Factors contributing to falls in a tertiary acute care setting in Cape Town, South Africa: A descriptive study

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Declaration

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Glossary

Adverse incident/event (AI): The National Guideline for Patient Safety Incident Reporting and Learning in the Public Health Sector of South Africa defines an adverse event as an "incident that results in harm to a patient that is related to medical management, in contrast to disease complications or underlying disease".[1p.10] The incident can be any event or circumstance leading to unintentional harm or suffering, and may necessitate additional care procedures. The World Health Organisation (WHO) definition further describes that harm may be physical, social or psychological,[2] and was used as the definition for this study. Adverse incidents (AIs) exclude *no harm incidents* (see Glossary) as well as *near miss* (see Glossary) events.

Acute hospital setting: A hospital that has onsite availability of a full range of diagnostic and therapeutic capabilities required to diagnose and treat acute physical illnesses.[3]

Agency nursing staff: In this study, an agency nurse was defined as a nurse who is registered with the South African Nursing Council (SANC) who is employed by a commercial nursing agency, and who provides temporary nursing cover in the hospital.[4]

Clinical consequences: For the purposes of this study, the definition of clinical consequences was taken from the Western Cape Department of Health (WCDOH) Adverse Incident Reporting and Risk Management Tool (Section C, Appendix G).[1] The description of clinical consequences includes sensory, motor, physiological or psychological reduction in bodily functioning suffered as a result of an AI, and is aligned with the WHO definition.[2] In contrast to the WCDOH and WHO definition, the National Reporting and Learning System (NRLS) and the National Database of Nursing Quality Indicators® (NDNQI®) analyse only the degree of physical harm suffered by a patient.[5] According to the WCDOH Adverse Incident Reporting and Risk Management Tool, the levels of clinical consequence include:

- Serious clinical consequence: Patients with death unrelated to the natural course of the illness and differing from the immediate expected outcome of patient management.

[1] Appendices are named according to their order of appearance in the main body of this thesis, starting in Chapter 1. Therefore, appendices referred to in the Glossary may not be in the correct alphabetical sequence.

- Major clinical consequence: Patients suffering a major permanent loss of function (sensory, motor, physiologic or psychological) unrelated to the natural course of the illness and differing from the immediate expected outcome of patient management. Significant disfigurement[2] as a result of the incident.
- Moderate clinical consequence: Patients with temporary and/or permanent reduction in bodily functioning (sensory, motor, physiologic or psychological) unrelated to the natural course of the illness and differing from the immediate expected outcome of patient management. Increased length of stay as a result of the incident. Surgical intervention required[3] as a result of the incident.
- Minor clinical consequence: Patients requiring increased level of care including review and evaluation, additional investigation, referral to another clinician/service.
- Minimum clinical consequence: Patients with no injury, increased level of care or length of stay.[4]

Comorbidity and multimorbidity: Comorbidity has various definitions, but it is usually referred to as the presence of one or more additional illnesses in an individual affected by the disease being studied.(6) Multimorbidity refers to two or more chronic conditions occurring in an individual.(6) This study makes use of a broad definition of comorbidity. This study refers to a situation where an individual who was admitted to the hospital with a primary diagnosis, also has a secondary diagnosis or more than one additional diagnosis or medical condition listed in the admission notes and/or discharge summary.

Fall Definition: A fall is "an unexpected event in which the participants come to rest on the ground, floor, or lower level".(7p.1619) At the research hospital, the fall definition is concurrent with Lamb and colleagues' definition; "an event which results in the patient or any part of the patient's body coming to rest inadvertently on the floor or other surface lower than the patient" (Falls Policy, 2017, Appendix B2),[5] and was the accepted definition for this study.

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[2] ,[3] The WCDOH Adverse Incident and Risk Management Tool does not qualify the terms "significant disfigurement", "surgical intervention", "increased length of stay". For the purposes of this study the level of clinical consequence was accepted as per the AI database form, but it is recommended that the terms be qualified to assist those who complete the form with correct classification.

[4] Increased length of stay may not be evident at the time of completing the report, therefore, to assist with the correct classification of clinical consequence, it is recommended that patients who fall be followed up prospectively by a falls team.

[5] The hospital Falls Policy was initially developed in 2013 and called the Falls Risk Policy. The policy was revised in 2017 and renamed the Falls Prevention and Management Policy. For the sake

Fall-related injury: Any physical damage resulting from a fall including soft tissue injuries, such as bruising, abrasions, lacerations,[8, 9] and fractures, dislocations and head injuries.[10-12]

Falls risk assessment versus a falls risk prediction tool (screening tool): Falls risk assessment is a process used to identify an individual's risk factors for falling, and those that may be amenable to intervention,[13] and is an in-depth and possibly ongoing process.[3] A falls risk screening or prediction tool aims to calculate a person's risk of falling, either as *at risk/not at risk* or at *low/medium/high risk* for falling.[3] The terms *falls risk screening* and *falls risk assessment* are sometimes used interchangeably. However, because there are fundamental differences between the two,[13] fall risk assessment and fall risk screening should be considered two separate processes. Therefore, if someone was screened and shown to be at high risk, this person would require a more detailed falls risk assessment that would be conducted by specific members of the multidisciplinary team (see Glossary).[13] For example, if a patient was found to have risk factors such as gait instability and poor balance, a referral would be made to physiotherapy for a detailed gait and balance assessment.[14] At the research hospital, while falls screening is done as part of the Falls Policy (2013 and 2017, Appendix B1-2), the screening tool is referred to as the Morse falls risk assessment tool (see Glossary), which could cause confusion.[13]

Fall risk factors: Factors significantly more prevalent in people fall than those that do not fall.[15] Significant risk factors identified to increase the likelihood of in-hospital falls include gait instability, urinary incontinence/frequency, a previous fall history, confusion or impaired judgement, and prescription of centrally acting sedative hypnotics.[15, 16]

Falls Team: A team approach is necessary to implement falls prevention practices effectively within hospitals, as there are multiple fall risk factors and interventions.[17] Falls teams should be multidisciplinary, and should include health workers as well as quality assurance personnel. Falls team roles typically include structured analysis of fall events, conducting trials to identify effective interventions to reduce falls, and evaluation and feedback to assist with institutional learning.[17, 18]

Global North: A grouping of countries based on political and socio-economic categories.[19] The Global North comprises North America, Western Europe, and developed parts of East Asia.[19] Countries or regions where English is an official language or with Anglo-Saxon ties

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of brevity, both policies will be referred to in this document as the Falls Policy and the version will be indicated using either 2013 or 2017.

are considered parts of the Global North, for example parts of Australasia and the islands of the Pacific Ocean.[19]

Health system failure: A fault, breakdown or dysfunction within a healthcare organisation's operational methods, processes or infrastructure.[20]

Hospital acquired condition (HAC): A health state that occurs as a consequence of hospitalization, including falls, blood incompatibility and pressure ulcers.[21]

Hospital units/ wards/specialities/departments: At the research site, hospital units of speciality include Trauma, Medical, Obstetrics and Gynaecology, Surgical, Intensive care unit (ICU), Psychiatry, Theatre, Radiology and Oncology.

Incidence of falls: The number of falls occurring in a given time. Incidence may be reported as a percentage of patients that fall, compared to the total number of patients admitted to the hospital over the same period, or as the rate of falls (see Glossary). The disparity in the description of published results on falls, led Lamb and colleagues, on behalf of the Prevention of Falls Network Europe (ProFaNE), to strongly recommend that data include the number of falls, number of people who fall, number of people who do not fall, people who fall more than once, and fall rate per patient occupied bed day (POBD).[7] Standardisation of reporting allows for better comparison of results. In this study, the incidence of falls is reported as falls rate, falls per 1000 POBD.

Injurious fall: A fall that results in physical injury (see Glossary Fall-related injury).

Kappa statistic: The kappa statistic is frequently used for the assessment of agreement between two or more raters when the measurement scale is categorical.[22, 23] The application of Cohen's kappa is only appropriate in cases where agreement between two raters is of primary interest. The extent of agreement among data collectors is called "inter-rater reliability".[22] Like most correlation statistics, the kappa can range from -1 to +1. Cohen suggested the Kappa result be interpreted as follows: values less than or equal to 0 as indicating no agreement, 0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41– 0.60 as moderate, 0.61–0.80 as substantial, and 0.81– 1.00 as almost perfect agreement.[24]

Low- and middle-income countries (LMIC): The Republic of South Africa (SA) is regarded as an upper-middle income country economically. However, in terms of healthcare, the SA population profile is aligned more with a low-income nation.[25]

Mental Status: In the context of this study, mental status refers to a temporary or permanent state of confusion. According to the Morse Falls Scale (MFS) variables, mental status is measured by checking the patient's self-assessment of his/her own limitations and comparing this self-assessment to their actual ability to walk.[26] The person that is

administering the MFS, must ask the patient, “Are you able to walk alone or do you need assistance?”. The patient is then scored based on their reply as *Normal* or *Over-estimates or forgets limits*:

- Normal: The patient is rated as *Norma*l if judging his/her own ability is realistic and the patient is aware of their own limitations.
- Over-estimates or forgets limits: If the patient’s response is unrealistic, not appropriate or consistent with nursing orders, or if the patient is not fully orientated to time, place or person, then he/she is considered to overestimate his/her own abilities.[26]

Modifiable (or reversible) fall risk factors: Risk factors for falls (see Glossary) that are amenable to interventions. For example, confusion, walking status, the use of psychotropic medication (see Glossary), increased length of stay (LOS) are factors that can potentially be modified with targeted interventions.[15, 27] Certain environmental and organisational factors are also modifiable.[28]

Morse Fall Scale (MFS) or Morse falls risk assessment tool (MFRAT): A tool used to screen patients for falls risk.[26] The MFS (Appendix A1-2) is the screening tool used to screen for fall risk at the research site as part of their Falls Policy (2013 and 2017). The hospital uses the term Morse falls risk assessment tool (MFRAT) in their policy, though it is more often referred to as the Morse Falls Scale (MFS) frequently in falls literature. Thus, in the context of this study is referred to as the Morse Falls Scale. The MFS has six sub-scales; *history of falling, secondary diagnosis, ambulatory aid, intravenous infusion, gait/transferring and mental status.*

Multidisciplinary team: A term to describe healthcare teams which comprise more than one healthcare professional from different disciplines, and who work together to achieve coordinated patient care.[29]

Multifactorial intervention: An intervention with multiple components targeted at addressing specific modifiable risk factors identified in the falls risk assessment.[3]

Near miss event: An event where unwanted consequences were avoided and did not reach the patient.[1]

Negative predictive value: The negative predictive value (NPV) shows the probability that a person testing negative for risk of falling will not fall.[30]

National Health Insurance (NHI): A healthcare financing system that is designed to pool funds to actively purchase and provide access to quality, affordable personal healthcare services for all South Africans based on their health needs, irrespective of their

socioeconomic status[31]. NHI is intended to ensure that the SA population has access to quality health services, which do not result in financial hardships for individuals and their families.[32] The SA government continues to explore the introduction of an NHI system.

No harm incident: An incident which reached the patient, but resulted in no discernible harm.[1]

Nursing levels: Various levels of nursing qualification exist in SA.

- Professional Nurse and Midwife awarded on completion of a four-year Bachelor Degree in Nursing and Midwifery.[33, 34] Registered professional nurses (RPNs) are responsible for the supervision of enrolled nurses (ENs) and enrolled nursing auxiliaries (ENAs), as well as typical nursing responsibilities.
- Staff nurse (SN) or enrolled nurse, awarded on completion of a three-year Diploma in Nursing, by theoretical and practical in-service training offered at accredited nursing education institutions.[34] ENs perform limited nursing care.[34]
- Higher certificate in Auxiliary Nursing, which is a one-year in-service training course offered by accredited nursing education institutions.[34] ENAs perform basic nursing procedures and care for patients on a general level.[34]

Nurse-sensitive outcome indicators: Measures that reflect changes in the health of patients that are directly affected by nursing care.[35]

Nurse skill mix: The percent of total nursing hours supplied by ENs, RPNs, ENAs and agency staff.[35]

Older adults: While generally accepted to indicate adults over 60-65 years of age, in LMIC, the onset of old age and its associated issues may commence for women when the reproductive years end.[36] While the 50 years of age is accepted as the definition of older adults for the WHO Older Adult Health and Ageing in Africa project,[37] for the purposes of this study, older adults were defined as those ≥ 60 years of age, aligned with the SA Human Rights Commission.[38]

Patient occupied bed day (POBD): A method to calculate bed occupancy. POBD can be used to report total bed occupancy at a hospital, or bed occupancy on a specific unit. A POBD begins the hour of admission and lasts for 24 hours from that time.[13]

Patient safety*:* The reduction of risk of unnecessary harm associated with healthcare to an acceptable minimum.[1]

Patient safety incident: An unintended or unexpected incident which could have, or did cause harm to a patient receiving healthcare.[2] The National Department of Health (NDOH)

further explains that patient safety incidents can be a *near miss*, a *no harm incident* or a *harmful incident.*[1] A patient safety incident is a type of adverse event.[39]

Positive predictive value (PPV): The probability that a person testing positive for risk of falling will have a fall.[30]

Psychotropic drugs: Medications which act on the central nervous system (CNS), including sedatives and hypnotics, neuroleptics, antipsychotics, antidepressants, anxiolytics and benzodiazepines and narcotic analgesics (Appendix P).[40] The adverse effects of psychotropic medications may include confusion, drowsiness, visual impairment, dizziness, hallucinations, and sleep disturbances, all of which can increase the likelihood of a fall.[41]

Rate of falls: A rate is the frequency of occurrence of a phenomenon in the population under study; how often an event happens in a given time in the population.[42] For this study, the average rate of falls per calendar month, and over the ten-month period of the study, is reported as falls per 1000 POBDs at the hospital. Fall rate was determined by the calculation: $Fall\ rate = \frac{Total\ number\ of\ falls\ in\ specific\ time\ period}{Patient\ occupied\ bed\ days\ in\ the\ specific\ time\ period}$ x 1000[13]

Receiver operating characteristic (ROC) curve analysis: This statistical test plots true positive (sensitivity) frequencies and 1-true negative (specificity) frequencies which generate the ROC curve. The graphic representation of true positive and false positive values helps determine if a test is accurate[43]. In this study, ROC curve analysis was used to illustrate how accurate the MFS is for predicting falls in the sample, and to find the optimal cut-off score for discriminating between patients who are at risk for falling and those who are not. The point closest to the left-hand corner represents the greatest discriminative point on the graph.[43] The maximum value for ROC curve analysis is an area under the curve (AUC) equal to 1, which describes a strong screening tool to differentiate between patients at risk and those not at risk.[43] An AUC level close to 0.5 describes a chance risk using the screening tool,[43] while an AUC close to 0 indicates incorrect classifications,[43] with the Fall Group described as low risk and the Non-fall Group described as high risk. The optimal cut-off point which differentiates those at risk and those not at risk for falling is usually where the sensitivity and specificity are at their highest (0, 1) on the curve.[43] When the cut-off point is high, with a high specificity value, sensitivity is lost and patients at risk may be missed.[30] When the cut-off point is lower, producing a higher sensitivity value, more patients could be mistakenly categorised as high risk.[30]

Rasch analysis: is considered the standard for assessing the psychometric properties of a scale.[44] The objective of Rasch analysis is to test how well observed data fits the expectations of the measurement model. An estimate of the internal consistency reliability of

the scale is available, based on the person-separation index.[45] Floor and ceiling effects, whether items are biased for certain groups, and single underlying constructs can be measured using the Rasch model.[44]

Safety climate: refers to the shared perceptions, attitudes and beliefs of employees about the way in which the hospital manages and achieves patient safety.[44] Safety climate has been used to provide a snapshot of the ethos of safety culture in an organisation.[46]

Safety culture: refers to "the product of individual and group values, norms, attitudes, beliefs, perceptions, competencies and the patterns of behaviour that determine the commitment to … an organisation's health and safety management".[47p. ii18]

Sensitivity: refers to testing a tool's ability to obtain a true positive.[43] In the context of this study, sensitivity is reported as the percentage of participants who fell and were predicted to fall (correctly classified as high risk).[30]

Serious reportable event (SRE): The National Quality Forum (NQF) considers a serious reportable event to be a largely, if not entirely, preventable adverse event that occurs within a healthcare setting. In addition, an SRE is indicative of a problem in a healthcare setting's safety systems, and the risk of occurrence is significantly influenced by the policies and procedures of the healthcare facility.[48] NQF's list of SREs includes both injuries occurring during care management (rather than underlying disease) and errors occurring from failure to follow standard care or institutional policies and procedures. Patient death or serious harm sustained from a fall is considered one of the 29 SREs by the NQF.[48]

Specificity: refers to a tool's ability to obtain a true negative.[43] In the context of this study, specificity is reported as the percentage of participants that did not fall and were not predicted to fall (correctly predicted as low risk).[30]

Waterlow score: The Waterlow score (Appendix J) was designed as a practical aid for nurses in managing and promoting awareness of the causes of pressure ulcer risk.[49] At the research hospital, the Waterlow score is used to screen for risk of pressure ulcer formation, and includes scoring, amongst other categories, continence status. For this study, information regarding continence status for participants was sourced from the Waterlow score chart recorded in the medical folders. Using the Waterlow Score chart, continence status is documented according to the categories:

- *Complete/catheterised*
- *Urine incontinent*
- *Faecal incontinent*
- *Urinary and Faecal incontinent*

In this study, any participant recorded as complete/catheterised was coded to be *continent*, and participants recorded as any of the other categories, was coded as being *incontinent*.

Youden index (YI): The Youden index is an index that is used to rate tests/tools in an objective manner to determine whether the tests really differ in their capacity to discriminate. The index is determined by adding sensitivity and specificity and subtracting one. The closer the Youden index is to 1, the higher the predictive accuracy of the test or tool.[50]

Abbreviations and acronyms

AI: Adverse incident

ANA: American Nurses Association

ARR: Adjusted rate ratio

AUC: Area under the curve

CEO: Chief Operational Officer

CI: Confidence interval

COHSASA: Council for Health Service Accreditation of Southern Africa

CNS: Central nervous system

CPT: Cape Town

DI: Downton index

ENA: Enrolled nursing auxiliary

EN: Enrolled nurse

HAC: Hospital acquired condition

HIIFRM: Hendrich ll falls risk model

HR: Human resources

HREC: Human Research and Ethics Council

ICU: Intensive care unit

IRR: Inter-rater reliability

IV: Intravenous

LMIC: Low- and middle-income counties

LOS: Length of stay

MRFAT: Morse falls risk assessment tool

MFS: Morse Falls Scale

NDOH: National Department of Health

NDNQI®: National Database of Nursing Quality Indicators

NHI: National Health Insurance

NHPPD: Nursing hours per patient day

NOF: Neck of femur

NPV: Negative predictive value

NRLS: The National Reporting and Learning System

NQF: National Quality Forum

NUM: Nursing unit manager

OR: Odds ratio

POBD: Patient occupied bed day

PPV: Positive predictive value.

PRoFaNE: Prevention of Falls Network Europe

QA: Quality assurance

RCT: Randomised controlled trial

ROC: Receiver operating characteristic

RPN: Registered professional nurse

SA: South Africa

SAGE: Study on global AGEing

SANC: South African Nursing Council

SAQ: Safety attitudes questionnaire

SCP: Standard care plan for the management of falls risk

SN: Staff nurse

SRE: Serious reportable event

STRATIFY: St Thomas risk assessment tool in falling elderly inpatients

TU/EU: Trauma unit/Emergency unit

TUG: Timed-Up-and-Go test

UK: United Kingdom

USA: United States of America

UCT: University of Cape Town

WC: Western Cape

WCDOH: Western Cape Department of Health

WHO: World Health Organisation

YI: Youden index

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Abstract

Introduction. Patient falls occur frequently in the acute hospital setting and are one of the most common adverse events experienced by hospitalised patients. In-hospital falls have negative outcomes for patients, causing injuries in up to half of those who fall. Falls in hospital create additional costs for health services due to increased length of stay (LOS), and greater health resource use. In contrast to much research focused on in-hospital falls worldwide, little is known about the rate, contributing factors and outcomes of inpatient falls in the state sector in South African hospitals. At the research hospital, a Falls Policy has been in place since 2013. The chosen falls risk screening tool, the Morse Falls Scale (MFS), had not been locally validated, and therefore its ability to accurately discriminate between patients who fall and patients who do not fall was unknown. A focused analysis of local falls incident reporting, and a description of contributory factors and consequences of falls, could better inform and target falls and fall injury prevention. Furthermore, this research may assist in service development and refining the Falls Policy.

Methodology. The aim of this study was to obtain broad-based data on the magnitude of patient falls, and to identify factors contributing to falls. The aim was achieved in two parts, the first was a retrospective record review design. Predictive risk factors for falls were explored by comparing two patient groups, a Fall-Group and a Non-fall Group. In the Fall-Group, further objectives related to describing circumstances surrounding fall events, including activities patients were performing at the time of the fall, the time of day and day of week the fall occurred, locations of fall events, and the clinical consequences sustained as a result of the fall. The use of the existing falls risk screening tool, the MFS, as well as its predictive accuracy to correctly identify patients at increased risk of falling was investigated. Second, a survey of nurses at the research hospital was undertaken to examine nurses' knowledge, attitudes and beliefs around the Falls Policy and current falls prevention practices.

Results. There were 171 reported fall events during the ten-month period, representing 11.77% of adverse events and a falls rate of 0.73 per 1000 patient occupied bed days (POBD) during this time. Significant predictive risk factors for falling were a longer LOS and having a greater number of comorbid conditions. While the mean age of the sample was 50.0 years (SD=17.3 years), the Fall Group was significantly older than the Non-fall Group (p = .004). There were significantly more deaths in the Fall Group (p = .001), and this group had a longer average LOS (p < .001) compared to the Non-fall Group. The only sub-scale

from the MFS that was significantly associated with falls was walking status. Minor-moderate clinical consequences were experienced as a result of the fall in 97% of cases (n=124). This study demonstrated that the MFS in use in the hospital has a low predictive accuracy of 55% at the current cut-off score of 50. At this score, the MFS has a sensitivity of 35.9% and a specificity of 75.4%. While an initial MFS was found in each of the cases, there was only evidence of a repeat MFS in 13 participants (9.7%) in the Fall Group. The nursing survey showed 70% of respondents had not had training on the Falls Policy (n=93) and only 37% (n=49) reported receiving regular feedback on fall rates. Receptiveness of most (66%, n=91) nurses to more training in falls prevention is encouraging.

Discussion. The fall rate of 0.73 falls per POBD was lower than expected when compared to international studies. At the research hospital, when the Falls Policy was introduced in 2013, a fall was not defined in the policy and as highlighted in the nursing survey, there still appears to be lack of clarity on the fall definition. The MFS had a low predictive accuracy at the current cut-off score. The low sensitivity and specificity of the MFS in this setting may be due to the MFS not being updated regularly as per the Falls Policy. A further reason for the MFS poor predictive value may be the younger age group found in this sample when compared to international studies where the scale has performed better.

Recommendations. The poor predictive value of the current risk screening tool found in this study is concerning. Therefore, further investigation into whether the MFS performs better if it is updated more frequently, and if completed in full, as per the Falls Policy, is recommended. Alternatively, the hospital should consider all patients with multiple comorbidities and those with longer length of stays at high risk, and provide interventions to minimise risk as per the Falls Policy. Future research into factors contributing to fall events and falls prevention should follow a prospective design and be supported at management as well as ward level. Further investigation into the most appropriate way to reduce harm from falls is recommended at the research site.

Conclusion. This descriptive study provides a starting point for the hospital to examine the Falls Policy and falls prevention strategies currently in use. It is hoped that the study will contribute to local awareness-raising and capacity-building and help the hospital evaluate current practice and set a baseline for improvement.

Chapter 1. Introduction and purpose of the study

Falls are a public health issue which occur frequently in both the community,[(51)6] and the hospital setting,[(52)] where patients are acutely unwell. The focus of this study is on falls sustained in hospital. The purpose of this study was to describe the rate and factors influencing the occurrence of adult inpatient falls in an acute tertiary hospital setting in Cape Town (CPT), South Africa (SA) using a retrospective record review. Patient[7] characteristics and circumstances contributing to falls were analysed, which may inform fall prevention strategies. The usefulness of the existing falls risk assessment tool, the Morse Falls Scale (MFS) (Appendix A1-2), in predicting risk of falls was investigated. Finally, nurses' knowledge, attitudes and behaviours regarding the Falls Policy (Appendix B1-2) and falls interventions were explored using a survey design. Chapter 1 provides the background for the study, discusses the study rationale, and introduces the research setting.

1.1 Background to the study

Patient falls occur frequently in hospitals, and are serious concerns for patients, families, hospital staff and administrators.[(52, 53)] Studies conducted the Global North (see Glossary) show that falls are one of the most common adverse incidents (AIs) experienced by hospitalised patients.[(5, 52)] For example, over 250 000 in-hospital falls occur annually in England and Wales,[(5)] and over one million falls in the United States of America (USA).[(52)] In response to the challenges raised by falls, best practice guidelines have been developed in many countries in the Global North.[(3, 13, 54)] While nationwide falls tracking systems exist in the United Kingdom (UK)[(5)] and Denmark,[(55)] there is no national falls database in South Africa. Fall rates from multi-site studies implemented over the last two decades in acute hospitals in the Global North, show fall rates to range between 3-12 falls per 1000 patient occupied bed day (POBD).[(5, 35, 52, 56)] However, no local peer-reviewed studies reporting on epidemiological data, or analysing in-hospital fall events in SA were found in a search of the literature to provide background to this study. Furthermore, studies describing in-hospital fall risk factors and the use of falls risk screening and prevention programmes in the acute care

[6] References are numbered according to their order of appearance this thesis document. Therefore, references start in the Glossary and continue in numerical order from the previous text in Chapter 1.

[7] It is acknowledged that people involved in research should be called participants, but due to lack of active participation in this research project, and their status as hospitalised, participants are referred to as patients throughout this thesis.

setting in SA hospitals are lacking. The only published data on fall rates in SA hospitals were available in the annual reports of the three major private hospital groups,[57-59] and a thesis,[60] also reporting on falls in hospitals in the private sector in SA. In comparison to rates published from the Global North, fall rates from the available grey literature in SA appear to be much lower, ranging from 0.54-1.8 falls per 1000 POBDs.[57-60] However, the magnitude and contributing factors to inpatient falls in the local public healthcare context is unknown. The two different healthcare systems will be discussed in more detail in section 1.4.

Several international studies have demonstrated that in-hospital falls have negative outcomes for the patient and the hospital,[53, 61, 62] and are considered an area of health system failure (see Glossary).[63] Injuries affect up to one-half of patients who fall in hospital,[11, 64] and range from minor lacerations and bruises to severe injuries such as fractures and subdural haematomas.[10, 65] Fractures of the femur make up the majority of fractures sustained in hospital fall events.[65] Fractures of the femur are associated with higher rates of discharge to institutional care due to loss of independence,[66] and increased mortality.[67] While personal injury is critically important to patients and staff, falls in hospital place added financial burden on the health service due to increased length of stay (LOS) post fall[53, 62, 68], and greater health resource use[53]. Naturally, in low- and middle-income settings, which may lack essential staff and supplies,[69] it may be argued that falls would put an even greater strain on struggling health care systems. The added burden of in-hospital falls drives the need for research in low- and middle-income countries (LMICs), such as the setting for this project.[69] In-hospital falls also cause emotional distress to caregivers, are a source of complaints and can result in litigation.[70, 71] Fear of complaints may add to staff concern about falls reporting, and possibly contribute to underreporting of patient falls.[72, 73] For these reasons, prevention of falls in the hospital setting is both a patient safety concern and a public health issue.

To help prevent in-hospital falls, individual hospitals need an understanding of the factors that contribute to falls in their specific context.[13, 74] The causes of in-hospital falls are multifactorial, and relate to the interaction between individual characteristics, environmental factors and organisational factors that influence fall rates.[64, 75] The literature review will examine these factors in detail. Falls risk screening tools were developed to provide healthcare providers with an objective measurement of a patient's risk for falling.[15] Based on risk status, preventative interventions can be put in place to decrease this risk in those with high scores.[15] To be useful, fall prediction tools should correctly discriminate between those with and without fall risk, in the population in which they are being used.[76] The MFS is the risk assessment screening tool used at the research site. Since the development of

the MFS, difficulties regarding variations in the scales' sensitivity, specificity and positive predictive value (PPV), and negative predictive value (NPV) have been encountered.[14, 77] Therefore, its clinical use and effectiveness as a tool to correctly predict patients at high risk of falls in an acute care setting has been questioned, particularly if it has not been validated in the specific hospital in which it is being used.[74, 78] At the research hospital, the threshold levels which separate those not at risk from those patients at risk of falls, had not previously been validated to determine the most appropriate cut-off scores. Furthermore, the sensitivity, specificity and predictive values of the MFS had not been investigated. Thus, this study set out to explore fall events at an urban tertiary academic hospital in Cape Town, to provide baseline data to guide policy and programme development.

1.1.1 The role of the physiotherapist

Assessment and rehabilitation for disorders of balance and gait as well as injuries sustained due to falls, lies within the remit of the physiotherapist, whether working with in- or out-patients.[79] In addition to the clinical care of the patient, there is an excellent opportunity for physiotherapists to become involved as members of a multidisciplinary falls team (see Glossary).[17] The use of a multidisciplinary approach in evaluating, planning, developing and implementing the Falls Policy, could improve the care of all hospital patients.[74] By conducting this research, it is hoped that the matter of falls will extend to a team beyond nurses and nurse management.

1.2 Rationale

In-hospital falls are a commonly reported patient safety incident (see Glossary) worldwide,[52, 80-82] and identified by the SA National Department of Health (NDOH) as a National Core Standard concerning patient safety.[83] However, little is known about the rate and contributing factors surrounding acute inpatient falls in the state sector in SA hospitals. Furthermore, the demographic characteristics of those who fall, as well as the circumstances and consequences of falls in terms of injuries sustained have also not been described. At the research hospital, baseline data and knowledge on specific local risk factors and vulnerable patient groups was unknown.[84] Therefore, it is difficult for the hospital to identify contributory factors and circumstances surrounding falls, which could provide useful lessons in future falls prevention.[74, 85]

A focused analysis of local falls incident reporting at the research hospital and a description of contributory factors and consequences of falls over a ten-month period, could better inform and target falls and fall injury prevention at this institution. Furthermore, this research could assist in service development and refining the Falls Policy. As recommended by best

practice guidelines, this study provides observational data and incident analysis to inform falls prevention interventions and organisational learning.[13]

The MFS had not been locally validated and therefore its ability to accurately discriminate between those who fall and those who do not fall was unknown. This study investigated which cut-off scores are clinically the most useful for accurately predicting fallers in the local patient population. Staff attitudes and beliefs about fall prevention as well as knowledge of local falls policy are crucial to a fall prevention programme.[86, 87] This study explored these factors.

1.3 Research questions

The key to contextually appropriate, evidence-informed practice, lies in the answers to these research questions:

- What is the reported rate and consequences of inpatient falls at this specific site?
- What are the factors that influence the occurrence of falls in this acute inpatient population?
    1. Are there frequently occurring patient-specific factors contributing to falls at this institution?
    2. What are nurses' experiences of the Fall Policy? Have nurses received fall prevention training? What is nurses' knowledge, attitude and behaviour towards in-hospital falls, falls prevention and the Falls Policy at the hospital?
- Is the MFS able to correctly predict those who fall in the local patient population, i.e. is it specific and sensitive? What might be the most valid score separating patients that fall and those that do not in this population?

1.4 Research setting

The research hospital is a 975-bed acute tertiary hospital in the public healthcare sector. It is situated in a large metropolitan area in CPT, in the Western Cape (WC).[88] The WC is one of nine provinces in SA and has a population of 5.8 million.[89] The City of Cape Town, which is the second most populous city in SA, has an estimated population of 4.52 million inhabitants, according to United Nations projections.[90] The most recent census, 2011, reports that in the WC, people older than 65 make up 5.5% of the population, which is lower than the national figure of just over eight percent.[91] The unemployment rate in the province is approximately 23.9%, and nearly 36% of households live below the poverty line of less than R3,500.[92] South Africa has two vastly different hospital sectors. The private, for-profit sector is better resourced than the strained public sector, both financially and in terms of

human resources per capita.[69, 93] Only 17 in 100 South Africans have private health insurance, therefore 45 million people or 82 out of every 100 South Africans rely on public healthcare.[94] . The post-apartheid government has committed to primary care principles and universal health coverage, which include the introduction of a National Health Insurance (NHI) system.[31]

In an email, Chantal Davids from the Human Resources (HR) department, confirmed that at the research hospital enrolled nursing auxiliaries (ENAs) (see Glossary) comprise 30% (n=423), staff nurses (SNs) 22% (n=314), and registered professional nurses (RPNs) 48% (n=669) of the total 1406 permanent nursing staff employed (Chantel.Davids@westerncape.gov.za, 22 July 2019). For the 2016/2017 financial year, the hospital had 49 953 inpatient admissions and a bed occupancy rate of 85%.[88] During 2017/18, the NDOH had a country-wide vacancy rate of 12.5% for nurses. It is unclear what the vacancy rate at the research site is, but agency nursing staff (see Glossary) are used daily to supplement nurse staff levels as confirmed in an email from HR (Mercy.Lazarus@westerncape.gov.za, 12 August, 2019). During informal discussions with nursing management and quality assurance (QA) personnel prior to conducting the study, the reported incidence of falls at the research hospital was estimated to be between 12-18 per month (M Govender 19 May 2016, M Ross, 24 May 2016, both personal communication), but a rate of falls had not previously been calculated.

The National Core Standards for Health Establishments in South Africa was published in 2011.[83] This document defines seven domains which the World Health Organisation (WHO) has described as areas where quality or safety may be at risk.[83] Sub-domain 2.4 and 2.5 of The Patient Safety, Clinical governance and Clinical Care domain pertain to management of clinical risk and adverse events. Sub-domain 2.4 describes the standard and criteria for reducing unintended harm to patients that have been identified as being at greater clinical risk. Sub-domain 2.5 outlines the standard and criteria to prevent, identify, manage and analyse patient safety incidents or adverse events.[83] In response to the national core standards, the NDOH developed a National Guideline to manage patient safety incidents in the Public Health Sector of South Africa.[1] In adhering to the national core standards, the research hospital implemented a compulsory Falls Policy in 2013 (Appendix B1). This policy was updated in May 2017, to comply with the national guideline to manage patient safety incidents (Appendix B2).

The Falls Policy (2013 and 2017), dictates that all inpatients must be assessed for falls risk with the MFS. Screening for falls risk is to be administered by a nurse on admission, on transfer from one ward/unit to another, following any significant change in health status or change in medication regime, and after a fall or near miss (Falls Policy, 2013). A risk score

is given according to risk factors identified as per the MFS. Based upon this score/level of risk, intervention strategies should then be implemented (Appendix C and D). The Morse falls risk interventions (Appendix C) was the intervention programme that correlated to the Falls Policy of 2013. The 2013 intervention programme lists five intervention categories, and corresponding interventions for each category. According to the 2013 policy, specified interventions were then implemented for each level of risk. When the Falls Policy was updated in 2017, the Morse falls risk interventions was replaced with the standard care plan for the management of fall risk (SCP) (Appendix D). At the research hospital, a risk score between 0-24 is considered *No risk,* and the action to be implemented per the Falls Policy (2017), is basic nursing care. Scores between 25-45 are considered *Low to moderate risk*, and scores above 46 are considered *High risk*. As the MFS increases in increments of five points, the current cut-off score is therefore effectively 50. Once a patient has been identified as at risk, the SCP is to be activated by nursing staff. The SCP includes a list of 19 *prescriptions,* which include environmental checks, education of patients and their family on fall prevention interventions, displaying *Fall risk* signs (Appendix E) above the patient's bed, for example. Environmental checks listed include the need to minimise clutter, ensure the bed is in the low position with the brakes on, ensure that personal belongings are within reach, that the patient has non-slip footwear, and that the call bell is within reach. An educational brochure for patients and visitors/family is available as a resource (Appendix F). The policy further outlines the procedure to be followed post fall, which includes completion of an AI report (Appendix G), and describes information that should be recorded in the nursing progress notes. Although AI reports exist, as far as the researcher is aware, there has been no detailed audit into its implementation. It is also unclear as to how the data that has been collected up to this point is being used to feedback and evaluate policy or service delivery. As falls are a frequently reported safety incident (M Ross, 24 May 2016, personal communication), there is a pressing need for local analysis of incident data, and exploration of how incident reporting could be improved, to better inform and target falls prevention and minimise risk to patients.

1.5 Structure of the thesis

The thesis is outlined in five chapters. The first chapter presents the background, rationale, and describes the research setting. Chapter 2 comprises a literature review to inform and support this study; it gives an account of the global burden of falls. International approaches to falls prevention and best practice guidelines are explored. A detailed account of the role of risk screening tools is given, and specific knowledge about the MFS is assembled. Chapter 2 ends by exploring studies describing organisational and staff factors which may contribute to inpatient falls. The methodology of the study is presented in Chapter 3, and

Chapter 4 presents the results. First, the rate of falls is described, followed by an examination of intrinsic factors which may contribute to falls by comparing the characteristics of a Fall-Group and a Non-fall Group. The predictive value of the MFS as an appropriate risk screening tool is investigated. Second, the survey of nurses' attitudes, beliefs and behaviours regarding the Falls Policy and falls prevention practice is examined. The chapter concludes with a summary of the main findings.

Chapter 5 presents the discussion, the limitations of the study and implications for the future, with relation to policy, practice and suggested research in the field of falls prevention. The chapter ends with the conclusion.

Chapter 2. Literature review

2.1 Introduction

The outline of this chapter is illustrated in Figure 1.

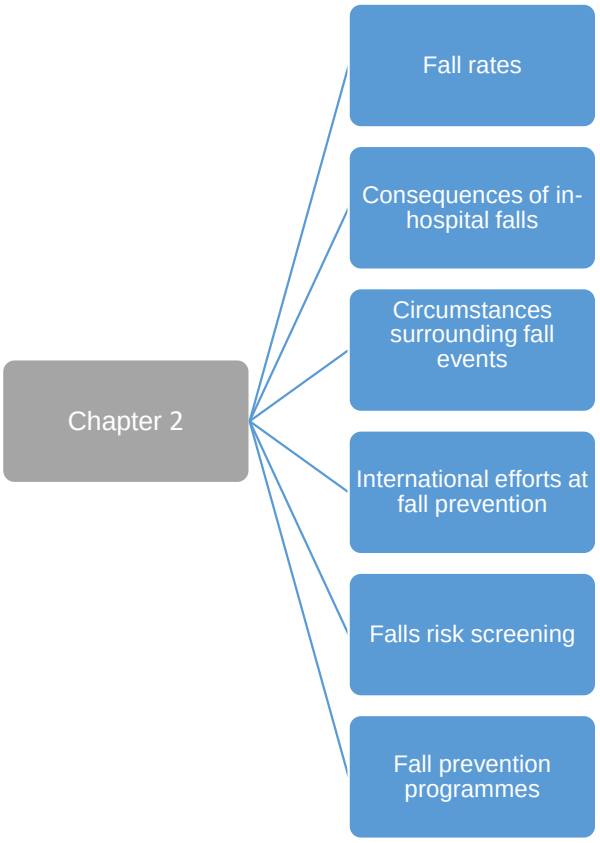

Figure 1. Outline of Chapter 2

The focus of this chapter is on fall events occurring in acute hospitals, which have been identified as being one of the most common adverse events experienced by inpatients in studies conducted in the Global North.[56, 95] In-hospital fall rates in the Global North range between three and 12 falls per 1000 patient occupied bed day (POBD),[52, 80, 81] and injuries result in up to one-half of patients who fall.[11, 64, 96] The high rate of falls and falls with injury, have prompted the establishment of falls reporting systems in countries such as the United Kingdom (UK) and Denmark.[55, 80] These centralised databases track and report on patient safety incidents, including falls and their consequences, on a national level to improve patient safety.[55, 80] In-hospital falls also have negative outcomes on the hospital itself, due to additional use of resources and extra cost.[53] In the United States of America (USA), in-hospital fall events are used as a national standard for measuring the quality of nursing care,[48] and the American Nurses Association (ANA) considers in-hospital falls a ‘’nurse

sensitive quality indicator" (see Glossary).[35] To delineate the problem of in-hospital falls, and the impact that these have on individuals, caregivers and health systems, it is necessary to have background information on international as well as local policies and frameworks, which guide falls prevention. Therefore, this chapter reviews previous literature reporting on fall rates, type of fall events, as well as the consequences of in-hospital falls. In each section, studies from the Global North are presented first, followed by studies from low- and middle-income countries (LMICs), including South Africa (SA). International efforts at fall prevention in hospitals are explored and discussed, including the use of fall risk screening tools. Studies investigating the validity and reliability of the falls risk screening tool used at the research site, the Morse Falls Scale (MFS) are explored, to place this research in context in respect to previous work in the field.

