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**EXPLORING PHENOMENA OVERCROWDING IN THE CONTEXT OF CHUK
EMERGENCY DEPARTMENT IN RWANDA: NURSES PERSPECTIVE**

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EMERGENCY DEPARTMENT IN RWANDA: NURSES PERSPECTIVE**

A DISSERTATION SUBMITTED

TO

**THE SCHOOL OF NURSING AT THE FACULTY OF HEALTH SCIENCES
FOR PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE MASTERS
IN NURSING MANAGEMENT**

BY

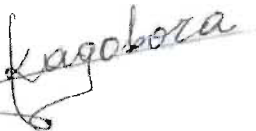
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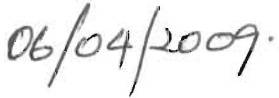
DECLARATION

I, KAGOBORA Pascasie, declare that this dissertation titled **“Exploring phenomena overcrowding in the context of Kigali Central University Teaching Hospital (CHUK) Emergency Department in Rwanda: nurses perspective”** is my original work. It has never been submitted for any other purpose, or at any other university. Sources of information utilized in this work have been acknowledged in the reference list.

Signature: 

Date: 





DEDICATION

This dissertation is dedicated to my husband MARARA M Camille and our children KALISA Alain, IGISARO Alice, KANYANGE Gloria, MBABAZI Divine, NSHUTI Allegra, KAMUFOZI GWIZA Christian, all my family members and relatives.

ACKNOWLEDGEMENT

I thank God for his love and marvelous plan for my life.

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Abstract

Emergency department overcrowding is a growing problem worldwide including Rwanda. Literature shows that this problem has an impact on the functioning of the health care system and the quality of care provided.

Research Methodology

This study aimed at exploring the phenomenon of overcrowding in ED/CHUK. Fifty one self-administered questionnaires were distributed to 40 ED nurses; these comprised three questions related to demographic data and 48 questions related to overcrowding. Correlation between overcrowding and causes and overcrowding with outcomes was explored and the Pearson's test demonstrated that there is no linear correlation between these variables.

Results

Findings from the demographic data demonstrated that the majority (92%) of ED nurse's were young (aged between 20 to 35 years). The majority (74%) of ED nurses had less than one to three years of experience in ED. With regard to overcrowding characteristics; nurses reported that the patient's waiting time for a physician varied between less than 30min to more than 180 min; ED beds occupancy varied between 1 hour to more than 24 hours; patients were placed in the ED hallways for 1 hour to more than 24 hours; waiting room occupancy varied between less than 1 hour to more than 24 hours. Nurses attributed overcrowding to a variety of causes, including; a lack of inpatients beds (95%), large volume of trauma patients (87%), patients with no urgent condition (66), inappropriate referral of chronic cases (61%), space limitation in emergency department (76%) and insufficient acuity ED beds (74%).

Perceived outcomes (impact) were also multiples including, boarding patient in ED (92%), increased stress among nurses (79%), stress among physicians (60%), and risk

of poor outcomes (60%), staff dissatisfaction (58%), violence between health care providers and patients (60%) and increased patient waiting time (58%).

Regarding the undertaken interventions to reduce ED overcrowding, 100% of respondent asserted that there was some sporadic interventions, but not consistent.

Recommendations:

Like in other countries ED/CHUK overcrowding is a complex problem that needs to be addressed by all stakeholders: CHUK managers, hospital staff, ED staff, Rwandan district hospitals and Ministry of health.

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LIST OF ABBREVIATION

CHUK: This abbreviation is in French: Kigali Centre University Teaching Hospital.

ED : Emergency Department

ENA : Emergency Nurses Association

ICU: Intensive Care Unity

ACEP: American College of Emergency Physicians

HIV: Human Immunodeficiency Virus,

AIDS: Acquired Immunodeficiency Syndrome

A2= Enrolled nurses

A1= registered nurses

SPSS: Statistical Package for Social Sciences

UKZN: University of Kwazulu Natal

Chapter 1

Introduction

1.1. Background to the Study

Overcrowding in emergency departments (ED) is a worldwide concern, as it has significant health implications (Twanmoh and Cunningham, 2006). Hoot, Nathan, and Aronsky (2008) asserted that it represents an international crisis that may affect the quality and access of health care. Derlet (2000) stated that although the causes of overcrowding are complex and multifactorial, the key reason for overcrowding is that EDs are too small and understaffed for the population they serve. Therefore, according to this author, the impact of overcrowding deserves to be explored and discussed in depth, as it has major implications to the functioning of the hospital.

Shactman and Altman (2002) assert that overcrowding in EDs is associated with poor outcomes of care and a greater likelihood of absence of care, especially where there are more patients than resources. According to Howard (2005) the Canadian emergency nurses association (ENA) believes that overcrowding in the EDs is the most significant challenge faced by professionals today, and it is a significant national problem that jeopardizes everyday patient care. Echoing the similar concern, Asplin et al., (2003) stated that ED crowding has become a major barrier to receiving timely emergency care in the United States and patients who present to EDs often, face long waiting times before they are treated, and for those who require admission, even longer waits for an inpatient

hospital bed. According to these authors, overcrowding is the most serious issue facing Canada's EDs and is a very grave patient health issue. According to Asplin et al., (2003) overcrowding results in increased patient suffering, prolonged waiting time, deteriorating levels of service, a worsened medical condition or even loss of life. Unless action is taken to effectively deal with this need, patient health will continue to be compromised and preventable patient deaths may continue (Asplin et al., 2003).

According to Shactman and Altman (2002) the hospital ED is the core of the health care safety net. It is often the chief point of contact with the health care system for many uninsured, under-insured, and underserved populations. The smooth functioning of the health care system as a whole depends on the availability of ED services, especially in cases of accidents, public health crisis or disasters, or the onset of serious health problems. Overcrowding can erode confidence in the system as a whole. In line with the above, Shactman and Altman state that many hospitals, particularly in urban centres, are diverting ambulances to other facilities because they are unable to adequately service arriving patients.

