaka
Zambia

APPENDIX 3: DATA COLLECTION TOOL

**THE UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
DEPARTMENT OF NURSING SCIENCES**

**QUESTIONNAIRE FOR NURSES
AN EVALUATION OF THE DOCUMENTATION OF FLUID INTAKE AND OUT
PUT AT MANSA GENERAL HOSPITAL IN MANSA DISTRICT, LUAPULA.**

PARTICIPATION IN THIS RESEARCH IS VOLUNTARY AND RETURNING IT BACK
THIS QUESTIONNAIRE MEANS YOU CONSENTED

AUDIT TOOL NUMBER:

DATE:

NAME OF WARD:

INSTRUCTIONS FOR THE RESPONDENTS.

1. No name should appear on/and or in this audit tool.
2. Answer all the questions.
3. Put the letter "X" in the box next to your choice.
4. Use a pen/pencil in the questionnaire.
5. Information documented in the audit tool will be kept confidential.

SECTION A: INTERNAL ATTRIBUTION

LENGTH OF SERVICE

1. For how long have you been in service?

a) 0-12 months

b) 1-2 years

c) 3-4 years

d) 5 and above years

SECTION B: SERVICE RELATED FACTORS

2. Is stationery available in your ward?

a) Available

b) Not available

3. Shortage of staff

a) Present

b) Not present.

4. Work load?

a) Heavy

b) Light

5. Supervision by nursing officer on fluid balance charts

a) Yes

b) No.

SECTION C: PERSONAL FACTORS

Knowledge on documentation and its value

6. Do you know how to balance a patient's intake/output chart?

a) Yes

b) No.

7. Explain your response, to question 6 above

.....

6. Do you document the patient's intake and output of surgical patients?

a) Yes

b) No

7. If no question 8 above, explain your response.

.....

8. Do you balance the patients' intake and output every 24 hrs

a) Yes

b) No

9. Have you attended any fresher course on documentation?

a) Yes

b) No

10. If yes when?

a) 0-12 months

b) 1-2 years

c) 3-4 years

d) 5 years and above

11. If no do you think the fresher courses would be helpful

in improving fluid balance documentation?

a) Yes

b) No

THE END

THANK YOU FOR YOUR COOPERATION

APPENDIX 4: CHECKLIST

**THE UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
DEPARTMENT OF NURSING SCIENCES**

**TOPIC: AN EVALUATION OF THE DOCUMENTATION OF FLUID INTAKE AND
OUT PUT AT MANSА GENERAL HOSPITAL IN MANSА DISTRICT, LUAPULA.**

SERIAL NUMBER:

DATE:

NAME OF WARD:

Name of Researcher.....

INSTRUCTIONS FOR THE DATA COLLECTORS.

1. No patients name should appear on the checklist instead a serial number
2. Put the letter "X" in the box next to observed item.
3. Use a pen/pencil in the questionnaire.
4. All Information collected should be kept confidential.

**SECTION A: INTAKE AND OUT PUT DOCUMENTATION
OFFICIAL USE**

FOR

PATIENTS BIOGRAPHICAL DATA

1. Are the following patients particulars filled in on the fluid chart

- Name
- Age
- Sex
- Ward
- Date
- Bed number
- Diagnosis
- Type of fluid
- Time of commencement
- Amount to be infused
- Output

2. Are Doctor's orders indicated on fluid balance chart?

- a) Yes
- b) No

3. Time commenced indicated

- a) Yes
- b) No

4. Amount is correctly documented.

- a) Yes
- b) No

5. The flow rate indicated on the chart.

- a) Yes
- b) No

6. Patient's diagnosis documented

- a) Yes
- b) No

7. Fluid type correctly documented.

a) Yes	<input type="checkbox"/>	<input type="checkbox"/>
b) No		<input type="checkbox"/>
8. Fluid commencement time indicated		
a) Yes	<input type="checkbox"/>	<input type="checkbox"/>
b) No	<input type="checkbox"/>	
9. Output correctly documented		
a) Urine output	<input type="checkbox"/>	
b) Vomitus	<input type="checkbox"/>	<input type="checkbox"/>
c) Others	<input type="checkbox"/>	
10. The 24 hours balance were accurately calculated		<input type="checkbox"/>
a) Yes	<input type="checkbox"/>	
b) No	<input type="checkbox"/>	

THE END

APPENDIX 4: TIME LINE

NO	TASK TO BE FORMED	DATES	PERSONNEL ASSIGNED TO TASK	PERSON DAYS
1	Finalizing proposal	June 2015	Researcher	
2	Presentation of proposal to graduate forum	August 2015	Researcher	
3	Submission of proposal to ethics committee	July 2015	Researcher	
4	Recruitment and training of research assistants	August 2015	Researcher	
5	Data collection	September 2015	Researcher team	
6	Coding of data (data entry)	October 2015	Researcher/Coder	
7	Data analysis	November 2015	Researcher	
8	Report writing	January 2016	Researcher	
9	Submit draft report	May 2016	Researcher	
10	Final report	May 2016	Researcher	