2.2 Methodology

A narrative review was done of the available literature relating to the topic, using the electronic databases PubMed, Cochrane, Scopus, Web of Science, Africa-wide Information and Google Scholar, for the period 2008 to 2019, using English only text from established peer-reviewed journals The search terms used are indicated in Table 1.

Table 1. *Literature search strategy*

Theme	**Search Terms**	**Results (Number of articles)**
In-hospital fall events	In-hospital falls	1462
	Accidental falls, patient safety events	
	Prevalence of falls	
	Fall rate	
	Falls Risk factors	
	Falls prevention	
Falls risk screening tools	Falls risk screening tools	296
	Morse falls scale	
	Falls Risk assessment	

Figure 2 illustrates that the number of articles was then reduced based on duplications. Abstracts were screened and then full text articles sourced based on setting, quality (peer-reviewed) and relevance. Pearling was done and secondary sources were searched. The researcher also reviewed relevant academic books, organisational publications and 'grey' literature.

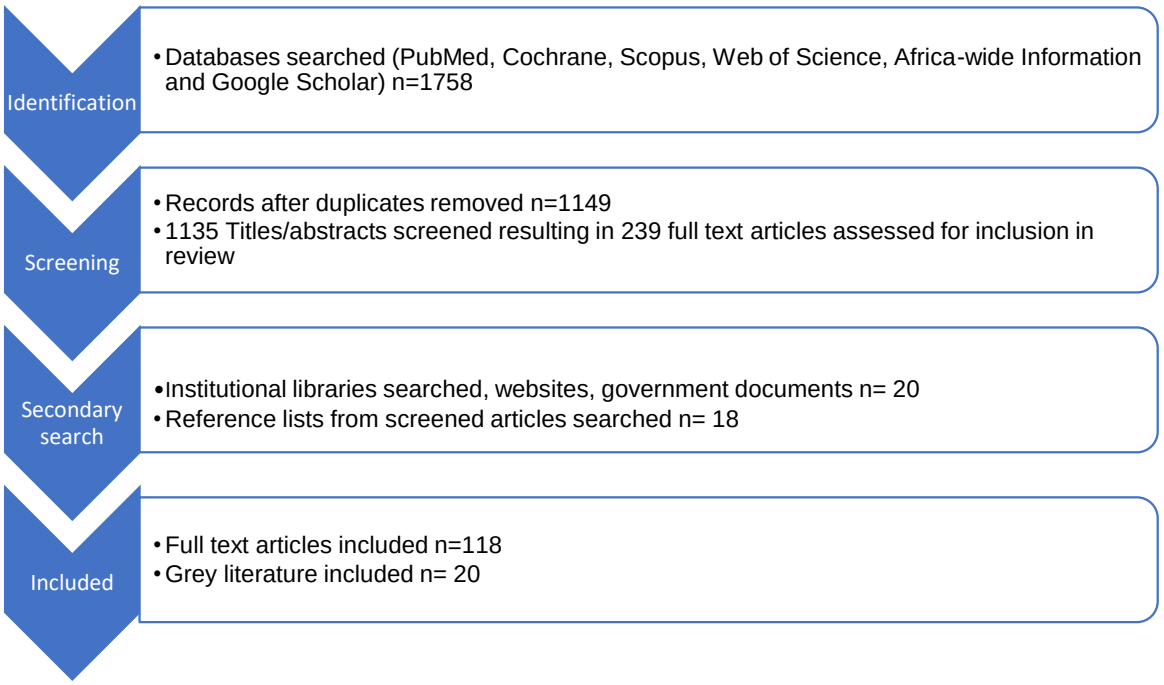

Figure 2. Flow process followed for literature review

2.3 Comparison of the number of studies from the Global North and low- and middle-income countries

A large volume of published studies describing the rate of hospital-based falls, as well as circumstances surrounding fall events in hospitalised adults exists. Most published studies found during the literature search were from an international perspective. Only nine peer-reviewed articles concerning in-hospitals fall events available in English were found from LMICs, and none of these reported on the use of the MFS. Regarding SA data on falls, four peer-reviewed articles describing the prevalence of falls and risk factors for falls in a community setting were found.[97-101] Kalula and colleagues' conducted a community-based study in three suburbs in Cape Town (CPT), SA, to investigate risk factors for falls in older adults.[97] A strength of Kalula and co-workers'[97, 98, 100] study, is that data were collected on many variables, including socio-demographic variables, which may be unique to the multi-ethnic SA population. A face-to-face survey as well as physical and cognitive tests were conducted, and other health-related factors were analysed and compared. The authors found that community-based falls are a significant problem in older adults in SA,[100] fall prevalence rates were 26.4%,[100] only slightly lower than the prevalence of falls reported (30%) in community studies in people over the age of 65 in the Global North.[3] However, the cross-sectional study design in Kalula and co-workers' study may have influenced participants' recall of fall events, and thus affected the reliability of the self-reported

information. In the same study, the high attrition rate (24.5%) resulted in missing data. Missing data may have affected the results, as the characteristics of those lost to follow up may have differed from those who were followed up.[99] In the same study, that all participants had to be independently ambulant, may have excluded frailer adults, with known increased risk of falls,[3] and thus may have underestimated the prevalence of falls in the communities studied. Kalula et al., found significant predictors of falls were a history of falls, dizziness/vertigo and ethnicity. The authors concluded that using tools validated in high income countries may not be predictive of falls in LMICs.[97] The authors therefore recommended that future studies be conducted to investigate specific fall risk factors in the South African population.[97] Williams et al.,[101] published results from the World Health Organisation Study on global AGEing (SAGE), investigating the prevalence, risk factors and disability associated with self-reported fall-related injury in communities in six LMICs.[101] SA was one of the LMICs included in the SAGE study, which analysed national data from a large cohort of adults over the age of 50 (n=32 663). While the study did not specify fall rates, the prevalence of fall-related injury was comparable to international studies,[51] and ranged from 6.6% in India, to 1.0% in SA, the lowest of all the countries included. However, the authors comment that under reporting of falls injuries may have occurred due to recall bias. Furthermore, pooling of country data may have masked patterns within individual countries, thus limiting comparison of injury rates between individual countries.[101] While work by Kalula and co-workers and Williams et al., give certain context for falls in the SA setting, a comparative analysis between the rate of falls, falls with injuries and risk factors for falling in the community [97] and those in hospitals is limited. Risk factors for in-hospital falls are likely to be different to those in the community, due to the patient in the hospital setting being acutely unwell.[102] The only previous in-hospital fall-related literature sourced from SA was grey literature. A thesis document describing falls events in two private hospitals in CPT,[60] and the annual reports from the three major providers of private healthcare services in SA, [57-59] which will be discussed in the subsequent sections.

2.4 Fall rates

The focus of this section is on in-hospital fall rates. Single- and multi-site studies conducted to evaluate the magnitude of the problem of falls, and injurious falls sustained in hospitals are therefore discussed. The abundance of falls data available in the Global North, and the apparent lack of peer-reviewed, published data available in SA is highlighted.

2.4.1 Nationwide and multi-site studies

During 2015/2016, 246 000 falls occurred in healthcare settings in the UK.[80] The reported fall rate[8] during this time ranged from 3-12 falls per 1000 POBD, with a national average of 6.6 falls in acute care. Most fall incidents occurred in acute hospitals (83%, n=204 269), strongly suggesting that patients in the acute hospital environment are at most risk of falling, when compared with fall rates in community and mental health hospitals.[80] A similar falls rate of 6.45 was reported at baseline in the 6-PACK study conducted in 24 wards across six hospitals in Australia.[103] In a large-scale study on acute adult inpatient falls, Bouldin and colleagues,[52] reported on data from 1263 hospitals across the USA. There were 315 817 reported falls during the 27-month period, a falls rate of 3.56,[52] substantially lower than the national average of 6.6 reported by the National Reporting and Learning System (NRLS).[80] The difference in study settings may explain the large difference between Bouldin and co-workers' and the NRLS (2016), fall rates. For example, Bouldin et al[49] did not include data from all acute units, unlike the NRLS, but only from medical, medical-surgical, and surgical units.[52] Medical wards are frequently associated with high fall rates when compared to other wards in the acute hospital setting.[85, 87, 96, 104-106] Likewise, in Bouldin and co-workers' study, both the fall rate, and the number of falls resulting in injury were highest in medical units and lowest in surgical units.[52] The variability of fall rates between different unit types may signal that risk factors vary significantly between the patient groups in each speciality or care unit. Risk factors for falling have been reported on extensively and will be discussed in section 2.7.

In comparison, as discussed in section 2.3, SA appears to have a dearth of published data on fall rates in the hospital setting. Netcare hospital group, Mediclinic International and Life Healthcare Group, reported fall rates across all levels of service (acute care, primary care and mental health services) ranging from 0.54-1.05 falls for 2018 in their annual integrated reports,[57-59] substantially lower than rates from the Global North. The annual reports from the three major private healthcare groups, are primarily business reports, aimed at shareholders and are freely available online. Therefore, the methodology and statistical tests used to analyse the data are unknown. Thus, these fall rates are difficult to compare with rates reported in peer-reviewed academic publications.[7, 107] In a further source of grey literature, Janse van Rensburg[60] conducted a study which investigated the factors contributing to falls in two private acute care hospitals in CPT.[60] Janse van Rensburg's

[8] Fall rates throughout this thesis document are falls per 1000 POBD (see Glossary). For the sake of brevity, a fall rate *of 6.6 falls per 1000 POBD* is reported as a fall rate of 6.6.

retrospective descriptive study included hospitalised adults who were reported to have fallen during a 17-month period. The final sample comprised 134 fall events, representing a fall rate of 1.1-1.8 falls per POBD across the two sites.[60] The rate of falls reported in Janse van Rensburg's study, though higher than the average rates published in the annual reports of the healthcare groups discussed above,[54-56] is less than previously discussed rates from international studies.[52, 80, 103]

2.4.2 Single-site studies

While the results of large-scale multi-site studies are more generalisable, single-site studies can provide individual hospitals with useful information in analysing falls with respect to their unique patient population. Some single-site studies include whole-hospital fall event analysis,[108, 109] while other studies analyse data from specific units.[10, 16] The advantage of whole-hospital studies is that an average whole-hospital fall rate is established, which in some countries in the Global North is used for benchmarking.[48] Best practice guidelines suggest individual hospitals use fall rates to track their progress with falls prevention initiatives, and as an outcome in evaluating the effectiveness of prevention practices instituted.[3, 13] In addition to average fall rates, if all units or specialisations are included in data analysis, unit specific fall rates can be tracked, allowing the hospital to identify units at higher risk, and where fall prevention practices may need to be introduced more urgently. Many single-site studies based on data from the acute hospital setting originating in the Global North were found in the literature search. The majority of studies reviewed used a retrospective descriptive design to analyse fall rates. Most studies gathered information from incident reports, and additionally, some used medical notes to source information. Previous studies have shown that using incident reports alone in retrospective epidemiological studies results in up to 25% of fall events being missed.[73] Thus the results of studies may be more reliable if data is sourced from both medical files and incident reports.[73, 110]

The range of fall rates reported in single-site studies appears to vary. For example, Anderson et al., reported a rate of 2.4 in their whole-hospital study.[108] Sato and colleagues reported a rate of 1.39 in their retrospective record review at a university hospital in Japan.[8] While both these studies included analysis of unit-based fall rates, the manner in which the units are categorised and reported differs, making direct comparison between the studies difficult. For example, Sato and co-workers analysed and reported on individual unit-specific data from 26 clinical departments, ranging from 0.00 in the emergency unit to 3.08 in respiratory medicine and rheumatology.[8] In contrast, Anderson et al., reported fall rates ranged from 0.75 in critical care to 6.47 in the rehabilitation speciality, but did not report how units were categorised or the specific rates per unit within the range.[108] In a cross-sectional study at a 370-bedded acute care hospital in Spain,[109] all patients who fell during their

admission in 2011 were studied retrospectively. In Aranda-Gallardo and colleagues' study, falls are reported as a frequency, using percentages. Most falls occurred in the medical wards (63.7%), followed by the surgical wards (20.2%), and lastly the critical care wards (16.1%).[109] During the study period, there were 128 reported falls, reported as a frequency of 0.64%.[109] It is unclear how the authors calculated this frequency, as the total number of admissions during this time is not specified in the article. Furthermore, by reporting falls as a percentage alone, rather than using fall rate (e.g., falls per 1000 POBD), the results are difficult to compare with previously discussed fall rates. Likewise, Garcia-Huete et al., reported a frequency of 0.55% of patient falls in 2009 and 0.37% in 2013.[111]

In studies from LMIC, Luzia and colleagues,[112] and de Souza and co-workers,[113] have published work done in Brazilian hospitals. As part of a falls prevention improvement initiative, a retrospective longitudinal study reported a fall rate of 1.7 falls over a 4-year period, at an urban university hospital.[112] While the study is limited in that it did not include all hospital units, Luzia and colleagues reported on number of falls per year, POBD, and the average yearly fall rate, illustrating varied fall rate in each year of the study.[112] Interestingly, the reported fall rate increased from 1.61 in the first year to 2.03 in the second year studied. The increase in rate of falls coincided with the creation of a falls committee, the introduction of a falls prevention protocol, increased focus on falls prevention training of staff, and awareness-raising for patients and their family members.[112] The authors suggest that the increase in fall rate in the second year analysed was likely due to an increased awareness of falls in the hospital, and a resultant increase in falls reporting.[112] However, the fall rate showed a steady decline in the subsequent three years that were analysed, suggesting a positive impact of the preventative measures that were put in place.[112] al Kouatly and colleagues reported a falls rate of 0.8 in a single hospital in Lebanon,[114] however, their study included fall events on medical-surgical and critical care units only, thus limiting comparison to whole hospital studies. The single peer-reviewed published study that was found originating from Africa (Egypt), reported a fall rate of 16.9,[10] substantially higher than the single-site fall rates discussed above. The sample in al Tehewy and colleagues' study, included adults over 60 years of age, in the internal medicine speciality only,[10] which may explain the higher fall rate reported in the their study.

Irrespective of whether a nationwide or a single-site study, the literature reviewed demonstrated that internationally fall rates are high. However, reported fall rates vary depending on sample size and setting. Moreover, the literature reviewed revealed a lack of data on fall rates in our local context. The next section discusses the consequences of in-hospital falls.

2.5 Consequences of in-hospital falls

Figure 3 introduces the direct and indirect consequences of in-hospital falls. While this study did not focus on the indirect harm which may result from a fall in hospital, evidence shows that apart from direct physical harm or injury suffered by the patient, a fall event can cause indirect harm by leading to fear of falling,[115, 116] activity limitation,[117, 118] and functional losses in terms of reduction in mobility.[118, 119] The psychological effects of a fall, such as fear of falling and loss of confidence, may not be evident immediately following a fall event and may be neglected consequences.[120] Furthermore, in-hospital falls result in higher rates of discharge to other health facilities, and increased need for home care.[121]

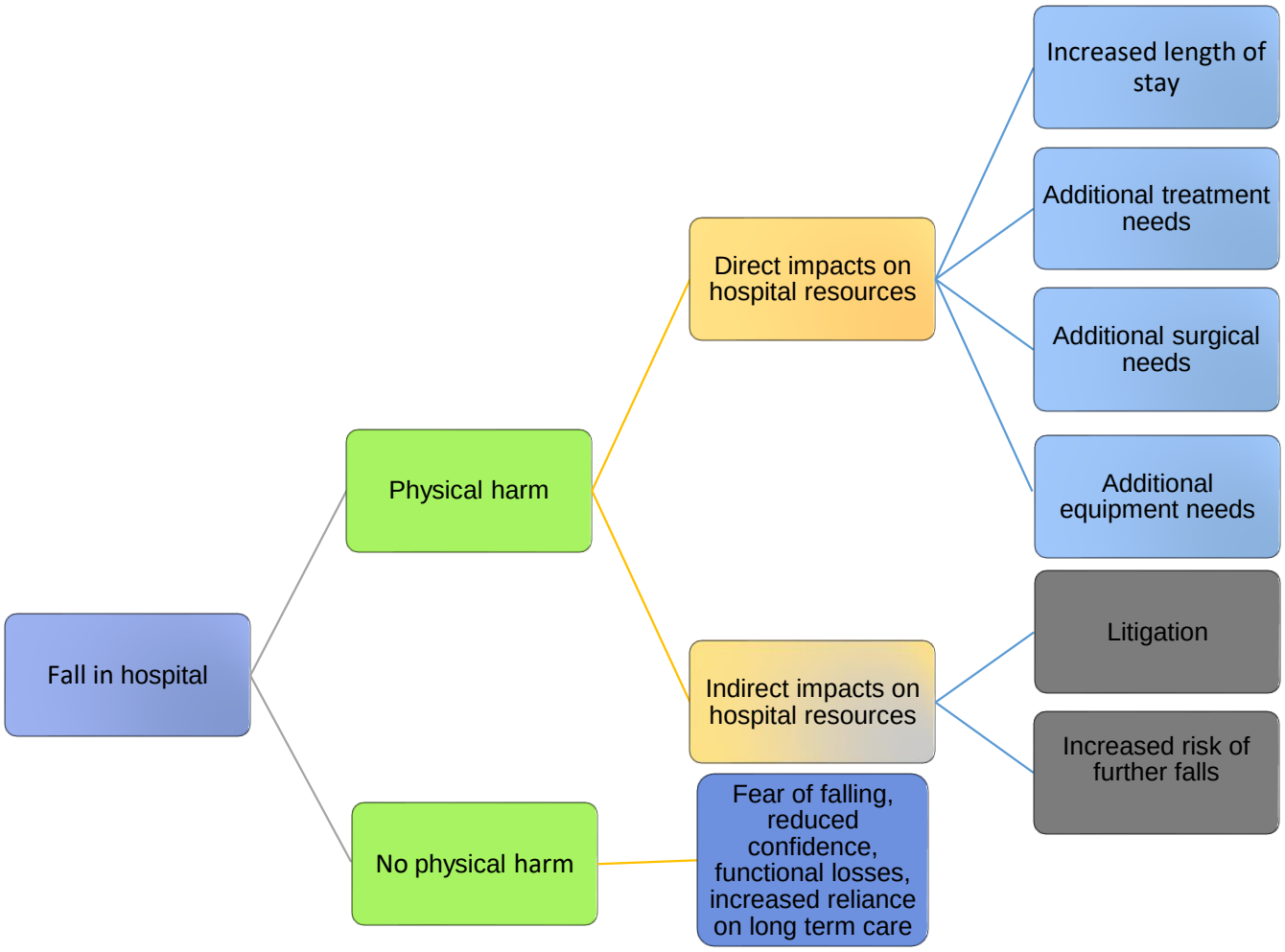

Figure 3. Direct and indirect impacts of in-hospital falls

Note. Adapted from "The incidence and costs of inpatient falls in hospitals", by NHS Improvement, 2017, p8. Retrieved from https://improvement.nhs.uk/documents/1471/Falls_report_July2017.v2.pdf

Studies from the Global North examining injuries resulting from in-hospital falls show that approximately one-third to one-half of all patients experience physical injury following a fall in hospital.[8, 11, 64, 96] Fall injuries can range from minor lacerations and bruises to severe injuries such as fractures[8, 10, 122] and death.[56, 63, 122] Studies from LMIC reporting on injurious fall rates show slightly lower figures in comparison to international data.[10, 113] De Souza and co-workers reported 28.6% (n=306) of falls resulted in injury.[113] Similarly, al Tehewy and colleagues, reported a 24% injurious fall rate,[10] and in grey literature, Janse van Rensburg reported an injurious fall rate of 26.8% (n=134).[60] A strength of al Tehewy and co-workers' study, is the prospective design used. The prospective study design is likely to reflect more reliable data than that obtained with a retrospective study design,[123] and enabled the researchers to track patients during their admission, and once a fall occurred. In al Tehewy and co-workers' study, patients who experienced a fall, had a detailed fall incident sheet completed, which included information about the circumstances surrounding the fall as well as consequences of the fall. However, it is unclear whether post-fall information was sourced from medical notes or via direct interview with the patients. It is also unclear how long post-fall the information was gathered, and whether the patients were followed up subsequently to monitor injuries that may not have immediately been evident.[120] Furthermore, the sample of patients who fell in al Tehewy and co-workers' study was small (n=50), and included adults over 60 years in a single speciality, limiting comparison to injurious fall rates in whole-hospital studies that include younger adults in their population (the association between increased age and the risk of injurious falls will be discussed in section 2.7.1). Besides the difference in study sizes and settings, variability in reported injurious fall rates between settings, may be due to errors in the way that fall injuries are classified by those reporting fall events.[124]

In an attempt to standardise the classification of physical harm sustained from falls, international falls databases such as the National Database of Nursing Quality Indicators (NDNQI®)[125] and the NRLS[1] have developed guidelines for injury classification (see Appendix H). The NRLS guidelines stipulate that hip fractures should be reported as severe,[5] yet over a quarter of National Health Service (NHS) trusts were found to be incorrectly reporting the degree of injury sustained in falls which resulted in hip fracture.[124] Fractures are the most common serious fall-related injury sustained in hospital.[65] A reported 3.9% of hip fractures sustained in the UK in 2015 occurred in hospital, amounting to over 2500 hip fractures.[124] Hip fractures have far reaching consequences and are associated with increased length of hospital stay (LOS),[62] higher rates of discharge to institutional care due to loss of functional mobility, and increased mortality.[62, 68, 119, 126] In a study using the NHS database, inpatient deaths due to falls amounted to 10% of deaths due

to unsafe care between 2010 and 2012.[63] Deaths due to in-hospital falls was the second highest cause of system failure (see Glossary) documented, after failure to act on or recognise deterioration in patients' condition.[63] Despite increased awareness and the introduction of fall prevention practices in countries in the Global North, the number of falls reported is increasing.[5, 121] The increased number of falls reported is likely due to changes in reporting practice as well as population aging.[55] Apart from the increase in reported falls emerging from international studies, evidence shows that the injuries from inpatient falls appear to be increasing too.[55, 127] In a nationwide study conducted in Denmark, the authors surmised that a focus on reducing LOS in the acute setting may lead to only the most at risk patients being hospitalised, leading to more falls, and particularly falls with injury.[55]

While personal injury is of critical importance to the patient and staff, falls in hospital place added financial burden on the health service due to increased LOS post fall.[53, 62, 128] Moderate and severe injuries may require additional medical intervention, including investigations and surgery, and greater health resource use.[53, 61, 62] Increased cost of healthcare becomes an important factor in managed health care.[129] For example, in the USA, the Centre for Medicare and Medicaid Services has identified in-hospital falls as a hospital acquired condition (see Glossary). Therefore, the Centre for Medicare and Medicaid Services does not cover the cost of expenses associated with care due to injuries sustained in an inpatient fall.[130] Non-payment is based on the premise that falls and fall-related injuries can reasonably be prevented through the application of evidence-based guidelines.[131]

In summary, while evidence from the Global North indicates that in-hospital falls occur often, frequently cause harm and can reasonably be prevented,[131] there is a scarcity of data on consequences resulting from fall events occurring in South African hospitals. The comparative lack of local data limits our understanding of the extent of the problem of falls and hampers planning and policy refinement to address and prevent fall events in hospital.

2.6 Circumstances surrounding fall events

To analyse falls, hospitals need to have a better understanding of the circumstances which surround fall events.[13] Circumstances may include the location of the fall, the activity of the patient at the time of the fall and whether the fall was witnessed or unwitnessed, to try to learn from these events.[5] Table 2 summarises the results of six studies which reported on circumstances surrounding fall events. Table 2 shows that falls occur frequently in patients' rooms and bathrooms, whilst transferring between the bed and the chair, and are often related to toileting. Most falls are unwitnessed, indicating that patients are unsupervised when they fall. The location of the fall event and the activity the patient was performing at

the time of the fall are sometimes captured together, making analysis of fall events difficult. Data regarding activity, location of fall and whether the fall was witnessed or unwitnessed, is frequently missing from incident reports.[132] Standardisation of reporting, including clearly defined parameters for reporting on fall events in incident reports would allow better comparison of results, and enable institutional learning from the incident.[132]

Table 2. *Circumstances surrounding fall events*

Authors	Study design	Sample size and Setting	Location of fall event: n (%)	Activity at time of fall Activity n (%)	Witnessed/unwitnessed n (%)	Remarks
Abreu et al., 2012[127]	Prospective longitudinal design	n=64 33 bed acute academic hospital medical ward only	Room: 53 (82.8%) Corridor: 6 (9.4%) Bathroom: 5 (7.8%)	Not reported	Not reported	Small sample limits generalisability of results.
Anderson et al., 2015[11]	Retrospective record review	n=1,438 863 bed acute community hospital	Bathroom: 558 (38.8.%) Bed: 400 (27.8%) Ambulating: 267 (18.6%) Chair: 140 (9.7%) Transfer: 73 (5.1%)	Not reported as separate from *location of fall event*	Not reported	The authors refer to the location of the event as *event type,* and do not separate the location of the event from the activity being performed at the time the patient fell. For example, ambulating is listed as an *event type* but should be an *activity*.
Anderson et al., 2015[108]	Retrospective record review	n=1,790 921 bed acute urban academic hospital	Not documented as separate from *activity at time of fall*	Transferring: 1111 (62.1%) Toileting: 311 (17.4%) Bed related activities: 310 (17.3%) Chair: 152 (8.5%) Wheelchair: 36 (2.0%) Shower: 37 (2.1%) Not documented: 128 (7.2%) Stretcher: 47 (2.6%)	Not reported.	*Location of event* and *activity* at the time of the fall are grouped together. For example, chair and shower are locations of fall events, and transferring and toileting are activities patients were performing when the fall event occurred.

Aranda-Gallardo et al., 2014[109]	Analytical cross-sectional design	n= 128 370 bed acute hospital	**In bed: 70 (56.5%)** **Moving to/from toilet: 44 (35.5%)** Seated:10 (8.1%) Walking: 7 (5.6%)	Not reported	**Alone: 90 (72.6%)** Accompanied: 28 (22.6%)	Study design not specified as prospective or retrospective design. *Location of event* and *activity* at the time of the fall are grouped together The number and percentages of fall events per *location* appear to be incorrect/unqualified, 131 (105.7%) The authors report on whether the patient was *alone* or *accompanied* when the fall occurred, which does not clarify whether the fall was *witnessed* or *unwitnessed*. Alone/accompanied falls are amount to 95.5%, the remaining 4.5 % are unaccounted for.
Chui et al., (2015)[133]	Nested case-control	n=83 750 bed acute urban hospital	**Bedroom: 44 (53%)** **Toilet bathroom: 34 (41%)** Corridor: 5 (6%)	Not reported	Not reported	Small sample size limits generalisability. Not reported as prospective or retrospective design. Activity at the time of fall and whether the fall was witnessed or unwitnessed is not reported on

Hignett et al., 2013[132]	Retrospective data form NRLS	n=19,980 Data reported to NRLS from acute inpatient settings in the UK	**Bed space: 6,232 (67%)** **Toilet: 1,786 (19.3%)** Communal area: 710 (7.6%) Multi-bed bay: 362 (3,9%) Other: 154 (1.7%)	**Mobilising to or from toilet/bathroom: 1,527 (28%)** Walking: 799 (14.7%) Fall from chair: 725 (13.3%) Transferring to bed/ chair/wheelchair: 673 (12.3%) Fall from bed: 505 (9.3%) Reaching for item: 323 (5.9%) Wandering: 318 (5.8%) Transferring from toilet/commode: 181 (3.3%) Other: 400 (7.3%)	**Unwitnessed: 14216 (91.7%)** Witnessed: 1289 (8.3%)	Not all data was available for analysis. 15,505 (78%) reports specified whether *witnessed/unwitnessed*. Only 5,451 (27.4%) records indicated patient *activity* at the time of the fall and less than half, n= 9,244 (47%) recorded the *location* of the fall. For location of fall, *multi-bed bay* is unclear as to how this differs from *bed-space* and is not qualified. The authors include qualifiers, for example *wandering*: walking with no apparent purpose, and *fall from chair or bed* with no intention of leaving chair/bed, for example if the patient was asleep.
Sato et al., 2018[8]	Retrospective record review	n=154 696 acute setting	**Room: 122 (79.2%)** **Bathroom: 13 (8.4%)** Corridor: 6 (3.9%) Dayroom:3 (1.9%) Elevator: 2 (1.3%) Other: 8 (5.1%)	**Elimination related: 68 (46.6%)** Unknown: 23 (15.8) Picking up /reaching for an object: 12 (8.2%) Standing up or walking: 10 (6.8%) Transferring to bed or wheelchair: 7 (4.8) Taking a shower: 6 (4.1) Whilst sitting: 4 (2.7) Other: 16 (11.1%)	**Unwitnessed: 102 (66.2%)** Witnessed: 49 (31.8%) Other: 3 (1.9%)	Categories for location of fall event are unclear dayroom, outside the ward elevator hall other patient room, other (not specified) More than 80% were at the bedside, though this is unclear in the categorisation of location of fall event.

The studies discussed in Table 2 are from an international perspective. One unpublished SA study which described the location of fall events reported results comparable to international retrospective studies regarding the location of falls and whether they were documented as assisted or un-assisted falls.[60] The circumstances surrounding fall events described in Janse van Rensburg's[60] study, are similar to international studies, with more than half of falls occurring at the bedside (n=74, 55.2%), followed by in the bathroom (n=47, 35.1%).[60] Likewise, most falls were reported as unassisted falls (n=131, 97.8%), although it is unclear whether falls were witnessed or unwitnessed as this variable was not specified in the study.[60] The activity that the patient was performing at the time of the fall was not specified, possibly as documenting patient activity was not part of the routine post-fall assessment at the hospitals that participated in the study. To minimise the direct and indirect consequences of falls, it is important that individual hospitals gain a comprehensive understanding of the circumstances surrounding fall events.[13] Once the circumstances surrounding fall events are better understood, targeted intervention strategies can be put in place to reduce both the rate of falls and falls with injury.[13]

2.7 International efforts at fall prevention

In response to the challenges raised by falls, best practice guidelines targeting community-based falls prevention, and specific guidelines for the prevention of falls in the acute hospital setting have been developed in many countries in the Global North.[3, 13, 54] Best practice guidelines outline the development and implementation of falls and falls injury prevention programmes, as well as strategies for evaluation of the effectiveness of these programmes.[13] Guidelines advise standardising falls prevention strategies, identification of falls risk factors, and implementation of multifactorial interventions targeting risks to prevent falls and fall injuries.[13] Whilst most research and best practice guidelines target adults over 65 years of age, the National Institute for Care Excellence (NICE) guidelines specify they be used for "people aged 50 to 64 who are admitted to hospital and are judged to be at higher risk of falling because of an underlying condition".[3p.6] While fall risk screening forms the basis of many in-hospital falls programmes, more detailed assessment of modifiable risk factors that may be amenable to intervention strategies is recommended.[28] Therefore, it is important for individual hospitals to identify what the significant risk factors are for falling in their local population. In addition, understanding which risk factors can be treated, improved or managed during the hospital stay, may prompt more effective and better targeted multifactorial assessments and interventions.

The causes of falls in acute hospitals are multifactorial, and relate to the complex interplay between individual patient-specific (intrinsic) risk factors, environmental (extrinsic) factors[134] and the process of care delivery, which includes organisational and staff-related variables.[76]

As the present study concerns falls in hospital, the literature review focussed on studies reporting on risk factors identified specifically in hospitalised patients. Intrinsic and extrinsic risk factors for in-hospital falls are now described. Finally, staff and organisational variables which may impact on falls prevention conclude the section.

2.7.1 Individual or intrinsic risk factors for in-hospital falls

Specific risk factors for falls (see Glossary) in hospitalised patients have been reported on extensively in literature from the Global North.[15, 27, 55, 96] Reviews consistently identify older age (>65years),[52, 88, 128, 129] a previous history of falls[15, 135] and gait instability,[15, 27, 136-138] as strong predictors of falls. In addition, multiple comorbidities, [55, 126, 138] agitation and/or confusion,[27, 66, 135, 136] issues with incontinence or frequency of toileting,[15, 135, 136] and the use of certain medications including psychotropic drugs,[15, 16, 137] have been identified as intrinsic risk factors for falls. A large volume of research has focused on risk factors that predict falls but cannot be treated, improved or managed, such as the age [66, 109, 127] and sex[9] [96, 140, 141] of the patient. However, Healey strongly advocates that hospitals attempt to identify risk factors that are modifiable to change, to manage these factors and thus minimise risk.[28]

Studies from LMICs describing intrinsic risk factors are scarce. De Souza et al., described frequently occurring characteristics in 1071 fall incidents.[113] The majority of falls (70.8%) occurred in patients 60 years and older, and more than half (61.5%) of those who fell were using medications associated with increased risk of falls.[113] Janse van Rensburg aimed to identify intrinsic factors that influence falls in hospital.[60] The study was based on 134 patients who fell, but similarly to De Souza and co-workers', Janse van Rensburg's study did not include a control group of patients that did not fall.[95] The mean age of patients who fell was 68.7 years (SD 15.1, range 20-92), and 79.9 % (n= 107) had one or more co-morbidities. Whilst only 2.2% (n=3) had a documented prior history of falls, most had mobility problems (59%, n=79).[60] However, no association between variables could be determined statistically without a comparator group. Furthermore, regression analysis, to ascertain whether intrinsic factors described predicted falls, was not performed in either de Souza et al., or Janse van Rensburg's study. Therefore, in studies aiming to identify risk

[9] Whilst sensitive to the issues of sex vs gender, the term *sex* is used in the context of this study instead of g*ender,* as this study does not refer to socio-cultural systems that include norms and expectations for males and females, but rather to the biological systems that influence sexual differentiation of the external genitals.139. Hyde JS, Bigler RS, Joel D, Tate CC, van Anders SM. The future of sex and gender in psychology: five challenges to the gender binary. Am Psychol. 2019;74(2):171.

factors that are predictive of falling, a control group should be included in the methodology.[142]

2.7.2 Extrinsic factors

Up to 25% of in-hospital falls have been reported as occurring due to extrinsic factors.[16] In their retrospective record review, Cox and colleagues report 28% (n=14) of falls were driven by environmental hazards, though how these were classified is not detailed, and affects the interpretation of the results. In a systematic review, Taylor and Hignett categorised extrinsic factors into organisational factors (including operations, policies, and procedures), people (staff, caregivers, and patients), and the environment.[143] Previous studies have investigated potential risk factors in the physical environment of the hospital, for example the use of inappropriate footwear,[142, 144] ward and bathroom layout,[145-147] objects that present a trip or slip hazard,[146-148] the location and distance of the bathroom,[145-147] and the type and design of flooring.[145, 149, 150] Calkins et al., reported significantly fewer falls in single patient use bathrooms, than when the bathroom is shared between two patients or where there is no bathroom in the room at all.[145] Wolf,[147] Calkins,[145] and co-workers, reported a higher rate of falls associated to rooms with direct visibility or proximity to the nursing station. The authors argued that it is common practice to position high risk patients close to the nursing station as part of fall risk reduction patients.[145, 147] Therefore, the high fall rate in beds close to the nursing station may be due to the intrinsic risk status of the patient, rather than the physical location of the room. In the only hospital-based study available in SA, environmental factors documented as contributing to falls were categorised as furniture, wet floors, heights of toilet seats, the availability of a call bells, and the use of bedrails.[60] Trips over ward furniture or equipment was documented as a contributing factors to falls in 13.4% (n=18), and slips on wet floors in 11.9% (n=16) of fall events. The heights of toilet seats and loose fitting shoes was documented as a contributing factor in 4 cases (2.9%).[60] In studies using a retrospective study design, researchers rely on previously documented information available in medical records and incident reports, it may not possible to ascertain the role of environmental factors on individual fall events, unless specifically documented as a contributing factor in the records.[142] al Tehewy and colleagues noted that protective measures put in place to prevent falls, and environmental factors which contributed to falls, such as the presence or absence of a call bell, bed side rail use and lack of hand rails, were not routinely documented in the patients' folders.[10] Therefore, studies employing a prospective design may be more useful in determining extrinsic factors contributing to falls using face-to-face interviews of patients and staff members.[142]

To mitigate potential risk posed by environmental factors, clutter can be removed, and furniture rearranged easily and cheaply. However, replacing of flooring, modification of

spatial organization of room, bathroom and ward layout would be a bigger challenge for hospitals. Whilst not the focus in this thesis, considering the aging infrastructure at the research site, the designed environment may contribute to fall risk at the hospital.

2.7.3 Organisational factors which influence fall rates

While human factors have been identified as the focus in adverse incidents (AIs) globally, organisational factors also contribute to AIs occurring in health establishments.[1, 20, 143, 151] Human factors contributing to fall events include staff attitude and knowledge in identification of risk and implementation of intervention strategies.[1, 20] A need for further training of nurses in falls prevention practices is frequently identified in literature where staff surveys are conducted.[152-155] In a multi-site audit conducted across nine acute care hospitals in Australia,[153] there were common barriers to compliance with operational policies and procedures experienced across the different hospitals. Barriers included insufficient falls education for staff, leading to a lack of knowledge about when to conduct risk assessments, and how to appropriately address identified risks.[153] Ayton et al., reported on barriers and enablers to the implementation of the 6-PACK falls prevention programme.[154] While barriers included a lack of resources and limited knowledge on falls prevention, enablers included regular face-to-face education and training for nurses, audit, reminders and feedback. Clear goals and a commitment from senior management, leadership and falls champions, was found to be key to the success of implementing a falls prevention programme in hospitals.[154] Furthermore, the provision of falls data was identified as an opportunity for organisational learning.[154]

Gaps in organisational culture, may influence patient safety culture (see Glossary), and therefore patient safety climate (see Glossary).[46] A positive patient safety climate has been reported to be associated with enhanced patient safety.[46] Lawton et al., surveyed staff and patients across three acute NHS hospitals in the UK, to establish whether patient and staff perceptions of safety climate related to safety outcomes.[156] The authors' findings revealed that staff and patient perceptions of safety both independently predicted safety outcomes.[156] The implication of the researchers' findings is that patient feedback about the safety of the care, in addition to data from staff, can be used to drive safety improvements in healthcare.[156]

Other organisational factors that can influence fall rates include staff shortages.[157] The availability of staff, for example to respond timeously to patients' needs, and supervise those that are confused, are important in fall prevention.[157, 158] Several reviews have highlighted the significant relationship between higher levels of nursing staff and improved patient outcomes, including patient falls.[158-161] Cho et al., reported more injurious falls with a larger

number of patients per nurse.[160] Besides nursing staff to patient ratios, the effect of nurse skill mix (see Glossary) on falls has been previously investigated.[16, 114, 158] Some studies suggest that lower in-hospital fall rates are associated with a higher ratio of registered professional nurses (RPNs) to enrolled nursing auxiliaries (ENAs).[16, 158] The one study from a LMIC investigated the effect of nurse staffing ratios on nurse sensitive outcome indicators (see Glossary) in targeted units in an acute hospital in Lebanon.[114] The authors found a significant association between nurse skill mix and patient falls (*OR*=2.40, CI 1.31-4.41, *p*=.005), with less skill mix resulting in more total falls on the medical-surgical unit only. The authors concluded that more research was needed across different units and sites, particularly in LMIC, due to a dearth of research.[114]

The results of studies analysing fall rates and nursing shifts remain inconclusive. Two studies found patients were more likely to fall during the night time shift.[16, 109] In contrast, Abreu et al., and al Tehewy and colleagues, found most falls occurred during the morning shift (8h00-16h00), and the least during the day shift (16h00-24h00).[10, 127] Abreu and co-workers hypothesised that the increased number of morning shift falls may be due to less supervision of patients during this busy period, as well as increased patient activity.[127] However, generalisability of the relationship between fall rates and nursing shifts is limited due to the small study sample (n=64). Moreover, al Tehewy et al., found falls occurred more frequently on weekdays than weekends.[10] The increased frequency of fall events during the week may be due to increased levels of activity on the ward on weekdays, including investigations, therapies, ward rounds and higher bed occupancy.[10] It is likely that a combination of interplay between of levels of patient activity over a 24-hour period, and nursing staff levels and responsibilities during different shifts, influence the occurrence fall events.[10] It may not be possible to isolate a single reason for increased fall rates during certain shifts due to the interplay between staff levels and responsibilities.[127] However, hospitals can analyse the trends and patterns of fall events in terms of times of day and days of the week, to identify more 'at risk' times.[13] Knowledge of trends of times of the day or days of the week when falls are more likely to happen, may assist with organisational planning regarding staffing levels, and perhaps increasing targeted interventions during these 'at risk' times.[13]

Organisational and human factors, including the perception of the culture of safety and staffing levels at the research hospital, may contribute to the occurrence of falls. Furthermore, staff attitudes and knowledge in risk identification and interventions to reduce falls have not been investigated at the research site. Based on identified falls risk, an intervention programme should be implemented to minimise the risk of falls, modify reversible risk factors, and reduce fall-related injuries.[14] Many international studies identify

risk factors for falling in the inpatient setting, but these studies may not be relevant to the SA hospital population.[97] Best practice guidelines recommend individual hospitals identify the significant risk factors for falling in their local inpatient population, then assess which of these are reversible, to develop more effective and better-targeted multifactorial assessments and interventions.[3, 13]

2.8 Falls risk assessment tools in the acute hospital setting

Many falls risk screening tools and falls risk assessment tools have been developed and reported on in the literature.[26, 162-164] Falls risk screening tools are designed to provide healthcare workers with objective measures to determine a patient's risk for falling, so that preventative interventions can be put in place to decrease this risk in those with high scores.[15] Examples of falls risk screening tools include the MFS, the St. Thomas risk assessment tool in falling elderly inpatients (STRATIFY), the Downton index (DI) and the Hendrich ll fall risk model (HIIFRM).[26, 163, 164] For falls screening tools to be useful, they should correctly discriminate between those at risk and those not at risk for falls in the specific population in which they are being used.[76] Although the MFS,[26] the STRATIFY,[163] and the HIIFRM[164] are three of the most commonly used risk screening tools, contrasting findings and poor predictive values in various healthcare settings have been described.[14, 30, 165-171] For example, Castellini et al., concluded that the STRATIFY was an inadequate in detecting almost two-thirds of acute inpatient falls in a retrospective observational study.[168] In a meta-analysis comparing fall risk tools in hospitalised adults, Harrington et al., found the STRATIFY and MFS were comparable in accuracy.[170] However, the sensitivity of the MFS was significantly higher the an the STRATIFY, whereas comparisons of specificity was inconclusive.[170] Likewise, the DI has shown poor sensitivity of 0.58 and specificity of 0.62.[172] With poor predictive values and the low sensitivity and specificity of fall risk assessment tools, health administrators and policy makers should question the value of using these scales in the acute hospital setting. The Royal College of Physicians reported that many acute NHS trusts have stopped using falls risk screening tools (a drop from 74% in 2015 to 34% in 2017).[124] These tools do not appear to sufficiently predict who will fall in hospital,[169] and are therefore no longer recommended by the NICE.[3]

The following section introduces the MFS, which is highlighted in preference to other scales as it is the instrument used at the hospital under study.