Shactman and Altman (2002) further state that hospitals report increased numbers of patients who leave without being seen by a physician, and more frequent "boarding" of patients who are waiting for an inpatient bed. As a result of overcrowding in EDs, emergency patients are diverted to more distant locations, risking increased morbidity and mortality (Shactman and Altman, 2002). Overcrowding can therefore be regarded as

a barrier to health care access for these populations who may have few health care alternatives (Slater, 2008).

Bogart (2000) argues that the phenomenon of ED overcrowding cannot be attributed to any single factor, but instead appears to be a product of complex causal relations, encompassing several internal and external factors, most of which are beyond the control of ED staff. Richards, Navarro and Derlet (2000) argue that the possible causes include the use of the ED for non-emergent cases, increasing patient acuity, labour shortages, lack of community-based alternatives to the ED, delays while waiting for laboratory testing to be completed, lack of public education regarding appropriate ED use, lack of availability of ED or inpatient beds (or both). According to Schull, Lazier and Vermeulen (2003), inpatient access block is the principal cause of ED overcrowding. Access block is defined as the proportion of ED patients requiring admission whose total time within the ED exceeds 8 hours.

According to the study by Slater (2008) ED overcrowding exposed seriously ill or injured children to the gaze of the morbidly curious. These conditions upset and angered the parents. This author reported that parents often left the hospital with inadequate answers to their questions, and many times had to make otherwise unnecessary return visits because they did not understand what to expect from the medication and treatment. The resultant hostility of the parents was naturally directed at the staff that had enough frustrations regarding the overcrowding. Slater (2008) also revealed that nurses had little time for nursing care, for example to relate to their patients, to teach, or to explain, even

minimally, the care to be given or the follow-up treatment necessary. The result was an exhausted, confused, and frustrated staff that lacked the satisfaction of knowing a job well done. Instead, they viewed themselves as part of the machinery that processed and treated patients and sent them home (Slater, 2008).

The study by Twanmoh and Cunningham (2006) revealed that emergency departments are specialist multidisciplinary units; they should have the capacity to care for patients with serious emergency conditions at all times. Communities depend on EDs to be available for patients who have acute problems that require time-sensitive treatment, such as trauma, acute myocardial infarction, acute abdomen, and stroke. The ED provides a key public service for communities and should be considered an essential service (Canadian Physician hospital care committee report, 2006).

In addition to caring for acutely ill or injured patients, EDs help ensure that basic health care is available to anyone, regardless of ability to pay. EDs care for underserved populations who have no other options for medical care due to the numerous socioeconomic barriers (Trzeciak and Rivers, 2003). Asplin's study as cited in (Trzeciak and Rivers, 2003) revealed that for indigent patients, the uninsured, and the homeless, the ED serves as a "provider of last resort".

Sammy's (2003) study revealed that overcrowding in EDs is a critical problem that requires urgent attention. This author however reported that the problems encountered by EDs in developing countries were different to those in the developed world. Problems in

developing countries, according to Sammy (2003) vary in magnitude and detail, from setting to setting, and from country to country.

1.2. Problem Statement

One of the actual concerns that are facing CHUK managers, staff and patients is overcrowding in ED/CHUK. This is reflected by patients lying on the floor, placed in the hallways, occupying all stretchers and wheel chairs because planned spaces are filled; patients are also boarding in ED for more than two weeks because inpatient beds are also filled. The outcomes of this problem are multiples including ED patient poor management, staff frustration, increased patients waiting time and dissatisfaction.

The Canadian Association of Emergency Physicians (2005) states that many factors may contribute to ED overcrowding, and most of them are beyond the control of emergency department. This association stated that understanding the causes and consequences of overcrowding in ED are essential to be effective in providing required leadership in this area, as it has a great impact on the functioning of the health care system as a whole.

The Rwandan public health sector is organised into three levels, with each level having a defined technical and administrative platform called a minimum package of activities. Each level coordinates with each other to prevent overlap and improve use of resources. Although the national referral hospitals provide the highest level of service and should function almost as referral centres from district hospitals, in reality, there is an overlap of

the activities of the district and national referral hospitals. This is because there is still an unclear delineation of responsibilities for the central-level national referral hospitals, and there are not enough functioning district hospitals, especially in urban areas. This results in national referral hospitals often assuming the responsibilities of district hospitals (Rwandan's Health Sector Policy, 2005).

CHUK, as a referral hospital, receives patients from all over, within and outside the country. Furthermore, the Rwandan population is growing rapidly following the genocide. According to the Rwanda National population and housing report (2002) the Kigali city alone had approximately 603,049 habitants in 2002, today the population is approximated 1 million, reported habitants only. This population forms about 1/8 of the Rwandan total population. This growing population may also affect the ED space and resources which have not been adapted to cater for this demanding population. Another factor that may contribute to ED crowding is the use of ED/CHUK by all trauma cases, regardless of the severity of injuries.

Ryan and Maguire (2006) reported that the international experience has shown that once the hospital bed occupancy rates exceed 85% there will be regular occasions on which no beds are available for patients requiring acute admission. Limited hospital beds have a high likelihood of leading to congestion in ED. The 2007 CHUK statistics revealed that the hospital occupation rate is around or above 100%. This may be a true reflection of the scenario in CHUK because some wards have more beds than the expected bed state, so as to accommodate the demand.