APPENDIX 5: GANTT CHART

ACTIVIY	JULY	AUGU ST	SEPTE MBER	OCTOBER	NOVEMBE R	MARCH	MAY
Finalizing Research proposal and Presentation of proposal to graduate forum							
Submission of proposal to ethics committee							
Data collection							
Coding of data (data entry)							
Report							

writing							
Submit draft report							
Final report							

APPENDIX 6: RESEARCH BUDGET

Research Budget

ITEM	UNIT COST (K)	MULTIPLYING FACTOR	TOTAL COST (K)
Stationery			
Reams of paper	25.00	25.00 x 7	175.00
Pens	0.50	0.50 x 10	5.00
Rubber	0.50	500.00 x 10	5.00
Pencils	0.25	0.25 x 10	2.50
Staples	20.00	20.00 x 1 (Box)	20.00
Staplers	60.00	60.00 x 2	120.00
Calculators	75.00	75.00 x 2	150.00
Subtotal			477.50
Typing services			
Laptop computer	4,500.00	4,500.00 x 1	4,500.00
Printer	750.00	750.00 x 1	750.00
Tonner	500.00	500 x 3	1,500.00
Binding machine	2,000.00	2,000.00 x 1	2,000.00
Spirals	0.50	0.50 x 20	10.00
Subtotal			8,760.00
Training of four (4) research assistants	25.00	25.00 x 2	50.00
Reams of paper			

File folders	10.00	10.00 x 5	50.00
Lunch allowance	50.00	50.00 x 5 x 5days	1,250.00
Out of pocket allowance	145.00	145.00 x 4 x 5days	2,900.00
Facilitation allowance	285.00	285.00 x 1 x 5days	1,425.00
Venue	200.00	200.00 x 5days	1,000.00
Subtotal			6,675.00
10% contingency			1,591.25
GRAND TOTAL			17,503.75

Budget justification

The budget will facilitate the smooth conducting of the study, starting with training of the assistant for data collection, allowance for the accompanying officers, transport costs, coding cost, stationery, typing services and workshop for Nurse for dissemination of finding

APPENDIX 7: FLUID BALANCE CHART

NAME:.....**AGE**.....

SEX:.....**WARD:**.....

DATE:.....**BED**

DIAGNOSIS:.....

DOCTOR'S ORDER:.....

RATE OF LOW:.....

DATE	FLUID TYPE	TIME OF COMM	AMOUNT	DATE	TIME	URINE OUTPUT	VOMIT	OTHER REMARKS

APPENDIX 7: FLUID BALANCE CHART



33 Joseph Mwilwa Road
Rhodes Park, Lusaka
Tel: +260 955 155 633
+260 955 155 634
Cell: +260 966 765 503
Email: eresconverge@yahoo.co.uk

I.R.B. No. 00005948
F.W.A. No. 00011697

25th June, 2015

Ref. No. 2015-Apr-013

The Principal Investigator
Mr. Chrispine B. Mwila
Mansa School of Nursing
P.O. Box 710392,
MANSA.

Dear Mr. Mwila,

RE: FACTORS ASSOCIATED WITH DOCUMENTATION OF FLUID INTAKE AND OUTPUT IN POST-OPERATIVE PATIENTS AT MANSA GENERAL HOSPITAL.

Reference is made to your corrections. The IRB resolved to approve this study and your participation as principal investigator for a period of one year.

Review Type	Ordinary	Approval No. 2015-Apr-013
Approval and Expiry Date	Approval Date: 25 th June, 2015	Expiry Date: 24 th June, 2016
Protocol Version and Date	Version-Nil	24 th June, 2016
Information Sheet: Consent Forms and Dates	• English.	24 th June, 2016
Consent form ID and Date	Version-Nil	24 th June, 2016
Recruitment Materials	Nil	24 th June, 2016
Other Study Documents	Questionnaires, Checklist.	24 th June, 2016
Number of participants approved for study	53	24 th June, 2016

Specific conditions will apply to this approval. As Principal Investigator it is your responsibility to ensure that the contents of this letter are adhered to. If these are not adhered to, the approval may be suspended. Should the study be suspended, study sponsors and other regulatory authorities will be informed.


Conditions of Approval

- No participant may be involved in any study procedure prior to the study approval or after the expiration date.
- All unanticipated or Serious Adverse Events (SAEs) must be reported to the IRB within 5 days.
- All protocol modifications must be IRB approved prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.
- All protocol deviations must be reported to the IRB within 5 working days.
- All recruitment materials must be approved by the IRB prior to being used.
- Principal investigators are responsible for initiating Continuing Review proceedings. Documents must be received by the IRB at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Any documents received less than 30 days before expiry will be labelled "late submissions" and will incur a penalty.
- Every 6 (six) months a progress report form supplied by ERES IRB must be filled in and submitted to us.
- ERES Converge IRB does not "stamp" approval letters, consent forms or study documents unless requested for in writing. This is because the approval letter clearly indicates the documents approved by the IRB as well as other elements and conditions of approval.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of ERES Converge IRB, we would like to wish you all the success as you carry out your study.

Yours faithfully,
ERES CONVERGE IRB


Dr. E. Munalula-Nkandu
BSc (Hons), MSc, MA Bioethics, PgD R/Ethics, PhD
CHAIRPERSON