2.8.1 The Morse Falls Scale

The MFS was published in 1989 and was originally developed and validated in varying patient populations including acute and rehabilitation wards as well as nursing homes in Canada.[26] With a cut-off score of 45 out of a possible 125 (with higher scores indicating

increased risk), the MFS was reported to have a sensitivity of 78%, a specificity of 83% and inter-rater reliability of 0.96, when published by its developers.[26] The positive predictive value (PPV) was 10.3% and the negative predictive value (NPV) was reported as 99.2% in the original study.[26] Scores on the MFS are based on a nurse's clinical assessment. The nurse sources the information by interviewing the patient and from the patient's medical folder. Six variables are assessed and assigned scores based on the assessor's judgement of the patient's status within each parameter. The MFS scores increase in 5-point increments, in a numeric range from 0 to a maximum of 125.[26] Although the original authors suggest that the threshold should be varied locally,[173] it has been commonly adopted in formats where 0–20 indicates no risk, ≥25 indicates at least low to moderate risk and ≥45, 50 or 55 indicates high risk.[14, 77, 174] At the research hospital, a total score between 0-24 is considered no or low fall risk; 25–45 is low to moderate risk level, and 46 or greater is high fall risk. Since the development of the MFS, difficulties regarding variations in sensitivity, specificity, PPV and NPV have been encountered.[30, 77, 141, 174] Scott et al., recommended validating fall risk assessment tools by analysing sensitivity, specificity, PPV and NPV, as well as using a receiver operating characteristic (ROC) curve analysis to select the optimal cut-off point.[78] By reporting on sensitivity and specificity alone, the accuracy of the tool to correctly predict the probability of a person identified to fall is not established. In this research project, the ROC curve was therefore used to determine the optimal cut-off point for discriminating between those at risk, and the area under the curve (AUC) to establish predictive accuracy of the scale. PPV, NPV, and sensitivity and specificity analysis were also performed.

Table 3 shows the optimal MFS cut-off score varies between 45 and 55. Furthermore, varying sensitivity, specificity and predictive values are noted. The fluctuating predictive accuracy of the MFS highlights that the MFS must be locally validated to determine whether it is useful and accurate at predicting those who fall in a specific setting.

Table 3. *Optimal cut-off scores for the Morse Falls Scale*

Reference	Mean age (years)	Optimal cut-off score	PPV %	NPV %	Sensitivity %	Specificity %	OR	Predictive accuracy	AUC % YI	Comments
Baek[175] **n=151 Fall** **694 Non-fall**	48	**51**	63	94	72	91	Not reported	Not reported	AUC= 77 YI= 0.63	The MFS showed relatively high predictive performance with an AUC of 0.77 and a YI of 0.63. Sensitivity and specificity are both above 70%.
da Costa-Dias[104] **n=100 Fall** **n=200 Non-fall**	76	**45**	45	82	78	52	3.8 (95% CI, 2.17-6.51)	60	AUC= 65 (95% CI=0.58-0.71 YI= 0.300	78 % true positives and 22% as false negatives. The predictive accuracy was only 60%, and AUC 0.648. Likewise, the YI was low. Authors concluded that the MFS may not be more valuable than nurse's clinical assessment of fall risk.
Healey[14] **n= 28 Fall** **n=439 Non-fall**	71.2	**55**	21	95.6	58.6	80.3	Not reported	Not reported	AUC Not reported YI= 39 (95% CI=0.20-0.58)	An MFS of $\geq$ 55 is significantly better than random chance at predicting patients who will fall, although sensitivity falls below 70 %. Only 58.6% of those who fell were identified, while 41.4% of those who fell were not predicted to fall.

Sung[138] **n=66 Fall** **n=100 Non-fall**	>55	**45**	66	76	62	79	Not reported	72.3	AUC= 71 YI Not reported	At a cut off score of 45 the MFS had relatively good accuracy. The balance between sensitivity and specificity is fair, but the sensitivity is below 70%.
Watson[30] **n=46 Fall** **n=454 Non-Fall**	68	**55**	12	96	87	34	Not reported	Not reported	AUC= 65 (95%CI 0.58-0.72) YI Not reported	Poor balance between sensitivity and specificity. AUC 0.647 signifies only moderate accuracy of the MFS in this setting.
Yazdani[141] **n=256 Fall** **n= 32,802 Non-Fall**	59	**45**	16	99.7	81.25	61.37	1.038 (95% CI, 1.033-1.043)	Not reported	AUC= 78 YI= 0.42	At a cut-off score of 45, the sensitivity is high, but specificity is not optimal. The AUC shows good predictive value of the MFS in this setting.

Note. MFS= Morse Falls Scale. NPV= Negative predictive value. PPV= Positive predictive value. OR= Odds ratio. YI= Youden index

2.9 Fall prevention interventions

At the research site, if a patient is classified as at risk for falls, according to the Falls Policy, the standard care plan for the management of falls risk (SCP) (Appendix D) should be activated by nursing staff. As discussed in Chapter 1, the SCP lists 19 interventions that nurses can institute to reduce the risk of falls. It is unclear which of the interventions are currently being used, and whether the interventions are evidence-based. The next section discusses the evidence for fall prevention interventions found in the literature.

Randomised controlled trials (RCTs) investigating the effect of single interventions, for example identification bracelets for high risk patients, vitamin D supplementation, bed sensor alarms, have not identified a statistically significant reduction in falls outcomes.[102] Patient education has been identified in the literature as having potential benefit in falls reduction.[176, 177] Haines et al., reported on an RCT where the intervention group was provided multimedia written and video-based patient education, and one-on-one follow-up from a physiotherapist.[176] The control group received written material only.[176] The fall rate did not differ significantly between the two groups (0.91, 95%CI= 0.58-1.42, *p*= 0.63). However, falls were less frequent in cognitively intact patients in the intervention group compared to cognitively intact patients in the control group (0.51, 95% CI=0.28-0.93, *p*= .03),[176] suggesting that in cognitively intact patients, providing educational materials alone, may make little or no difference to the rate of falls or risk of falling. The research hospital has a brochure '*Information to prevent falls'* (Appendix F), which is designed for patients and their families/visitors. However, as highlighted by Haines et al., providing written information as a single intervention, without one-on-one follow up and reminders to patients may not be effective at reducing falls.[176]

Interventions to improve safety in the patient's personal environment includes the call bell being accessible,[178] adequate lighting,[147, 148] availability of grabrails, and products such as mobility assistive devices, lifting devices,[145] wheelchairs and commodes.[142] The heights and ability to lower beds and chairs,[146, 147, 179] and make them stable by having functional brakes, as well as the presence of functional bed rails has been highlighted as being important.[142, 146] While nursing staff manage the patient's immediate physical environment, all members of the multidisciplinary team have a crucial role to play in falls prevention. Poor lighting, call bells, bed rails and brakes of beds, as well as wheelchairs and commodes that are faulty should be reported to nursing staff, and can be easily rectified with a reliable maintenance team. The aging infrastructure at the research hospital, and availability of assistive devices and functional equipment, may be barriers to implementing interventions listed on the SCP. Barriers to implementing falls prevention programmes and features of the

falls prevention programme that nurses feel may require improvement are therefore investigated in the nursing survey in this study.

Multifactorial interventions have been investigated with mixed results.[75, 81, 134, 180] The updated Cochrane review of hospital-based falls (2018),[102] included 24 trials (97 790 participants, mean age 78 years), and concluded that multifactorial interventions may reduce the rate of falls in hospitals.[102] However, evidence for exactly which combinations of care are most effective at reducing falls outcomes still needs to be established.[3] Barker and colleagues conducted a nine-year retrospective observational study involving 271 095 patients from a single hospital in Australia.[181] The multifactorial fall prevention programme instituted in Barker and co-workers' study,[181] included the establishment of a multidisciplinary falls committee (see Glossary). All patients on *high risk* wards were assessed for risk using the STRATIFY risk assessment tool.[181] Targeted interventions were instituted for patients identified as *high risk*. The interventions included placement of a *falls-alert sign* above the patient's bed, supervision of patients in the bathroom, use of a high–low bed, lowered to floor level, ensuring that patients' walking aids were within reach, establishment of a toileting regime, and use of bed/chair alarm.[181] The programme was referred to as the 6-PACK programme.[181] The results of Barker and colleagues' study showed no difference in the rate of falls over the study period.[181] However, there was a significant sustained reduction in injurious falls following the implementation of the programme.[181] The authors noted that improved reporting of incidents occurred during the observation period, and hypothesised that improved reporting practice may explain the unchanged fall rate.[181] Following the success of the single site observational study, Barker and colleagues later conducted the 6-PACK RCT across six hospitals, including 24 wards over a 12-month period.[81] The 6-PACK trial investigated the effect of a fall risk tool, and individualised use of one or more of six interventions,[81] versus usual care in control wards, on the rate of falls and falls with injury. The results were based on 46 245 admissions. While there was an improvement in falls prevention practice reported in the intervention wards, the rate of falls (1.04, CI 0.78 to 1.37; p =0.796) and fall injuries (0.96, 0.72 to 1.27; p =0.766) were similar in intervention and control wards. The cause of no effect for the intervention, may be due in part to control wards already having good prevention practices in place. Furthermore, staff skill mix, the availability of mobility aids, and the use of medication acting on the central nervous system (CNS) were not considered. Moreover, falls risk factors including gait, balance, muscle strength, functional impairment, and use of walking aids; and complexity of illness were not investigated. The authors concluded that future research should focus on system level and environmental interventions, as these may offer improved effectiveness at reducing fall rates and injuries from falls.[81]

Conversely, a non-randomised controlled evaluation of the FallSafe project, involving 16 hospitals in the UK, reported a reduction in fall rate in the intervention wards (adjusted rate ratio (ARR) 0.75, 95% confidence interval (CI) 0.68-0.84 $p< 0.001$).[182] There was no change in the fall rate in control wards in this observational study (ARR 0.91, 95% CI 0.81-1.03 $p= 0.13$).[182] The FallSafe project involved bundles of care offered by nurses to patients.[182] Care bundles consisted of the call bell being in sight and reach of the patient, a cognitive screen, questions about fear of falling, history of falls noted. In addition, taking lying and standing blood pressure, a medication review, including reduction in night sedation, ensuring the patient used safe footwear, and evidence of urine dip-test taken and recorded were included interventions.[182]

Miake-Lye et al., conducted a systematic review interrogating inpatient fall prevention programmes and concluded that there is strong evidence that multi-component programmes can reduce the risk for falls by as much as 30%.[75] The authors describe frequently used components of prevention programmes including risk assessments for patients, patient and staff education, bedside signs and wristband alerts, footwear advice, scheduled and supervised toileting, and a medication review. Many of these components are included in the research hospital's SCP. Themes associated with successful implementation of fall prevention programmes were identified as organisational support and a culture of safety.[75] Organisational factors which improved the success of falls programmes, included leadership support, engagement of front-line staff in programme design, guidance of the prevention programme by a multidisciplinary falls team. Furthermore, pilot testing the interventions, the use of information technology systems to provide data about falls and staff education and training, changes in pessimistic attitudes about falls prevention were all associated with successful implementation of falls prevention programmes.[75] While components of previously investigated interventions are included in the SCP, organisational factors contributing to falls have not been investigated at the research site. Thus, baseline nursing staff attitudes, use and knowledge regarding the Falls Policy, and training received are investigated in this study.

Despite the optimal combination of which interventions are most effective at reducing the rate of falls and injuries from falls being unconfirmed, organisations should be proactive in reducing the risk of modifiable risk factors. To reduce the risk of falls, the research hospital should consider patient factors, environmental factors and organisational factors that are amenable to change. The research hospital has established and implemented a Falls Policy, which includes a risk screening tool, and an intervention programme to minimise fall risk. However, the degree to which the policy and interventions in the SCP are being used has not been evaluated. Best practice guidelines in falls prevention refer to the cyclical

process of planning, implementing and evaluating falls prevention programmes.[17] This study aims to provide data to assist with evaluating the use of the current Falls Policy and intervention programme.

2.10 Conclusions of the review

The evidence indicates that in-hospital falls are a problem,[52, 53] that falls cause harm,[8, 64] and that harm from falls is increasing.[5, 55, 121] We know that certain circumstances surrounding fall events, such as the location of the fall, the activity the patient was performing at the time of the fall, and whether the fall was witnessed or not, occur frequently.[8, 108, 127, 132] The literature review identified specific intrinsic risk factors which can place hospitalised patients at increased risk of falls. Moreover, environmental and organisational factors can contribute to in-hospital falls.[20, 143, 151] The literature search revealed a scarcity of research from LMIC with regards epidemiological data, and factors contributing to falls, particularly from the African continent. Baseline descriptive data for fall rates in SA was only found in annual reports of private healthcare groups in SA,[57-59] and a thesis document,[60] all grey literature, not published in peer-reviewed sources. The single study investigating characteristics and circumstances surrounding fall events in South African hospitals was found a thesis document.[60] While staff-related factors impacting in-hospital fall events appear to have been the focus of international research, increasingly, research focus appears to be shifting to exploring organisational culture and safety climate in institutions. Nursing staff attitudes, knowledge and beliefs regarding falls prevention practices at the research hospital were unknown, and barriers to implementation of the Falls Policy had not previously been identified.

While many falls risk screening tools are in use, a review of the relevant literature indicated that these tools have demonstrated variable predictive accuracy.[30, 104, 138, 141, 175] Thus, if used, risk screening tools should be validated in that specific clinical environment, to determine the most optimal cut-off score, to ensure efficient use of limited resources.[13]

Systematic reviews reflect limited high-quality evidence from RCTs or observational studies on which to base fall prevention programmes,[75] and novel solutions are needed. The focus of this research was not on interventions to reduce fall outcomes. However, current ward practice on which interventions are commonly used as part of fall prevention, was investigated. It is hoped that the information from this study will act as a baseline for development of the falls prevention programme, and give insight into how the Falls Policy is currently being used.

Chapter 3. Methodology

3.1 Introduction

As highlighted in Chapter 2, falls are a public health issue which occur frequently in the hospital setting.[52] In-hospital falls have negative outcomes for the patient and the hospital and are considered an area of health system failure.[63] Falls in hospital invariably extend the duration of hospital stay, influence patient outcomes and ultimately have additional impact on the health system. A review of the literature revealed a scarcity of published data from low- and middle-income countries (LMIC) regarding in-hospital falls. This study set out to establish the rate and associated risk factors for falls in hospitalised adults. A description off fall events and their consequences, and analysis of the predictive accuracy of the current falls risk screening tool, the Morse Falls Scale (MFS) may assist the hospital with evaluation of the current Falls Policy and assist with further policy development. This chapter describes the research design, sampling strategy, selection criteria, and instrumentation and materials used in the present study. The study procedure and statistical analysis of data, as well as ethical considerations are discussed.

3.2 Aims of the study

The **overall aim of the study** was to determine the reported occurrence of falls and the patient-specific and staff-related factors, which may influence falls at the research site. The aim was achieved by comparing a group of patients who fell and a group of patients who did not fall, and by conducting a survey of nurses.

The specific aims linked to specific objectives of the study were as follows:

Aim one: To describe the rate and predictors of falls in the tertiary hospital

Objective 1: To determine

- the total number of in-patient falls reported in a ten-month period between 1 June 2016 and 31 March 2017.
- the rate of reported inpatient falls, described as the number of falls per 1000 patient occupied bed days (POBD).
- the number of in-patient falls per department/ward/speciality.

Objective 2: To compare patient-specific characteristics in a group of patients who fell, (the Fall Group)[10] and a control group of patients that did not fall (the Non-fall Group), to ascertain the factors associated with fall events. The patient-specific characteristics for between-group analysis included:

- demographic data (age, sex).
- medical characteristics, including length of stay (LOS) and number of comorbidities.
- discharge destination and mortality.
- a history of falls, the presence of a secondary diagnosis, ambulatory aids, walk/ gait status, the presence of intravenous (IV) therapy, a mental state of confusion, as taken from the MFS sub-categories
- other known risk factors, including administration of psychotropic drugs, and issues with continence.
- documented MFS scores and MFS risk category allocation.

Objective 3: In the Fall Group, to describe the

- frequency of use of the MFS post fall.
- circumstances surrounding falls, if documented, including the time of day, day of week, location of fall event and activity at the time of the fall.
- the number of inpatient falls that result in injury.

Objective 4: Further objectives related to the predictive validity of the MFS:

- To establish if the MFS correctly identified patients with and without falls by calculating the sensitivity, specificity, positive predictive values (PPV), and negative predictive values (NPV) of the MFS.
- To ascertain the predictive value of different MFS cut-off scores to determine which score is most useful in identifying in-hospital patients at high risk of falls.

[10] Whilst it is acknowledged that it is preferable not to define patients by their pathologies Strudwick, R. M. (2016). Labelling patients. *Radiography*, *22*(1), 50-55., the cases and control group are referred to as the Fall and Non-Fall Group for the purpose of brevity in this document.

Secondary aim: To examine the knowledge, attitudes and behaviours of nursing staff regarding in-hospital falls, the Falls Policy and interventions to minimise fall risk.

By use of a questionnaire, the following objectives for the secondary aim were:

Objective 1 of secondary aim: To describe the demographic characteristics of nursing staff in terms of

- the percentage of nurses employed at the hospital for less than one year, between one and five years, and longer than five years.
- the percentage of nurses employed on their current ward for less than one year, between one and five years, and longer than five years.
- the percentage of nurses that report having had falls prevention training, and in those that have had training, to ascertain how long ago this training occurred.

Objective 2 of secondary aim: In the same sample, to describe nurses' experiences of the Falls Policy by exploring

- whether nurses believe the current Falls Policy is useful in prevention of patient falls.
- nursing staff knowledge of the definition of a fall, the Falls Policy and fall prevention programme.
- nurses' perceptions of ward practice of falls prevention and the post-fall procedure.

Objective 3 of secondary aim: To ascertain nurses' perceptions of

- areas of the falls prevention programme that might need to be revised.
- possible barriers to implementing the falls prevention programme.
- the need for fall prevention training, and in those that feel training is required, the preferred mode of such training.

The research components of this study were conducted in two parts, the retrospective record review, and the nursing survey, which ran concurrently.

3.3 Retrospective record review

3.3.1 Study design

A quantitative method, using a descriptive retrospective record review design[183]. The advantages of this design are easy access to already existing information in patient folders, adverse incident (AI) reports and the quality assurance (QA) database. The main disadvantages posed by this design are missing data, for example missing MFS forms, and uncertainty regarding the quality of previously documented information in folders, fall data captured on the QA database, and in incident reports. For the purposes of this study,

participants were grouped into ‘cases’, the Fall Group, and ‘controls’, the Non-fall Group, and differences between the two groups were analysed.

3.3.2 Sampling method and identification of cases and controls

For the Fall Group, total population sampling was carried out,[184] information was gathered from the existing AI database at the research site The database included a MicroSoft Excel spreadsheet with a list of all patients reported to have experienced a fall. For the control group, the admissions database was used to compile a list of the next consecutively admitted patient who did not fall. Each entry was checked and selected if it met the inclusion criteria.

3.3.3 Patients

Cases: Inclusion criteria included all adult inpatients, 18 years or older, who experienced a fall, or more than one fall whilst an inpatient between 1 June 2016 and 31 March 2017. This fall must have been reported in an AI report and entered onto the QA database.

Controls: The control group consisted of the folder of the next consecutively admitted adult patient, 18 years or older to the same ward, who was not reported to have fallen. Patients whose medical files were not available to the researcher or had missing data were excluded.

3.3.4 Instrumentation and materials

For the Fall Group, the AI database was the initial data source. The researcher developed a data capturing tool (Appendix I) based on references in the literature[11, 85, 109] and the Falls Policy. Additional information was sourced from patient medical records, drug chart and Waterlow score (see Glossary) chart (Appendix J).

3.4 Knowledge, attitudes and behaviours of nurses regarding in-hospital falls

3.4.1 Study design

Quantitative method, descriptive cross-sectional survey design[185, 186] using a purposely designed questionnaire (Appendix K1-3), based on a previous study.[44] The advantages of using a descriptive survey design is that the research can produce a large amount of empirical data in a short time, for a low cost.[185] The researcher could therefore plan and set a definitive time-span for conducting the survey, which assisted in delivering results. The advantage of using an existing questionnaire, was that time formulating questions was saved, and only minor modification was required. The main disadvantages of a survey design is a low response rate, and that data that is produced can lack details or depth on issues investigated.[185] As this project aimed to gain baseline insight on behaviours,

attitudes, experiences and knowledge of nurses, the survey study design was considered most practical.

3.4.2 Sampling method

The sampling frame was a sample of convenience. All eligible nurses where given the opportunity to complete the questionnaire.

3.4.3 Participants

All registered professional nurses (RPNs), enrolled nurses (ENs) and enrolled nursing auxiliaries (ENAs) employed on the inpatient wards at the research site at the time of the survey, were included in the study. Nurses volunteered and gave written consent (Appendix L1-3) to complete the questionnaire. Agency nursing staff and senior nursing management were excluded from the study. Agency staff were excluded as these nurses may have limited knowledge and exposure to the culture of falls reporting, ward falls prevention practices and falls. Similarly, senior nursing management may have different experience of the Falls Policy to nurses working on the wards, and where therefore excluded. As this project aimed to provide a snapshot of the experiences of nurses that provide hands-on care and prevention strategies to prevent falls, the survey was limited to those providing nursing care at ward level. The sample size was restricted to the number of nursing staff who responded to the survey.

3.4.4 Instrumentation and materials

The researcher developed a questionnaire based on the existing Falls Policy (2017) (Appendix B2) and references in the literature.[44] The questionnaire (Appendix K1-3), informed consent (Appendix L1-3), and information documents (Appendix M1-3) were translated into Afrikaans and isiXhosa, so that nurses who were more comfortable sharing information in either of these languages were not excluded.

Demographic information pertaining to length of employment at the hospital, level of nursing qualification, and falls training received was questioned. A Likert scale analysing knowledge, attitudes and behaviours was used to explore nursing staff knowledge of the falls definition and policy, use of the MFS, ward practice in falls prevention and falls intervention strategies frequently used. Finally, there were open-ended questions to identify whether there are features of the falls prevention programme that nurses feel may require improvement, whether barriers to implementation of prevention measures exist and questions related to training needs in fall prevention.

3.5 Procedure

Ethical approval was obtained from the University of Cape Town (UCT) Faculty of Health Sciences Human Research and Ethics Committee (HREC) (HREC ref: 874/2016, Appendix N). An Institutional application to conduct the study (Appendix O1-2) was granted by the hospital in April 2017 (Appendix O3).

- The QA department and Information management were contacted via email and a meeting was held where the study was explained, and necessary documentation provided.
- Thereafter, the QA manager shared a spreadsheet from the electronic AI database for patient slips/trip/falls for the period between 1 June 2016 and 31 March 2017.
- Study personnel were identified and trained (refer to section 3.5.1).
- A pilot study for the record review was conducted (refer to section 3.5.2), and following the pilot study, medical records were requested for each of the eligible patients from the database, in batches of 10-20 folders
- Demographic information and details of the fall event was sourced from the database.
- The medical folders were scrutinised for information regarding the use of the MFS, recorded details of the fall event, documented post fall interventions, as well as relevant medical information using the data capturing tool developed by the researcher.
- Further information regarding medication was sourced from the drug chart contained in the medical folder and medication administered within 24 hours of the fall event was cross referenced against the psychotropic drug list (Appendix P) provided courtesy of B Chisholm (B Pharm).[40]
- Information on continence was sourced from the Waterlow score chart (Appendix J) which is completed on admission by nursing staff.
- Information was inputted into the spreadsheet manually by the researcher and the research assistant.
- Once the Fall Group data collection had been concluded, to generate the control group list, the researcher contacted the Deputy Director of information management via email and a meeting was held to discuss requirements.
- The admissions database as well as information regarding bed occupancy and POBDs, was provided by information management in the format of a spreadsheet following this meeting.

- The subsequent patient admitted to the same ward as the person who fell was selected from the admissions list, and a Non-fall Group was drawn up.
- The Non-fall Group data was collected in the same manner, using the same variables for the Fall Group, but with no details of fall event, using the same data capturing tool (Appendix I).
- If the folder was not available, the next patient admitted on the same day was collected, to approximate an equal number in each group.
- Likewise, details of medication were sourced in the same way, except medications prescribed on the same day as the MFS was completed were considered.
- For the nursing survey, the researcher contacted authors (Appendix Q) of a previously developed falls prevention nursing survey (Appendix R)[44] to request permission to use and modify their survey.
- The questionnaire was modified and feedback was sourced from a panel of experts (refer to section 3.5.3) (Appendix S).
- The modified questionnaire was then tested for accuracy of data entry.
- Following electronic communication with the Head of Nursing, the researcher attended a nursing management meeting three weeks before the nursing survey, where the title, aims, objectives, rationale, potential benefits and risks of the study, and logistics were explained to the ward managers. Introductory emails were sent to nursing unit managers (NUMs) (Appendix T1).
- The survey documents were printed and the survey was trialled in two randomly selected wards, over a two-week period prior to the full hospital survey (refer to section 3.5.4). Thereafter, the full survey commenced. Once surveys had been delivered to the wards, follow-up emails were sent to NUMs (Appendix T2) to remind them about the survey.
- Consent forms and questionnaires were distributed to the inpatient wards at the hospital. The survey took part over a six-week period concurrent with the main study.
- Completed survey responses were then entered onto a spreadsheet by the primary researcher.

3.5.1 Study personnel

The data capturers comprised the primary researcher, and two assistants, each a qualified Audiologist [BSc. (Audiology)], and both registered as post graduate students in the Faculty of Health Sciences at UCT at the time of data capturing. Training and monitoring of data

capturers in retrospective record reviews is recommended,[183] to limit compromising the validity of data. Thus, data capturers were trained prior to data abstraction. Training included a review of the variables to be examined, an explanation of use of the data capturing tool/key document (Appendix I), the data extraction spreadsheet, and verification of accuracy of captured data by the primary researcher. To reduce error and ensure consistency in data abstraction, the data capturing tool/key document was provided, which was organised in a similar order to the format of the AI database.[183] The data capturing tool/key document, was drawn up by the primary researcher and includes a description of each variable found in each column, where to source the information for each variable, and clearly defined options available in the drop-down menu (where applicable). To check accuracy of data entry of the data capturers, to standardise data collection to ensure that both assistants and the researcher interpreted and categorized the information in the folders in the same way, for both the Fall- and Non-fall Group, data abstractors practiced coding several patient records. After training, continual monitoring was provided to minimise inaccuracies and ensure that the abstractors coded data timeously. The spreadsheets were updated and shared on dropbox (*http://dropbox.com*), and any issues or discrepancies that arose during the coding process were discussed and clarified online or in face to face meetings.

3.5.2 Pilot study for retrospective record review

The aim of the pilot study was to test inter-rater reliability (IRR).[22] Initially, two separate IRR tests were conducted. Figure 4 illustrates that ten patient folders were initially requested from the medical record department, comprising the first five patient folders from the Fall Group, and the first five patient folders from the Non-fall Group. It was not possible to blind the assistants to the purpose of the study, nor to the group they were capturing data for, which may have introduced reviewer bias.[183] One assistant and the researcher independently sourced and entered data of the first five cases from the Fall Group into a spreadsheet using the same medical folders, referred to as Test 1. The second assistant and the researcher also completed five entries into a second MicroSoft Excel spreadsheet, using the medical folders of the first five cases in the Non-fall Group (Test 2) (Figure 4). The quality threshold for IRR was set at a percent agreement of 95%, and a Kappa statistic (see Glossary) of above .90.[22] The data entries between the primary researcher and the assistant for Test 1 and Test 2 were then compared, any discrepancies discussed, and repeated until there was 100% agreement on all items.

In addition, accuracy of the existing AI falls database was tested, to determine whether data inputted from the AI report matched the AI database (Figure 4). Furthermore, data independently inputted from the AI report by the researcher and the assistant was cross

checked against the AI database (Figure 4, Test 3). Five randomly selected (drawn out of a hat) AI forms of the Fall Group were requested from QA. Both researcher and assistant 1 completed five data entries onto a blank spreadsheet from the randomly selected AI reports. The original QA dataset was then compared to both versions compiled by the researcher and assistant 1 to test for accuracy of data previously captured.

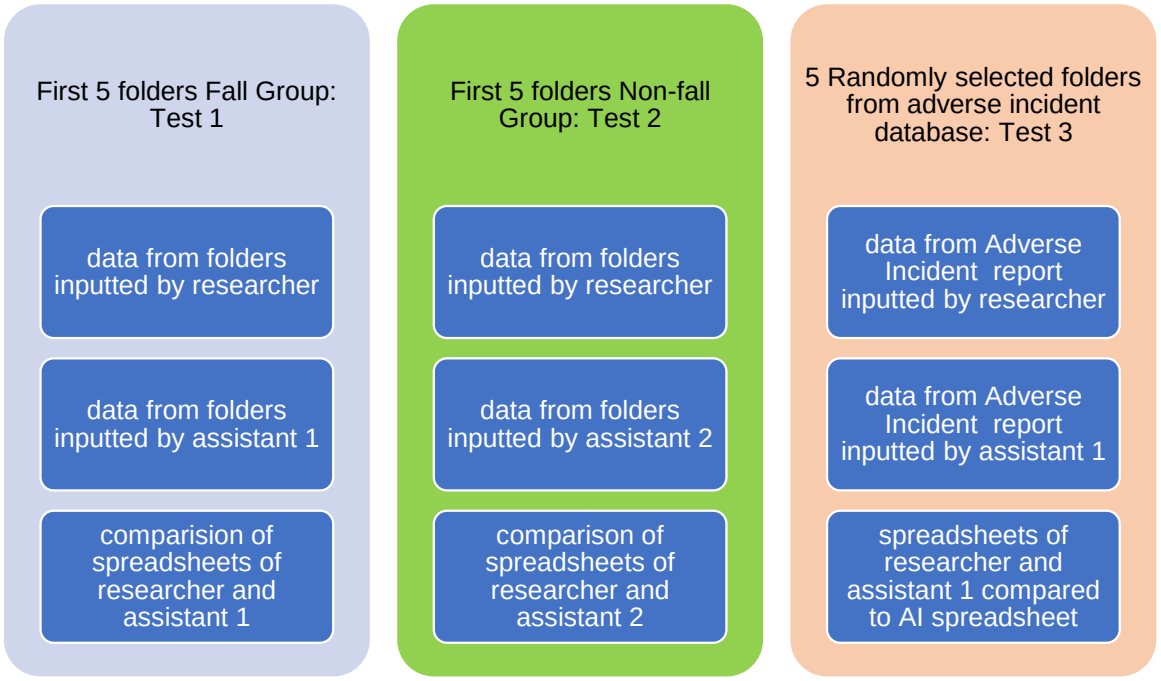

Figure 4. Inter-rater reliability testing procedure for the Fall-Group, Non-fall Group and adverse incident database

The results of the pilot study are presented in Chapter 4 (section 4.1.1).

3.5.3 Previous reliability and validity testing for the nursing questionnaire

The questionnaire used and modified for this study, was originally developed and used as part of the 6-PACK nursing staff survey.[106] The aim of the 6-PACK nursing survey was to explore staff knowledge and attitudes regarding falls prevention practices, and behaviours required to change to effectively implement the prevention programme. Additionally, the authors aimed to describe perceived barriers to, and enablers of, the 6-PACK programme,[106] and to gain an understanding of safety climate in wards participating in the 6-PACK study. In total, the 6-PACK survey contained 79 questions in the form of a Likert scale, and three open-ended questions, including the short version of the safety attitudes questionnaire (SAQ) (Appendix R). The SAQ[187] has been used previously to assess staff perception of safety climate, and was subjected to Rasch analysis (see Glossary) prior to use in the 6-Pack staff survey.[44] The SAQ component of the survey, while demonstrating adequate internal consistency reliability, showed limitations in measuring the underlying construct, and floor and ceiling effects.[44] The 6-PACK nursing staff survey was piloted

during pre-implementation studies, and additionally, focus groups with nurses were held.[106] The authors report the length of the survey was the main issue raised by pilot participants, however, the authors deemed it difficult to further reduce items without losing important content,[106] and therefore the survey was used in the 6-PACK study as it appears in Appendix R (Note that the SAQ questions are highlighted in yellow for ease of comparison for the reader). Thus, the 6-PACK survey questions related to staff knowledge, attitudes and beliefs surrounding falls prevention practice has not undergone previous reliability and validity testing.

For the present study, the SAQ aspect of the survey was removed, as this study was not investigating safety climate. Relevant questions from the 6-PACK survey, in addition to questions based on the current Falls Policy by the primary researcher, were used to formulate a modified questionnaire. The modified questionnaire aimed to provide baseline insight into attitudes and beliefs about falls, current falls prevention practice and potential barriers to fall prevention practice experienced by nurses at the research hospital.

To check the modified questionnaire for contextual and vocabulary equivalence, the researcher presented the questionnaire to a panel of three experts with experience in both clinical and senior management areas, and with an in-depth knowledge of the hospital Fall Policy. The panel included the Head of the QA department, Chief/Senior physiotherapist, and a representative from nursing management, each employed at the research hospital and who were not participants in the study. It was deemed important that the time taken to complete the questionnaire should be less than 10 minutes, so as not to interfere with nursing duties and break time. Thus, the panel were also asked for feedback on time taken to complete the questionnaire. The questionnaire was emailed to the panel, and electronic feedback (Appendix S) returned. The responses from the panel of experts are detailed in Chapter 4 (section 4.1.2). Following finalisation of the questionnaire, the process of translation into isiXhosa and Afrikaans began. Two assistants with these languages as their first language translated the English questionnaire, informed consent form and information sheet into isiXhosa and Afrikaans. The isiXhosa and Afrikaans versions were then back translated into English by a second person who was blind to the original document.[188, 189] The researcher then compared the original survey and the back-translation to ensure conceptual and vocabulary equivalence.[188] There were no discrepancies with the translation of the Afrikaans survey. Minor discrepancies were found with the isiXhosa back translation. Therefore, a meeting was held with both isiXhosa translators where consensus on each item was reached. Thereafter, the isiXhosa version was finalised.

3.5.4 Trial nursing survey

Three weeks prior to commencing the full hospital survey, a trial was undertaken. The aim of the trial was to identify any logistical errors in the procedure. For this, the researcher randomly selected two wards (by pulling ward numbers out of a hat). The ward managers of the two wards were emailed and the date confirmed. On the commencement date, the researcher and the research assistant met with the unit managers, and provided hard copies of the English, Afrikaans and isiXhosa questionnaires (Appendix K1-3), informed consent forms (Appendix L1-3), and information documents (Appendix M1-3). The questionnaires, consent forms and information sheets were made available to the nurses on each ward for one week. In addition, two clearly marked, sealed 'post boxes' were provided to each ward. Post boxes were stored in a safe place on the ward (for example the staff common room) and staff deposited their completed questionnaires and consent forms into each box. After one week, the researcher returned to the wards to collect the boxes. Nursing unit managers (NUMs) were not involved in the distribution or administration of the surveys to avoid hierarchical coercion, and to ensure strict confidentiality and anonymity of the nurses wishing to participate. The NUMs from both trial wards requested that a further week be given to allow staff more time to complete the questionnaire. The boxes were therefore left for a further week on the wards and thereafter collected. The results from the surveys returned in the trial, were included in the main study results. One week after completion of the trial, the main study commenced, with two changes made to the study protocol from the trial. Due to the request from NUMs on the trial wards for an additional week, the time that questionnaires were made available was increased from one to two weeks. In addition, the researcher and assistant visited each ward after the first week to ensure copies of all documents were available in each language, and to remind staff on duty about the study and encourage them to complete the questionnaire.

3.6 Data management

All data for the retrospective record review were captured electronically and entered into MicroSoft Excel spreadsheets on site at the research hospital by the research assistants and the primary researcher. All data were anonymised as codes were given and individual patients were not identifiable. Files created were saved in cyberspace, on Dropbox (*http://dropbox.com*). The information was shared with the research assistants and supervisor. The master spreadsheet was updated throughout the data collection process. Once data entry was complete, the primary researcher cleaned and analysed data. Only the researcher and the supervisor had access to cleaned data. All files created during statistical analysis were also saved in Dropbox and backed up manually upon creation of these files by SPSS 24 *(IBM* SPSS Statistics for Windows, version 24, IBM Corp., Armonk, N.Y., USA).

For the nursing survey, the hard copies were retained by the researcher and stored in a locked cupboard. The researcher entered data onto an excel spreadsheet. Data from the trial wards were included in the results. Data were cleaned and analysed by the primary researcher. Nursing staff and wards were not identified by name, surveys were anonymous. The computer used was updated with McAfee Endpoint Security 10.5.5 antivirus software (https://www.mcafee.com).

3.7 Data analysis

Data analysis was performed using *SPSS 24 (IBM* SPSS Statistics for Windows, version 24, IBM Corp., Armonk, N.Y., USA). Descriptive information and statistics were used to describe characteristics of the sample in this study.

For aim one, objective 1, the rate of falls was described using falls per 1000 POBD (see Glossary), and falls per speciality (categorical variables) were described using frequency tables and proportions.

For aim one, objective 2, descriptive statistics were used to describe patient-specific characteristics in the Fall Group the Non-fall Group. Continuous variables such as age, length of stay (LOS) and MFS scores were described using mean and standard deviation or medians, depending on the normalcy of distribution of data. Categorical variables (sex, discharge destination, death status, number of comorbidities, history of falls, secondary diagnosis, intravenous (IV)/IV access, ambulatory aids, walking status, mental status, psychotropic medication, continence issues, MFS ranking) were described using frequency tables and proportions.

Chi-square tests of independence were used to measure the association between groups (Fall Group and Non-fall Group). A p value less than .05 was considered statistically significant. Parametric tests (independent sample t-tests) were used to analyse between-group differences for continuous variables such as age, where data was normally distributed. For abnormally distributed data (length of stay and MFS score), non-parametric tests (Mann Whitney U-tests) were used. A bivariate logistic regression model was performed to determine the predictors of falling. Significant variables found in the univariate between-group analyses were entered into the regression model.