Staffing may also contribute to ED/CHUK overcrowding because when patient and nurse ratio is inadequate activities are performed slowly and this contribute to patient long stay in ED. According to Malone (2003) the international accepted norms are one nurse to four general ED patients, one nurse to two critical cares ED patients, and one nurse to one ED trauma patient. In ED/CHUK one nurse is caring for 7 critical ill patients as illustrated in the actual ED/CHUK staffing below.

Staffing: CHUK/ED has a total of 40 nurses (enrolled nurses and advanced diploma nurses) and 2 general doctors to look after the needs of these patients in ED (day and night). Specialist doctors only come for rounds in the morning and whenever they are called to attend to special cases. At the ED in CHUK nurses work in 3 shifts per day and there are 8 nurses per shift. Among these 8 nurses per shift, one coordinates the department's activities, one handles referrals to other hospitals on the ambulance, one nurse handles triage and reception of patients, one nurse handles trauma cases, one nurse cares for the critically ill patients in the high care room where we have 7 beds and generally those patient wait for a bed in Intensive care unit (ICU), one nurse handles resuscitations, another works with the physician in the examination room, where we have 5 beds almost filled with patient waiting for an inpatient bed.

An unpublished study conducted in ED/CHUK by Kamali Inocent founded that one nurse was caring for 9 trauma patients instead of one patient as accepted by international norms.

Even though some causes of ED/CHUK overcrowding are assumed, this study aimed at exploring the causes, consequences and possible solutions.

1.3 Purpose of the Study

The purpose of this study is to explore the phenomenon overcrowding in ED, to identify ED nurses perspectives on the causes, consequences and undertaken/proposed solutions to alleviate overcrowding in CHUK ED. Hoping that the findings will be considered in the future by improving ED functioning.

1.4 Objectives

The objectives of this study were to:

1. To describe overcrowding in CHUK/ED as perceived by nurses.
2. To explore the causes of overcrowding in ED at CHUK as perceived by nurses
3. To describe the outcomes of overcrowding in ED/CHUK.
4. Explore interventions to reduce or control overcrowding at ED/CHUK

1.5 Research Questions

1. What are the characteristics of an overcrowded ED?
2. What are the triggers of overcrowding in CHUK/ED?
3. What are the major, immediate and others outcomes of overcrowding in ED/CHUK?
4. What interventions have been implemented to address overcrowding in CHUK/ED?
4. What other interventions may be possible solutions to overcrowding in CHUK/ ED?

1.6 Significance of the Study

According to Fatovich et al., (2005) ED overcrowding have been reported as impairing access to emergency care, compromising clinical care, prolonging patient pain and suffering, and have been linked to fatalities. Chung, (2005) also noted that ED overcrowding increased staff frustration and violence between patients and staff.

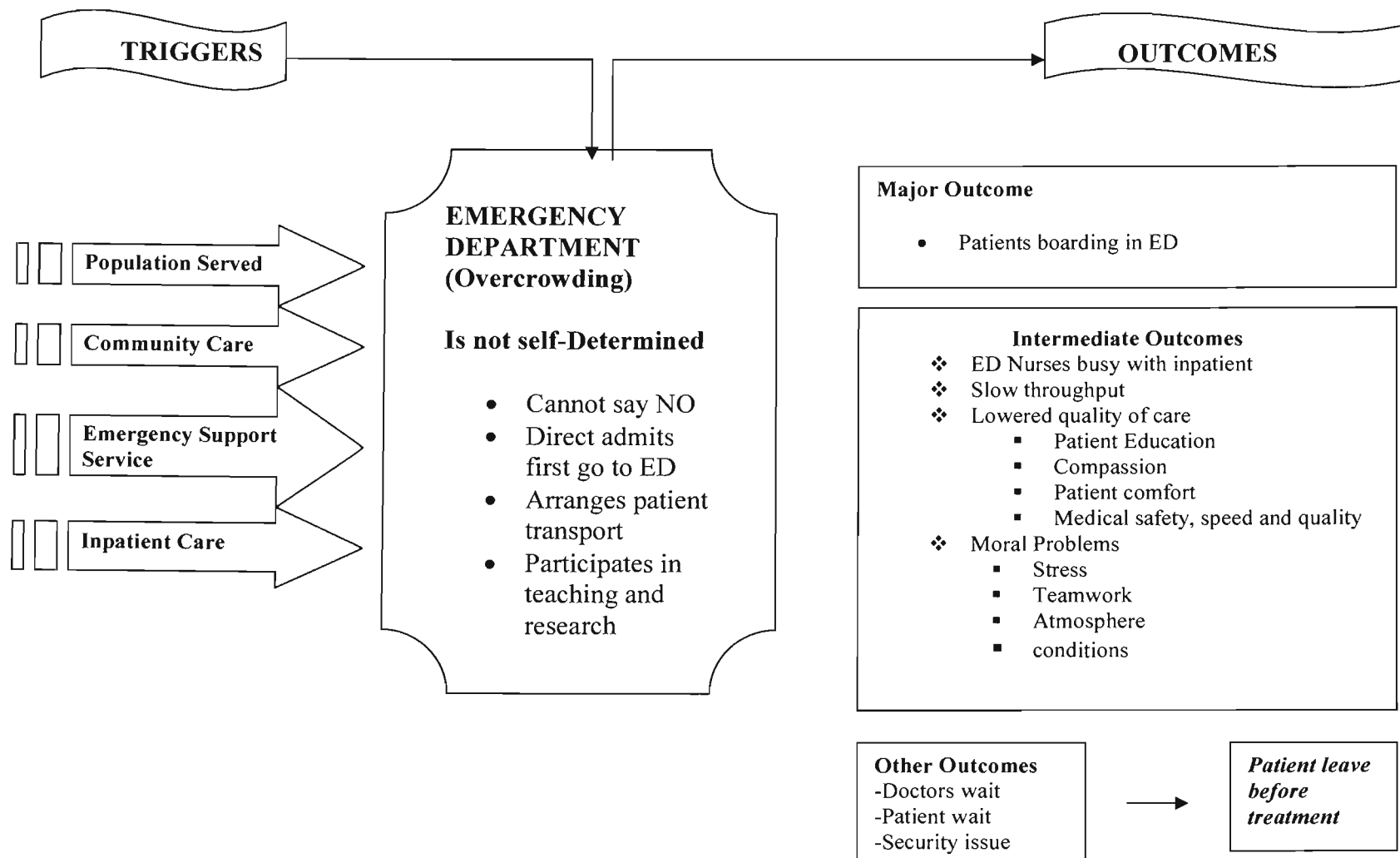
Nursing is a profession that practices advocacy of the patient and nurses have the ethical and moral obligation to protect patients and peer colleagues safety and wellbeing. Thus informing stakeholders in ED crowding, its causes and consequences is vital if policies and programs are to impact the real problem of health care systems.