Objective 3 for aim one concerned the Fall Group. The frequency of use of the MFS post fall, circumstances surrounding falls, and the number of inpatient falls that result in injury were described using descriptive statistics including frequencies and proportions.

Objective 4 for aim one related to the predictive validity of the MFS. The diagnostic value of the MFS scores ranging from 20 to 70 was explored using receiver operating characteristic (ROC) curves, with an area under the curve (AUC) analysis based on admission MFS scores, using patients who fell while hospitalised as the 'gold standard'. Sensitivity analysis, including specificity, PPV, NPV and accuracy, was performed for the different cut-off scores of the MFS (Table 4). Chi-square statistics were calculated for the estimation of risk of falling with odd ratios (ORs) and 95% confidence intervals (CIs).

Table 4. *Equations with the current MFS cut-off point of 50*

Fall prediction status	**Had a fall**	**Did not have a fall**
Predicted to fall	A (True positive)	B (False positive)
Not predicted to fall	C (False negative)	D (True negative)

Note. Calculations:

Sensitivity= A/A+C (True positive/True positive + False negative)
Specificity= D/B+D (True negative/False positive + True negative)
Positive predictive value (PPV)= A/A+B True positive/True positive + False positive)
Negative predictive value= D/C+D (True negative/False negative + True negative)

The secondary aim of this study was to examine the knowledge, attitudes and behaviours of nursing staff regarding in-hospital falls and the Falls Policy. For the nursing survey, the sample was too small to support adequately powered tests and therefore no inferential statistics were performed. Objective 1, 2 and 3 of secondary aim was to describe the demographic characteristics of nurses, nurses' experiences of the Falls Policy, and to ascertain nurses' perceptions of areas that may need to be improved, barriers to implementation and need for further falls training. Descriptive statistics such as frequency and percentage were used to achieve these objectives.

3.8 Ethical considerations

This study complied with the 2013 Declaration of Helsinki.[190]

3.8.1 Autonomy

It is usually a requirement when conducting patient safety research to obtain informed consent from individual patients. However, the World Health Organisation (WHO)[191] recommends this requirement be waived by research ethics committees in certain conditions. These conditions include if the research does not directly alter individuals' medical plans, if the risks posed to these patients are minimal, if it is not practically feasible to obtain individual informed consent and if the privacy and anonymity of individual patients is assured. In this study, the retrospective nature of data collection implied that there was no

modification of management of the study population, therefore the patients were not exposed to any additional clinical risk. As the patients had already been discharged from the research institution, it was not possible to obtain consent from individual patients to access their records, thus written consent was requested from the hospital Chief Executive Operator (CEO) (Appendix O1). For the nursing survey, there was no threat of coercion which could have impacted on autonomy of staff, as staff could choose whether to complete the survey or not.

3.8.2 Confidentiality

The main threat identified was confidentiality with the record reviews. To safeguard against this threat, all entries were anonymised, and individual patients were not identifiable. Patient names were not recorded, rather codes were given.

In the nursing survey, to facilitate frank comment without fear of disclosure, participants remained anonymous and surveys were self-administered. All data were reported as aggregated data to safeguard against the threat of victimisation. Wards were identified under the broad unit terms “Medical, Surgical, Psychiatry, Trauma/Emergency care, Gynaecology and Intensive care”, and not by individual names to avoid stigmatising of wards. A sealed “post box” was provided in a safe area (e.g. staff common rooms) on each ward for nurses to submit the questionnaires. Only the researcher and the assistant had access to the collected questionnaires, which were kept in a safe area.

It may be possible from publication that the hospital can be identified, posing social and reputational risk, despite the researcher not identifying the research setting by name. The hospital is referred to as a tertiary level hospital in the Western Cape. In the literature there is very little stigma associated with hospitals that openly report their figures for falls. Whilst nursing staff may have some inadvertent focus in the study, senior nursing management was most encouraging of the research (M Ross 24 March 2016, A Mohamed 15 March 2017, both personal communication).

3.8.3 Beneficence and non-maleficence

This study did not pose significant clinical, psychological or social risk to the patients whose records were reviewed as all cases were anonymised and the medical management of the patients was not altered. Although individual participants did not have any direct benefit, the results of the study may inform fall policy and thus protect future patients from fall events. It is hoped that by having a clearer understanding of the knowledge, attitudes and behaviours of nurses with regards the Falls Policy and falls prevention practices, future staff training can be targeted more specifically at any gaps in knowledge and practice identified. During informal consultation with the Head of Nursing, (24 March 2016, personal communication), it

was ascertained that nurses have not been involved in previous research in the field of falls prevention. In the wards identified as having a high number of falls, there is potential risk of stigmatisation of nurses. To safeguard against this, wards were not identified by their specific name, rather by the specialisation “Medical, Surgical, Psychiatry, Trauma/Emergency care, Gynaecology or Intensive care ward”. It is believed that the benefit for the institution for future policy development outweighed the risk and additional burden to staff.

3.8.4 Justice

It is hoped that the results yielded from this study will help with improved knowledge of the circumstances and characteristics of fall events at the research hospital, as well as better fall management. Improved knowledge on factors contributing to falls at the hospital may drive policy review and development. As highlighted in the literature review, most falls research has been conducted in countries in the Global North. There is a scarcity of knowledge on in-hospital falls and how they impact on patients and health systems in LMICs. As this research was conducted in a LMIC, the researcher has a responsibility to use the results from this study to facilitate organisational learning. The researcher will ensure that the results of this study are provided to management at the institution. The researcher will offer to present the findings of the research both at management and departmental level, to ensure that nurses at ward level may benefit from knowledge of the results of the research.[192] Furthermore, the researcher has every intention of publishing the results of this study.

Chapter 4. Results

The results of this study are now presented in three sections, the first describes the results of the pilot study for the retrospective record review and the responses from the panel of experts for the nursing questionnaire. Fall rates and a comparison of the Fall and Non-fall Group in terms of demographic and medical characteristics, Morse Falls Scale (MFS) scores and other variables are presented in the subsequent section. The predictive accuracy of the MFS is investigated, and details the circumstances surrounding fall events are reported. Finally, the knowledge, attitudes and behaviours of nursing staff regarding in-hospital falls and the Falls Policy are explored.

4.1 Results of the pilot study for retrospective record review and nurses' survey

4.1.1 Results of the pilot study for retrospective record review

The procedure of the pilot study was described in detail in Chapter 3 (section 3.5.2). The results of Test 1 revealed a percent agreement of 96.3%, and inter-rater reliability (Cohen's kappa statistic) (see Glossary) of 0.97, indicating *almost perfect* level of agreement.[22] There was disagreement in one entry regarding the place of fall. The primary researcher coded the location of the fall as '*shower'*, and assistant 1 coded '*bathroom*'. In response to the discrepancy, all falls occurring in the bathroom were coded under '*Bathroom/toilet/shower*' in the study. Test 2 revealed a percent agreement of 100% and inter-rater reliability (IRR) Kappa value of 1. Test 3 found a percent agreement of 100% between the both raters and the AI dataset, and a IRR Kappa value of 1.

The time taken to analyse each folder and incident varied considerably between cases, but in general the time taken to complete the Non-fall Group was substantially less due to less information being required from the folders.

4.1.2 Responses from panel of experts regarding nurses' questionnaire

The procedure for the nursing survey is described in Chapter 3 (section 3.5.4). Each of the three panel experts took less than 10 minutes to read and complete the questionnaire. No panel members reported that any of the questions were ambiguous or pre-empted them to answer in a specific way. In terms of clarity of the questions, there were four suggestions, which involved minor word changes. Table 5 shows the question number, the corresponding original question and the suggested change. Two panel members commented on Question 8.

Table 5. *Modified nursing survey questions with corresponding suggestions from the panel*

Question number	Original question	Suggested change
4	On what ward do you most frequently work?	On **which** ward do you most frequently work?
8	Incident reporting provides us with a way of measuring how we are going with patient falls.	Incident reporting provides us with a way of measuring how we are **progressing** with patient falls Incident reporting provides us with a way of measuring how we are **doing** with patient falls.
17	I feel confident to request the doctor's order for a physiotherapy consult for high risk patients	**I feel confident to refer high risk patients** for a physiotherapy **assessment**.
19	Each patients falls risk status is communicated during handover report between shifts.	Each **patient's falls** risk status is communicated during handover report between shifts.

One panel member suggested stressing that the questionnaire would be anonymous, and highlighted an error in the questionnaire. Question 17 in the questionnaire implied that the physiotherapy department at the research site requires a doctor to refer a patient for assessment by a physiotherapist. However, all professionals may refer appropriately.[193] In response to the panel's suggestions, the wording in Question 4, 8, 17 and 19 was changed

4.2 Retrospective record review

For numerical data including age, length of stay (LOS), and MFS score, histograms were used to check for normalcy of distribution of data. The histogram for age showed the distribution was relatively normal, therefore parametric t-tests were used. For LOS and MFS score, data was skewed to the right therefore Mann Whitney-*U* tests to analyse between-group differences were used.

4.2.1 Final sample

There were 171 fall incidents reported between 1 June 2016 to 31 March 2017. The total number of patients who experienced a fall during this time was 168, as three patients experienced two falls each. Figure 5 illustrates the final sample of 256 individuals included in this study, 134 patients who fell, the Fall Group, and 122 patients who did not fall, the Non-fall Group.

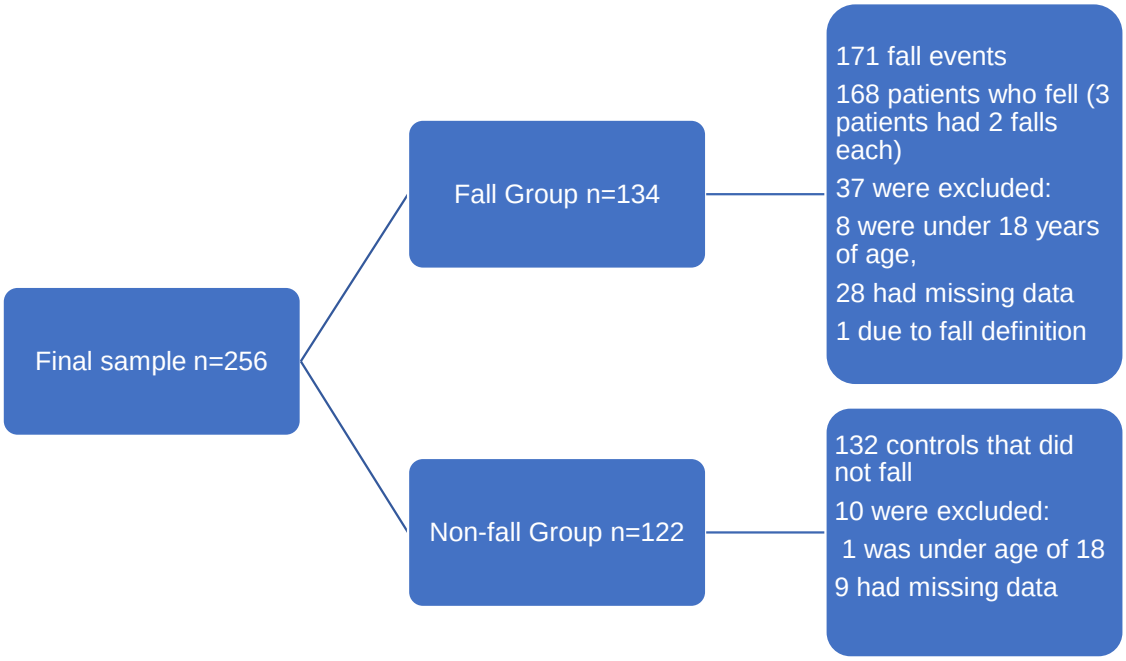

Figure 5: The final sample consists of a Fall Group and a Non-fall Group

4.2.2 Fall rates

The first objective was to determine the total number of falls reported in the ten-month period, and the rate of reported inpatient falls. Between 1 June 2016 and 31 March 2017, there were 1452 adverse incidents (AIs) reported at the research hospital, of which 171 were falls. Thus, falls represent 11.77% of reported AIs in these ten months, the second most common reported incident after pressure ulcers, confirmed by the head of Quality Assurance at the research hospital, Ms M Govender via email (Miladevi.Govender@westerncape.gov.za, 18 June 2018) and an average rate of 0.73 falls per 1000 patient occupied bed day (POBD) (Table 6).

Table 6. *Number and rate of falls per month*

Month	Total admissions/ transfers in	Number of falls	Percentage of falls	Patient occupied bed days (POBD)	Falls per 1000 POBD
June 2016	4162	12	0.28	23263.5	0.515
July 2016	4346	24	0.55	24081	0.996
August 2018	4477	17	0.37	24160.5	0.703
September 2016	4238	16	0.37	24171.5	0.661
October 2016	4320	23	0.53	24469	0.939
November 2016	4332	21	0.48	23715.5	0.885
December 2016	3657	15	0.37	23402.5	0.640
January 2017	3948	18	0.45	22897	0.786
February 2017	3981	15	0.37	21627	0.693
March 2017	4135	10	0.24	23545.5	0.424
Total	**41606**	**171**	**0.41***	**235333***	**0.726***

Note. * indicates average.

As can be seen in Table 7, over a third of all reported falls occurred on medical wards, n=62 (36.3%), with surgical wards experiencing the second highest number of falls (n=52, 30.4%). oncology (n=19, 11.1%) and obstetrics and gynaecology (n=17, 9.9%) had similar numbers of fall events occurring. The remainder of wards reported 8 fall events between them (4.7%).

Table 7. *Total number of reported falls per specialty*

Hospital speciality	Number of falls	Percent
Medicine	62	36.3
Surgery	52	30.4
Oncology	19	11.1
Obstetrics and Gynaecology	17	9.9
Trauma/emergency unit	13	7.6
Psychiatry	4	2.3
Intensive care unit	2	1.2
Theatre	1	0.6
Radiology	1	0.6
Total	**171**	**100**

4.2.3 Demographic characteristics of the Fall Group and the Non-fall Group

Objective 2 set out to compare the Fall Group and the Non-fall Group in terms of patient-specific characteristics to ascertain the determinants of falling. Regarding the demographic characteristics of the two groups, the Fall Group (n= 134) comprised 55.2% females and 44.8% males (Table 8). In comparison to the Fall Group, the Non-fall Group (n=122) comprised 45.1% females and 54.9% males. The sex of the patient was not associated with falling (p= .105; OR 1.5, 95% CI= 0.92-2.46, Table 8).

The mean age of the sample was 50.0 years (SD=17.3 years; range= 18-93, Figure 6), and the Fall Group (*mean age* 53.0; SD=16.8 years) was significantly older than the Non-fall Group (*mean age* 46.9; SD=17.4 years; t=-2.91, p= .004, d = 0.36, Table 8).

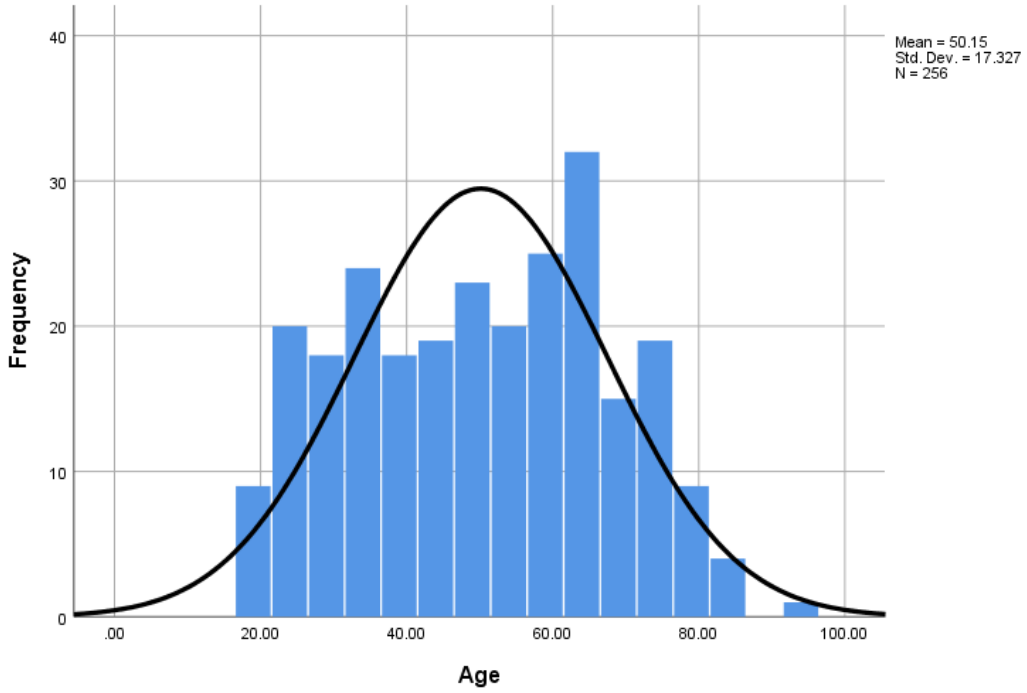

Figure 6. Histogram of age in years

4.2.4 Medical characteristics

The median LOS of the Fall Group (*13 days*) was significantly longer than the Non-fall Group (median= 5 days, $U = 3584$, $p < .001$, $r = 0.62$). The histogram in Figure 7 indicates that most of the Non-fall Group had a LOS of less than 20 days. While the Fall Group generally had a LOS of less than 20 days, they also had more observations of LOS longer than 20 days (Figure 7).

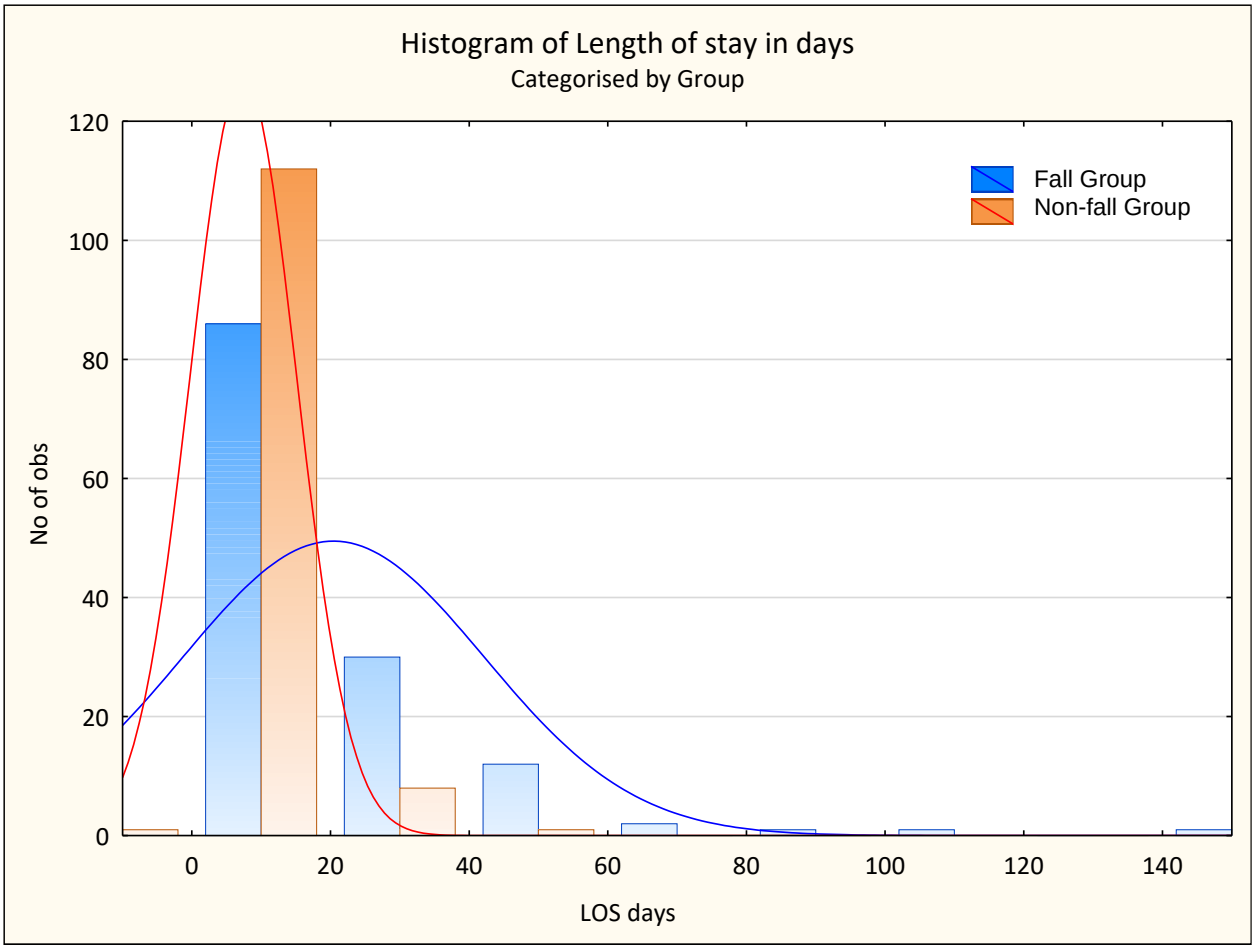

Figure 7. Histogram of length of stay in days

Note. Fall group n= 134 Non-Fall Group n=122. -20-0 category denotes less than a 24- hour admission. The red and blue lines signify the curve skewed to the left.

Figure 8 shows the Fall Group had a significantly higher frequency of a greater number of comorbidities. The Non-fall Group had a significantly higher frequency of having no comorbidities (*p*= .016; Table 8), with 15 cases (11.2%) of the Fall Group having no comorbidities compared to 33 cases (27%) in the Non-fall Group.

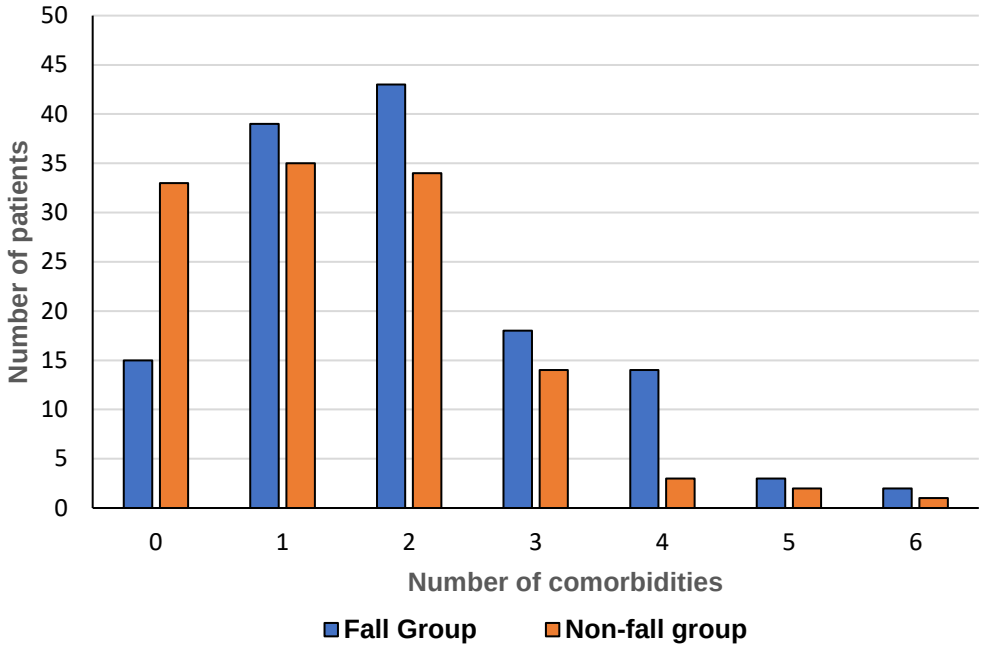

Figure 8. Frequency of comorbidities occurring in the Fall and Non-fall Group

4.2.5 Analysis of discharge destination

Of the 134 individuals in the Fall Group, 17 died and eight had unknown origin and/or discharge destination and were thus excluded from this analysis. Of the remaining 109, 71.6% (n=78) were reported to return to their admission origin, and 28.4% (n=31) went to a different destination (Table 8). Of the 122 in the Non-Fall Group, 25 had an unknown origin or discharge destination, and two died. These 27 cases were excluded from this analysis. Of the remaining 95 cases, 85.3% (n=81) went back to the same admission origin, and 14.7% (n=14) to a different destination (Table 8), which included either another hospital, rehabilitation facility, nursing home, or home. There was a statistically significant difference between the two groups for discharge destination (p= .019, OR 0.43, 95% CI= 0.22-0.88), with participants in the Fall-Group more likely to be discharged to a different discharge destination.

Off the Fall Group, most patients (n=83, 76.1 %) were discharged home. While 15 patients (13.7%) went to a rehabilitation unit on discharge, nine patients (8.3%) were discharged to another hospital, and two (1.8%) were reported as being discharged to a nursing home. In the Non-fall Group, 92 patients (96.8 %) were discharged home, two (2.1%) were discharged to a rehabilitation facility and one patient (1.1%) to another hospital.

There was also a statistically significant difference between the number of deaths in the two groups. Of the 134 patients in the Fall group, 17 died compared to two deaths out of 122 participants in the Non-fall Group (p= .001; OR 8.72, 95% CI= 1.97-38.57) (Table 8).

Table 8. *Demographic and medical characteristics of the Fall Group and the Non-fall Group*

Variables	Fall Group n = 134	Non-fall Group n = 122	χ^2	*p*	*V*	OR (95% CI) Fall/Non-fall
Sex			2.628	.105	.101	1.5 (0.92-2.46)
Female	74 (55.2%)	55 (45.1%)				
Male	60 (44.8%)	67 (54.9%)				
Comorbidities			15.641	.016*	.247	-
0	15 (11.2%)	33 (27%)				
1	39 (29.1%)	35 (28.7%)				
2	43 (32.1%)	34 (27.9%)				
3	18 (13.4%)	14 (11.5%)				
4	14 (10.4%)	3 (2.5%)				
5	3 (2.2%)	2 (1.6%)				
6	2 (1.5%)	1 (0.8%)				
Different discharge location[a]			5.544	.019*	.165	0.43 (0.22-0.88)
No	78 (71.6%)	81 (85.3%)				
Yes	31 (28.4%)	14 (14.7%)				
Died			11.343	.001*	.210	8.72 (1.97-38.57)
Yes	17 (12.7%)	2 (1.6%)				
No	117 (87.3%)	120 (98.4%)				

*$p < 0.05$.

Note. [a] Data based on 109 in the Fall Group and 95 for the Non-fall Group.

4.2.6 Analysis of MFS subscales

The following six key areas (Table 9) are extracted from the MFS subscales and are presented and the results compared between the groups.

4.2.6.1 History of falls

Of the 134 cases in the Fall Group, five cases did not complete the subscale of falls history on the MFS. Therefore, n is 129 for the Fall Group. For the Non-fall Group, three cases were not specified, therefore n= 119. As can be seen in Table 9, in both groups, over 80% of participants were documented as having no history of falls (Fall Group 82.2%, n=106, Non-fall Group 85.7%, n=102). A history of falls was not associated with falling (*p*= .448; Table 9).

4.1.6.2 Presence of a secondary diagnosis

Of the 134 Fall cases, five MFS were incomplete on the section for secondary diagnosis on the MFS and were excluded, leaving n= 129. Likewise, in the Non-fall Group, in five cases,

the presence or absence of a secondary diagnosis was not specified, therefore n=117. A secondary diagnosis was not associated with falls (p = .150; Table 9).

4.1.6.3 Ambulatory aids, intravenous therapy and walking status

As shown in Table 9, in both groups most participants were documented to use no ambulatory aids (Fall Group 74.8% and Non-fall Group 82.8%), and the use of ambulatory aids was not associated with falls (p= .305). Likewise, the presence of intravenous (IV) therapy was not associated with falls (p= .767). Patients reported to *know their own limits* were not less likely to fall compared to patients who did not know their own limits (p= .625; Table 9). However, walking status was significantly associated with falls (p= .021; Table 9). Participants in the Fall Group were more likely to have a *weak* walking status, whereas those who did not fall were more likely to have a *normal* walking status. Although more than 60% of participants in the Fall Group had either a *weak* or *impaired* walking status, more than 70% did not use a walking aid.

Table 9. *Characteristics of the two groups based on the six sub-scales of the Morse Falls Scale*

Morse Falls Scale variable	Fall Group	Non-fall Group	χ^2	*p*	*V*	OR (95% CI) Fall/Non-fall
History of falls[b]			0.575	.448	.048	1.3 (0.66-2.58)
Yes	23 (17.8%)	17 (14.3%)				
No	106 (82.2%)	102 (85.7%)				
Secondary diagnosis[c]			2.073	.150	.092	1.45 (0.87-2.41)
Yes	79 (61.2%)	61 (52.1%)				
No	50 (38.8%)	56 (47.9%)				
IV/IV Access[d]			0.088	.767	.019	0.93 (0.56-1.53)
Yes	61 (47.3%)	59 (49.2%)				
No	68 (52.7%)	61 (50.8%)				
Ambulatory aids[e]			2.373	.305	.099	-
None	95 (74.8%)	96 (82.8%)				
Crutches/cane/walker	19 (15%)	11 (9.5%)				
Furniture	13 (10.2%)	9 (7.8%)				
Walking status[f]			7.756	.021*	.177	-
Normal	50 (39.7%)	69 (57%)				
Weak	63 (50%)	41 (33.9%)				
Impaired	13 (10.3%)	11 (9.1%)				
Mental status[g]			0.239	.625	.031	0.84 (0.42-1.68)
Knows own limits	107 (83.6%)	103 (85.8%)				
Over-estimates or forgets limits	21 (16.4%)	17 (14.2%)				

Note. [b] Data based on 129 Fall group and 119 in the Non-fall Group. [c] Data based on 129 in the Fall Group and 117 in the Non-fall Group. [d]Data based on 129 in the Fall Group and 120 in the Non-fall Group. [e]Data based on 127 in the Fall Group and 116 in the Non-fall Group. [f]Data based on 126 in the Fall Group and 121 in the Non-fall Group. [g]Data based on 128 in the Fall Group and 120 in the Non-fall Group.

*$p < 0.05$.

4.2.7 Other variables

Most participants in both groups were prescribed psychotropic medication (Table 10). Although more participants in the Non-fall Group (69.7%, n=85) compared to the Fall Group (59.8%, n=79) were prescribed these drugs, the administration of psychotropic drugs within 24 hours of the fall event (p= .102), was not associated with falling. Continence issues documented according to the Waterlow score chart (p= .581) was not associated with falling (Table 10).

Table 10. *Record of psychotropic drug administration and continence issues in both groups*

Variable	Fall Group N = 134	Non-fall Group N = 122	χ^2	p	V	OR (95% CI) Fall/Non-fall
Psychotropic drugs[h]			2.674	.102	.103	0.65 (0.39-1.09)
Yes	79 (59.8%)	85 (69.7%)				
No	53 (40.2%)	37 (30.3%)				
Continence issues[i]			0.304	.581	.038	1.27 (0.54-2.98)
Yes	15 (13.3%)	10 (10.8%)				
No	98 (86.7%)	83 (89.2%)				

[h]Data based on 132 in the Fall Group. [i]Data based on 113 in the Fall Group and 93 in the Non-Fall Group.

*$p < 0.05$.

4.2.8 MFS risk score and risk category

The Fall Group (*median score*= 40; IQR = 35-55) had significantly higher MFS scores compared to the Non-fall Group (*median score*= 35; IQR = 15-46.25; U= 6070.5, p= .002, r = 0.26). In addition, the ranking of the Fall Group on the MFS was significantly higher than that of the Non-fall Group (χ^2 = 16.661, p= .001, V= .258; Figure 9), indicating that a higher proportion of those in the Fall Group were classified as being *low-moderate* and *high* risk.

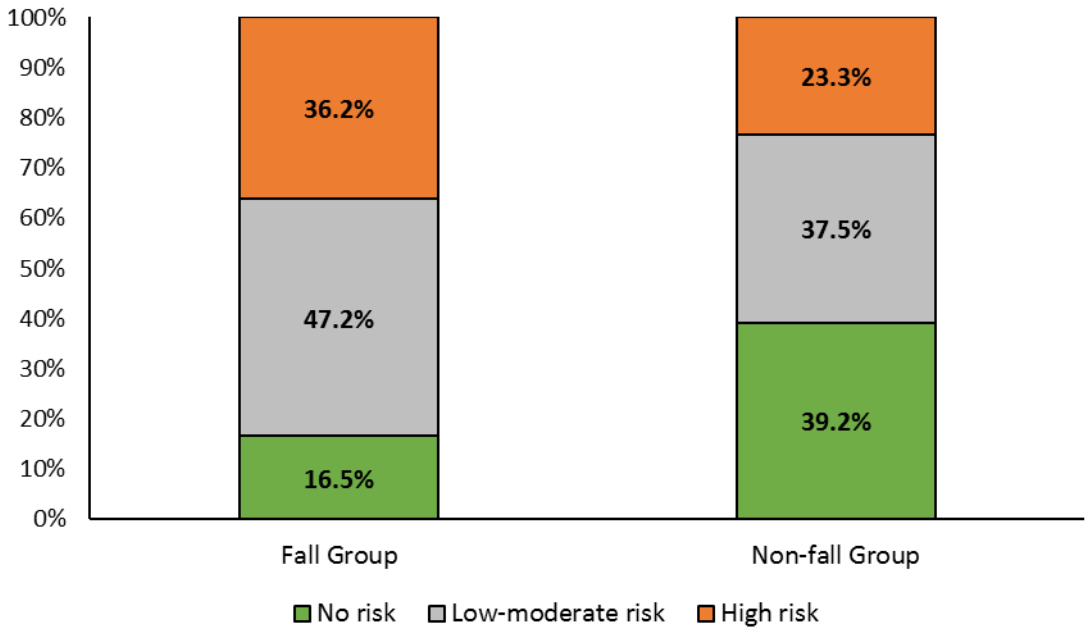

Figure 9. MFS risk categories of the Fall Group and Non-fall Group

4.2.9 Determinants of falling

A bivariate logistic regression model was constructed to assess which variables best predicted falling. Significant variables found in the univariate between-group analyses described above were entered into the regression model. These variables were: age, LOS, number of comorbid conditions, being discharged to a different location, having died, walking status and MFS score.

However, once being entered into the regression model, age, being discharged to a different location, having died, walking status and MFS score were no longer significantly associated with falling status. These variables were therefore removed from the final model. The final model was significant, $\chi^2(2, N = 196) = 39.52$, $p < .001$, Nagelkerke $R^2 = .244$. This model accurately predicted falling 66% of the time. The final regression equation was $y = -1.398 + (0.079 \times \textit{length of hospital stay}) + (0.336 \times \textit{number comorbid conditions})$. Staying in hospital longer and having a greater number of comorbid conditions predicted a higher likelihood of falling.

The following two sections relate to objective 3, and describe the use of the MFS post fall, as well as the circumstances and characteristics surrounding fall events.

4.2.10 Use of the MFS

All sections of the MFS were completed in 117 (87.3%) of the Fall group and 101 (82.8%) of the Non-fall Group. Post incident MFS scores were only recorded 13 participants (9.7%) in the Fall Group ($M = 45 \pm 20.67$).

4.2.11 Circumstances and characteristics surrounding fall events

Of the 134 fall events, 92 (68.7%) occurred during the week and 41 (30.6%) during the weekend. One case (0.7%) was not documented. Thursday was the most common day for patients to fall (29 falls, 21%) and the number of falls on other days of the week was relatively equal (11-16%).

Figure 10 shows that while generally fall events were evenly spread over the 24-hour period, there were multiple small spikes fall events, particularly between 12 and 3pm, and 9-12pm. The results indicate the least likely time for patients to fall was between 6-9pm (Figure 10).

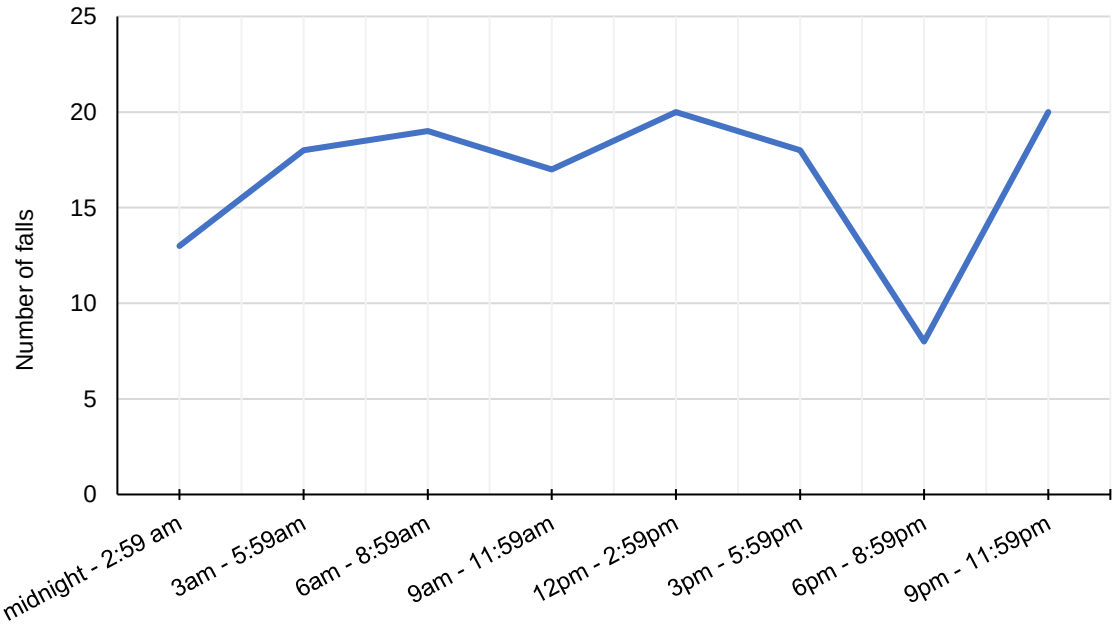

Figure 10. Time of day fall occurred

As shown in Figure 11, most patients fell at the bed/bedside (n= 59, 44%), a quarter fell in the bathroom (n=34, 25%), and 32 falls (24%) occurred in the ward.

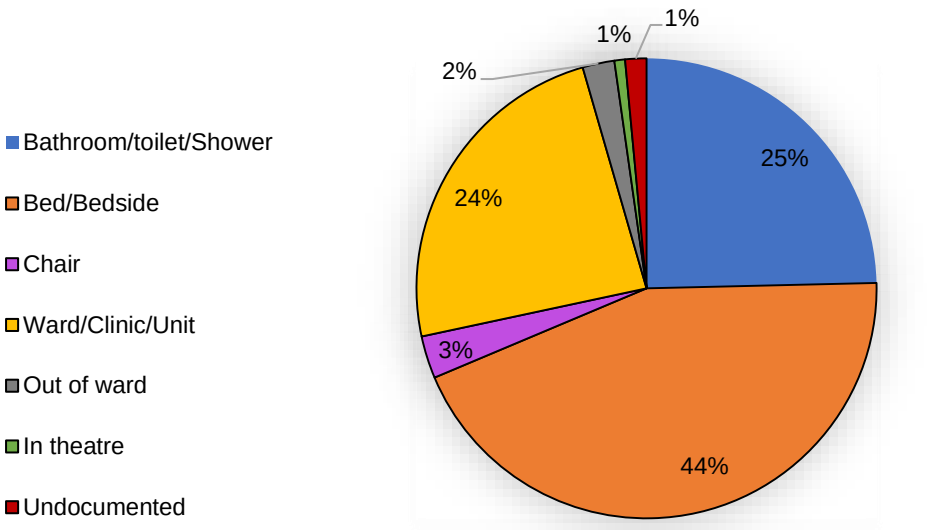

Figure 11. Location of fall

The most common activities at the time of the fall event were ambulating (n= 35, 26%) and transferring to/from bed (n=28, 21%). There were 28 (21%) cases where the activity at the time of the fall was not documented in the medical notes. The remainder of fall events were documented as occurring whilst patients were toileting (n=13, 9%), standing up from a chair (n=8, 6%), reaching for an object (n=3, 2%). Seizures or faint was documented as the activity in 6 events (5%), and 13 falls (10%) were recorded as “other activities”.

Most falls were unwitnessed (79 falls, 59%). Only 18 fall reports (13.4%) specified that the fall had been witnessed. In 37 cases (27.6%) it was not specified in the adverse Incident (AI) report or the medical notes whether the fall had been witnessed or not witnessed by another person.