Trout, Magnusson and Hedges (2000) also cited waiting time as the most important cause of dissatisfaction of patients attending emergency departments. In a survey by Cooke and Jenner cited in (Cooke et al., 2004) of patients attending emergency departments, a reduction in the waiting time was the most important area for quality patient care improvement.

In Rwanda, especially in CHUK, there is no research done on this topic to serve as reference and to inform decision making to the management of the hospital, so the findings obtained from this study may provide information that might be used for continuous quality improvement in the CHUK in general and in ED in particular. The findings may also set precedence for interested researchers to conduct further search in this domain. Findings from this study may also suggest recommendations that could help

to arrive at solutions to the problem of overcrowding and give direction to the hospital and ED managers as to how to address this problem.

1.7 Concept Framework



Conceptual Framework for interrelationships between emergency department (ED) overcrowding and its causes adapted from Estey, Ness, Saunders, Alibhai, and Bear (2003).

According to the framework designed by Estey et al., (2003), Emergency Department overcrowding is not determined by the department itself but is dependent on other factors over which it has no control. For example, external triggers such as the population served, community care, emergency support services, and inpatient care. According to these authors due to such triggers, the ED cannot say no to patients who come and admits every one. Over and above providing care ED has to arrange for patient transport, and also participate in teaching and research. These factors eat away the time that nurses would be dedicating to patient care and impact on the outcomes.

Triggers of ED overcrowding, as defined in this study are : Population served = ED use by low-acuity patients, high acuity patients, Patients with chronics diseases, demographic growth, socio-economic problem: shortage of community care (health centres and district hospitals), private clinics referrals to ED; limited access or slow turn-around for diagnostic images, laboratory, and wait for transportation; Emergency department: shortage of nurses, inexperienced staff, equipment shortages, facilities design; Inpatient care, more longer-stay patients, shortage of unit beds. Major outcomes include; Patients boarding in ED. Intermediate outcomes include; ED Nurses busy with inpatient, slow throughput, and Lowered quality of care, Patient Education, Compassion, Patient comfort, Medical safety, speed and quality, Moral Problems, Stress, Teamwork, Atmosphere, conditions. Other minor outcomes include making doctors and patients wait, security issues and patients leaving before they are treated.

1.8. Definition of Concepts

1.8.1 Emergency Department Overcrowding: Emergency department overcrowding has been defined as “a situation in which the demand for emergency services exceeds the ability of a (emergency) department to provide quality care within acceptable time frames (The Canadian Physician Hospital Care Committee Report, 2006). http://www.health.gov.on.ca/english/public/pub/ministry_reports/improving_access/improving_access.pdf.

1.8.2 Emergency Department (ED): Emergency department is department of a hospital responsible for the provision of medical and surgical care to patients arriving at the hospital in need of immediate care. Emergency department personnel may also respond to certain situations within the hospital such cardiac arrests (Emergency department definition, 2008). Retrieved from <http://www.medterms.com/script/main/art.asp?articlekey=12156>

1.8.3 Nurse: a nurse is a highly trained and skilled professional who cares for the sick and infirm. A nurse helps to educate patients in issues of healthy living and wellness as well as any current or chronic disease process and treatment. A nurse performs treatments and procedures as prescribed by physicians, physician assistants and nurse practitioners. Nurses combine the fine art of caring with scientific knowledge and skills acquired throughout their education and careers. Nurses work in many different settings and perform duties related to the setting in which they work. A nurse’s scope of practice is defined by the level of education and license earned (Quan, 2008).

Nurses in the context of this study are A1 (Registered nurses) and A2 (Enrolled nurses) working in CHUK Emergency Department.

1.8.4 A Phenomenon: A phenomenon is an occurrence or circumstance that is observed, something that impresses the observer as extraordinary, or a thing that appears to and is constructed by the mind Burns and Grove (2007, p. 167). In this study, Phenomenon refers to overcrowding in emergency department at CHUK.

Chapter 2

Literature Review

2.1 Introduction

Quantitative research is typically conducted within the context of previous knowledge. To contribute to the evidence base, quantitative researchers strive to understand what is already known about a research problem. A thorough literature review provides a foundation on which to base new evidence (Polit and Beck, 2008, p. 65).

This chapter aimed to cover the following themes:

- Conceptualisation of ED overcrowding
- Triggers of ED Overcrowding
- Outcomes of ED overcrowding
- Interventions to reduce or control ED overcrowding

2.2 Conceptualisation of Overcrowding in ED

Despite a significant body of research, there is no standard definition or measurement of ED crowding (Jones, Allen, Flottemesch and Welch, 2007). Similarly Weiss et al., (2004) reported that overcrowding discussions lack a standardised scale or definition, because no criterion standard defining “overcrowding” exists, no two hospitals are talking about the

same entity when they discuss overcrowding, a single universally acceptable definition of ED overcrowding does not exist. A survey done by Derlet, Richards and Kravitz as cited in (Schull and Cooke, 2008) of United States emergency department directors, multiple possible implicit definitions were suggested: a) patients waiting more than 60 minutes to see physician; b) all ED beds filled more than 6 hours a day; c) patients placed in corridors more than 6 hours a day; d) emergency physicians feel rushed more than 6 hours a day; and e) waiting room filled more than 6 hours a day.

According to Fatovich, Nagree and Sprivulis (2005) overcrowding refers to the situation where the ED function is impeded, primarily because the number of patients waiting to be seen, undergoing assessment and treatment, or waiting for departure, exceeds the physical or staffing capacity of the ED. Viccellio, Schneider and Asplin (2008) define crowding as a crisis that results from the practice of “boarding” or holding, emergency patients who have been admitted to the hospital in the emergency department.

The United State General Accounting Office (2003) observed that overcrowding occurs when patients outnumber the ED staff or in hospital treatment beds. The situation is typically manifested in excessive patient ED boarding, ambulance diversions, and lengthy patient waits for service. Crowding manifests itself in patients being monitored in non treatment areas (i.e. hallways), while awaiting access to inpatient beds or technology.

Overcrowding in the ED refers to a "situation where patients in the ED requiring inpatient care are unable to gain access to appropriate hospital beds within a reasonable

time frame" (Fatovich and Hirsch, 2003). Overcrowding is defined as a supply-side issue, suggesting that it is "a situation in which the identified need for emergency services outstrips available resources in the ED" (Asplin et al., 2003). Empirical literature shows that there are various conceptualisations of the term overcrowding. For example the American College of Emergency Physicians (ACEP), (2002) defined Emergency overcrowding as when there are more patients requiring acute care than there is available staff or treatment beds; when the waiting time exceeds a reasonable period; when patients are monitored in the hallways; and when patients are forced to wait for treatment space or inpatient beds. With similar perspective, Richards, Navarro and Derlet (2000) proposed that ED overcrowding definition includes the following: a) all available beds in the ED are full, b) patients are placed in ED hallways because there are no inpatient beds available, c) the ED is at some point closed due to saturation or a diversion to ambulance traffic, d) the waiting room is full, e) emergency physicians feel rushed and f) waits to see a physician are greater than one hour.

2.3 Triggers of ED Overcrowding

Overcrowding in hospital emergency departments has become a major focus for public concern (Estey et al., 2003). Understanding the factors leading to crowding is the first step to finding a solution (Birkhahn, Patel, Jensen, Datillo and Bove, 2007). However no single factor stands out as the reason why crowding occurs rather, a number of factors are associated with crowding including many outside the emergency department (United States General Accounting Office, 2003). Similarly Estey et al., (2003) asserted that the

phenomena of ED overcrowding cannot be attributed to any single factor but instead appears to be a product of complex causal relations, encompassing several internal and external factors, most of which are beyond the control of ED staff. Possible causes include use of the ED for non-emergent cases, an aging population, increasing patient acuity, labour shortages, lack of community-based alternatives to the ED, delays while waiting for laboratory testing to be completed, lack of public education regarding appropriate ED use and the range of services available in general practitioners offices, lack of long term care and other alternative settings, and lack of availability of ED or inpatient beds or both (Richards et al., 2000). Insufficient number of in-patient beds, increased complexity and acuity of patient systems, the occupancy of stretchers and length of stay of admitted patients in EDs were also cited as mains causes of overcrowding (Rowe et al., 2008).

According to Chung (2005) underlying causes of ED overcrowding include both external and internal factors. This author documented that the most cited causes of overcrowding were increasing patient acuity, aging population, high patient volume, hospital bed shortage and workforce shortage. Internal factors such as poor operations and hospital processes like consultant delays, laboratory delays, inadequate examination spaces, and avoiding hospitalisation, through extensive therapy in the ED, may be partially responsible. Less amenable external factors include government regulations, access barrier to primary care, increased number of indigent or uninsured patients using ED as their primary source of care, poor coordination between home care services and primary

care physicians, increasing prevalence of Acquired Immunodeficiency Syndrome (AIDS), substance abuse and psychiatric disease.

Weinick, Billings and Burstin (2007) identified that existing literature has placed a great deal of emphasis on the role of primary care in the overcrowding of Emergency Departments. Specifically, inaccessibility to a primary care provider has led many to seek non-urgent care in the ED where care is perceived as fast, efficient, superior to that of a primary care physician, and most importantly free. Similarly, Weinick, Billings and Burstin (2002) study documented that some of the reasons for using the ED for less urgent conditions are both financial and access to care. These authors maintain that the ED has been founded to provide more accessible services to those individuals who are uninsured than primary health care providers. On the other hand Cherry et al., (2001) revealed that one potential reason that patients increasingly seek care at the ED is that they have problems finding or scheduling a timely appointment with primary care physicians. This provision of ED services to less urgent conditions that could have been handled at primary health care level contributes to ED overcrowding (Weinick et al., 2002) The Report of Canadian physician hospital care committee (2006) also reported that the main cause of overcrowding was a lack of integration between community and hospital healthcare resources.

According to the Canadian Association of Emergency Physicians (2007) the primary cause of ED overcrowding is one of lack of hospital capacity, including a shortage of acute care beds, limited access to diagnostics staffing shortages, limited community care

resources, access to specialist services and a lack of integration of community and hospital-based resources. The Maryland Health Care Commission and Health Services Cost Review Commission (2003) reported the demand for ED services as a major elements contributing to ED overcrowding. This commission revealed that the composition of ED users has changed over time, with patients presenting increasingly complex conditions requiring an overall greater use of resources. Derlet and Richards (2000) revealed that further issues caused by the lack of capacity within the system is that, in many hospitals, the only way patients can gain urgent admission for investigation or treatment is to be declared an “Emergency” and to be admitted through the ED.