Nearly all patients (*n*= 130; 97.7%) were reported to have sustained *minor or moderate clinical consequences* (see Glossary) because of their fall. Three patients (2.3%) had *minimum clinical consequences* (see Glossary). In one patient the consequence was not specified. Nearly one-third of patients suffered soft tissue injury post-fall, just over a quarter required increased level of care, and just under one-fifth suffered emotional harm/upset. The next section presents the results as pertaining to objective 4, which concerns the predictive validity of the MFS.

4.2.12 Discriminative ability of the MFS score

A receiver operating characteristic (ROC) curve for the discrimination between those that fell and those that did not fall based on their MFS score is presented in Figure 12. The area under the curve (AUC), indicating discriminative ability of the MFS score to detect the presence of falling, was 0.614 (*p* = .002; 95% CI: 0.544 – 0.685). These results indicate that the MFS score can discriminate between patients who did and did not fall 61% of the time, and therefore has a relatively low diagnostic capability.

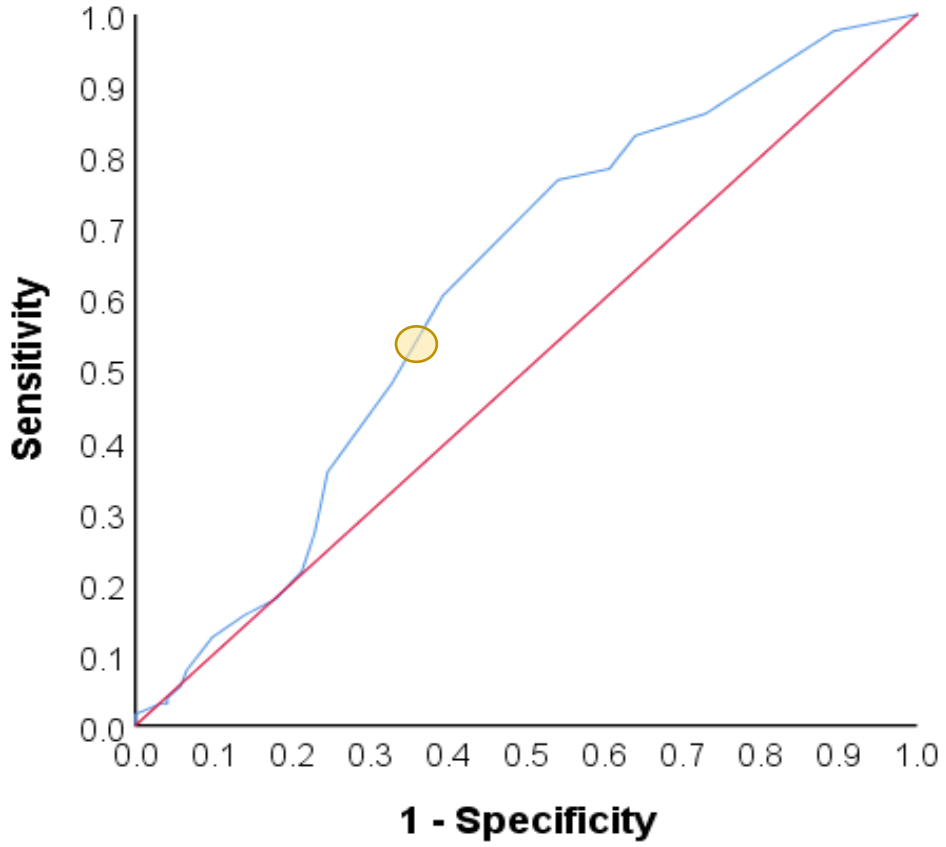

Figure 12. ROC curve to investigate the diagnostic value of different MFS cut-off scores to determine which score is most useful in identifying in-hospital patients at high risk of falls.
Note. The AUC was 0.614 (p = .002; 95% CI: 0.544 – 0.685), showing poor predictive accuracy of the MFS.

To determine the optimum cut-off MFS score that predicts a fall event, the point on the ROC curve that maximises Sensitivity and 1-Specificity was computed. Data from the ROC curve were inputted manually, and confirmed an optimum cut-off point is a MFS score of 37.5. At this MFS score, sensitivity rate is 0.61 or 61% and the specificity rate is 0.61 or 61%.

Table 11 shows the sensitivity of the MFS at the current cut off score of 50 is 35.9% and the specificity is 75.%. At a cut-off score of 40 the sensitivity increases to 60.5%, and the specificity decreases to 60.7%. The predictive accuracy of the MFS improves from 55% to 60.8% by lowering the cut-off value to 40 (Table 11).

Table 11. *Comparison of predictive values at MFS cut-off values of 50 and 40*

Test statistics	MFS cut-off point of 50	MFS cut-off point of 40
Sensitivity	35.9%	60.5%
Specificity	75.4%	60.7%
PPV	60.5%	61.9%
NPV	52.9%	59.2%
Accuracy	55%	60.8%

True positive and true negative values were manually calculated and inputted as can be seen in Table 12. The bolded black (MFS>50) is the current standard for determining who is at high risk, but at a cut-off score of 50, only 35.7% of fallers were correctly identified to fall, and 64.3 % were identified as at high risk to fall but did not fall. From this data, it appears that anyone with an MFS above 37.5 should be considered high risk. As the MFS increases in increments of 5 units, at the cut-off of 40, 60.5% of fallers were correctly identified to fall, and 60.7% were correctly identified not to fall, a sensitivity of 61% and a specificity of 61%. Those incorrectly identified to fall and not fall were 39.5% and 39.3% respectively.

Table 12. *True and false positive and negative values to ascertain the optimal cut-off score on the MFS*

MFS cut-off scores	True positive Sensitivity	False negative	True negative Specificity	False Positive
MFS > 35 = high risk	76.7%	23.3%	45.9%	54.1%
MFS > 40 = high risk	60.5%	39.5%	60.7%	39.3%
MFS > 45 = high risk	48.1%	51.9%	67.2%	32.8%
MFS > 50 = high risk	**35.7%**	**64.3%**	**75.3%**	**24.7%**
MFS > 55 = high risk	27.1%	72.9%	77%	23%
MFS > 60 = high risk	21.7%	78.3%	78.7%	21.3%

Note. Here MFS scores increase in units of 5 according to the MFS scoring system.

4.3 Nursing survey

The secondary aim of the present study was to examine the knowledge, attitudes and behaviours of nurses regarding in-hospital falls using a questionnaire. The following section presents the results from the survey of nurses.

4.3.1 Nursing survey response rate

A total of 137 of the 600 surveys were returned, a response rate of 22.8%. All 137 were included in data analysis. However, not all of returned surveys had a response to each item. Therefore, for the nursing staff characteristics section of the survey, *n* ranges from 124-133 (Table 13).

4.3.2 Demographic characteristics of respondents

Objective 1 of the secondary aim was to describe the demographic characteristics of nurses. As can be seen in Table 13, 91% (n=121) of nurses had worked at the institution for longer than one year, 61% (n=82) reported working more than five years. Under 10% (n=12) had worked at the hospital for less than a year. Furthermore, 77.6% (n=104) of respondents reported working on the same ward for more than a year, yet 70 % (n=93) had not received falls prevention training. Half (n=65) were RPNs. Most returned questionnaires (75%) were from nurses working frequently on the Medical (n=46) and surgical wards (n=47).

Table 13. *Demographic characteristics of nurses*

Demographic characteristics	***n***	%
Time employed at this hospital?	**133**	
< 4 months	1	0.8
4-12 months	11	8.3
1-5 years	39	29.3
> 5 years	82	61.7
How long have you worked on this ward?	**134**	
< 4 months	12	9
4-12 months	18	13.4
1-5 years	49	36.6
> 5 years	55	41
Qualification	**130**	
Registered professional nurse	65	50
Staff nurse/enrolled nurse	49	37.7
ENA	16	12.3
Frequently worked ward	**124**	
Surgery	47	37.9
Medicine	46	37.1
ICU	9	7.3
Psychiatry	9	7.3
Trauma	6	4.8
Radiotherapy	4	3.2
Obstetrics and Gynaecology	3	2.4
Received fall prevention training	**133**	
Yes	40	30
No	93	70
If received training, how long ago	**37**	
< 6 months	11	29.7
6-12 months	9	24.3
1-2 years	5	13.5
> 2 years	12	32.4

Objective 2 of the secondary aim was to describe nurses' experiences of the Falls Policy. The responses to the survey questions were divided into five broad categories, and the results from the corresponding question are presented in each category, namely

- Nurses' experiences of the fall prevention programme
- Ward practice of falls prevention
- Falls Policy
- Post-fall procedure
- Fall definition

4.3.3 Nurses' experiences of the fall prevention programme

Over half the respondents (59%) revealed their belief that the current falls prevention programme is effective at reducing falls. Supporting this, 80% disagreed with a negatively worded statement that falls risk assessment is a "waste of time". Most of the surveyed nurses (82%) believed that incident reporting "provides a way of measuring progress" on falls prevention. Most participants (83%) reported the MFS was a "useful way to identify at risk patients", and most (82%) were confident to use the scale (Figure 13).

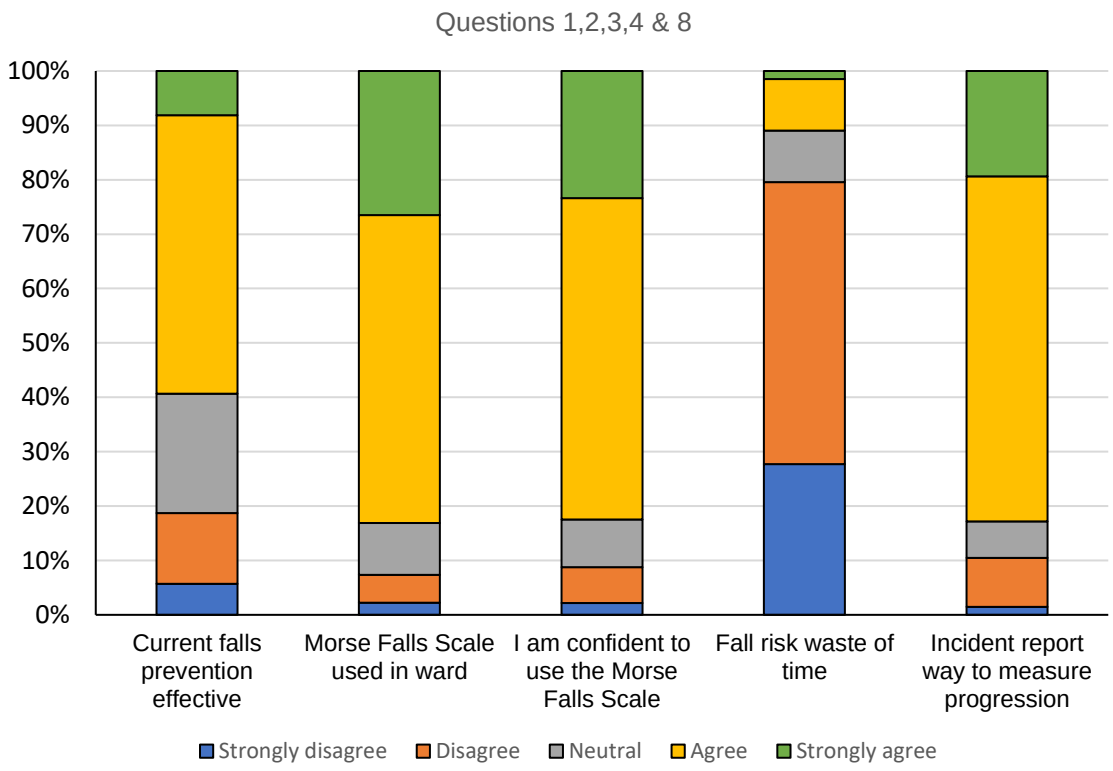

Figure 13. Nurses' experiences of the fall prevention programme

4.3.4 Nurses' perceptions of ward practice of falls prevention measures

While only 37 % of respondents reported that they received regular feedback on the number of falls occurring on their wards, most (79%) disagreed with a negatively worded statement indicating that falls prevention is a "priority on their ward". Less than one third (27%) of nurses reported using 'High risk' signs at the bedside to identify at risk patients, but most (82%) reported positioning high risk patients close to the nursing station. Nurses reported that falls risk status is "communicated during handover between shifts" (77%), and 67% received "reminders to use fall prevention strategies".

4.3.5 Fall policy

Most nurses (86%) believed it is their responsibility to activate the standard care plan for at risk patients, and similar numbers (89%) agreed that it is their responsibility to update the patient's fall risk status. Almost three quarters (73%) reported they know how to complete an AI form, and 83% disagreed that they should report a fall only when an injury occurs

4.3.6 Post fall procedure

While most nurses (78%) were aware of the post fall procedure to be followed, 70% felt confident to refer a patient for physiotherapy.

4.3.7 Fall definition

With the regards the understanding of the definition of a fall, while 68% of respondents agreed that "sliding off a chair is considered a fall", that is 31% did not agree or were neutral. Only 32% believed that a "stumble in the bathroom" where the patient is caught should be reported in incident report, yet most (91%) agreed that "all falls should be reported".

4.3.8 Open-ended questions

For open-ended questions, the responses were grouped into categories to enable analysis. The first question asked nurses what features of the current falls prevention programme they believe need improvement. Just over half of respondents gave feedback on this question (n=73, 52.9%). Table 14 identifies that the most common reported features of the falls prevention programme respondents feel should be improved, are staff training in falls prevention (26%), repairing and provision of equipment (23.3%), and a review of how falls risk is assessed (15.1%).

Table 14. *Features of the current falls prevention programme that need improvement*

What features of the falls prevention programme need improvement?	n	%
	73	
Staff training on falls prevention	19	26
Repairing and provision of equipment	17	23.3
Review of how falls risk is assessed	11	15.1
All aspects	6	8.2
No features need improvements	6	8.2
There is no falls prevention programme	4	5.7
The use of interventions- there are no *high-risk* signs available	3	4.1
Communication between members of the MDT	3	4.1
Feedback to nursing staff regarding fall events	1	1.4.

A third (n=25, 37.3%) of nurses that responded to question two “What barriers do you feel may exist to implementing falls prevention programmes on your ward?” reported a lack equipment, or faulty equipment is a barrier to implementing the falls programme. Low staffing levels (n=18, 26.9%) and a lack of falls prevention training (n=13, 19.4%) were also seen as barriers.

Regarding the questions evaluating the need for further training in falls prevention, m most respondents (66.4%, n=91) reported wanting more training in falls prevention, and of those just under half, (49.5%) wanted the training to be in the form of ward-based training and 37.4% wanted workshops. The remaining 12 % (n=11) requested a combination of written material, workshops and ward training with internet learning and there was one that gave no response.

4.4 Summary of results

In summary, between 1 June 2016 and 30 March 2017, there were 171 reported fall events at the research hospital, representing an average fall rate of 0.73 falls per 1000 POBD. The factors associated with falls in univariate analysis were:

- Age (p= .004)
- LOS (p < .001)
- Higher number of number of comorbidities (p= .016)
- Discharge destination (p= .019)
- Number of deaths in each group (p= .001)
- Walking status

- MFS score
- MFS rank

However, following logistic regression, longer LOS and having a greater number of comorbid illnesses predicted a higher likelihood of falling 66% of the time.

While all sections of the MFS were completed in over 80% of both groups, a post fall MFS score was only recorded in 13 cases (9.7 %). At the current cut-off score of 50, the MFS has a sensitivity of 35.9% and a specificity of 75.4%, and a predictive accuracy of 55%. Data from the ROC curve implies that the most optimum cut-off score to predict whether a patient is at high risk of falls is a score of 37.5. At this score, the sensitivity is 61% and the specificity is 61%. As the MFS increases in increments of 5 units, at the cut-off of 40, 60.5% of fallers were correctly identified to fall, and 60.7% were correctly identified not to fall. The results showed the discriminative ability of the MFS score to detect the presence of falling is 0.614 (95% CI: 0.544 – 0.685).

In summary, the nursing survey had a low response rate of 22.8%. While the results showed evidence of staff stability, with most nurses 91% having been at the hospital for over one year, 70% of respondents reported not having received falls prevention training. Positive attitudes towards fall prevention were revealed, though only 37% of nurses reported getting regular feedback on fall rates. However, fall risk status is being communicated at handover regularly (77%). High risk signs do not appear to be commonly used in practice (27% of nurses reported using this strategy), but positioning high risk patients close to the nursing station is frequently used (82%). There was evidence of lack of clarity of fall definition and what incidents to report. While 83% agreed that not only injurious falls should be reported, only 68% considered sliding off a chair to the floor to be a fall, and as few as 32% of respondents thought a stumble in the bathroom should be reported in an incident report. Most (66%) nurses reported wanting more training in falls.

Chapter 5. Discussion

The purpose of this study was to determine the rate of inpatient falls and describe the factors which may contribute to falls at the research site. The main findings of this thesis are discussed below.

The most important and clinically relevant finding was the low fall rate when compared to studies reporting on fall rates from the Global North. While international multi-site studies have described rates between 3-12 falls per patient occupied bed day (POBD),[5, 81] single site whole hospital studies rates appear to be lower, reportedly between 1.39-2.4 falls per POBD.[8, 11] Single site studies from low- and middle-income countries (LMICs) reveal rates from 0.8-16.9,[10, 112, 114] but include specific wards or specialities only, making comparison of results with whole hospital studies difficult. The low fall rate in the present study was unexpected, especially in the context of an under resourced healthcare system.[112, 194] There is a dearth of evidence in peer-reviewed journals on fall rates from South Africa (SA) with which to compare the fall rate found in the current study. Grey literature sources describe fall rates of 0.54-1.8 across multiple sites.[57-60] However, the methodology is not reported on in the reports of the three major healthcare groups, limiting the comparison of results with the present study. Although investigation of under reporting of falls was beyond the scope of this study, previous studies have indicated that approximately 25% of falls in the acute hospital setting are not reported in incident reports.[73, 110] Toyabe suggested that non-injurious falls, first falls, falls occurring on a holiday, and falls that were unwitnessed were less likely to be reported.[73] In contrast, Hill et al., found that patient falls were less likely to be reported if they occurred subsequent to an earlier fall, or if the fall occurred during the morning or afternoon shift.[110] Best practice guidelines advocate that at the outset of policy development and falls prevention planning, the definition of a fall should be clearly described.[3, 54] At the research hospital, when the Falls Policy was introduced in 2013, a fall was not defined. When the policy was revised in 2017, a falls definition was added. However, the results from the nurses' survey in the present study indicate some disagreement on the definition of a fall, and which events should be reported. As has been brought to the foreground in previous research, common barriers to the reporting of adverse incidents (AIs) and near miss events include deficiencies in staff knowledge, time constraints, inadequate feedback, and staff beliefs about risks.[195] It is possible that patient falls were under reported during the time period of data collection in the present study, due to lack of clarity on which events to report.[196] In the current study, the results indicated that there is a lack of falls training. While most nurses felt confident to complete an AI report, it bears consideration that gaps in knowledge on which incidents to report may be leading to

under reporting of falls. Therefore, it may be that the fall rate found in the current study may be an underestimation of the problem. Likewise, the possible lack of clarity on which incidents to report may explain the high number of injurious falls, and the low number of *no harm incidents* (see Glossary) recorded, when compared to other retrospective single-site studies, which have shown fall injuries to be sustained in approximately one-quarter to one-half of in-hospital falls.[11, 64, 96] Interestingly, the present study shows a high number of injurious falls in a younger population, contrary to findings of previous research,[11, 96, 197] where older, frailer patients are more likely to suffer injurious falls.[74]

The number of incidents reported reflects reporting culture rather than the actual number of patient falls,[5] therefore, a low falls rate does not signify a 'safe' environment; it may represent under reporting.[74] Likewise, a high falls rate reporting rate should not be interpreted as 'unsafe', it may represent a more open culture. Indeed, as more focus is placed on falls prevention, the reporting rate may increase.[5, 127] A non-punitive approach to reporting and analysing errors and events is recommended, as punitive cultures result in events not being reported, and therefore missed opportunities to identify and introduce prevention measures.[198] It is evident from the nursing survey results, that some nurses perceive organisational factors as barriers to effective falls risk management. The results of the nurses questionnaire revealed low staffing levels, the lack of training in falls prevention, and the lack of, or faulty equipment were all areas that some nurses believe can be improved at the institution. Likewise, some nurses reported that the way falls risk is currently assessed should be improved.

The perception by some nurses that the current assessment tool should be reviewed is relevant when considering the results of the predictive accuracy of the Morse Falls Scale (MFS) in the context of the present study. Analysis of the receiver operating characteristic (ROC) curve indicated the accuracy of the tool to correctly predict patients who fall is lower than in previous studies.[104, 138, 141, 175] As highlighted in previous studies, variations in sensitivity and specificity of the MFS have been encountered.[101, 135, 137, 173] While a cut-off score of 51[175] has shown high sensitivity and specificity, the current study indicated the MFS has a low sensitivity and a high specificity at the current cut-off score of 50. Furthermore, the findings revealed that even if the cut-off score is reduced to 40, the sensitivity and specificity rate remains low.[27] Oliver and colleagues suggested that to be clinically useful, a falls risk prediction score should have at least a sensitivity and a specificity of 70%.[27] Thus, the results suggest the use of the MFS in this studies' setting should be re-evaluated. The relatively young mean age of the population found in the current study may have influenced the predictive accuracy of the MFS in this study.[14] Healey and Haines, found no evidence that the MFS was better at predicting falls in people younger than 75

years of age, other than would be expected by chance.[14] As alternative risk screening tools have previously demonstrated poor predictive accuracy,[168, 172] they are unlikely to be more appropriate that the MFS in this setting. Research has shown that using screening tools is not superior to regular clinical assessment of risk factors.[199] Therefore, the National Institute of Clinical Excellence (NICE) guidelines no longer recommend the use of falls risk screening tools in the acute hospital setting.[3] Moreover, the results of the present study indicate the MFS is not being updated in accordance with the Falls Policy. It appears that the completion of the MFS may be perceived as a required task that is done as a "once off". Furthermore, the infrequent use of *fall risk* alert signs above high-risk patients' beds, gives impetus to the suggestion that completing the MFS may not result in actions to drive preventative measures based on the risk category at the hospital.

In addition to the low predictive accuracy of the MFS, when analysing individual subscales of the MFS, the only variable that was statistically different between the two groups (Fall Group and Non-fall Group), was *walk/gait* status. That none of the other categories were different between the two groups suggests that the scale itself may not discriminate correctly between the variables. Alternatively, the lack of difference between the two groups regarding subscales on the MFS, may be due to the MFS being frequently incomplete. Additionally, there were omissions in all the categories on the MFS. The reasons for incomplete sub-scales were not explored in this study, but may have been due to error, or the staff member may not at the time of completing the form, have had the necessary detail to complete it entirely. According to the survey results, most respondents reported the belief that the Falls Policy and MFS are useful. These results suggest nurses appear open to procedures related to fall management. However, based on the results of the current study, the reliability, validity and process of using the measuring tool in this context is questionable.

Table 15 documents intrinsic risk factors for in-hospital falls identified in previous studies. Concurrent with previous studies, the results of the present study revealed increased age is was associated with falls.[16, 121, 200] However, the average age for the fall group in this study was younger than expected when compared to published studies from the Global North.[16, 64, 96] De Souza et al., in a study from a LMIC,[113] and unpublished grey literature from SA,[60] reported the mean age of patients who fall to be 65 years or older.

Table 15. *Intrinsic risk factors for in-hospital falls*

Intrinsic risk factor	Comment
Age	The risk of falling in hospital increases with increasing age, specifically in patients over the age of 65[55, 96, 138, 201]. Epidemiological studies have described increased fall rate with increased age.[66, 109, 127] Both Aranda-Gallardo et al., and Babine et al., describe over half of the fall events being experienced by participants older than 70 years of age.[66, 109] The NRLS reports that 77% of all documented falls occur in patients over the age of 65, despite this age group representing 40% of total admissions during the reported time.[80] Cox and colleagues, in multi-variate analysis, found that age significantly increased risk for falling in 160 medical-surgical patients.[16]
Sex	While reported fall rates of males are higher than females in some international studies,[15, 56] the sex of the patients as a risk factors for falls has not been established conclusively.[96, 140, 141]
History of falling	A history of falls has been shown to be a significant intrinsic falls risk factor in systematic review.[15, 136] A large multi-site study (n=281,865), reported that a recent fall (within the preceding 6 months), was a strong predictor of falling (OR=2.98).[135] al Tehewy and colleagues, found that a history of falling was an independent predictor of falls in logistic regression (p=0.007), though this was a small study and included patients from one medical ward only.[10]
Number of listed co-morbidities/ secondary diagnosis	Patients with a higher number of comorbidities have a higher risk for adverse outcomes in hospital.[202] Memtsoudis et al., reported higher comorbidity scores in patients who fell in hospital post hip and knee replacements, suggesting a higher burden of comorbid disease in their study sample.[121] Comorbidities including chronic conditions such as cerebrovascular disease, chronic obstructive pulmonary and renal disease, neurological disease, and malignancy are associated with higher rates of in-hospital falls.[55, 126, 138] Jorgensen and colleagues[55] investigated the association between chronic conditions and in-hospital fall-related major injuries in a large-scale nationwide study in Denmark. The sample in Jorgensen and co-workers' study was patients over the age of 65 years. The age of the sample, as well as the study setting may make comparison to a single site setting in a LMIC problematic, where the age of the population,[91] and disease burden may be different.[25]
Walking status	Impaired mobility or unsteady gait has been reported as a significant intrinsic risk factor for falls in systematic reviews,[15, 27, 136, 138] and single site studies.[200, 203] Abreu and colleagues found partially dependent patients were more likely to experience a fall, though no explanation was offered as to how gait dependency was classified.[127]
Mental status of confusion/delirium	Confusion has been shown to be a significant intrinsic risk factor in both systematic review,[27, 136] and single-and multi-site studies.[66, 135] In the hospital setting, confusion can be acute and transient, due to the patient being unwell, and may therefore be a modifiable risk factor that should be specifically assessed and managed.[66, 204]
Psychotropic medication prescribed and administered.	The use of psychotropic medication has been found to be a significant risk factor for in-hospital falls in both systematic reviews,[15, 27] and other studies.[16, 41, 133, 205] However, risk may depend on which type of central nervous system drug is used. For example, in their multi-site prospective study of 1,412 patients over the age of 70 years, Ballokova et al., concluded that different benzodiazepines may predispose older patients to falls more than others.[205] Diazepam showed the strongest association with falls.[205] In contrast, Chiu et al., reported the use of tricyclic antidepressants and narcotics increased the risk of falls by 3.36 (CI: 1.10-10.2), and 2.09 (CI: 1.1-3.98) respectively.[133]

Continence issues	Increased frequency of toileting and issues with continence have been shown to be a significant intrinsic risk factor for falls in systematic reviews.[15, 136] In their multi-site study, Moe et al., found that taking a laxative was a strong predictor of a fall (OR=1.54), likely due to increased urgency to get to the toilet.[135]

It is possible that the younger mean age of the Fall Group found in this study reflects the younger mean age of hospitalised patients at the research site[206] when compared to countries in the Global North, where many hospital beds are occupied by older adults,[64, 207] known to have a higher frequency of falls[124]. In SA, only 8.4% of our population is 60 years or older, [89] and the average life expectancy is 64.2 years, 8.4 years lower than the average global life expectancy.[94] However, the aging population in SA is increasing at a rate of 3% per year the highest growth rate of any age cohort in South Africa.[208] Therefore, SA hospitals should be proactive in their approach to falls prevention. The research hospital, as one of SAs premier tertiary academic health centres, should aim to reduce both the fall rate and the number of injurious falls accordingly.

Concurrent with the results of previous studies, a longer length of stay (LOS), and having a higher number of comorbidities were associated with falls.[53, 128] The LOS of the Fall Group in the present study was also longer than the average LOS reported by the hospital.[88] One might expect patients who have a longer LOS may be more unwell,[121] have less physiological reserves, more procedures and more drugs. As highlighted in the present study, because patients in the Fall Group stayed longer, it is likely that their health status may have changed during the time of their admission. It bears consideration that had the MFS been updated according to the hospital policy if the patient's health status changed, or more regularly, the patients' fall risk category may have changed too. As a result, more patients may have been classified as *at risk* for falls, and preventative measures put in place to prevent the fall. However, as previously discussed, there was a low repeat MFS rate. The lack of updated MFS scores may affect the reliability of the present studies' results.

While most patients were discharged home in both groups, analysis of discharge destination was significantly different between the groups. For the Fall Group, more people were discharged to a different destination, and a higher frequency of patients were discharged to a rehabilitation facility, implying that the Fall Group experienced a change in functional ability between admission and discharge. Knowledge of discharge destination does not help predict falls risk, and it was not possible in this study to determine whether the fall incident was the causative factor for the change in discharge destination. However, a change in discharge destination indicates that people who experience in-hospital falls may require ongoing care.[121] Ongoing care in the form of rehabilitation may place an additional financial and care burden on families and the state health system.[53] Memtsoudis et al., described increased morbidity in patients who sustained in-hospital falls following orthopaedic procedures,[121] though this outcome has not been reported on widely in the literature. While

the results of this study revealed significantly more patients in the fall group died, one cannot attribute death to the fall event itself in this retrospective review. However, the increased morbidity suggests, when considering the longer LOS and increased frequency of co-morbidities, that patients who fell may have been more unwell. Therefore, sicker patients may be at higher risk of falls, and should be more carefully monitored.[74]

The clinical implications of the results of this study, and implications for the hospitals Falls Policy will now be discussed.

5.1 Implications for policy

As highlighted by the results of this research, the MFS is not correctly identifying patients at risk for falls, is not regularly repeated after a fall event, and is frequently incomplete. Thus, the hospital may wish to critically re-examine the Falls Policy, despite its relatively recent revision (2017). The stated purpose of the policy is to identify patients at risk for falls, and to ensure the safety of patients. As revealed in this research, the falls risk tool is not reliably identifying patients the fall, and most reported falls are injurious, implying that the Falls Policy may not be optimal.

Based on the poor predictive accuracy of the MFS as highlighted in this study, it is recommended that the hospital remove the use of the MFS, and alternatively put processes in place for assessing patients for risk factors regularly. Furthermore, strategies for making fall prevention more routine should be adopted.[209] It is recommended that nurses establish a baseline risk for falls on admission or transfer to the ward. Contrary to some studies (Table 15), a history of falls was not a significant risk factor for falls in the current study. However, considering the strong association in previous studies, nurses could consider asking specific questions such as whether the patient has a recent falls history, and whether they use walking aids at home that may not have been brought with the patient into the hospital, to try to mitigate risk. Nonetheless, some risk factors may not be evident at the initial nurse screening time. The inability to score mobility, assess medication and screen for confusion are examples of previously identified risk factors (Table 15) that staff may not be able to assess at the time of admission, indicating more regular and ongoing assessment of risk may be required.[74]

If the hospital insists on continued use of the MFS, the results of this study indicate the cut-off should be reduced from 50 to 40. It is worth considering initiation of an across-the-hospital compulsory weekly falls risk status update, to ensure that falls risk is evaluated regularly.[82] Thus, a more accurate falls risk status is likely to be reflected, on which to base

intervention practice, as fluctuations in risk status occur frequently in patients in the acute hospital setting.[14]

Analysing falls is one of the key ways to prevent future falls.[3, 13] Organisational learning from this analysis can be used to inform practice and policies, and to prevent future falls.[3, 13] Morbidity and mortality (M & M) meetings could be considered as a platform to raise awareness of the problem of falls, and include professionals beyond just nursing and quality assurance (QA) personnel in falls analysis and prevention planning. A multidisciplinary team M & M meeting could be adopted by the research hospital to create a venue for analysis of care processes, a platform to launch QA initiatives, and a culture of safety.[210] M & M meetings, which traditionally focus on surgical events, have evolved to incorporate review of adverse events in a multidisciplinary setting, with analysis and feedback provided by multiple experts and an appreciation of the systems of care and the need to develop systems-based practice.[211] M & M meetings occur on a quarterly basis at the hospital,[84] and as far as the researcher is aware, are not attended by members of the multidisciplinary team. Falls events are not discussed as an agenda item at these meetings, and is an example of a missed opportunity for organisational learning about the context of falls at the hospital.[74]

A falls team involving a range of professionals should be established,[75] considering the impact of increased comorbidities and mobility issues on the risk of falls found in this study. The falls team should therefore include doctors, nurses, therapists and QA personnel. Framing falls prevention solely as a nursing issue will lead to missed opportunities to prevent falls.[87] The falls team should be involved in policy planning, falls incident tracking, and how to present meaningful falls data back to the wards, in order to positively impact falls prevention practice.[13] All patients who are reported to fall should be followed up by the falls team to ensure compliance with the post fall procedure. Furthermore, the direct clinical consequences sustained, for example, injury, additional investigations, and impact of the fall on LOS and discharge destination, may be more accurately ascertained and recorded.[13]

The hospital should investigate the current method of recording of fall-related incidents, to include fall specific details.[13] For example, the location of the fall event, the activity the patient was performing at the time of the fall, and whether the fall was witnessed or unwitnessed will aid analysis and learning from fall events.[3, 13, 17]

5.2 Clinical implications

The results indicated that Thursday was the most common day for falls to occur, and that there were multiple spikes in the number of falls occurring over a 24-hour period. Analysis of

the reasons for the increased frequency of falls during these periods is beyond the scope of this study, but may be due to ward routines and practices resulting in less supervision of patients during these times.[10] Unit managers could be motivated to consider the specific routines in place on their wards, and how these routines may impact fall rates during the aforementioned times.[13] Likewise, a reduced frequency of falls was identified during evening visiting hours, likely when visitors are present, and patients may have increased monitoring and assistance.[127] Visitors and family members can be encouraged to assist the patient or signal to nurses that the patient requires assistance. While provision of education brochures for patients or families is included in the standard care plan (SCP), patient education on falls prevention using materials alone, has not been shown to influence the rate of falls.[154, 176] A significant reduction falls has however been achieved in randomised controlled trials (RCTs), when educational materials are accompanied by individual sessions with healthcare professionals, trained in falls prevention, and which addresses targeted risk factors in cognitively intact patients[154, 176] Therefore, if appropriate, hospital staff should discuss the patient's risk of falling and their need for close monitoring with carers, or family, as well as provide written educational material.

The use of fall risk signs was revealed by the nursing survey to be infrequently used as an intervention to alert others to high falls risk patients. Barker and colleagues' reported a sustained reduction in the rate of injurious falls when fall risk signs were used as part of a falls programme in 2009.[181] However, when used in combination with five other interventions in the 6-PACK study, the authors found no difference in falls or fall injuries.[81] Therefore, the value of falls alert signs as part of a falls management programme remains inconclusive. The results of this study suggest nurses do not perceive feedback at ward level pertaining to falls is being provided. While a lack of feedback may have a detrimental impact on nurses' efforts to improve patient safety,[154] regular feedback provided as part of nursing handover could help to promote a safety culture within the organization.[212]

Healey et al., advocate that hospitals should specifically assess and address individual modifiable risk factors rather than count risk factors.[28] Table 15 highlights previous studies investigating the association between gait instability and in-hospital falls. Similarly to previous single site studies,[200, 203] the present study revealed gait instability as a significant modifiable risk factor for falls. The results highlighted that while most patients in the Fall Group had either a *weak* or *impaired* walking status (see Glossary), nearly three-quarters did not use a walking aid. Moreover, the most frequently reported activity the patient was performing at the time of the fall was *ambulating*. Therefore, patients with gait instability

should be referred to physiotherapy for a gait and balance assessment, and possibly for the provision of assistive devices.[13] In the present study, falls occurred most frequently at the bed/bedside. Thus, interventions aimed at reducing fall events at the bedside such as ensuring the patient's call bell and assistive devices are within reach, may be most useful in this context. Nursing management may wish to consider screening a patient's ability to transfer safely, and then refer to physiotherapy for further assessment and assistance with transfer and mobility training. Key aspects of the physiotherapist's profession is health prevention and promotion.[213] In addition, physiotherapists are rehabilitation specialists.[213] Thus, the physiotherapy profession is uniquely poised to assist in falls prevention and improving patient safety. Referrals to physiotherapy can be made by anyone in the multidisciplinary team,[193] and the nursing survey revealed most nurses feel confident to refer to physiotherapy. Collaboration with the multidisciplinary team is included in the SCP, and nurses should be encouraged to refer at risk patients.

Discrepancies in clinical consequences and injuries sustained and recorded were identified in this review.[11] Whilst not the focus of investigation in this study, these discrepancies may have been due to the time frame in which incidents are reported and recorded according to the hospital policy, and the lack of follow up by a falls team. The survey showed that while most staff know there is a post fall procedure to be followed, the lack of repeat MFS evident in the notes suggests that the procedure is not being followed. Staff should follow the hospital post fall procedure guidelines for managing patients immediately after a fall.[74]

5.3 Training implications

This study identified that while the majority of nurses had worked at the institution for longer than one year, most had not received falls prevention training. However, an opportunity exists, as the results indicate most nurses appear receptive to falls prevention training. Therefore, if the hospital aims to reduce falls and harm from falls, it is recommended that the

[11] Four cases of injuries sustained due to the fall incident that were not recorded on the incident forms were discovered during the record review. The four cases should have been classified as having sustained '*major clinical consequence*', as the AIs resulted in fractures to the upper limb, lower limb, a neck of femur fracture, facial fracture, brain contusion and chipped tooth. In addition to the physical harm suffered by the patient, these four cases as well as other cases revealed required extra investigation, medical management and surgical procedures required, which would have incurred additional costs for the hospital. That none of these additional consequences were noted on the incident form implies that the process of recording the consequences of falls is imperfect and consequences of the fall event are being missed. The process of recording and following up fall patients should be reconsidered so that consequences that are not immediately evident are not missed.

falls programme be supported by education of nursing staff, which has been shown to be a key factor in the successful implementation of such a programme in acute hospitals.[154] Ward based training and workshops were identified by nurses in this study as the preferred format for training, and should be considered. Previous research has shown that face-to-face ward-based training in falls prevention is more effective than training provided in a classroom environment.[82] Knowledge of risk identification and education has been highlighted as a critical barrier to implementing falls clinical practice guidelines,[82] as was shown to be the case in this study. The hospital could consider piloting training on wards with high fall rates,[42] for example the medical wards, identified in the present study to have a high rates of falls. The hospital should consider instituting mandatory training for new employees and yearly refresher courses, as regular updates and communication have been shown to be important in sustaining practice.[42, 154, 155] Training should be provided by an individual who is a trained health professional, and not a member of staff, with experience in fall prevention and training, as this has been shown to be effective in upskilling in the hospital environment.[212] Whilst this study was limited to surveying nursing staff, as nursing staff are the initial point of contact for falls risk screening, falls prevention training should not be limited to nursing staff but should include all members of the multidisciplinary team.[30]

As has been highlighted, this study showed that the MFS is frequently incomplete and often not repeated. Although no evidence specifically linked to nurse training on use of the MFS was found, the results of this study suggest that should the use of the MFS be continued, nurse training should be conducted. Training should include how to assess and score each sub-scale correctly, the importance of correct completion for each sub-scale, how often to repeat the screening, and how to translate the risk score into implementation of fall prevention strategies. Most falls were unwitnessed, as is the case in previous studies.[8, 109, 132] Therefore, the key to reducing falls may be to increase awareness among staff of specific individual risk factors for falls, so that nurses are alerted to those at higher risk and can monitor or assist these vulnerable patients more regularly.

5.4 Environmental considerations

Whilst not explicitly investigated in this study, the results of survey suggest nurses perceive environmental factors are contributing to patient falls. Lack of and faulty equipment was highlighted as both an area of the falls programme that needs improvement, and as a the most common barrier to the implementation of the falls programme in this study. It is therefore recommended that environmental reviews be conducted regularly, to reduce the risk of falls. The hospital could consider combining environmental reviews with Health and

Safety reviews. As most falls in the present study occurred at the bed or bedside, environmental reviews should include checking the immediate bedside area. The survey highlighted that repairing and provision of equipment at could be improved. Thus, functionality of brakes of beds and cot sides should be ensured, and bedside tables should be within the patients reach. In this study, a quarter of falls occurred in bathrooms, thus environmental assessment should include review of availability of grab rails and non-slip surfaces in the bathroom.[145]

A range of alarm systems and alert devices are available and are used internationally. Monitoring systems include motion sensors, video surveillance and pressure sensors,[214, 215] which come at an initial financial cost and in terms of ongoing maintenance and training.[216] Therefore, such systems should be tested for suitability before purchase, and the first step would be ensuring the current call bell system is functional,[12] and is within the range of the patient when sitting out in a chair, when in bed, and when in the bathroom.[178] Mobility aids should be available, and always be within patient reach.