Cooke et al., (2004) study revealed that delays in laboratory and X-ray often results in a delay of treatment and admission. In teaching hospitals, ED throughput can be slowed down by the need to train students in emergency medicine (Derlet and Richards, 2000). In addition, it has been shown that students often generate inefficiencies by ordering more tests and processing patients slower than experienced physicians (Delia, 2007). This may be especially problematic in the ED where the urgency of many conditions and the need to streamline patient flow requires rapid decision making.

Shortage of qualified ED staff was cited as a cause of overcrowding by Knapp et al., (2004) these authors suggest that experienced ED nurses are truly the backbone of emergency care. Global shortages in key medical subspecialties and surgical specialties and variations in geographic availability are both long-standing contributors to ED overcrowding, particularly for rural hospitals (Knapp et al., 2004)

According to Lambe et al., (2003) lower ratios of physicians and nurses to patients are associated with longer waits and ED overcrowding. Emergency physician staffing ratios vary substantially among hospitals (from 1.8 – 5.0 patients per physician hour) in small hospitals, the emergency physician may be the only physician on duty, whereas in larger hospitals, another physician is available to respond to inpatient needs (Zun, 2001).

Overcrowding and resource scarcity often lead to excessive patient boarding in the ED, as many EDs must board patients when inpatient beds are unavailable. Many factors contribute to inpatient boarding in the ED, including lack of physical ED and inpatient beds, which are often exacerbated by inadequate or inflexible nurse-to patient staffing ratios; a severe shortage of on-call emergency physicians to handle specialised patient care; delays in cleaning rooms after patient discharge; inefficient diagnostic and ancillary services on inpatient units; and inadequate community resources to effectively handle discharged patients (Rondeau and Francescutti, 2005)

According to Derlet and Richards (2008) many countries health departments do not have adequate ambulatory clinic facilities for their uninsured patients. It is common knowledge that these patients will receive care in the local ED. Many uninsured and/or indigent patients do not even bother using these clinics, but instead use the ED for primary care; providing them with alternatives for primary care which increases ED overcrowding.

2.4 Outcomes of ED Overcrowding

The effects of overcrowding have been previously reported, and include ambulance diversion, impaired access to emergency care, compromised clinical care, prolonged pain and suffering, and prolonged inpatient length of stay, and have been linked to fatalities (Fatovich et al., 2005).

ED overcrowding is undesirable and risky. Adverse effects include long waits, prolonged pain and suffering, patient dissatisfaction, additional procedures, increased length of hospitalisation, increased revisit, increased permanent disability, increased mortality rates, ambulance diversion, decreased physician productivity, increased staff frustration and increased violence (Chung, 2005).

Most importantly, patient care is worsened by boarding and evidence-based research demonstrates that boarding results in the following: 1) Delays in care, 2) Ambulance diversion, 3) increased hospital lengths of stay, 4) Medical errors, 5) increased patient mortality, 6) financial losses to hospital and physician, 7) medical negligence claims (Viccellio et al., 2008). When emergency patients are boarded, they lie on gurneys or sit in chairs in the emergency department, often filling every available space, including the hallways. This has a significant negative effect on patient safety, comfort and satisfaction. It also ties up resources, rendering emergency staff unable to care for additional patients from the waiting room or from an ambulance.

Cowan and Trzeciak (2005) reported that boarding in the ED is not only a barrier to specialised inpatient care, but it also has been identified as a potential high-risk environment for medical errors. Critically ill patients boarding in the ED are physically

separated from the watchful eye of the intensivists who are ultimately responsible for their care. All of these factors could potentially lead to delays in recognizing deterioration in a patient's condition and in initiating critical interventions, and may detract from optimal patient care.

Limited hospital bed capacity results in the boarding of admitted patients in the ED. Patients are placed in hallways, storage rooms, and annexes. In some of these ED hallways, patients are sicker than admitted patients already occupying inpatient beds. Boarding of patients in the ED results in significant ED congestion and is associated with poor outcomes (Fatovich et al., 2005).

Wealth of research demonstrates the severe consequences of emergency department overcrowding on patients and physicians (Viccellio et al., 2008). Among the findings are: sick people wait too long to receive emergency care. The Centers for Disease Control and Prevention founded that for patients judged by the triage nurse to be critical; more than 10% waited more than an hour to see a physician in the emergency department. This is a critical problem, because many illnesses are time dependent, and early intervention gives rise to better outcomes. Late diagnoses may be too late, with permanent consequences of disability or death (Pines, Hollander and Localio, 2006). A study by Pines and Hollander (2007) examined the complication rate of patients with acute coronary syndrome and found a significant increase in serious complications (approximately 6% versus 3% incidence of death, cardiac arrest, heart failure, bradycardia, stroke, or hypotension) in patients seeking emergency care during times of crowding.

Liew and Kennedy (2003) documented that boarding increases the total length of stay in the hospital, further worsening access to emergency care. Several studies document a total hospital length of stay to be a full day longer among patients boarded in the emergency department versus patients with similar illnesses promptly placed in the inpatient units. Furthermore Weiss, Ernst and Nick (2005) documented that boarding increases walkout. These authors indicate that the longer people wait, the greater the likelihood they will leave prior to receiving care.

Inadequate inpatient capacity for a patient population with increasing severity of illness forces the ED to serve as a holding area for admitted patients. The term 'boarding' refers to patients who are admitted to the hospital but who remain in the ED, sometimes for more than 24 hours, because of the lack of available beds (Cowan and Trzeciak, 2005)

A number of articles document the increase in medical errors associated with boarding and crowding (Weissman et al., 2007) and many of these are errors of omission and not commission, since the emergency staff must simultaneously care for inpatients and focus on the new emergencies coming in the door (Cowan and Trzeciak.,2005).