Limitations likely to arise are time-constraints, staff turnover, staffing issues such as staff responsiveness, staff resources,[217] variable numbers of non- permanent “agency staff” who may not be familiar with hospital policy and procedures, and other competing activities occurring in the ward. However, sustained reductions in falls and falls injuries have been achieved using evidence-based interventions and quality improvement initiatives. Mordiffi and colleagues,[82] describe a ten-year project which included evidence-based interventions and quality improvement initiatives which were implemented systematically.[82] The authors conclude that falls prevention is a continuous process comprising many phases, that can achieve sustained reductions in falls and falls with injury.[82] Likewise, Walsh and colleagues,[18] describe a multifaceted fall prevention programme, which was implemented incrementally over 13 years. The programme achieved a substantial and sustained decline in fall rates. Walsh and co-workers conclude that institutions that have competing clinical and financial priorities, such as is the case at the site for this research study, may find an incremental approach to falls reduction useful.[18]

[12] Although not investigated in this study, it has come to the attention of the researcher that the patient call-bell system at the research hospital is not currently functional and due to aging infrastructure is going to be very costly to replace. Hospital management is investigating solutions to solve the non-functional call-bell system, but it is likely that the lack of a functional system impacts greatly on patient falls.

5.5 Strengths and limitations of the study

One of the strengths of this study is that it was a whole-hospital study. The study included data from all wards and departments at the research hospital, not only wards traditionally to have been shown to have higher frequency of falls.[10, 109] Thus, the results are more generalisable to the entire hospital. A further strength is that this study considered staff viewpoints in the form of a whole-hospital nurses survey, as well as a record review. Therefore, a more holistic view of the factors contributing to falls is presented. Most nurses who responded to the questionnaire had worked at the hospital on a specific ward for more than a year. That most nurses had been in employ for longer than a year, implies respondents were aware and conscious of fall reporting climate, interventions implemented and ward practice regarding fall prevention, adding to the strength of the survey results.

However, the limitations of this study must also be considered. Limitations arise mainly from its measurement approach and research design. A limitation of this study is that this is a single-centre study. Thus, the findings are not generalizable to other patient groups or settings.

To minimise the risk of chronological bias, the researcher chose to limit the selection time frame to a ten-month period. Chronological bias, such as changes in policy over time may affect the way falls are reported and recorded at the institution. Random sampling was not possible due to limited numbers of patients who fell during the ten-month period. Purposive sampling was therefore used in this study, and sampling bias[183] may have been introduced, affecting the generalisability of the results of this study. Selection bias may affect this study, as patients who fell were over-represented. Therefore, future research should consider weighting the sample to avoid over representation of patients who fall.[16]

Patient safety incident data in general is prone to reporting error and bias.[218] Reporting error and bias will affect the number and type of reported incidents and how the data are interpreted.[73, 218] Falls are known to be underreported,[73, 110] and reporting bias may be a limitation to this study. The initial data source was the adverse incident (AI) database. It could not be confirmed whether data inputted into this database had undergone reliability testing, and therefore the data source itself may be a source of error and bias. The results of the pilot study indicated the information recorded in the AI reports was consistent with that documented in the medical notes, however, the pilot study used a very small sample, limited to five cases. In the main study, when comparing the AI database entries against what was recorded in each folder, four cases were found, which appear to indicate discrepancies in

reporting and capturing, and a degree of error in the system.[13] While commenting on the quality of recorded information and the system of follow up after a fall was not the focus of this study, it was apparent that attention should be paid to follow up of patients that fall, to not miss possible harm that is not initially evident immediately post fall.

Medical record review for in-hospital falls particularly may be an unreliable source.[201, 219] Collection of data was a challenge, due to unavailability of medical records and partially reported cases. Folders of one out of five patients eligible for inclusion (after excluding for age and fall definition) in the Fall Group were not available and resulted in a smaller sample size, which may have affected the results. It is unclear why these folders were not available from the Medical Records Department; whether there was a systematic reason for the unavailability of these records, or whether it is an issue with management of medical records in general. Further analysis of fall events should follow a prospective design to mitigate the threat of missing data.[123]

Regarding the nursing survey, the response rate was low. Survey designs are known to have a low response rate, and previous studies surveying nurses in hospitals have had similar response rate to the rate achieved in the present study.[220] Additionally, not all respondents completed all the questions, particularly the open-ended questions. Therefore, small sample bias and generalisability of these results to the entire nursing population at the hospital is limited. The response rate was disappointing, especially considering the effort made by the researcher to mitigate a low response rate by attending meetings and the introduction of the study to unit managers. Volunteer bias may affect the generalisability of results, respondents may not be representative of views of all nurses at the hospital,[185] which threatens both the internal and external validity of the survey results. Respondents may have had a particular interest in fall prevention. Likewise, non-response bias, may affect the results of this study,[123] in that the views of those that did not respond are not represented in the results, and differ from those who did respond. The Hawthorne effect may affect the reliability of the survey results.[221] As respondents were aware their

[13] While the reported rate of falls in this study was low, injurious falls accounted for 97.7% of reported events. The four discrepancies found would have likely been classified as *serious injury*. In the United States of America, *serious injury* is considered a *serious reportable event*, an event that should never occur.

responses are being studied, they may have changed their responses to produce more socially desirable results, based on their perceptions of expectations of the research.[221]

The survey used was originally used in the pre-implementation phase of the 6-PACK programme (see Procedure).[103] In its original form, the 6-PACK nursing survey included questions on safety climate from the short version of the safety attitudes questionnaire (SAQ). The SAQ was previously validated,[44] however, as measuring safety climate was not an aim in this project, the SAQ items were omitted from the questionnaire in this study. Items related to beliefs about falls and current falls practice, including the hospital Falls Policy and intervention programme, were taken from the original questionnaire, and only minor word changes were made (as described in the Procedure). The original authors used best practice guidelines and a sound theoretical framework on which to base the 6-PACK questions.[103] However, the face and construct validity of the nurses survey were not assessed prior to this study. Thus, raising raises issues regarding internal validity of the survey, especially when considering that the SAQ items were omitted in the present study. Thus, error and bias related to validity of the questionnaire may affect the results of this study. Additionally, the open ended questions were negatively worded and may have introduced response bias.[222]

In addition, reviewer bias may have affected the results.[183] The researcher attempted to mitigate against reviewer bias by training the assistants, developing a key to aid standardised data extraction, practicing coding and checking reliability of extracted data. However, it was not possible to keep the assistants blind to the purpose of the study, nor to which cases were in Fall Group and Non-fall Group.

5.6 Recommendations for future research

Future research should be conducted using a prospective design. If the hospital retains the use of the MFS, research should be conducted into whether the predictive accuracy of the MFS improves if it is used correctly in this specific setting. Therefore, it is necessary to determine whether use of the scale improves with nursing-specific MFS training. A pilot study in a ward with patients in the medicine speciality, identified in this study as having a high fall rate is suggested. Alternatively, future research could investigate other methods for assessing risk more regularly. For example, the use of the Timed-Up-And- Go (TU G).

The goal of a falls prevention programme is to reduce the fall rate and harm from falls. Thus, ‘usual care’ interventions currently used with ‘at risk’ patients should be identified, and the links between risk screening and an individualized plan in this setting investigated. A

pilot study exploring the effect of a multifactorial intervention programme in comparison to 'usual care' should be conducted at the site. Additionally, other methods for screening for fall risk could be investigated.

Factors contributing to falls include intrinsic, extrinsic and organisational variables. In this study, analysis focused on individual rather than systemic factors, given that medical records were the source. However, the nursing survey indicated a need for further study of the context and systems in which the fall prevention practice is being provided. At institutional level, to try to prevent harm from falls, a better understanding environmental and organisational factors contributing to falls should therefore be investigated.

5.7 Conclusion

This study highlighted that while the reported fall rate at the research hospital is low when compared to international studies, falls are the second most frequent adverse event reported. Furthermore, falls in this setting resulted in clinical consequences including physical harm, in the vast majority of those who fell. The current risk screening tool was shown to be inadequate in predicting fall events, and fall risk is not being updated routinely. The MFS as it is currently being used, is lacking in adequate sensitivity, specificity and predictive ability. While identifying those at risk is a necessary phase of a fall prevention programme, the risk status of the patient should be communicated to staff, used to guide an individual intervention plan, and address modifiable risk factors. In addition, risk status should be updated regularly to ensure patient safety.

This descriptive study provides a starting point for the hospital to examine the Falls Policy and falls prevention strategies currently in use. It is hoped that the study will contribute to local awareness-raising and capacity-building and help the hospital evaluate current practice and set a baseline for improvement.

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Appendices

Appendix A1-2: Morse falls risk assessment tool version 2013 and 2017

Appendix A1: Morse falls risk assessment tool 2013

STA : 3375

MORSE FALLS RISK ASSESSMENT TOOL

PATIENT NAME: **FOLDER NO:** **(PATIENT STICKER)**	**ADMISSION DATE:** _____ **WARD:** _____	**ASSESSMENT DATE:** _____

ALL PATIENTS TO BE ASSESSED FOR THEIR FALL RISK:

- On admission
- On transfer from one ward/unit to another
- Following any change of status / condition
- Following a fall

(P.T.O. for score guideline)

VARIABLES		**SCORE**	
History of falling	No Yes	0 25	
Secondary Diagnosis	No Yes	0 15	
Ambulatory Aids	None Crutches/cane/walker Using furniture for support	0 15 30	
IV or IV access (i.e. Heploc)	No Yes	0 20	
Walk/Gait	Normal Weak Impaired	0 10 20	
Mental Status	Knows own limits Over-estimates or forgets limits	0 15	
	INITIAL TOTAL SCORE		

ANY SCORE UPDATES MUST BE RECORDED IN THE PATIENT'S NURSING RECORDS.

ASSESSOR'S NAME: _____ **RANK:** _____

SIGNATURE: _____ **PERSAL:**

RISK LEVEL	SCORE	ACTION
No Risk	0-24	Good Basic Nursing Care
Low to Moderate Risk	25-45	Implement Standard Fall Prevention Interventions
High Risk	46+	Implement High Risk Fall Prevention Interventions

MORSE FALLS SCALE VARIABLE DESCRIPTIONS

HISTORY OF FALLING

0 -If the patient has not fallen, this is scored 0.
25 -If a patient has fallen during present hospital admission or within last 3 months.

SECONDARY DIAGNOSIS

0 -No more than one medical diagnosis is listed on the patient's chart.
15 -More than one medical diagnosis is listed on the patient's chart.

AMBULATORY AIDS

0 -The patient walks without a walking aid.
15 -The patient uses crutches, a cane or a walker.
30 -The patient walks clutching onto the furniture/walls for support.

INTRAVENOUS THERAPY

0 -The patient does not have an intravenous apparatus or a heparin lock inserted.
20 -The patient has an intravenous apparatus or heparin lock inserted.

WALK/GAIT

**NB… If the patient is in a wheelchair, he/she is scored according to the gait they use when transferring from wheelchair to bed/chair.*

0 -The patient has a normal walk. A normal walk is characterized by the patient walking with the head erect, arms swinging freely at the side and striding without hesitation.
10 -The patient has a weak walk. With a weak walk, he/she is stooped but able to lift the head while walking without losing balance. Steps are short and the patient may shuffle.
20 -The patient has an impaired walk. With an impaired walk, the patient may have difficulty rising from the chair or attempts to get up by pushing on the arms of the chair or by bouncing. The patient's head is down and he/she watches the ground, steps are short and the patient shuffles. Because the patient's balance is poor, the patient grasps onto the furniture, a person or a walking aid for support and cannot walk without assistance.

MENTAL STATUS

When using this scale, mental status is measured by checking the patient's self assessment of his/her own limitations and ability to walk. Ask the patient, "Are you able to walk alone or do you need assistance?"

0 -The patient's reply, judging his/her own ability is realistic and the patient is aware of own limitations. The patient is rated as "normal".
15 -The patient's response is not appropriate or consistent with nursing orders. If the patient's response is unrealistic, then he/she is considered to overestimate his/her own abilities or the patient is not fully orientated to time, place or person.

16.05.2013

Appendix A2: Morse falls risk assessment tool 2017

STA : 3375

MORSE FALLS RISK ASSESSMENT TOOL

PATIENT NAME:	**ADMISSION DATE:**	**ASSESSMENT DATE:**
FOLDER NO: (PATIENT STICKER)	**WARD:**	

ALL PATIENTS TO BE ASSESSED FOR THEIR FALL RISK:

On admission

On transfer from one ward/unit to another

Following any change of status / condition

After a fall or a near miss

Each shift change where risk score is 46+ (High Risk)

Every 2 days where risk score is 25-45 (Low to Moderate Risk).

(P.T.O. for score guideline)

VARIABLES		**SCORE**	
History of falling	No	0	
	Yes	25	
Secondary Diagnosis	No	0	
	Yes	15	
Ambulatory Aids	None	0	
	Crutches/cane/walker	15	
	Using furniture for support	30	
IV or IV access (i.e. Heploc)	No	0	
	Yes	20	
Walk/Gait	Normal	0	
	Weak	10	

	Impaired	20	
Mental Status	Knows own limits	0	
	Over-estimates or forgets limits	15	
INITIAL TOTAL SCORE			

ANY SCORE UPDATES MUST BE RECORDED IN THE PATIENT'S NURSING RECORDS.

ASSESSOR'S NAME: _____ RANK: _____

SIGNATURE: ___ PERSAL: ____

RISK LEVEL	SCORE	ACTION
No Risk	0-24	Basic Nursing Care
Low to Moderate Risk High Risk	25-45 46+	Activate Standard care Plan for the Management of Fall Risk

MORSE FALLS SCALE VARIABLE DESCRIPTIONS

HISTORY OF FALLING

0 -If the patient has not fallen, this is scored 0.

25 -If a patient has fallen during present hospital admission or within last 3 months.

SECONDARY DIAGNOSIS

0 -No more than one medical diagnosis is listed on the patient's chart.

15 -More than one medical diagnosis is listed on the patient's chart.

AMBULATORY AIDS

0 -The patient walks without a walking aid.

15 -The patient uses crutches, a cane or a walker.

30 -The patient walks clutching onto the furniture/walls for support.

INTRAVENOUS THERAPY

0 -The patient does not have an intravenous apparatus or a heparin lock inserted.

20 -The patient has an intravenous apparatus or heparin lock inserted.

WALK/GAIT

**NB… If the patient is in a wheelchair, he/she is scored according to the gait they use when transferring from wheelchair to bed/chair.*

0 -The patient has a normal walk. A normal walk is characterized by the patient walking with the head erect, arms swinging freely at the side and striding without hesitation.

10 -The patient has a weak walk. With a weak walk, he/she is stooped but able to lift the head while walking without losing balance. Steps are short and the patient may shuffle.

20 -The patient has an impaired walk. With an impaired walk, the patient may have difficulty rising from the chair or attempts to get up by pushing on the arms of the chair or by bouncing. The patient's head is down and he/she watches the ground, steps are short and the patient shuffles. Because the patient's balance is poor, the patient grasps onto the furniture, a person or a walking aid for support and cannot walk without assistance.

MENTAL STATUS

When using this scale, mental status is measured by checking the patient's self assessment of his/her own limitations and ability to walk. Ask the patient, "Are you able to walk alone or do you need assistance?"

0 -The patient's reply, judging his/her own ability is realistic and the patient is aware of own limitations. The patient is rated as "normal".

15 -The patient's response is not appropriate or consistent with nursing orders. If the patient's response is unrealistic, then he/she is considered to overestimate his/her own abilities or the patient is not fully orientated to time, place or person.

23.05.2016

Appendix B1-2: Falls Policy

Appendix B1: Falls risk Policy 2013

HOSPITAL NOTICE NO. 9/2013 24 MAY 2013

FALLS RISK POLICY

RATIONALE:

The aim of this policy is to improve patient safety and quality of care by reducing the risk of falls on the part of frail, aged and reduced-mobility patients by identifying at-risk patients as early as possible.

POLICY

1. All inpatients must be assessed for their falls risk. This can be done daily, weekly or monthly, depending on risk level but must at least occur:

On admission

On transfer from one ward/unit to another

Following any change of health status

Following a fall

2. The risk assessment tool to be used is the Morse Falls Risk Assessment Tool (see STA 3375 attached).

3. Intervention strategies are based on the level of risk/score:

0-24 (low risk) 25-45 (medium risk) 46-100 (high risk)

and are set out in the attached “Morse Falls Risk Interventions” document.

PROCEDURE AFTER A FALL

Should a fall occur in spite of the above interventions, the following steps must be followed:

1. Initial Post-fall Assessment :

1.1 Establish whether the patient has any injuries;

1.2 Find out what happened. (This is necessary to identify the cause of the fall so that appropriate action can be taken).

2. Documentation and Follow-up :

2.1 The incident must be reported immediately to all the relevant supervisors and managers, and an Adverse Incident Report (currently PD 436) must be completed by the end of duty.

2.2 A detailed progress note should be entered into the patient's records, and must include the results of the post-fall assessment.

2.3 The patient must be seen by a doctor for further evaluation.

2.4 Fall prevention interventions should be reviewed and care plans modified as appropriate.

2.5 Staff must be informed that the patient has fallen and is at risk for additional falls.

Your co-operation will ensure that patient falls are kept to a minimum, and that those that do occur are dealt with appropriately.

DR xxxxxxxxx

CHIEF EXECUTIVE OFFICER

BA/MS/JH/MG/am

(Ref: c:\hosp.not 2013\Falls risk policy.doc)

<table>
<tr><td colspan="4">Review Date : May 2018</td><td>Supersedes / Amends:</td><td>Number</td><td>Date</td></tr>
<tr><td colspan="2">Nursing Division</td><td></td><td colspan="2">Admin & Support</td><td></td><td></td></tr>
<tr><td colspan="4">Clinical Departments</td><td></td><td colspan="2">DOH Circular Ref :</td></tr>
<tr><td colspan="4">Health Sciences Faculty</td><td></td><td colspan="2">File Ref :2.2.7 (Nursing Manual)</td></tr>
</table>

Appendix B2: Falls prevention and management Policy 2017

HOSPITAL NOTICE NO. 10/2017 22 MAY

2017 FALLS PREVENTION AND MANAGEMENT

PURPOSE

The purpose of the falls prevention and management policy is to:

Identify patients at risk for falls; and

To ensure the safety of the patient.

Definition of a fall

A fall is defined as an event which results in the patient or any part of the patient's body coming to rest inadvertently on the floor or other surface lower than the patient.

POLICY

The prevention and management of patients at risk for falling is the responsibility of the multi- disciplinary team.

The risk assessment tool to identify patients at risk for falling is the Morse Falls Risk Assessment Tool (STA 3375)

Forms to be used in conjunction with this policy:

Adverse Incident Report (AIRMS) (STA 01003247)

Standard Care Plan (STA3490)

When a patient falls, the post fall assessment procedure must be followed.

SCOPE

All patients must be assessed for fall risk according to the Morse Falls Risk Assessment Tool (STA 3375):

On admission;

On transfer from one ward/unit to another;

Following any significant change of health status or change in medication regime;

After a fall or a near miss.

Complete Standard Care Plan:

Risk score is 46+, assess patient every shift change;

Risk score is 25-45, assess patient every 2nd day.

Display an alert signage above patient's bed side (attached).

EDUCATION AND TRAINING

Patient and Family

Educate the patient and family on measures to prevent falls and promote safety.

Provide the patient with information leaflet on admission and discharge (attached).

Nursing staff

Operational Managers to ensure that all staff assigned, received training with regard to the Falls Prevention and Management Policy (procedures, tools).

Clinical Facilitators to create awareness during general orientation and induction to the ward with respect to Falls Prevention and Management Policy.

Falls Risk Assessment

AIRMS Training

On-going In-service training at ward level by the Operational Managers. A database must be kept accordingly.

Review the Fall Prevention and Management Policy annually.

PROCEDURE

Record the following information in the nursing process:

On admission

Initial assessment done, total score from the Morse Fall Risk Assessment Tool.

On transfer

Reassessment, change in score, Standard Care Plan and review times.

Following a change in health status

Reassessment and describe the incident, Standard Care Plan and review times.

Following a fall

Description of event, change in health status, reassessment and score, Standard Care Plan, review times.

Post fall assessment

Complete AIRMS form.

POST FALL ASSESSMENT

Following a fall:

Assess the patient for any obvious injury and establish what happened.

Reassure patient and, depending on the condition, place back into bed.

Record and document patient's vital signs (Temperature, Pulse, Respiration and Blood Pressure) in patient's progress notes.

Report incident immediately to the Doctor and Registered Nurse.

Record incident in the nursing process, description of event (location, activity occurring time, who was present, patient's condition and response at the time of the incident - including pain); assessment finding care plan and patient outcomes.

Notify the patient's family/guardian of the incident.

Keep assessment tool in patient file.

Complete an Adverse Incident Report before the end of shift and forward to the Quality Assurance Department

Communicate to multi-disciplinary team that the patient has fallen and is at risk for additional falls.

Ensure effective handover/communication between shifts with regard to the patients f all status.

On discharge, provide patient and family with information regarding falls risk and preventative strategies (Information Leaflet).

Record information together with mobility status of patient on discharge in the nursing process.

Your co-operation will ensure that patient falls are kept to a minimum, and that those that do occur are dealt with appropriately.

DDK/MG/MO/am

FACTORS CONTRIBUTING TO IN-HOSPITAL FALLS

(Ref: c:\hosp.not 2017\Falls Risk policy.doc)

Review Date : May 2022				Supersedes / Amends:	Number	Date
Nursing Division		Admin & Support				
Clinical Departments			X	DOH Circular Ref :		
Health Sciences Faculty			0	File Ref : 2.2.7 (Nursing Manual)		

Appendix C. Morse falls risk interventions (2013)

MORSE FALLS RISK INTERVENTIONS

INTERVENTION ***Implement low risk interventions for all hospitalized patients.***	SCORE **0-24 (low risk)**	**25-45 (medium risk)**	**46-100 (high risk)**
1. COMMUNICATION			
Orient patient to surroundings and hospital routines Very important to point out location of the bathroom. If patient is confused, orientation is an ongoing process. Call bell in easy reach – make sure patient is able to use it. Instruct patient to call for help before getting out of bed.	Yes	Yes	Yes
Patient/Family Education Verbally inform patient and family of fall prevention interventions.	Yes	Yes	Yes
Shift Report Communicate the patient's "at risk" status.	Yes	Yes	Yes
Plan of Care Collaborate with multi-disciplinary team members in planning care. Multi-disciplinary team should tailor patient-specific prevention strategies. It is inadequate to write "Fall Precautions".	Yes	Yes	Yes

Post a “Falls Awareness” sign at patient’s bedside, e.g. “Fall Risk”.	prn	Yes	Yes
Do rounds every 2 hours or more frequently as required. This includes change in position, toileting, offering fluids and ensuring that patient is warm and dry.	prn	Yes	Yes
Obtain doctor’s order for physical therapy consult.			
Ensure doctor’s referral for further intervention where necessary, i.e. Allied Health Professionals.	prn	prn	Yes
2. TOILETING			
Assess bowel and bladder functioning.	Yes	Yes	Yes
Discuss needs with patient and implement appropriate action.	Yes	Yes	Yes
Provide a commode at bedside (if appropriate).	prn	prn	Yes
Urinal/bedpan should be within easy reach (if appropriate).	prn	prn	Yes
3. MEDICATION			
Evaluate medications for potential side effects.	Yes	Yes	Yes
Consider peak effect that affects level of consciousness, walk and elimination when planning patient’s care.	Yes	Yes	Yes
Consider the review/management of medications and supplements to promote the reduction of fall risk.	prn	prn	Yes

4. ENVIRONMENT			
Bed/Stretchers	Yes	Yes	Yes
Low position with brakes locked and functional cotsides.			
Bedside stand/bedside table/locker			
Personal belongings within reach.	Yes	Yes	Yes
Room "clutter" –remove unnecessary equipment and furniture	Yes	Yes	Yes
Ensure pathway to the bathroom is free of obstacles and is well-lit.	Yes	Yes	Yes
Consider placing patient in the bed that is closest to the bathroom.	Yes	Yes	Yes
If appropriate, consider placing patient on a mattress on floor as need arises, e.g. psychiatric patients.	No	No	Yes
Use a night light as appropriate.	Yes	Yes	Yes
5. SAFETY			
Non-skid (non-slip) footwear.	Yes	Yes	Yes
Do not leave patient unattended in diagnostic or treatment areas.	prn	Yes	Yes
Consider placing the patient in a room near the nursing station for close observation, especially for the first 24-48 hours of admission.	prn	prn	Yes
If appropriate, consider using protection devices, e.g. chemical or physical restraints, helmets or gloves.	prn	prn	Yes
If "Fall Risk Prevention Interventions" have been initiated and are unsuccessful for confused patients, consider using restrainers.	prn	prn	Yes

Morse Fall Scale(gen-12)27.08.2013

Please file under 2.2.7 behind Hospital Notice 9/2013

Appendix D: Standard care plan for the management of fall risk

STA : 3490

Name:

Folder Nr:

Ward:

Department:

STANDARD CARE PLAN FOR THE MANAGEMENT OF FALL RISK

DATE	PROBLEM STATEMENT	EXPECTED OUTCOME(S)	EVALUATION AND ASSESSMENT	PRESCRIPTIONS
	PROBLEM: Potential fall risk CAUSE: * History of falling Secondary diagnosis Ambulatory Aids IV access Impaired walk/gait Altered mental status DATA BASE: Morse Falls Risk Score…… * Mobility…… Ambulatory Aids…… * IV Access…… Mental status…….	Patient will be free from any falls during hospitalisation Patient and family educated on fall prevention interventions	E DAY: DATE: A TIMES:	Orientate patient to surroundings and location of Ensure bed is in low position with brakes locked. Ensure bed locker and personal belongings are Ensure call bell is within reach and educate patie Instruct patient to call for help before getting out Apply bedside rails if required. Remove unnecessary equipment and furniture a Consider placing patient near Nursing station. Assist patient to bathroom / toilet. Offer bedpan / urinal as required. Monitor, record and report on Morse Falls Risk S Communicate fall risk status during Handover re Display “Fall risk” sign above patient’s bed. Evaluate medication for potential side-effects. Ensure patient has non-slip footwear. Educate patient and family on fall prevention inte Collaborate with multidisciplinary team. Monitor, record and report on mental status…… Obtain Doctor’s order for restraints, e.g. chemica

Appendix E: Falls risk sign

Appendix F: Information to prevent falls brochure

STA: 3538

NURSING DIVISION

INFORMATION TO PREVENT FALLS

PATIENT INFORMATION

- Do not hesitate to call a nurse for assistance when you need to get out of bed if you are feeling weak or dizzy.
- Sit at the side of the bed for a few minutes BEFORE you get up.
- Do not use bedside tables for support as they have wheels and could roll away from you.
- If you use a walking aid or wheelchair at home, bring it to the hospital and keep it within reach.

- For your own safety, the nurse may pull your bed rails up. Please do not try to climb over it; call the nurse for assistance.
- Notify the nurse of any spills or wet areas on the floor so they may be cleaned up quickly.

- Use your bed bell to call for assistance.
- If you have any drains or catheters, please be careful when walking.
- Wear proper fitting shoes or slippers when walking about.

VISITORS / FAMILY INFORMATION

To assist the nursing staff in ensuring the safety for your family member / friend, please ensure the following:

- Before you leave the bedside, please make sure the bed bell and the locker is within reach of the patient.

- If the bed rails are put up, it is for safety reasons. DO NOT lower them.

- If there is any change in the patient condition while you are visiting, please notify the nurse immediately.

- If the patient wants to walk about, please inform the nurse first.

Appendix G: Adverse Incident Reporting and Risk Management Tool

STA010003247 WC DoH ADVERSE INCIDENT MANAGEMENT TOOL FINAL VERSION

WESTERN CAPE DoH ADVERSE INCIDENT REPORTING AND RISK MANAGEMENT TOOL

PATIENT /STAFF LABEL (IF APPLICABLE)

Western Cape Government Health

SINJANI REF NUMBER **SECTION A: INCIDENT REPORTING FORM**

Patient □ Staff □ Visitor □ Contractor □ Facility □ Facility Name :

DATE OF INCIDENT TIME DEPT/WARD/UNIT

CLINICAL RELATED EVENTS □ **Not Applicable**

DATE OF ADMISSION **PATIENT DIAGNOSIS**

Pressure Ulcers □
Transferred with □Observed on admission □
Acquired during hospital stay □
SPECIFY THE GRADE
Redness □
Abrasion □
Blister □
Ulcer □
Cavity □

Procedure/Treatment Error □
Patient Identification □
Site Identification □
Omission/Commission of Procedure □
Omission/Commission of Treatment □
Retention of Foreign Object □
Dislodged Tube / Line □
Other *(Specify)* □

Refused Hospital Treatment □

Alleged Sexual Assault □

Healthcare Acquired Infections □
Surgical Site Infection □
Urinary Tract Infection □
Ventilator Associated Pneumonia □
Central Line Infection □
Peripheral Line Infection □
Communicable Diseases □
Other *(Specify)* □

Deaths / Suicide □
Attempted Suicide □
Suicide □
Anaesthetic Related Death □
Unexpected Death □

Equipment Related Event
Equipment Malfunction □
Non Availability of Essential Equipment □
Non Availability of Associated Consumables □
Other *(Specify)* □

Medication Related Event □
Dispensing Error □
Prescription Error □
Administration Error □
SPECIFY THE TYPE OF ERROR
Incorrect Patient □
Incorrect Medication □
Incorrect Dose □
Incorrect Route □
Incorrect Time □
Medication Omitted □
Non Availability of Medication □
No Prescription Available □

Patient Injuries /Harm Event □
Falls/ Slips □
Self-Inflicted Injuries □
Other *(Specify)* □

Blood Related Event □
Adverse Reaction to Blood Product □
Wrong Patient / Blood Type □

CONDITION OF THE PATIENT BEFORE THE INCIDENT □ **Not Applicable**

BP Pulse Resp. Glascow Coma Scale Sedated □ YES □ NO
□ Alert/Orientated □ Disorientated □ Other □ Cotsides Yes / No / NA Waterlow Score Morse Scale Score
Mobility : Without Assistance □ With Assistance □ Immobile /Bedbound □

CONDITION OF THE PATIENT AFTER THE INCIDENT □ **Not Applicable**

BP Pulse Resp. Glascow Coma Scale Sedated □ YES □ NO
□ Alert/Orientated □ Disorientated □ Other
Mobility : Without Assistance □ With Assistance □ Immobile /Bedbound □

STAFF RELATED EVENTS □ **Not Applicable**

Sharps(Blades/Scalpel/Needles) □
Exposure to Body Fluids □
Heat/ Burns/Explosion □
Radiation Exposure □

Hazardous Substance □
Sprain or Strain *(specify below)* □
***Lifting/ Turning/Moving Patient □
***Handling /Pushing/Pulling Object □

Occupational Acquired Disease □
TB □ HIV □ Latex □ Hepatitis □ Dermatitis □
Other *(Specify)*

SAFETY & SECURITY RELATED EVENTS □ **Not Applicable**

Damage to Personal Property □
Damage to Facility Property □
Use/Possession of Weapons □
Possession of Illegal Substance □
Bomb / Fire Threat □

Loss of Patient Possessions □
Theft / Burglary □
Infant Abduction □
Abscondment - Post Vacation Leave □
Abscondment - Facility □

Physical Assault □ Threatening Behaviour □
Verbal Abuse □
BY WHOM : Patient □ Public □ Staff □
TO WHOM : Patient □ Public □ Staff □
Other *(Specify)*

SECURITY NOTIFIED □ **Yes** □ **No** □ **Not Applicable** **Security Officer Name :**
REPORTERS NAME
DESIGNATION: **SIGNATURE:** **PERSAL NUMBER:**

DATE	NAME AND DESIGNATION OF PERSONS NOTIFIED	REPORTER'S NAME, DESIGNATION, SIGNATURE, PERSAL NUMBER

WC DoH Adverse Incident Reporting and Management Tool Page | 1

STA010003247 WC DoH ADVERSE INCIDENT MANAGEMENT TOOL FINAL VERSION

INCIDENT NARRATIVE REPORT and IMMEDIATE ACTIONS TAKEN *(Chronological point form ,facts only)*		
Name:	Designation/ Signature/Persal	Date:
WITNESS REPORT □ Not Applicable		
Name:	Designation/ Signature/Persal	Date:
DOCTOR'S FINDINGS /REPORT □ Not Applicable		
Name:	Designation/ Signature/Persal	Date:
MANAGER /SUPERVISOR'S COMMENTS □ Not Applicable		
Name:	Designation/ Signature/Persal	Date:
SECTION A AND THE NARRATIVE TO BE COMPLETED BEFORE THE END OF DUTY		

SECTION B : SUPERVISORS / MANAGERS REPORT (INVESTIGATION / ROOT CAUSE ANALYSIS)

CONTRIBUTING FACTORS ***(Multi Factorial and LIMIT to 3 main causes)***

Acts or Omission in respect of :

Availability of Information ☐	Equipment Maintenance/ Management ☐	Record Keeping ☐
Continuum of Care Management ☐	Induction /Orientation ☐	Staffing ☐
Communication amongst Staff ☐	Patient Assessment ☐	Supervision of Staff ☐
Communication with Family ☐	Patient Monitoring ☐	Social Factors ☐
Communication with Patient ☐	Physical Environment ☐	Safety & Security Measures ☐
Competency/ Training ☐	Patient Identification Process ☐	Specific High Risk Factors ☐
Consumables ☐	Procedural/ Policy Compliance ☐	Specify: ☐

TYPE OF HARM / OUTCOME ***(Directly related to the event)***

Near Miss ☐	Pressure Ulcer ☐	Loss of Man Hours ☐
Adverse Reaction ☐	Dislocation of Joint / Fractures ☐	Soft Tissue Injury ☐
Brain injury ☐	Emotional Harm /Upset ☐	Spinal Injury ☐
Burn ☐	Infection ☐	Sexual Contact ☐
Containment /Seclusion ☐	Increased Length of Stay ☐	Unplanned Medical Intervention ☐
Damage /Loss of Property ☐	Increase Level of care ☐	Unplanned Surgical Intervention ☐
Death ☐	Interruption of Service Delivery ☐	Other ☐
Deterioration in Condition ☐	Loss of Continuum of Care ☐	*Specify*

FIRST LINE MANAGER /SUPERVISOR COMMENTS ***(Operational Managers)***

FIRST LINE **REMEDIAL ACTIONS TAKEN** ***(To prevent Recurrence)***

Education/ Training / Awareness ☐ Equipment Replaced / Serviced ☐ Attended /Referred to OH Clinic / EU ☐

Name: Signature/Persal Date:

SECOND LINE MANAGER / SUPERVISOR / HOD ☐ N/A

SECOND LINE **REMEDIAL ACTIONS TAKEN** ***(To prevent Recurrence)***

Documentation Changes ☐ Policy + SOP Formulation / Review ☐ Other (specify) ☐

Staffing Changes ☐ Consulted Security Improve Service ☐

Name: Signature/Persal Date:

HOD / MEDICAL MANAGER / FBU HEAD / FACILITY MANAGER / CEO / Designated Persons Comments :

REFERRED TO Clinical Risk Review Committee ☐ Clinical HOD ☐ M&M Meeting ☐ QA Forum ☐

Adverse Incidents Review Committee ☐ OHS Forum ☐ Security Forum ☐ Other ☐ specify

Name: Signature/Persal Date:

STA010003247 WC DoH ADVERSE INCIDENT MANAGEMENT TOOL FINAL VERSION

SECTION C : RISK ASSESSMENT

CONSEQUENCES TABLE

	SERIOUS□	MAJOR□	MODERATE□	MINOR□	MINIMUM□
CLINICAL CONSEQUENCES	Patients with death unrelated to the natural course of illness and differing from the immediate expected outcome of patient management. Maternal death associated with labour and delivery. Procedures involving the wrong patient or body part. Suspected suicide in hospital. Retained instruments or unintended material requiring surgical removal. Medication error involving the death of a patient. Intravascular gas/air embolism. Haemolytic blood transfusion. Infant discharged to the wrong family.	Patients suffering a major permanent loss of function (sensory, motor, physiologic or psychological) unrelated to the natural course of the illness and differing from the expected outcome of patient management. Significant disfigurement as a result of the incident. Patient at significant risk due to being absent against medical advice (abscondment) or refusing hospital treatment. Threatened or actual physical or verbal assault of patient	Patients with temporary and /or permanent reduction in bodily functioning (sensory, motor, physiologic or psychological) unrelated to the natural course of the illness and differing from the expected outcome of patient management. Increased length of stay as a result of the incident. Surgical intervention required as a result of the incident.	Patients requiring increased level of care including: Review and evaluation. Additional investigation Referral to another clinician / service	Patients with no injury, increased level of care or length of stay
STAFF	Death of staff member	Permanent disability of staff member Physical Injury resulting in > 2 weeks Loss of Man Hours	Staff member sustained injuries requiring medical treatment resulting in restricted duties and Loss of Man hours of 1-2 weeks Temporary disability	Physical injury resulting in < 1 week Loss of Man Hours	Near Miss / No injury to staff member requiring medical treatment No loss of man hours
FACILITY	Extensive damage to property resulting in the complete loss of service capability Death of persons Huge Financial Loss Infant Abduction	Major damage to property Loss of service capability including cancelled appointments / procedures , Major financial loss Physical Injury to persons requiring treatment / surgical intervention Permanent disability	Moderate damage to property Reduced efficiency or some disruption on services delivery Physical Harm /Injury to persons requiring minor treatment and hospitalisation Injury resulting in temporary disability , Significant financial loss	Minor damage to property No interruption in service delivery Emotional Harm to persons requiring counselling Low Financial Loss	No damage to property No Harm /Injury to persons No interruption in Service delivery Low financial Loss

PROBABILITY CATEGORIES		LIKELIHOOD TABLE
Frequent	□	Is expected to occur again either immediately/within a short period of time(likely to occur most weeks /months)
Likely	□	Will probably occur in most circumstances (several times a year)
Possible	□	Possibly will re cur- might occur at some time (may happen every 1 -2 years)
Unlikely	□	Possibly will re cur- could occur at some time in 2 -5 years
Rare	□	Unlikely to recur – may occur only in exceptional circumstances (may happen every 5 to 30 years).

SEVERITY ASSESSMENT CODE (SAC) MATRIX		CONSEQUENCE				
		SERIOUS	MAJOR	MODERATE	MINOR	MINIMUM
Likelihood	Frequent	High	High	Moderate	Low	Low
	Likely	High	High	Moderate	Low	Very Low
	Possible	High	Moderate	Moderate	Low	Very Low
	Unlikely	High	Moderate	Low	Very Low	Very Low
	Rare	Moderate	Low	Low	Very Low	Very Low

RISK: High (Red) □ Moderate (Orange) □ Low (Yellow) □ Very Low (Green) □

DOCUMENTATION REVIEW

Incident Report Completed?	□ YES □ NO □ NA	Refused Hospital Treatment Form	□ YES □ NO □ NA
HCF Pressure Ulcer Report	□ YES □ NO □ NA	OHS Annexure 1 Report / Medical Report	□ YES □ NO □ NA
HCF HAI Notification Report	□ YES □ NO □ NA	FPS 100 Report on Suspected Unnatural Death	□ YES □ NO □ NA
HCFSecurity Notification Report	□ YES □ NO □ NA	J88 Medico Legal Report	□ YES □ NO □ NA
HCF Equipment Report	□ YES □ NO □ NA	SER 46 Blood Reaction Report	□ YES □ NO □ NA

Quality Assurance Managers /Designated Persons Comments / Monitoring /Follow Up /Summary

Name: Designation/Signature/Persal Date:

Appendix H1-2: Classification of falls injuries

Appendix H1: National Reporting and Learning System: Classification of harm from falls

- "no harm: where no harm came to the patient, eg no visible bruising
- low harm: required first aid, minor treatment, extra observation or medication, eg graze on right hand
- moderate harm: likely to require outpatient treatment, admission to hospital, surgery or a longer stay in hospital, eg fractured pubic rami
- severe harm: where permanent harm, such as brain damage or disability, was likely to result from the fall, eg fractured neck of femur
- death: where death was the direct result of the fall".

Appendix H2: National Database of Nursing Quality Indicators: Classification of harm from falls

"None—patient had no injuries (no signs or symptoms) resulting from the fall, if an x-ray, CT scan or other post fall evaluation results in a finding of no injury

Minor—resulted in application of a dressing, ice, cleaning of a wound, limb elevation, topical medication, pain, bruise or abrasion

Moderate—resulted in suturing, application of steri-strips/skin glue, splinting or muscle/joint strain

Major—resulted in surgery, casting, traction, required consultation for neurological (basilar skull fracture, small subdural hematoma) or internal injury (rib fracture, small liver laceration) or patients with coagulopathy who receive blood products as a result of a fall

Death—the patient died as a result of injuries sustained from the fall (not from physiologic events causing the fall)"[125p.14-15].