According to Sprivulis, Da Silva, Jacobs, Frazer, and Jelinek (2006) the emergency medicine community has long been aware of the dangers of crowding and delays in care. Several recent studies, looking at large databases that compare mortality rates in patients seeking emergency care during times of crowding versus times of no crowding, conclude that the rate of death is higher during times of crowding. Chalfin, Trzeciak, Likourezos

and (2007) looked at outcomes for intensive care unit (ICU) patients subjected to a delay of >6 hours in transfer to an ICU, and found increased hospital length of stay (7 versus 6 days) and higher mortality rates (10.7% versus 8.4%) for these patients.

Crowding increases medical negligence claims, which increases health care costs for everyone. The frequency of medical liability law suits filed against emergency physicians is increased, simply based on whether the patient waited more than, rather than less than, 30 minutes to be seen by the physician (Viccellio et al., 2008)

Ambulance diversion is also one of significant outcome of ED overcrowding in hospital, it is as a response to capacity constraints (Schull et al., 2003). Such crowding and diversion have raised an alarm regarding the ability of the health care system to respond to catastrophe.

The study by Estey et al., (2003) revealed that nurses were performing no nursing related activities because of the ED workload. The author asserted that nurses were asked to work a lot of overtime. In addition to their regular duties, nurses often perform tasks such as taking blood, cleaning, portering and arranging transport. The burden of caring for admitted patients as well as emergency patients, and the requirement to juggle the requests of physicians. Caring for these distinct patient groups was said to present a difficult challenge. The pressure on nurses was increased by their feeling of discomfort in providing care to admitted patients under ED conditions.

According to Knapp et al., (2004) ED overcrowding produces a series of negative effects: first and foremost is that overcrowding places both patients and health care professionals, at risk. Excessive clinical demands in an already saturated ED often lead to medical errors and poor outcomes. Gordon, cited in Knapp et al., (2004) documented that overcrowding increased utilisation of hallways and other suboptimal, poorly equipped locations as patient treatment areas, challenging patient comfort, care satisfaction, and confidentiality and adding additional risk for error.

The United States General Accounting Office (2003) noted that the only way busy clinicians, faced with too many patients to care for, is to spend less time with each patient. The fine line between a highly efficient assessment and an incomplete assessment is easily crossed, generally at the expense of the patient. Knapp et al., (2004) documented that high-stress practice environment of a crowded ED is one that also contributes mightily to staff burnout, higher turnover rates, and worsening deficiencies in clinical staffing. Overcrowding contribute to patient dissatisfaction, especially for those patients with acute injuries and other painful conditions.

ED overcrowding has been reported to compromise patient safety, and the critically ill are an especially vulnerable population and are at-risk for serious adverse events. Although the impact of ED overcrowding on patient outcome has not yet been investigated in rigorous prospective observational studies, survey studies in the literature have linked ED overcrowding to clinically significant delays in diagnosis and treatment, as well as to poor patient outcomes (Derlet and Richards, 2002). One report by Derlet and

Richards (2002) linked ED overcrowding to delays in identification and treatment of time-sensitive conditions, such as acute coronary syndrome, stroke, surgical emergencies, and septic shock. ED overcrowding has also been shown to cause ambulance diversion and significant delays in ambulance transport for patients with acute cardiac emergencies, regardless of the severity of illness (Schull et al., 2003).

Overcrowding was also associated with medication delays (Schull, Morrison, Vermeulen and Redelmeier (2003). In addition to delays in therapy, ED overcrowding may also have an impact on the speed at which critical illness is recognised, through ambulance diversion, triage delays, and delays in bringing patients into treatment rooms. ED overcrowding also results in extraordinarily long waiting times, causing some patients to leave the ED without being seen by a physician. Patients in the early hours of disease presentation that are initially well appearing and triaged as “no emergent” have the potential to leave the hospital without treatment and could become severely ill outside the hospital. Stirling, Higgins and Cooke (2001) study identified an association between increased violence against staff and longer waiting times because few patients tend to become more agitated and violent in crowded conditions. Instances of violence have occurred in various ED waiting rooms over who is to be seen first, creating a hostile atmosphere. Bodily harm has occurred to both nursing staff and emergency physicians. Gillespie and Melby (2003) documented that physical and verbal aggression among patients was more prevalent when emergency department waiting times were increased. Overcrowding in the Emergency Department is a major contributing factor in the development of work-related stress, it is a grave problem because it can often cause life-

threatening situations; thereby, adding more stress to an already stressful environment (Velianoff, 2002).

Overcrowding in the emergency department often results in long waiting times for patients and an increased risk of adverse and poor patient outcomes (Derlet and Richards, 2002). Overcrowding often results in a delay in the provision of care, pressure to move patients quickly through the system, and providing care in less desirable places such as hallways and waiting areas (Bradley, 2005). This often leads to feelings of anxiety and stress among emergency department nurses because these conditions prevent the nurses from providing adequate patient care. A study done by Rowe et al., (2008) reported that overcrowding has a major impact on the stress levels of nurses, along with their recruitment.

Comparing the level of stress among physicians and nurses this study revealed that stress caused by overcrowding is lower among physicians (65%) than nurses (82%). Similarly Ryan and Maguire (2006) asserted that ED staff (medical, nursing and ancillary) morale is affected by a persisting inability to carry out an ED primary function adequately. This is increasingly manifested in decisions being taken by staff members, particularly nursing staff, to either change their contracts of employment to go part-time or to leave emergency nursing completely.