Appendix I: Data capturing tool/key

Column	Description	Where to source information
A	Finished	Mark with YES once all data collected. Highlight in RED if need to discuss or continue
B	Participant Number	Provided by spreadsheet
C	Reason for exclusion	If under 18, missing information or folder unavailable. Write reason for exclusion
D	Date of birth	From folder sticker: yyyy-mm-dd
E	Age	Spreadsheet will auto calculate
F	Sex	From folder sticker M or F
G	Ward	Provided by spreadsheet
H	Department	Provided by spreadsheet
I	Med record number	Provided by spreadsheet
J&K	Initial and surname	Provided by spreadsheet
L	DOA- Date of Admission	Provided by spreadsheet
M	Date of Discharge	From medical notes/discharge summary
N	LOS -length of stay	Will auto calculate
O	Admitted from (dropdown box for options)	From nursing admission notes Options on dropdown menu: • Community Health Centre • Home • Nursing Home • Secondary hospital • Tertiary hospital • unknown

P	DC (discharge) to (dropdown box for options)	From nursing notes/ discharge summary Options on dropdown menu: • Community Health Centre • Home • Home with increased level of care • Nursing home • Rehabilitation facility • Died • Secondary hospital • Tertiary hospital • Unknown
Q	Different discharge destination	If admission and discharge destination are physically different locations. Yes= different discharge destination from admission origin or No= same discharge destination as admission origin
R, S, T	Primary/secondary/tertiary admission diagnosis and co morbidities	From admission or discharge summary Note all co morbid or secondary diagnoses
U	Number of co-morbidities	total all listed co-morbidities
V, W, X, Y, Z, AA	MFS Subscales	From Morse falls scale document. Drop down menu for each subscale • History of falls (Y/N/ not documented) • Secondary Diagnosis (Y/N/not documented) • Ambulatory aids (None/Crutches, cane, walker/Furniture/not documented) • IV therapy/heploc (Y/N/not documented) • Walking status (normal/weak/impaired/not documented) • Knows own limits (Y/N/not documented)
AB	Mental status (confused (Yes/no)	From nursing notes/ medical notes preceding 24 hours to fall event fallers From nursing notes/medical notes on day of MFS completion for non-fallers
AC	Record of psychotropic Medications	From drug chart. Look for meds given during admission that are on the psychotropic drug list. For Fall group: Drug must have been given in the 24 hours preceding the fall event. Document drug name
AD	Continence issues	From Waterlow Score Chart
AE	Morse Falls scale done (Yes/No)	Is there evidence of the MFS in the folder? If No, then V-AA will be all be noted as: Not documented

AF	Recorded MFS	What was the documented value? If not totalled, note: Not totalled
AG	Documented MFS category	From MFS. There is a dropdown list • No risk • Low-moderate risk • High risk

For Fall group: Please complete further information as follows:

AH	Date of fall event	Provided by QA Dataset
AI	Day of week	Will auto calculate
AJ	Time of incident	24-hour clock Provided by the QA dataset
AK	Location of fall	From dropdown menu • Bathroom/toilet/shower • Bed/bedside • Other (Specify) • Ward/Unit • Chair • Not documented • Out of ward
AL	Activity at time of fall	From dropdown menu • Transferring to/from bed • Chair transfer • During ambulation • Not documented • Other (specify) • Toileting/bathroom activity • Seizure/faint • Reaching for an object
AM	Witnessed/unwitnessed	From dropdown menu • Witnessed • Unwitnessed • Not documented
AN	Evidence of Post Fall MFS Score	Yes/No
AO	Clinical consequence	Provided by QA datasheet • Serious • Major • Moderate • Minor

		• Minimum
AP	Type of harm sustained	Provided by QA datasheet

Appendix J: Waterlow score chart

WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY

RING SCORES IN TABLE, ADD TOTAL. MORE THAN 1 SCORE/CATEGORY CAN BE USED

BUILD/WEIGHT FOR HEIGHT		SKIN TYPE VISUAL RISK AREAS		SEX AGE	
AVERAGE		HEALTHY	0	MALE	1
BMI = 20-24.9	0	TISSUE PAPER	1	FEMALE	2
ABOVE AVERAGE		DRY	1	14 - 49	1
BMI = 25-29.9	1	OEDEMATOUS	1	50 - 64	2
OBESE		CLAMMY, PYREXIA	1	65 - 74	3
BMI > 30	2	DISCOLOURED GRADE 1	2	75 - 80	4
BELOW AVERAGE		BROKEN/SPOTS GRADE 2-4	3	81 +	5
BMI < 20	3				
BMI=Wt(Kg)/Ht (m)^2					

MALNUTRITION SCREENING TOOL (MST)
(Nutrition Vol.15, No.6 1999 - Australia

A - HAS PATIENT LOST WEIGHT RECENTLY
YES - GO TO B
NO - GO TO C
UNSURE - GO TO C AND SCORE 2

B - WEIGHT LOSS SCORE
0.5 - 5kg = 1
5 - 10kg = 2
10 - 15kg = 3
> 15kg = 4
unsure = 2

C - PATIENT EATING POORLY OR LACK OF APPETITE
'NO' = 0; 'YES' SCORE = 1

NUTRITION SCORE
If > 2 refer for nutrition assessment / intervention

CONTINENCE		MOBILITY	
COMPLETE/ CATHETERISED	0	FULLY	0
URINE INCONT.	1	RESTLESS/FIDGETY	1
FAECAL INCONT.	2	APATHETIC	2
URINARY + FAECAL INCONTINENCE	3	RESTRICTED	3
		BEDBOUND e.g. TRACTION	4
		CHAIRBOUND e.g. WHEELCHAIR	5

SPECIAL RISKS

TISSUE MALNUTRITION		NEUROLOGICAL DEFICIT	
TERMINAL CACHEXIA	8	DIABETES, MS, CVA	4-6
MULTIPLE ORGAN FAILURE	8	MOTOR/SENSORY	4-6
SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC,)	5	PARAPLEGIA (MAX OF 6)	4-6
PERIPHERAL VASCULAR DISEASE	5	**MAJOR SURGERY or TRAUMA**	
ANAEMIA (Hb < 8)	2	ORTHOPAEDIC/SPINAL	5
SMOKING	1	ON TABLE > 2 HR#	5
		ON TABLE > 6 HR#	8

MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY MAX OF 4

SCORE
10+ AT RISK
15+ HIGH RISK
20+ VERY HIGH RISK

Scores can be discounted after 48 hours provided patient is recovering normally

Appendix K1-3: Nursing questionnaire

Appendix K1: Nurses' questionnaire, English version

Thank you for participating in this survey.

We recognise the importance of your privacy so please note:

- All information collected in this survey **will be anonymous.**
- **Your employer will not know whether you have participated in the survey**.
- No personal details are required, so **we have no way of linking your survey responses to you**.
- All results will be grouped, for example '70 % of nurses strongly agreed that falls prevention is primarily the role of the physiotherapist'.

Please answer the following 6 questions by ticking the appropriate box:

1. How long have you worked at this hospital?

□ < 4 months □ 4-12 months □ 1-5 years □ >5 years

2. How long have you worked on this ward?

□ < 4 months □ 4-12 months □ 1-5 years □ >5 years

3. What is your qualification?

□Professional nurse □Enrolled nurse/Staff Nurse □ENA_____

4. On which ward do you most frequently work? _____

5. Have you received falls prevention training at this hospital before?

□ Yes □ No

6. If you have received falls prevention training at this hospital before, how long ago was it?

□ < 6 months □ 6-12 months ago □ 1-2 years ago □ >2 years ago

Please circle the response that **best matches your perceptions/experiences** of the falls prevention and management programme **on the ward where you most frequently work.**

1. The current falls prevention programme is effective at reducing falls on my ward.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

2. The Morse Falls Risk Assessment Tool used on my ward is a useful way to identify patients at risk of falling.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

3. I feel confident to use the Morse Falls Risk Assessment Tool to identify patients at risk of falling.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

4. Falls risk assessment is a waste of time.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

5. It is my responsibility to activate the Standard Care Plan for patients I identify as having potential fall risk.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

6. It is my responsibility to update my patient's falls risk status if a fall and/or change in condition occurs.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

7. Falls prevention is not a priority on my ward.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

8. Incident reporting provides us with a way of measuring how we are progressing with patient falls.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

9. I know how to complete an adverse incident report using the Adverse Incident Management Tool.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

10. I should only report falls in which the patient suffers an injury.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

11. As a ward we receive regular feedback with regard to the numbers of patient falls on our ward.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

12. If a person slides off their chair to the floor, that is considered a fall.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

13. If a patient stumbles in the bathroom and I help them keep their balance and “catch them”, I should report this in an incident report.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

14. I should report all patient falls on an incident form.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

15. On our ward we display a ‘falls risk’ alert sign above the bed to communicate to staff which patients are at risk of falling.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

16. On our ward we position high falls risk patients closest to the nursing station.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

17. I feel confident to refer high risk patients for a physiotherapy assessment.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

18. If a patient falls on my ward, there is a post fall procedure that must be followed to ensure prompt identification of injuries.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

19. Each patient's Falls risk status is communicated during handover report between shifts.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

20. I receive regular reminders to use falls prevention strategies.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

Comments:

What features of your current fall prevention programme need improvement?

_____

_____

What barriers do you feel may exist to implementing falls prevention programmes on your ward?_____

Would you like more training on Falls prevention? _____

If yes, what format would you like this training to take? Eg. Internet course, workshop, written material, on- ward training

Appendix K2: Nurses' questionnaire, Xhosa version

Enkosi ngokuthatha inxaxheba koluphando lwethu.

Siyakwazi ukubaluleka kokugcina izinto zakho ziyimfihlo ngoko sicela uqahela:

- **Zonke inkcukacha eziqokelelwayo koluphando azizobanegama lakho**
- **Umqashi wakho akozokwazi ukuba uthathe inxaxheba koluphando**
- Akukho zinckcukacha ngoqoba lwakho ezizodingeka ngoko asizokwazi ukudibanisa impendulo zakho negama lakho
- Zonke iziphumo zizodityaniswa, umzekelo '70% yoNesi iyangqinelana kakhulu ukuba uthintelo lokuwa kwabantu ngumsebenzi we fisiyotherapist"

Sicela uphendule lemibuzo mithandathu ilandelayo ngoku phawula kwi bhokisi efanelekileyo:

1. Unexesha elingakanani uphangela kwesibhedlele?

☐ Ezingaphantsi kweenyanga ezine	☐ Phakathi kweenyanga ezi-4 ne-12	☐ Phakathi ko-1 no-5 iminyaka	☐ Ngaphezu kweminyaka emihlanu

2. Unexesha elingakanani uphangela kweliwadi?

☐ Ezingaphantsi kweenyanga ezine	☐ Phakathi kweenyanga ezi-4 ne-12	☐ Phakathi ko-1 no-5 iminyaka	☐ Ngaphezu kweminyaka emihlanu

3. Yintoni imfanelo (iqualification) yakho?

□Professional nurse □Enrolled nurse /Staff Nurse □ENA

4. Uphangela kweliphi iwadi kakhulu? _____

5. Wakhe walufumana uqeqesho lokuthintela ukuwa kwesisibhedle ngaphambili?

□ Ewe □ Hayi

6. Ukuba wakhe walufumana uqeqesho lokuwa kwesisibhedlele ngaphambili, kwakunini ngoko?

☐ Ngaphantsi kweenyanga 6	□ 6-12 iinyanga ezidlulileyo	□ 1-2 kwiminyaka edlulileyo	☐ Ngasentla kwiminyaka emibini edlulileyo

Sicela wenze isangqa kwimpendulo oyibona ifanelekile ngokolwazi lwakho lwe**nkqubo yothintelo nolawulo lokuwa kwiwadi osebenza kulo kakhulu**

1. Inkqubo yothintelo lokuwa kwiwadi osebenza kulo ekhoyo ngoku iyimpulelo ukunciphiseni ukuwa?

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

2. Isixhobo zokujonga ukuwa esibizwa iMorse falls risk assessment tool esisetyenziswa kwiwadi lam siyanceda ekuboneni izigulane ezimngciphekweni wokuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

3. Ndiziva ndizithembile ekusebenziseni iMorse Fall Risk Assessment Tool ekufumaneni izigulane ezisemngciphekweni wokuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

4. Ifall risk assessment yinkcitho xesha

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

5. Luxanduva lwam ukuqala I Standard Care Plan for izigulane endizibona ziemngciphekweni wokuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

6. Luxanduva lwam ukutshintsha umngcipheko wokuwa wesigulane sam okanye utshintsho lwesimo lwesigulane sam

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

7. Uthintelo lokuwa ayiyonto ephambili kwiwadi lam

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

8. Ukuxela izigigaba zokuwa siyasinceda ekulinganiseni indlela esiya phambili ngayo kukuwa kwezigulane

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

9. Ndiyayazi indlela yokwenza I Adverse Incident report ndisebenzisa I Adverse Incident Management Tool.

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

10. Kumele ndixele izigigaba zokuwa xa isigulane sonzakele qha

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

11. Kwiwadi lethu sihleli sifumana ingxelo yamanani ezigulane eziwayo

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

12. Umntu otyibilakayo estulweni awe phantsi lonto ibala njegokuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

13. Ukuba ndigane isgulane sigxadazela egumbini langasese ndisincede sikwazi ukuma, kumele ndenze ingxelo kwi incident report

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

14. Kumele ndenze ingxelo yazo zonke izgulane eziwileyo kwi incident form

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

15. Kwiwadi lethu siyabonsa l ‘fall risk’ sign phezu kwebhedi ukwazisa istuff ukuba zeziphi izigulane ezisemngciphekweni wokuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

16. Kwiwadi lethu izigulane ezisemngciphekweni wokuwa sizibeka kufuphi kwi gumbi loNesi

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

17. Ndizisa ndizithembile ekuthumeleni isugulane esisemngciphekweni wokuwa kwiphysiotherapist

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

18. Ukuba isigulane siwili kwiwadi lam kukhona inkqubo yokuwa ekufuneka ilandelwe ukufumana nokubona ngokukhawuleza ukwenzakala kwesigulane

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

19. Ingxelo yomngcipheko wokuwa wesigulane ngasinye iyathenthwa ngambikokuba iyanikezelwa ngaphakathi kweshifts

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

20. Ndihlala ndikhunjuzwa njalo ngokusebenzisa indlela zokuthintela ukuwa

A	B	C	D	E
Andivumi kakhulu	Andivumi	Ndithathi hlangothi	Ndiyavuma	Ndivuma kakhulu

Izimvo:

Zintoni ocinga ukuba zingaphuculwa kwinkqubo yenu yothintelo lokuwa ekhoyo ngoku?

_____

_____

_____

____

Ucinga ukuba yintoni imiqobo ekhoyo ekubekeni inkqubo yothintelo lokuwa kwiwadi lakho?_____

_____

_____

Ingaba uyafuna uqeqesho lwendlela yokunthitela ukuwa?

Ukuba ewe, ufuna yenzwe ngendlela enjani lengqeqesho? Umzekelo Internet course, workshop, written material, on ward training

_____

_____

Appendix K3: Nurses' questionnaire, Afrikaans version

Dankie dat u aan hierdie opname deelneem.

Ons erken die belangrikheid van u privaatheid, so neem asseblief kennis dat:

- Alle informasie wat versamel word deur hierdie opname **sal anoniem wees.**
- **U werkgewer sal nie weet dat u aan hierdie opname deelgeneem het nie.**
- Geen persoonlike besonderhede word vereis nie, daarom het ons geen manier **om u opname antwoorde aan u te koppel nie.**
- Alle uitslae sal gegroepeer word, byvoorbeeld '70% van verpleegsters het sterk ooreengekom dat valvoorkoming hoofsaaklik die rol van die fisioterapeut is.'

Beantwoord asseblied die volgende 6 vrae deur die toepaslike blokkie te merk:

1. Hoe lank werk u al by hierdie hospital?

□ < 4 maande □ 4-12 maande □ 1-5 jaar □ >5 jaar

2. Hoe lank werk u al in hierdie saal?

□ < 4 maande □ 4-12 maande □ 1-5 jaar □ >5 jaar

3. Wat is u kwalifikasie?

□ Geregistreerde verpleegster □ Ingeskrewe verpleegster/ Personeel verpleegster □ ENA

4. In watter saal werk u die meeste? _____

5. Het u al ooit valvoorkoming opleiding ondergaan in hierdie hospitaal?

□ Ja □ Nee

6. As u al valvoorkoming opleiding in hierdie hospital ondergaan het, hoe lank gelede was hierdie opleiding?

□ < 6 maande □ 6-12 maande gelede □ 1-2 jaar gelede □ >2 jaar gelede

1. 1. Die huidige valvoorkomingsprogram is effektief om valle in my saal te verminder.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

2. Die Morse Falls Risk Assessment Tool wat in my saal gebruik word is 'n nuttige manier om pasiënte te identifiseer wat die risiko loop om te val.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

3. Ek is vol vertroue om die Morse Falls Risk Assessment Tool to gebruik om pasiënte te identifiseer wat die risiko loop om te val.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

1.

4. Valrisiko-assessering is 'n mors van tyd.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

5. Dit is my verantwoordelikheid om die Standard Care Plan te aktiveer vir pasiënte wat ek identifiseer as ‘n potensiële valrisiko.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

6. Dit is my verantwoordelikheid om my pasiënt se valrisiko status by te werk indien 'n val en / of verandering in toestand voorkom.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

7. Valvoorkoming is nie 'n prioriteit in my saal nie.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

8. Insidentverslae bied ons 'n manier om te meet hoe ons vorder met pasiënte wat val.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

9. Ek weet hoe om ‘n Adverse Incident Report te voltooi deur die Adverse Incident Management Tool te gebruik.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

10. Ek moet net valle rapporteer waanneer die pasiënt beseer word.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

11. As ‘n saal ontvang ons gereeld terugvoer van die aantal pasiënte wat in ons saal val.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

12. As ‘n pasiënt van ‘n stoel af op die vloer val, word dit as ‘n val beskou.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

13. As ‘n pasiënt in die badkamer struikel en ek hulp sy/hom om sy/haar balans te hou en “vang” hom/haar, moet ek dit in ‘n voorval verslag rapporteer.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

14. Ek moet alle pasiëntevalle in ‘n voorval verslag rapporteer.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

15. In ons saal vertoon ons 'n waarskuwingsteken oor pasiënte se beddens om te kommunikeer aan die personeel wie die pasiënte is wat die risiko loop om te val.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

16. In ons saal plaas ons die hoë valrisiko pasiënte naaste aan die verpleegstasie.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

17. Ek is vol vertroue om hoë valrisiko pasiënte te verwys vir 'n fisioterapie-evaluering.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

18. As ‘n pasiënt in my saal val is daar ‘n na-val prosedure wat gevolg moet word om vinnige identifisering van beserings te verseker.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

19. Elke pasiënt se valrisiko status word gekommunikeer tydens die oorhandigingsverslag tussen skofte.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

20. Ek ontvang gereelde herinneringe om valvoorkomingstrategieë te gebruik.

A	B	C	D	E
Stem glad nie saam nie	Stem nie saam nie	Neutraal	Stem saam	Stem heeltemal saam

Kommentaar:

Watter eienskappe van die huidige valvoorkomingsprogram kan verbeter word?_____

_____

Watter hindernisse voel u bestaan wat die implemtenteering van ‘n valvoorkomingsprogram in u saal voorkom?

_____

_____

Wil u meer opleiding oor die voorkoming van valle hê? _____

Indien ja, in watter formaat wil u hierdie opleiding hê? B.v. In f yes, what format would you like this training to take? Eg. Internet kursus, geskrewe materiaal, kursus, in-saal opleiding

_____

_____

Appendix L1-3: Informed consent

Appendix L1: Participant informed consent, English version

Participant Informed Consent Form

Name of the project: “Factors contributing to falls in an acute tertiary care hospital: A descriptive study”.

I _____ have read the Information Sheet. I understand what is required of me. I do not feel that I am forced to take part in this study and I am doing so of my own free will. I know that I can withdraw at any time if I so wish and that it will have no bad consequences for me.

Signed:

Participant Date and place

_____ _____

Researcher Date and place

The UCT’s Faculty of Health Sciences Human Research Ethics Committee can be contacted on 021 406 6338 in case you have any ethical concerns or questions about your rights or welfare as a participant on this research study.

Appendix L2: Participant informed consent, Xhosa version

Ifom Yemvume Yokuthatha Inxaxheba

Igama leprojekthi: “Factors contributing to Falls in an Acute Tertiary Hospital: A Descriptive Study”

Mna _____ Ndilifundile Iphepha leNgcaciso. Ndiyayiqonda into efunekayo kum. Andiziva ndinyanzelwa ukuthatha inxaxheba koluphando kodwa ndithatha inxaxheba ngokwentando yam. Ndiyazi ukuba ndinokurhoxisa nanini na ukuba ngaba ndiyathanda kwaye akukho miphumo emibi kum.

Sayinwe:

_____ _____

Nxaxheba Umhla kunye nendawo

_____ _____

Umphandi Umhla kunye nendawo

Unokuqhagamshelana ne-Faculty yeSayensi yezeMpilo kwiKomiti yeeNkcazo zoPhando lwaBantu kwiYunivesithi yaseKapa kwi-021 406 6338 ukuba ngaba unayo nayiphi na inkxalabo yokuziphatha okanye imibuzo malunga namalungelo akho okanye inhlalakahle njengothatha inxaxheba kulolu cwaningo lophando.

Appendix L3: Participant informed consent: Afrikaans version

Deelneemster ingeligte toestemmingsvorm

Naam van die projek: “Faktore wat bydra tot val in‘n akute tersiêre sorghospitaal: 'n Beskrywende studie”.

Ek _____ het die inligtingsblad gelees. Ek verstaan wat van my verwag word. Ek voel nie dat ek vorseer word om aan hierdie studie deel te neem nie en ek doen dit van my eie vrye wil. Ek weet dat ek enige tyd van hierdie studie kan onttrek en dat dit geen slegte gevolge vir my sal hê nie.

Geteken:

_____ _____

Deelneemster Datum en plek

_____ _____

Navorser Datum en plek

Die “UCT Faculty of Health Sciences Human Research Ethics Committee” kan op 021 406 6338 gekontak word indien u enige etiese kwessies of vrae oor u regte of welsyn as ‘n deelneemster in hierdie navorsingstudie het.

Appendix M1-3: Information sheet, survey of nurses

Appendix M1: Information sheet, English version

Information Sheet: Informed consent, Survey of nurses

Thank you for your time and considering participating in this study which is being done to try and find out about the different causes of inpatient falls.

Why is this study being done?

You may know, that in-hospital falls are common throughout the world, but we do not know whether this is a problem at this hospital too. We need to know how nurses are using the current Falls Policy and what methods you think are useful to help prevent falls. We are also interested to hear whether you are experiencing any difficulties in decreasing the risk that patients are at on the wards you work on. Without this information it is difficult for the hospital to identify contributory factors and circumstances surrounding falls. This study could help us learn about how to prevent patients from falling when they are in hospital.

Why are you being asked to take part?

As part of this study we need to describe whether nurses have received training in Falls Prevention, how nurses are using the Falls Risk assessment and Intervention forms, what you know about the Falls Risk Policy, and any difficulties you are having in trying to prevent patients from falling.

Please read the information below. You can only be part of this study if you want to be, and if you agree to be part of it.

How many people will take part in the study?

All nurses working on the inpatient wards are being asked to take part in this survey.

What will happen if you decide to take part in the study?

I have developed a questionnaire relating to the current Falls Policy and Falls Intervention which is in place at the hospital. The questionnaire will be handed to you today for you to complete if you want to participate. You will need to mark off your choice with a cross or tick. It will take about 10 minutes to complete, and when you have completed it, you will need to return it back to me by posting it into the sealed ‘post box’ which will be kept in the designated area on your ward for one week. After one week I will collect the box. You will

also need to sign an informed consent form. This will be posted in the “Informed Consent” post box.

You do not need to write your name on the survey and your answers will remain anonymous, as each questionnaire is coded. Your employer will not know whether you have participated in the survey. No personal details are required, so we have no way of linking your survey responses to you.

You will need to indicate your level of nursing qualification, how many shifts you work on this ward per week, whether you have received any previous falls prevention training and how long ago this training was. This information will help determine if all nursing staff in the study are similar and if there may be an association with choices/ interventions that nurses have chosen.

Wards will be identified under the broad unit terms “Medical, Surgical, Psychiatry, Trauma/Emergency care, gynaecology and Intensive Care”, and not by individual ward names to avoid stigmatising of wards as “high or low risk”.

What are the risks and discomforts of this study?

We do not expect any risk to you. The questionnaire is completely anonymous and we will have no way of linking your survey to you.

Are there any benefits to you for being in this study?

If you participate in this study you may not directly benefit, but you will help with providing useful information on how patient falls are reported, how the Falls Risk assessment and Intervention forms are being used. This may guide future planning in falls prevention training and management at the hospital.

What other choices do you have?

Your participation in this study is voluntary and you can at any time while filling in the questionnaire stop and choose not to continue, with no consequences.

What will happen when the study is over?

All completed questionnaires will be locked away and stored in a safe place that only I can access, for one year. The results of the study will be available in 2018 and I will email them to your various ward managers, who will share them with you.

Will you receive any reward for taking part in this study?

There is no reward offered for taking part in this study.

Who will see the information which is collected during the study?

Only the research team will have access to the questionnaire's. This consists of Christine Rogers, Professor Jennifer Jelsma and Athene Irving. The questionnaire is completely anonymous as it is coded, and we will have no way of linking your survey to you.

Who do I speak to (or contact) if I have any questions about the study?

If you have any questions please contact me, my details are attached to the end of this form. The UCT's Faculty of Health Sciences Human Research Ethics Committee can be contacted on 021 406 6338 in case you have any ethical concerns or questions about your rights or welfare as a participant on this research study.

Kind Regards

Athene Irving
(Researcher)
Email: atheneirving@gmail.com
Tel no: 0798953653

Christine Rogers
(Supervisor)
Division of Communication Sciences and Disorders
University of Cape Town
Email: Christine.rogers@uct.ac.za
Tel. no. 021 4066315

Professor Marc Blockman
Head of Human Research and Ethics Committee- UCT Faculty of Health Sciences
Old Main Building of Groote Schuur Hospital,
Floor E52, Room 23,
Observatory, 7925.
Tel: 021 406 6338
See more at: http://www.health.uct.ac.za/fhs/research/humanethics/about

Appendix M2: Information sheet, Xhosa version

Iphepha leNgcaciso: Imvume ekwazisiweyo, Uphando lweeNesi

Siyabulela ngexesha lakho nokuvuma ukuthatha inkxaxheba koluphando lokuqokelela ulwazi ngonoobangela bokuwa kwezigulane kwisibhedlele.

Kutheni kusenziwa oluphando?

Inokuba uyazi ukuba ukuwa kwezigulane ezibhedlele yinto eqhelekileyo kwihlabathi lonke, kodwa asiyazi ukuba yinto eqhelekileyo nalapha kwesi sibhedlele. Sidinga ukwazi ukuba oomongi noomongikazi balapha bayayibenzisa iFalls Policy, kwaye zeziphi inzinto ocinga zifaneleyo ukuqinisekisa ukuba izigulane aziwi. Sinqwenela nokwazi ukuba nifumana bunzima buni ekuhliseni umngcipheko wokuwa kwezigulane emawadini enisebenza kuwo. Ngaphandle kolulwazi kunzima ukuba sisbhedlele sibone ezona zizathu nonoobangela abadala ukuba izigulane ziwe. Oluphando lungasincenda ngokufunda ngendlela zokuvikela izigulani ekuweni xazise sibhedlela.

Kutheni uceliwe ukuba uthathe inkxaxheba koluphando?

Koluphando sidinga ukuchaza ukuba oomongi noomongikazi balufumene na uqeqesho kwi Falls Prevention (ekunqandeni ukuwa kwezigulane), ukuba balusebenzisa njani uvavanyo lwe Falls Risk assessment nee Intervention forms, ukuba banolwazi olungakanani ngepolisi ye Falls Risk Policy, kwaye bafumana bunzima buphi na ekunqandeni izigulane ukuba zingawi.

Uyacelwa ukuba ufunde iinkcukacha ezingezantsi. Ungathatha inkxaxheba koluphando ukuba uyafuna, kwaye ukuba uyavuma .

Bangaphi bantu abazokuthatha inkxakxheba koluphando?

Bonke omongi noomongikazi bamawadi anezigulane ezilalisiweyo kwisibhedlele sase bayacelwa ukuba bathathe inkxaxheba koluphando.

Kuzokwenzeka ntoni ukuba ndivumile ukuthatha inkxaxheba koluphando?

Ndize noluhlu lwemibuzo edibene nepolisi i Falls Policy and Falls Intervention esetyenziswayo kwesisibhedlele . Le mibuzo uzakuyinikwa namhlanje ukuba uvumile ukuba yingxenye yoluphando . Uzokukhetha impendulo kwezi uzinikiweyo ubeke u 'X' kwimpendulo

nganye oyikhethileyo. Ukuphendula le mibuzo kungathatha imizuzu elishumi(10) , xa ugqibile ukuphendula , uzokuyibuyisela kum ngokuyafaka kwi "POST BOX" evaliweyo ezokubekwa kwindawo kwindawo ethile kwiwadi lakho. Emva kweveki enye, ndizokuyilanda le bhokisi, ndizodinga ukuba utyikitye iform yemvume , lo form izokubane bhokisi yayo ebhalwe "Informed consent" ekufuneka uyifake kuyo.

Akunyanzelekanga ukuba igama lakho ulibhale kwiphepha lemibuzo, kwaye iimpendulo zakho zizohlala zifihlakele. Umqashi wakho akazukuyazi ukuba uthathe inkxaxheba koluphando. Asizidingi iinkcukacha ezinokuchaza ukuba ungubani, ngolohlobo akuzubakho nxulumaniso phakathi kweempendulo zakho nawe.

Kuzokufuneka uchaze izinga le mfundo yakho lokonga , ukuba usebenza kangaphi kweli wadi ngeveki, ukuba wawulufumene na uqeqesho lwe Falls Prevention kwaye wawulufumene nini. Olu lwazi luzokusinceda ekuqondeni ukuba wonke umntu oyingxenye yoluphando unolwazi olufanayo, kwaye ukuba olu lwazi lunonxulumaniso olunjani neempendulo ezikhethiweyo.

Amawadi azakubizwa ngamagama aqhelekileyo anje ngooo" Medical, Surgical, Psychiatry, Trauma/ Emergency Care, Gynaecology no Intensive Care", awazukubizwa ngamagama awo asetyenziwa apha esibhedlele ukunqanda ukukhomba lokuba umngcipheko umngakanani kwelo wadi.

Ngowuphi umngcipheko endinokuwufamana xa ndithatha inkxaxheba koluphando?

Akukho bungozi okanye mngcipheko ozayo kuwe ngokubayingxenye yoluphando, ngokuba zonke iinkcukacha zakho zizohlala zifihliwe, ngoko asizokwazi ukudibanisa impendulo zakho negama lakho.

Ukhona umvuzo oza kum ngokuthatha kwam ixkxaxheba koluphando?

Ukuba uthathe inkxaxheba koluphando akukho mvuzo oza kuwe ngqo, kodwa uyakuba uncedile ngokusinika ulwazi olubalulekileyo oluchaza ukuba ukuwa kwezigulane kuxelwa njani ,nokusetuyenziswa uvavanyo lweFalls assessment and Intervention Forms. Olu lwazi luzokusinceda ekuphuculeni uqeqesho lweFalls Prevention nokuphathwa kwesibhedlele.

Ukuba andivumi kuzokwenzeka ntoni?

Inkxaxheba yakho ixhomekeke kuwe kwaye ungayirhoxisa nanini na ufuna ngelixa uphendula imibuzo, akukho sohlwayo okanye bungozi obuzakulandela ngokurhoxa okanye ukuzikhwebula kwakho.

Kuzokwenzeka ntoni emva kokuba olu phando kuggityiwe?

Onke amaphepha aneempendulo azokuvalelwa kwindawo ekhuselekileyo , ibendim ndedwa okwaziyo ukuwafumana kwixesha elingangonyaka. Iziphumo zoluphando zizokukhululwa kwaye ndizokuzithumelela abaphathi benu, bona banixelele ngazo.

Ingaba ikhona into endizakuyizuza ngokuba yingxenye yoluphando?

Akukho mvuzo ozokuwuzuza ngokubayingxenye yoluphando.

Ngubani ozokubona ulwazi olugokelelwe koluphando?

Liqela loluphando qha olukwaziyo ukubona iimpendulo zenu. Eli qela liquka uChristine Rogers, Professor Jennifer Jelsma kunye no Athene Irving. Iinkcukacha zakho zifihlakele , ngoko ke ayikho indlela yokukudibanisa neempendulo ezinikileyo.

Ndingathetha nabani ukuba ndinemibuzo ngoluphando?

Ukuba unemibuzo, qhagamishelana nam, iinkcukacha zam zichaziwe ngezantsi. Ungaqhagamishelana ne UCT's Faculty of Health Sciences Human Research Ethics Committee kule nombolo; 021 406 6338 ukuba indlela yam yokuziphatha ayiqondakali okanye unemibuzo ngamalungelo/ impilo yakho njengengxenye yoluphando.

Ozithobile,

Athene Irving

(Researcher)

Email: atheneirving@gmail.com

Tel no: 0798953653

Christine Rogers

(Supervisor)

Division of Communication Sciences and Disorders

University of Cape Town

Email: Christine.rogers@uct.ac.za

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Professor Marc Blockman

Head of Human Research and Ethics Committee- UCT Faculty of Health Sciences

Old Main Building of Groote Schuur Hospital,

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Tel: 021 406 6338

See more at: http://www.health.uct.ac.za/fhs/research/humanethics/about

Appendix M3: Information sheet, Afrikaans version

Inligtingsblad: Ingeligte toestemming, Opname van verpleegsters

Dankie vir u tyd en dat u dit oorweeg om aan hierdie studie deel te neem, wat gedoen word om te probeer uitvind wat die verskeie oorsake van in-pasiënt valle is.

Hoekom word hierdie studie gedoen?

U weet dalk dat in-hospitaal valle algemeen oor die hele wêreld is, maar ons weet nie of dit ook ‘n probleem by die Hospitaal is nie. Ons wil weet hoe verpleegsters die huidige Falls Policy gebruik en watter metodes u dink nuttig is om valle te voorkom. Ons stel ook belang om te hoor of u enige probleme ervaar om die risiko van pasiënte te verminder in die sale waar u werk. Sonder hierdie informasie is dit moeilik vir die hospitaal om bydraende faktore en omstandighede rondom val te identifiseer. Hierdie studie kan vir ons help leer hoe om te verhoed dat pasiënte val terwyl hulle in die hospitaal is.

Hoekom word u gevra om deel te neem?

As deel van hierdie studie moet ons beskryf of verpleegsters opleiding ontvang het in Falls Prevention, hoe verpleegsters die “Falls Risk assessment and Intervention” vorms gebruik, wat u weet van die Falls Risk Policy en enige probleme wat u ondervind om

pasiënte te voorkom van val. Lees asseblief die onderstaande inligting. U kan slegs deel wees van hierdie studie as u wil wees, en as u instem om deel daarvan te wees.

Hoeveel mense sal aan hierdie studie deelnem?

Alle verpleegsters wat in die in-pasiënt sale werk by xxxxxxxxx sal gevra word om aan hierdie opname deel te neem.

Wat sal gebeur as u besluit om aan hierdie studie deel te neem?

Ek het 'n vraelys ontwikkel met betrekking tot die huidige “Falls Policy” en “Falls Intervention” wat in die hospital ingestel is. Die vraelys sal vandag vir u gegee word om te voltooi as u wil deelneem. U sal u keuse met ‘n regmerkie of kruis merkeer. Dit sal ongeveer 10 minute neem om te voltooi en sodra dit voltooi is sal u dit vir my terugstuur deur dit in die verseëlde posbus te sit wat vir ‘n week in ‘n aangewese gebied in u saal sal wees. U moet ook ‘n ingeligte toestemmingsvorm teken. Dit sal in die “Informed Consent” posbus geplaas word.

U hoef nie u naam op die opname te skryf nie en u antwoorde sal anoniem bly, aangesien elke vraelys gekodeer is. U werkgewer sal nie weet of u aan die opname deelgeneem het nie. Geen persoonlike besonderhede word vereis nie, dus onskan nie u antwoorde aan u koppel nie.

U moet moet asseblief u vlak van verplegingskwalifikasie aandui, hoeveel skofte u per week in hierdie saal werk, of u vorige valvoorkomingsopleiding ontvang het en hoe lank gelede hierdie opleiding was. Hierdie inligting sal help om vas te stel of alle verpleegpersoneel in die studie soortgelyk is en of daar 'n assosiasie met keuses/intervensies is wat verpleegsters gekies het.

Sake sal gedidentfiseer word onder die breë eenheidsterme “Mediese, Chirurgiese, Psigiatrie, Trauma / Noodsorg, Ginekologie en Intensiewe Sorg”, en nie deur individuele saalname nie, om stigmatisering van sale as “hoë of lae risiko” te vermy.

Wat is die risiko’s en ongemak van hierdie studie?

Ons verwag geen risiko vir u nie. Die vraelys is heeltemal anoniem en ons sal geen meneer hê om u opname aan u te koppel nie.

Is daar enige voordele vir u om in hierdie studie te wees?

As u aan hierdie studie deelneem, mag u nie direk baat vind nie, maar u sal help met die verskaffing van nuttige inligting oor hoe patient valle gerapporteer word, hoe die “Falls Risk and Intervention” vorms gebruik word. Dit kan lei tot toekomstige beplanning in valvoorkomingsopleiding en -bestuur by die hospital.

Watter ander keuses het u?

U deelname aan hierdie studie is vrywillig en u kan te enige tyd tydens die invul van die vraelys stop en kies om nie voort te gaan nie, sonder enige gevolge.

Wat sal gebeur nadat die study verby is?

Alle voltooide vraelyse sal toegesluit word en in ‘n veilige spasie gehou word vir ‘n jaar, wat slegs ek tot toegang het. Die uitslae van die studie sal in 2018 beskikbaar wees en ek sal dit vir u verskeie saalbestuurders epos, wie dit dan met u sal deel.

Sal u enige beloning ontvang vir deelname aan hierdie studie?

Daar word geen beloning aangebied om aan hierdie studie deel te neem nie.

Wie sal die inligting wat tydens die studie ingesamel word, sien?

Slegs die navorsingspan sal toegang hê tot die vraelyse. Dit bestaan uit Christine Rogers, Professor Jennifer Jelsma en Athene Irving. Die vraelys is heeltemal anoniem, aangesien dit gekodeer is, en ons kan nie u opname aan u koppel nie.

Met wie kan ek praat (of kontak maak) as ek enige vrae het oor die studie?

As u enige vrae het, kontak my asseblief, my besonderhede is aan die einde van hierdie vorm aangeheg. Die “UCT Faculty of Health Sciences Human Research Ethics Committee” kan op 021 406 6338 gekontak word indien u enige etiese kwessies of vrae oor u regte of welsyn as deelnemer aan hierdie navorsingstudie het.

Vriendelike Groete

Athene Irving
(Navorser)
Epos: atheneirving@gmail.com
Tel no: 0798953653

Christine Rogers
(Opsigter)
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Tel: 021 406 6338
Sien meer by: http://www.health.uct.ac.za/fhs/research/humanethics/about

Appendix N: Human Research and Ethics Committee approval

Faculty of Health Sciences
Human Research Ethics Committee

Room ES3-46 Old Main Building
Groote Schuur Hospital
Observatory 7925

Telephone [021] 406 6492
Email: sumayah.Ariefdien@uct.ac.za
website:
www.health.uct.ac.za/fhs/research/humanethics/forms

06 March 2017

HREC REF: 874/2016

Mrs C Rogers
Health & Rehab Sciences
Communication Sciences & Disorders
F-45 OMB

Dear Mrs Rogers

PROJECT TITLE: FACTORS CONTRIBUTING TO FALLS IN A TERTIARY ACUTE CARE SETTING: A DESCRIPTIVE STUDY (Master's candidate- A Irving)

Thank you for your response letter, addressing the Issues raised by the Human Research Ethics committee (HREC).

It Is a pleasure to inform you that the HREC has formally approved the above-mentioned study.
Approval Is granted for one year until the 30 March 2018.
Please submit a progress form, using the standardised Annual Report Form If the study continues beyond the approval period. Please submit a Standard Closure form if the study Is completed within the approval period.

(Forms can be found on our website:
www.health.uct.ac.za/fhs/research/humanethics/forms)

We acknowledge that the student, A Irving will also be Involved In this study.
Please quote the HREC REF in all your correspondence.
Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal Investigator obtain appropriate Institutional approval before the research may occur.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRE) number: IRB00001938 HREC 874/2016

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on
Harmonisation Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DOH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines.
The Human Research Ethics Committee granting this approval Is In compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Appendix O1-3 Institutional permission documents

Appendix O1: Letter to hospital Chief Executive Officer

Chief executive officer

To Dr …….

RE: Request permission to conduct research at your facility:

Thank you for taking the time to read the following information.

My name is Athene Irving. I am a postgraduate student doing a Master's degree in Physiotherapy at the University of Cape Town. My supervisor is Christine Rogers and my co supervisor is Professor Jennifer Jelsma. My research interest is adult falls prevention and the proposed title of my study is: "Factors contributing to falls in an acute tertiary care hospital: A descriptive study". I am conducting this study to fulfil the requirements for an MSc degree in Physiotherapy. I would like to conduct my research at your hospital.

I will be following the formal institutional application process, seek formal approval form the Head of Nursing, and complete Annexure 2 from the Western Cape Provincial Health and Research Committee.

Studies conducted in developed countries show that falls are one of the most common adverse events experienced by hospitalised patients. Studies in Africa are lacking: no epidemiological data on falls in the acute care setting has been found by the researcher, and therefore the magnitude of the problem in our local context is unknown. Without baseline data and knowledge on specific local risk factors, vulnerable patient groups and patterns and trends, it is difficult for the hospital identify contributory factors and circumstances surrounding falls. This study will provide this data which could offer useful lessons into future falls prevention.

Your hospital was chosen as a site for this research as it is a large tertiary acute hospital in the Western Cape with Trauma/Emergency, Medical and Surgical wards, as well as Intensive Care Units. This will be a single site study.

Research Aims and Objectives: The overall aim of the study is to determine the reported occurrence of falls, and factors contributing to falls in an acute tertiary level hospital in the Western Cape. Unit specific fall rates and the characteristics of patients who fall will be determined. The circumstances surrounding falls in terms of when and where patients fall, and the consequences of falls will be described. Secondary objectives relate to the predictive

validity of the Morse Falls Scale (MFS) and investigating the diagnostic value of different MFS cut-off scores in order to determine which score would be most useful in identifying in-hospital patients at high risk of falls. Further objectives relate to the nursing staff, to describe nursing staff knowledge, attitudes and beliefs towards in-hospital falls, falls prevention and the existing falls policy.

The first part of my study will be a retrospective record review and will include all adult inpatients, admitted to the hospital, 18 years or older that had a fall or more than one fall, as reported in a completed adverse incident report between 1 January 2015 and 31 December 2016. The control group will consist of the folder of the next consecutively admitted adult patient, 18 years or older to the same ward who was not reported to have fallen. Data will be collected using the adverse incident reports and then by accessing the medical records of these patients. I will develop a checklist to gather data and will do the data collection myself. A feasibility/logistical pilot study will be undertaken to determine any discrepancies in data collection. The pilot study will adhere to the same procedure as the actual study, and will use 10 patient folders. I will email the quality assurance manager at the institution to request permission to gain access to the adverse incident reports and request the folders for these patients and the control group from medical records. I will then visit the institution to analyse these records and complete the self-designed questionnaire.

The second part of my study will be a survey of Nurses. This will be in the form of a self- designed questionnaire based on the existing Falls Policy, which will assess the knowledge, attitudes and beliefs of nursing staff regarding in-hospital falls, the falls policy and interventions to minimise fall risk. The analysis of this will give useful information with regards falls reporting and may guide future planning in falls prevention training and management at the hospital. The population will include all nurses employed at the hospital at the time of the survey, who volunteer to complete the questionnaire. No additional costs will be incurred by the hospital or the nurses that agree to participate in this study. I will email nursing management to discuss the purpose of the survey and will explain the title, aims, objectives, rationale and potential benefits and risks of the study and provide information sheets to disseminate to the staff on the wards with the same information. I will offer to arrange an information session with staff on the identified wards if further information is required. A pilot study will be completed prior to the actual survey, by conveniently selecting a ward, and using the same procedure as described above in order to identify any logistical errors in the procedure. Once permission has been granted, questionnaires will be made available to the nurses on each ward for one week and a clearly marked, sealed ‘post box’ supplied to each

ward, to be stored in a safe place on the ward, where the staff can deposit their completed questionnaires. After one week, I will collect the boxes from the wards. Service delivery on the ward should not be disrupted by this study, the questionnaires will be made available and staff can complete them when a good opportunity arises.

My requirements for the Retrospective record review will be access to the Adverse Incident Reports and the medical folders of these patients, and for the control group as described above. I would also require a small private space to sit and do the data collection. For the Survey of Nurses, I would require your permission to contact Nursing Management to discuss the study, and to disseminate information leaflets to the nursing staff. The nursing questionnaire should take no longer than 10 minutes to complete. There will be no costs incurred by the hospital or nursing staff. Stationery and photocopying costs will be covered by myself. Nursing staff participation in the survey will be voluntary and verbal and written information will be provided to inform this.

The hospital will not be mentioned by name, though it may be possible from publication that the hospital can be identified, posing social risk, in spite of this. The hospital will be referred to as a tertiary level hospital in the Western Cape. The research does not pose clinical, psychological or social risk to the patients whose records are being reviewed as patient names will not be recorded, and the medical management of the patients is not being altered. In the nursing survey, participants will remain anonymous and surveys will be self-administered. All data will be reported as aggregated data and no data will be identified with individual participants. This will safeguard against the threat of victimisation. Wards will identified under the broad unit terms “Medical, Surgical, Psychiatry, Trauma/Emergency care, gynaecology and Intensive Care”, and not by individual ward names to avoid stigmatising of wards as “high or low risk”.

Only the researcher will have access to the collected raw data which will be kept in a safe area for one year. All electronic devices and data storage be password protected and protected against hacking attempts.

Although individual participants will not have any direct benefit, the results of the study may inform fall policy and thus protect future patients from fall events. It is hoped that the results yielded from this study will help with improved knowledge of the circumstances and characteristics of fall events in the population, as well as better fall management. This may drive policy review and development. It is hoped that by having a clearer understanding of the knowledge, attitudes and beliefs of nurses, that future staff training can be targeted more

specifically if gaps are identified in knowledge of the current policy, risk identification and risk intervention strategies.

The researcher will ensure that the results of this study are provided to management at the institution after completion of my thesis in 2018.

Thank you for considering letting your facility, patients and nursing staff be part of this study.

Please feel free to contact me, or my supervisor with any further queries. All contact details appear below.

Kind Regards

Athene Irving

(Researcher)

Email: atheneirving@gmail.com

Tel no: 0798953653

Christine Rogers

(Supervisor)

Division of Communication Sciences and Disorders

University of Cape Town

Email: Christine.rogers@uct.ac.za

Tel. no. 021 4066315

Professor Marc Blockman

Chairperson: Human Research and Ethics Committee- UCT Faculty of Health Sciences

E 52, Room 23

Old Main Building, Groote Schuur Hospital,

Observatory, 7925.

Tel: 021 406 6338

See more at: http://www.health.uct.ac.za/fhs/research/humanethics/about

Appendix O2: Permission letter to Head of Nursing

23 March 2017

To The Head of Nursing: Mr xxxxxxxxx

RE: HREC REF 874/2016

Permission to conduct Nursing staff Survey

Thank you for taking the time to read the following information.

My name is Athene Irving. I am a postgraduate student doing a Master's degree in Physiotherapy at the University of Cape Town. My supervisor is Christine Rogers and my co supervisor is Professor Jennifer Jelsma. My research interest is adult falls prevention and the proposed title of my study is: "Factors contributing to falls in an acute tertiary care hospital: A descriptive study". I am conducting this study to fulfil the requirements for an MSc degree in Physiotherapy. I am conducting my research at your hospital.

Studies conducted in developed countries show that falls are one of the most common adverse events experienced by hospitalised patients. Studies in Africa are lacking: no epidemiological data on falls in the acute care setting has been found by the researcher, and therefore the magnitude of the problem in our local context is unknown. Without baseline data and knowledge on specific local risk factors, vulnerable patient groups and patterns and trends, it is difficult for the hospital identify contributory factors and circumstances surrounding falls. This study will provide this data which could offer useful lessons into future falls prevention.

Research Aims and Objectives: The overall aim of the study is to determine the reported occurrence of falls, and factors contributing to falls in an acute tertiary level hospital in the Western Cape. Unit specific fall rates and the characteristics of patients who fall will be determined. The circumstances surrounding falls in terms of when and where patients fall, and the consequences of falls will be described. Secondary objectives relate to the predictive validity of the Morse Falls Scale and investigating the diagnostic value of different MFS cut-off scores in order to determine which score would be most useful in identifying in-hospital patients at high risk of falls. Further objectives relate to the nursing staff, to describe nursing staff knowledge, attitudes and beliefs towards in-hospital falls, falls prevention and the existing falls policy.

The first part of my study will be a retrospective record review and will include all adult inpatients, admitted to the hospital, 18 years or older that had a fall or more than one fall, as reported in a completed Adverse Incident Report between 1 January 2015 and 31 December 2016. The control group will consist of the folder of the next consecutively admitted adult patient, 18 years or older to the same ward who was not reported to have fallen.

The second part of my study will be a survey of Nurses. This will be in the form of a self- designed questionnaire based on the existing Falls Policy, which will assess the knowledge, attitudes and beliefs of nursing staff regarding in-hospital falls, the falls policy and interventions to minimise fall risk. The analysis of this will give useful information with regards falls reporting and may guide future planning in falls prevention training and management at the hospital. The population will be all nursing staff employed on the inpatient wards at the time of the survey, who volunteer to complete the questionnaire. I will provide information sheets to disseminate to the staff on the specified wards which will explain the title, aims, objectives, rationale and potential risks and benefits of participating in the study. I am able to offer further information for staff if it is required. A pilot study will be completed prior to the actual survey, by conveniently selecting a ward, and using the same procedure as described above in order to identify any logistical errors in the procedure. Once formal permission has been granted by yourselves and the Hospital CEO, questionnaires will be made available to the nurses on the wards for one week and a clearly marked, sealed ‘post box’ supplied to each ward, to be stored in a safe place on the ward, where the staff can deposit their completed questionnaires. After one week, I will collect the box from the wards.

The nursing questionnaire should take no longer than 10 minutes to complete. Service delivery on the ward should not be disrupted by this study, the questionnaires will be made available and staff can complete them when a good opportunity arises. There will be no costs incurred by the hospital or nursing staff. Stationery and photocopying costs will be covered by myself. Nursing staff participation in the survey will be voluntary and verbal and written information will be provided to inform this.

In the nursing survey, participants will remain anonymous and surveys will be self-administered. All data will be reported as aggregated data and no data will be identified with individual participants. This will safeguard against the threat of victimisation. Wards will identified under the broad unit terms “Medical, Surgical, Psychiatry, Trauma/Emergency care, gynaecology and Intensive Care”, and not by individual ward names to avoid stigmatising of wards as “high or low risk”.

Only the researcher will have access to the collected raw data which will be kept in a safe area for one year. All electronic devices and data storage be password protected and protected against hacking attempts.

Although individual participants will not have any direct benefit, the results of the study may inform fall policy and thus protect future patients from fall events. It is hoped that the results yielded from this study will help with improved knowledge of the circumstances and characteristics of fall events in the population, as well as better fall management. This may drive policy review and development. It is hoped that by having a clearer understanding of the knowledge, attitudes and beliefs of nurses, that future staff training can be targeted more specifically if gaps are identified in knowledge of the current policy, risk identification and risk intervention strategies.

The researcher will ensure that the results of this study are provided to management at the institution and to the individual wards that were selected to participate in the study after completion of my thesis in 2018.

Your formal permission for nursing staff participation in this study will be appreciated.

Please feel free to contact me, or my supervisor with any further queries. Should you have any concerns regarding the human rights and welfare of any of the participants; or the conduct of this study, please contact the UCT FHS Human Research and Ethics Committee.

All contact details appear below.

Kind Regards

Athene Irving
(Researcher)
Email: atheneirving@gmail.com
Tel no: 0798953653

Christine Rogers
(Supervisor)
Division of Communication Sciences and Disorders
University of Cape Town
Email: Christine.rogers@uct.ac.za
Tel. no. 021 4066315

The UCT's Faculty of Health Sciences Human Research Ethics Committee can be contacted on 021 406 6338 in case you have any ethical concerns or questions about your rights or welfare as a participant on this research study.' See more at: http://www.health.uct.ac.za/fhs/research/humanethics/about

Appendix O3: Permission letter from hospital Chief Operating Officer

Western Cape Government
Health

E-mail: [redacted]

To: Mrs C. Rogers
F45 Old Main Building
Groote Schuur Hospital
Observatory
7925

E-mail: Christine.Rogers@uct.ac.za / atheneirving@gmail.com

Dear Mrs Rogers

RESEARCH PROJECT: Factors Contributing to Falls in a Tertiary Acute Care Setting. A Descriptive Study

Your recent letter to the hospital refers.

You are hereby granted permission to proceed with your research which is valid until **30 March 2018.**

Please note the following:

a) Your research may not interfere with normal patient care.
b) Hospital staff may not be asked to assist with the research.
c) No additional costs to the hospital should be incurred i.e. Lab, consumables or stationary.
d) **No patient folders may be removed from the premises or be inaccessible.**
e) Please provide the research assistant/field worker with a copy of this letter as verification of approval.
f) Confidentiality must be maintained at all times.
g) Should you at any time require photographs of your subjects, please obtain the necessary indemnity forms from our Public Relations Office (E45 OMB or ext. 2187/2188).
h) Should you require additional research time beyond the stipulated expiry date, please apply for an extension.
i) Please discuss the study with the HOD before commencing.
j) Please introduce yourself to the person in charge of an area before commencing.
k) On completion of your research, please forward any recommendations/findings that can be beneficial to use to take further action that may inform redevelopment of future policy / review guidelines.
l) Kindly submit a copy of the publication or report to this office on completion of the research.

I would like to wish you every success with the project.

Yours sincerely

[redacted]

Appendix P: Psychotropic drug list

ANTIPSYCHOTICS

TYPICAL ANTIPSYCHOTICS

- Amisulpiride: Solian®
- Chlorpromazine: Largactil®, Chlorpromazine HCl-Fresenius®
- Flupentixol: Fluanxol®
- Fluphenazine: Modecate®
- Haloperidol: Serenace®, Sandoz Haloperidol®
- Pimozide: Orap®
- Sulpiride: Eglonyl®, Espiride®, Sandoz Sulpiride®, Bio-Sulpiride®
- Trifluoperazine: Stelazine®
- Zuclopenthixol: Clopixol®

ATYPICAL ANTIPSYCHOTICS

- Aripiprazole: Abilify®
- Clotiapine: Etomine®
- Clozapine: Aspen Clozapine®, Cloment®, Leponex®
- Olanzapine: Zyprexa®, Velotab®, Adco Olanzapine®, Mylan Olanzapine®, Olexar®, Oleanz®, Redilanz®
- Paliperidone: Invega®, Xeplion®
- Quetiapine: Setoquel®, Dopaquel®, Mylan Quetiapine®, Quetoser®, Serez®, Spec Quetiapine®, Truvalin®, Kizofrin®, Psyquet®
- Risperidone: Risperdal®, Aspen Risperidone®, Risperlet®, Schizorol®, Zoxadon®, Perizal®, Rispacor®, Risnia®, Risperidone Hexal®, DRL Risperidone®
- Ziprasidone: Geodon®

MOOD STABILISERS

- Lithium: Camcolit®, Quilonum®

ANXIOLYTICS

BENZODIAZEPINES

- Alprazolam: Xanor®, Adco-Alzam®, Mylan-Alzam®, Zopax®, CPL Alliance Alprazolam®
- Bromazepam: Lexotan®, Brazepam®, Sandoz Bromazepam®, Bromaze®
- Chlordiazepoxide: Librium®
- Clobazam: Urbanol®
- Diazepam: gan®, Pax®, AL Diazepam®, Pharma-Q Diazepam®, Betapam®
- Dipotassium clorazepate: Tranxene®
- Flurazepam: Dalmadorm®
- Lorazepam: Ativan®, Tranqipam®
- Oxazepam: Serepax®, Purata®
- Prazepam: Demetrin®

AZASPIRODECANEDIONE DERIVATIVES

- Buspirone: Pasrin®

DIPHENYLMETHANE DERIVATIVES

- Hydroxyzine: Aterax®, Pharma-Q Hydroxyzine®

CARBAMATES

- Meprobamate: Equanil®

OTHER ANXIOLYTICS

- Etifoxine: Stresam®

HYPNOTICS AND SEDATIVES

BENZODIAZEPINES

- Brotizolam: Lendormin®
- Flunitrazepam: Rohypnol®, Sandoz Flunitrazepam®
- Loprazolam: Dormonoct®
- Lormetazepam: Loramet®
- Midazolam: Dormicum®, Aspen Midazolam®, Midazoject®, Accord Midazolam®, Pharma-Q Midazolam®
- Nitrazepam: Arem®
- Temazepam: Normison®
- Triazolam: Halcion®

BENZODIAZEPINE-RELATED DRUGS

- Zopiclone: Imovane®, Adco-Zopimed®, Alchera®, Austell-Zopiclone®, Bio Zopiclone®, Sandoz Zopiclone®, Z-Dorm®, Zopigen®, Zopivane®
- Zolpidem: Stilnox®, Adco-Zolpidem®, Ivedal®, Mylan-Zolpidem®, Noxidem®,Nyxe®, Zolnoxs®, Zolpihexal®, Medploz®

ALDEHYDES AND DERIVATIVES

- Chloral hydrate: made up in hospital

OTHER HYPNOTICS AND SEDATIVES

- Diphenhydramine: Betasleep®, Sleepeze-PM®
- Doxylamine: Restwel®, Somnil®

ANTIDEPRESSANTS

TRICYCLIC DERIVATIVES

- Amitriptyline: Sandoz Amitriptyline®, Trepiline®; Combo +chlordiazepoxide: Limbritol®
- Clomipramine: Anafranil®, Clomidep®, Equinorm®
- Dosulepin: Thaden®
- Imipramine: Tofranil®, Ethipramine®
- Trimipramine: Tydamine®

SELECTIVE SEROTONIN REUPTAKE INHIBITORS (SSRIs)

- Citalopram: Cipramil®, Adco Talomil®, Bio Citalopram®, Cilate®, Cilift®, Ciloram®, Citalo Hexal®, Citalopram Actor®, Citalopram Winthrop®, DRL Citalopram®, Recita®, Austell Citalopram®, Arrow Citalopram®, Depramil®
- Escitalopram: Cipralex®, Citraz®, Accord Escitalopram®, Mylan Escitalopram®, Zitolex®, Zytomil®, Aspen Escitalopram®, Lexamil®
- Fluoxetine: Prozac®, Lorien®, AL Fluoxetine®, Fluoxetine Actor®, Lilly Fluoxetine®, Nuzak®, Ranflocs®, Rezak®, Sandoz Fluoxetine®, Zydus Fluoxetine®, ProHexal®
- Fluvoxamine: Luvox®, Faverin®, Fluvoxamine Hexal®
- Paroxetine: Aropax®, Adco Paroxetine®, Deparoc®, Lenio®, Parax®, Paroxetine Unicorn®, Paxil®, Serrapress®, Xet®
- Sertraline: Zoloft®, Settra®, Sertraline Winthrop®, Austell Sertraline®, Dyna Sertraline®, Serdep® Serlife®, Zolid®

MONAMINE OXIDASE TYPE A INHIBITORS

- Moclobemide: Depnil®

MONAMINE OXIDASE INHIBITORS, NON-SELECTIVE

- Tranylcypromine: Parnate®

OTHER ANTIDEPRESSANTS

- Mianserin: Lantanon®
- Maprotiline: Ludiomil®
- Mirtazapine: Remeron®, Adco Mirteron®, Aspen Mirtazapine®, Miradep®, Mylan Mirtazapine®, Mytra®, Ramure®, Sandoz Mirtazapine®
- Trazodone: Molipaxin®, Aspen Trazodone®
- Desvenlafaxine: Exsira®
- Duloxetine: Cymbalta®, Cymgen®, Yelate®
- Venlafaxine: Efexor®, Efegen®, Sandoz Venlafaxine®, Venlor®, Venlafaxine XR Adco®, Odiven®
- Bupropion: Wellbutrin®
- Reboxetine: Edronax®
- Agomelatine: Valdoxane®
- Vortioxetine:Brintellix®

ANTIEPILEPTICS

BARBITURATES AND DERIVATIVES

- Phenobarbital: Lethyl®, Sedabarb®
- Primidone: Mysoline®
- Phenytoin: Epanutin®

BENZODIAZEPINE DERIVATIVES

- Clonazepam: Rivotril®
- Clobazam: in benzo section
- Diazepam: in benzo section
- Lorazepam: in benzo section
- Midazolam: in sedative hypnotics section

SUCCINIMIDE DERIVATIVES

- Ethosuximide: Zarontin®

CARBOXAMIDE DERIVATIVES

- Carbamazepine: Tegretol®, Degranol®, Sandoz Carbamazepine®
- Oxcarbazepine: Trileptal®, Mylan Oxcarbazepine®

FATTY ACID DERIVATIVES

- Valproic acid: Convulex®, Epilim®, Epilizine®, Navalpro®, Vanapro®

OTHER ANTIEPILEPTICS

- Gabapentin: Neurontin®, Epleptin®
- Lamotrigine: Lamictin®, Dyna Lamotrigine®, Epitec®, Sandoz Lamotrigine®, Aspen Lamotrigine®, Lamidus®
- Levetiracetam: Keppra®, Redilev®, Dyna Levetiracetam®, Torcetam®
- Topiramate: Topamax®< Sandoz Topiramate®, Epimate®, Toplep®, Epitoz®, Topirol®
- Vigabatrin: Sabril®

OPIOIDS (NARCOTIC ANALGESICS)

- Codeine: in LOADS of over-the-counter combination analgesics e.g. Myprodol®
- Dihydrocodeine: DF-118®
- Hydromorphone: Jurnista®
- Morphine: Morphine Sulphate Fresenius®, MST Continus®, Pharma-Q Morphine®, SRM-Rhotard®, Mist. Morphine; combination: Omnopon Fresenius®, Cyclimorph®
- Oxycodone: Oxycontin®, Oxynorm®
- Fentanyl: Durogesic®, Adco Tenyl®
- Pethidine: Pethidine HCL Fresenius®, Pharma-Q Pethidine®
- Dipipanone: Wellconal®
- Methadone: Physeptone®
- Pentazocine: Sosenol®
- Buprenorphine: Temgesic®, Sovenor®
- Tilidine: Valoron®
- Tramadol: Tramal®, Austell Tramadol®, Dolatram®, Domadol®, Nobligan®, TramaHexal®, Tramaspen®, Tramazac®, Tramgesic®; combination: Tramacet®

Appendix Q: Email correspondence and permission to use and modify: Falls prevention nurse survey

Inbox

athene irving <atheneirving@gmail.com> Mon, Sep 12, 2016, 10:08 PM

to anna.barker

Dear Professor Barker

Thank you for taking the time to read this email.

My name is Athene Irving. I am a post graduate student doing a master's degree in Physiotherapy at the University of Cape Town, South Africa. My research interest is adult falls prevention and the proposed title of my study Is: "Factors contributing to falls in an acute tertiary care hospital: A descriptive study"

Part of my study is going to be investigating the knowledge attitudes and behaviours of nurses with regard to falls prevention and the existing falls policy at the research institution.

I would like to ask your permission to use and modify your Falls prevention nurse survey, as it appears on pages 56-57 of : An evaluation of the preventing falls and harm from falls in older people best practice guidelines for Australian hospitals.

Any further information on the reliability and validity testing of this survey would be greatly appreciated.

With kind regards

Athene Irving

Darshini Ayton <darshini.ayton@monash.edu> Sep 29, 2016, 7:55 AM

to me

Dear Athene

Thank you for your email and apologies for the delay in replying. I am responding on behalf of Associate Professor Anna Barker.

We are happy for you to use and adapt this survey, however it would be great if could share data and/or consider a joint publication.

The SAQ component of the survey has been validated using RASCH. I will put you in touch with Dr Sze-Ee Soh who was responsible for this component. It may be interesting doing a validation study in your study sample as well.

It would be great to discuss further. Wondering if we could organise a teleconference?

Let me know your thoughts.

Kind regards,

Darsh--

Dr Darshini Ayton

Research Fellow and Lecturer

RESPOND Project Manager

Falls and Bone Health team

Health Services Research Unit

Division of Health Services

Department of Epidemiology and Preventive Medicine

School of Public Health and Preventive Medicine

Monash University

The Alfred Centre

99 Commercial Road

Melbourne VIC 3004

Phone: +61 3 9903 1660

Fax: +61 3 9903 0556

Email: Darshini.Ayton@monash.edu

athene irving <atheneirving@gmail.com> Sep 29, 2016, 7:49 PM

to Darshini, Christine

Dear Darsh

Thank you for your reply. I have cc'd my supervisor Christine Rogers in on this email

We would be very happy to set up a teleconference to discuss further.

I would be very grateful to be in touch with with Dr Sze-Ee Soh to get further insight into the validation of the survey.

Looking forward to hearing from you.

Regards

Darshini Ayton <darshini.ayton@monash.edu> Fri, Oct 14, 2016, 1:33 AM

to me, Christine

Hi Athene and Christine.

I have cc'd in Sze-Ee Soh and also Anna Barker.

I think South Africa is 9 hours behind Melbourne in time?

Would a teleconference on Tuesday 25th of October at 5pm AEST (8am your time?) suit everyone?

Kind regards,

Darsh

athene irving <atheneirving@gmail.com> Mon, Oct 17, 2016, 6:29 PM

to Christine, Darshini

Dear Darsh

I can be available at that time. Would it be an option to do a Skype conference?

Regards

Sze-Ee Soh <sze-ee.soh@monash.edu> Oct 26, 2016, 2:15 AM

to Christine, Darshini, me

Dear Athene,

It was lovely chatting with you yesterday. As promised, please find attached the following:

6-PACK falls survey (note the highlighted questions are components of the Safety Attitudes Questionnaire[SAQ])

6-PACK pre-implementation protocol paper

6-PACK outcome paper

SAQ Rasch analysis in acute Australian hospitals

Please let us know if you need anything else.

All the best.

Cheers,

Sze-Ee Oct 26, 2016, 8:18 PM

athene irving <atheneirving@gmail.com>

to Christine, Sze-Ee, Darshini

Yes, thank you so much!

It was fantastic for me to be able to gain insight into the nursing questionnaire and its background, as well as to share in your experience in this field of research.

I am very inspired.

Will be in touch once I have heard back from the Physiotherapy department at UCT regarding my proposal.

Regards

Appendix R: Original 6-PACK nursing survey

NURSE SURVEY

Thank you for participating in this survey

We recognise the importance of your privacy so please note:

- *All information collected in this survey will be anonymous.*
- *Your employer will not know if you have participated in the survey.*
- *No personal details are required so we have no way of linking your survey response to you.*
- *All results will be grouped for example "80% of nurses strongly agreed that falls risk assessment tools are a useful way of identifying patients at risk of falling".*

Please answer the following five questions by ticking the appropriate box:

1. How long have you worked at this hospital?
□ <4 months □ 4-12 months □ 1-5 years □ > 5 years

2. How long have you worked on this ward?
□ <4 months □ 4-12 months □ 1-5 years □ > 5 years

3. What is your qualification?
□ Registered nurse □ AIN □ Other (specify)

4. On what ward do you most frequently work?
□ 9E □ 6E □ 11W □ 7E1

5. How many shifts do you usually work on the above ward?
□ <1 shift per week □ 1 shift per week □ 2-4 shifts per week □ 5 shifts per week

Please circle the response that best matches your perceptions/experiences of the falls prevention and safety climate **on the ward where you most frequently work**.

Please answer the following items with respect to your ward using the scale below.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

	Strongly disagree▼	Disagree▼	Neutral▼	Agree▼	Strongly agree▼
Nurse input is well received on this ward.	A	B	C	D	E
The current falls prevention program is effective at reducing falls on my ward.	A	B	C	D	E
In this ward, it is difficult to speak up if I perceive a problem with patient care.	A	B	C	D	E
Falls risk assessment tools are a useful way of identifying patients at risk of falling.	A	B	C	D	E
Disagreements in this ward are resolved appropriately (i.e. not who is right, but what is best for the patient).	A	B	C	D	E
Falls risk assessment tools are better than my own judgment for identifying patients most at risk of falling.	A	B	C	D	E
I have the support I need from other staff to care for patients.	A	B	C	D	E
Low-low beds are an effective way to prevent injuries in patients at risk of falling out of bed.	A	B	C	D	E
It is easy for personnel here to ask questions when there is something that they do not understand	A	B	C	D	E
Keeping the bed rails up is an effective way to prevent injuries in patients at risk of falling out of bed.	A	B	C	D	E
The physicians and nurses in this ward work together as a well-coordinated team.	A	B	C	D	E
It is not my responsibility to stop patients from falling.	A	B	C	D	E
I would feel safe being treated here as a patient.	A	B	C	D	E
Falls risk assessment is a waste of time.	A	B	C	D	E
Medical errors are handled appropriately in this ward.	A	B	C	D	E
The falls risk assessment tool used on this ward is a useful way of identifying patients at risk of falling.	A	B	C	D	E
I know the proper channels to direct questions regarding patient safety in this ward.	A	B	C	D	E
I don't have time to complete a falls risk assessment on all of my patients.	A	B	C	D	E
I receive appropriate feedback about my performance.	A	B	C	D	E
A "Falls risk" sign above the bed is a useful way to communicate to staff what patients are at risk of falling.	A	B	C	D	E

Please answer the following items with respect to your ward using the scale below.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

My suggestions about safety would be acted upon if I expressed them to management on this ward.								A	B	C	D	E
It is my responsibility, as a patient's treating nurse, to assess their falls risk each shift.								A	B	C	D	E
I like my job.								A	B	C	D	E
It is my responsibility to implement prevention strategies for patients I identify as high falls risk.								A	B	C	D	E
Working on this ward is like being part of a large family.								A	B	C	D	E
Falls are not a problem on my ward so falls prevention programs are not required.								A	B	C	D	E
This ward is a good place to work.								A	B	C	D	E
Falls prevention is not a priority on this ward.								A	B	C	D	E
I am proud to work on this ward.								A	B	C	D	E
Incident reporting provides us with a way of measuring how we are going with patient falls.								A	B	C	D	E
Morale amongst staff on this ward is high.								A	B	C	D	E
I never know what to write on a falls incident report.								A	B	C	D	E
When my workload becomes excessive, my performance is impaired.								A	B	C	D	E
I know incident reporting is important but I just don't have time to do it.								A	B	C	D	E
I am less effective at work when fatigued.								A	B	C	D	E
I only report falls in which the patient suffers an injury.								A	B	C	D	E
I am more likely to make errors in tense or hostile situations.								A	B	C	D	E
Falls prevention is primarily the responsibility of the physiotherapist.								A	B	C	D	E
Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure).								A	B	C	D	E
Management supports my efforts:	Unit Mgt	A	B	C	D	E	Hosp Mgt	A	B	C	D	E
Management doesn't knowingly compromise patient safety:	Unit Mgt	A	B	C	D	E	Hosp Mgt	A	B	C	D	E
Management is doing a good job:	Unit Mgt	A	B	C	D	E	Hosp Mgt	A	B	C	D	E
Problem staff are dealt with constructively by our:	Unit Mgt	A	B	C	D	E	Hosp Mgt	A	B	C	D	E
I get adequate, timely information about events that might affect my work from:	Unit Mgt	A	B	C	D	E	Hosp Mgt	A	B	C	D	E
You can't stop older people from falling.								A	B	C	D	E
The levels of staffing in this ward are sufficient to handle the number of patients.								A	B	C	D	E
It is my responsibility to update my patient's falls risk status each shift if a fall and/or change in condition occurs.								A	B	C	D	E
This hospital does a good job of training new staff.								A	B	C	D	E
There are more important things I should do than falls prevention strategies for my high risk patients.								A	B	C	D	E
All the necessary information for diagnostic and therapeutic decisions is routinely available to me.								A	B	C	D	E
My supervisors have assisted when I raise problems about falls on my ward.								A	B	C	D	E
Trainees in my discipline are adequately supervised.								A	B	C	D	E
Positioning high falls risk patients in high visibility areas is an effective way to prevent them from falling.								A	B	C	D	E
Targeted management programs for patients with delirium and confusion are used on my ward.								A	B	C	D	E
High falls risk patients often have medication reviews to reduce their use of psychoactive drugs on my ward.								A	B	C	D	E
There is strong leadership for falls prevention on my ward.								A	B	C	D	E

Please answer the following items with respect to your ward using the scale below.

A	B	C	D	E
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Strongly agree▼
Agree▼
Neutral▼
Disagree▼
Strongly disagree▼

My supervisors are supportive of falls prevention activities on my ward.	A	B	C	D	E
I experience good collaboration with other nurses on this ward.	A	B	C	D	E
I am given useful feedback about whether I am using falls prevention strategies properly.	A	B	C	D	E
This feedback helps me use falls prevention strategies more effectively.	A	B	C	D	E
I experience good collaboration with staff physicians on this ward.	A	B	C	D	E
I experience good collaboration with pharmacists on this ward	A	B	C	D	E
If a patient has had a fall on the ward, this is always discussed at handover.	A	B	C	D	E
I receive regular reminders to use falls prevention strategies.	A	B	C	D	E
I receive useful support and training from falls prevention leaders.	A	B	C	D	E
Falls risk assessment and prevention strategies have been incorporated into the ward's standard processes.	A	B	C	D	E
Falls prevention best practice guidelines are a useful resource.	A	B	C	D	E
Use of 'specials' are an effective way of preventing patients from falling.	A	B	C	D	E
In this ward it is difficult to discuss errors.	A	B	C	D	E
I report all patient falls to the person in charge of my shift.	A	B	C	D	E
I am encouraged by my colleagues to report any patient safety concerns I may have.	A	B	C	D	E
I report all patient falls on the incident reporting system.	A	B	C	D	E
The culture in this ward makes it easy to learn from errors of others.	A	B	C	D	E
I document all patient falls in the patient file's (medical records).	A	B	C	D	E
Communication breakdowns that lead to delays in delivery of care are common	A	B	C	D	E
Exercise programs are commonly used to reduce the risk of falls in high falls risk patients on my ward.	A	B	C	D	E
Exercise programs are an effective way of preventing falls in high falls risk patients.	A	B	C	D	E
Post falls management procedures are in place on my ward to ensure prompt identification of fall injuries.	A	B	C	D	E
An active falls prevention leader is essential for falls prevention programs to be successful on my ward.	A	B	C	D	E

Comments:

How do you think training in falls prevention could be improved at this hospital?

What are the best features of your current falls prevention program?

What features of your current falls prevention program need improvement?

Appendix S: Email correspondence with panel of experts: Nursing survey

Dear .....

Thank you for taking the time to read the following information.

As you know, I am currently enrolled as a postgraduate student doing a Master's degree in Physiotherapy at the University of Cape Town. My supervisor is Christine Rogers and my co supervisor is Professor Jennifer Jelsma. My research interest is adult falls prevention and the title of my study is: **"Factors contributing to falls in an acute tertiary care hospital: A descriptive study".** I am conducting this study to fulfill the requirements for an MSc degree in Physiotherapy.

Data collection for the first part of the study is continuing, I am getting ready to do the nursing survey part of the study and **would like to request your assistance with this please.**

Attached please find the information letter about the study and **specifics of what I would like your assistance with.**

Please could you let me know whether you would be willing to help. It should take no more than 20 minutes of your time.

Thank you once again for your help thus far.

Kind regards
Athene Irving

5 February 2018

Why is this study being done?

You may know, that in-hospital falls are common throughout the world, but we do not know whether this is the same in our local context. Part of our study is aimed at identifying whether nurses have received training in Falls Prevention, how they are using the Falls Risk assessment and Intervention forms, what they know about the Falls Risk Policy, and any difficulties they are having in trying to prevent patients from falling. This study could help us learn about how to prevent patients from falling when they are in hospital.

Why are you being asked for assistance?

I have developed a questionnaire relating to Nurses perceptions/experiences with regards falls prevention and management on the wards in which they work, and the policy which is in place at the research facility. I am asking for assistance with **two areas** of this:

1. **TIME taken to read and complete the questionnaire**. Please read and complete the attached questionnaire (You can mark any answer, and do not have to send the completed questionnaire back to me). Please time how long it takes you to do this and give the following feedback: **It took me**

- **0-10 minutes**
- **11-20 minutes**
- **21-30 minutes**

2. Please **comment on the clarity of questions** and highlight any specific questions you feel are

a. not clearly stated and/or

b. ambiguous- do you feel any questions pre-empt you to answering them in a specific way?

Thank you for your help with this, it is greatly appreciated.

Kind Regards

Athene Irving

(Researcher)

Email: atheneirving@gmail.com

Tel no: 0798953653

Christine Rogers

(Supervisor)

Division of Communication Sciences and Disorders

University of Cape Town

Email: Christine.rogers@uct.ac.za

Tel. no. 021 4066315

Appendix T1-2: Emails to nursing unit managers

Appendix T1: Introductory email to nursing unit managers

Dear Sister

Thank you for your time in reading this email.

My name is Athene Irving. I am a Physiotherapy Masters student, currently busy with research at this hospital.

My research is aiming to **describe factors contributing to inpatient falls at the hospital**. We hope that the analysis of this will give useful information with regards falls reporting and may guide future planning in falls prevention training and management at the hospital.

Part of this study involves a **survey** of all consenting nursing staff employed on the inpatient wards at the hospital. I am attaching a copy of the nurses information sheet as well as the survey for your information.

xxxxxxxxx has asked me to liaise with you to meet you on Monday 17th September to let us know who

my research assistant and I would like to meet a **designated person, chosen by yourselves on the wards. We will**:

- **provide the information sheet** attached which explains the title, aims, objectives, rationale and potential risks and benefits of participating in the study.
- be able to **attend a handover meeting** to introduce myself and my research assistant to **give further information** for staff on a suitable day during the period if you think this is a good time for this to be done
- **provide questionnaires and consent forms** to the nurses on the wards in English, Xhosa and Afrikaans.
- provide a sealed post box to each ward which will need to be left and stored in a safe place on the ward, where the staff can deposit their completed questionnaires.
- After two weeks, we will collect the box from the ward on Monday 1 October 2018.

The nursing questionnaire should take no longer than 5-10 minutes to complete. Service delivery on the ward should not be disrupted by this study, the questionnaires will be made available and staff can complete them when a good opportunity arises. Stationery and photocopying costs will be covered by myself. Nursing staff participation in the survey will be voluntary and verbal and written information will be provided to inform this. Participants will remain anonymous and surveys will be self-administered.

What I request from you (please):

- the **name (and email address)** of a person from your ward who we can meet on Monday 17 September
- **A convenient time** for us to meet on this day
- For you to suggest a safe **place to leave the boxes for nurses** to deposit their completed surveys (possibly a tea room if this is available to nursing staff)
- For you to **contact me with any further information you would like.**

Thank you again for your time and assistance!

Kind regards
Athene Irving
Student number: HINATH001
HREC REF: 874/2016

Appendix T2: Follow-up email to nursing managers

Dear Nursing Sisters and Managers

Thank you for your time in reading this email and your help with conducting the Falls Study.

My research assistant Lebogang Lefao and myself delivered the Nursing **questionnaires and consent forms** to the wards in English, Xhosa and Afrikaans, on Monday. **We are** able to **attend a handover meeting** to **give further information to** staff on a suitable day during the survey period if you think this is a good time for this to be done. Please let me know if you would like me to do this.

We will come around to the ward during the study period to replenish forms if they run out. If you notice that there are no forms left, you can contact me on this email or on 0798953653 and I will do my best to get to you as quickly as possible with more.

- After two weeks, we will collect the box from the ward on Monday 1 October 2018.

The nursing questionnaire should take no longer than 5-10 minutes to complete. Service delivery on the ward should not be disrupted by this study, staff can complete them whenever a good opportunity arises. Stationery and photocopying costs will be covered by myself. Nursing staff participation in the survey is voluntary and verbal and written information has been provided to inform this. Participants will remain anonymous.

Please **contact me with any further information you would like.**

Thank you again for your time and assistance!

Kind regards
Athene Irving
Student number: HINATH001

HREC REF: 874/2016