It has been shown internationally that where a patient is detained in ED, beyond the time where the decision is taken to admit, clinical outcomes are adversely affected

(Richardson, 2006) and this relates to the reality that EDs cannot adequately fulfil both their primary function and also functions as an inpatient ward. As a result, both functions are performed sub-optimally with consequent predictable adverse effects on patient outcome.

Ryan and Maguire (2006) documented that the persistent overcrowding in EDs results in patients having confidential histories taken within a common place with other patients or visitors. Often medical staff has no choice but to examine patients in corridors and discuss diagnoses in the presence of other patients or visitors. This practice is totally unacceptable and is an affront to patient dignity. This association suggests that, in the absence of a major incident or some other totally unexpected event, it is unacceptable for any patient to remain on a trolley in ED beyond the time of the decision to admit, unless it is in the patient's clinical interest not to be transferred to an inpatient bed. Remaining overnight awaiting hospital admission is unacceptable and inexcusable.

Derlet and Richards (2000) documented decision errors resulting from miss communication during periods of overwhelming patient volume. With increasing numbers of patients, errors such as mislabeled specimens or drug dosing occur. This author asserted that patients with subtle presentations of serious diseases such as rupturing aortic aneurysms, ectopic pregnancy, or stroke may miss the "golden hour" of effective treatment. Additionally, patients with serious infections such as sepsis, pneumonia or meningitis may experience delays which result in bad outcome.

2.5 Solutions to ED Overcrowding

There is not one universal solution to resolve ED overcrowding, resolutions will vary from institution to institution (Howard, 2005). However, in this section we highlight some suggestions to alleviate emergency department crowding.

According to Derlet and Richards (2008) the Ontario expert working group suggested a variety of tools and recommendations to aid health care stakeholders and government. This Expert working group provided a set of suggested toolkit interventions to assist healthcare providers in alleviating emergency department overcrowding (Derlet and Richards, 2008). As each healthcare setting is unique, there can not be a “one size fits all” solution, therefore, these interventions are being provided as part of a toolkit that organisations may choose from after doing their own root cause analysis of emergency department overcrowding: 1) Reducing time to ED decisions: improved access to diagnostic services, results and reports; improved physical design elements; use of medical directives; improved time to specialist consultation; “See and treat” protocols. 2) Improving bed availability: integrated discharge planning; bed management coordinators or teams; improved admission processes and procedures; improved capacity planning; hospital policies for bed availability priorities and bed use; emergency department clinical decision units. 3) Improving integration: advanced home care teams; enhanced ability to assess and manage patients in long-term care home settings; provide alternatives for primary care of the uninsured patient.

A study by Brewster, Rudell and Lesser (2001) reported that higher nurse staffing ratios were effective in reducing ED overcrowding. Spetz, Seago, Coffman, Rosenoff, and O'Neil (2000) proposed one nurse to four general ED patients, one nurse to two critical care ED patients, and one nurse to one ED trauma patient.

According to Derlet and Richards (2008) a patient's visit to the ED is often at the end of a cascade of adverse health events, many of which are preventable. Regular visits to primary care could mitigate the number of patients presenting to the ED for uncontrolled diabetes, hypertension, obesity and hyperlipidemia. ED physicians regularly treat patients with sexually transmitted diseases, prenatal, and perinatal problems, which could be more easily addressed at ambulatory clinics. Coronary artery, neurovascular disease and smoking are related to lifestyle, as well as genetics, and national education campaigns have been helpful to educate the public. The incidence of cancer is increasing and often a new diagnosis of cancer is made by the ED physician in their evaluation of patients with common complaints. Routine screening for colorectal, breast, cervical and ovarian cancer, among others, should be expanded at community level for early diagnose and prevention of many diseases so as to alleviate ED burden.

One example of positive change has been safety improvements in automobiles such as seatbelts, airbags, dashboards, and frame design. These changes have prevented death and disability for patients involved in motor vehicle collisions. The role of alcohol in vehicular trauma is well recognised, and recent interventions to reduce impaired driving have had limited success. Trauma patients with serious injuries have the potential to

consume enormous ED resources, intubation, chest tubes, fracture management, and wound care performed in the ED often takes hours to complete (Derlet and Richards, 2008).

Coleman, Irons and Nicholl (2001) suggest that by strengthening ties to the community, a hospital may encourage patients with less urgent health needs to seek more appropriate care settings than the ED. For example, patient education provided by primary care doctors and pharmacists were found to effectively reduce non urgent ED visits among Medicaid children and chronically-ill patients, Some hospitals have adopted programs that educate physicians, and nursing homes about ED alternatives, and encourage these providers to educate their patients.

Access to beds in a timely manner is a key to avoiding waits in the emergency department (Richardson, 2001). In the absence of a major incident or some other totally unexpected event it is unacceptable for any patient to remain on a trolley in an ED beyond the time of the decision to admit, unless it is in that patients' clinical interest not to be transferred to an inpatient bed. Remaining overnight awaiting hospital admission is unacceptable and inexcusable (Ryan and Maguire, 2006). Continuous Quality Improvement offers a framework for repeated evaluation and process redesign to improve patient care and outcomes within the ED on a continuous basis. Adoption of Continuous Quality Improvement techniques has been found to decrease unnecessary waiting times,

improve patient satisfaction, increase ED throughput, and improve net revenue for the department (Lavelly, 2002).

According to Schneider, Zwemer, Doniger, Dick, Czapranski, and Davis (2001) better management of inpatient resources has been shown to be among the most effective ways in which a hospital can reduce ED overcrowding. This author asserted that the most effective techniques to reduce overcrowding were related to organisational or process changes made external to the ED rather than within the ED. The management of inpatient flow is paramount to avoiding ED flow breakdown. Examples of some of the organisational or process changes that have been shown to be effective are: ongoing evaluations of length of stay; accelerating the discharge process by discharging earlier in the day or moving patients to extended care facilities; restriction of in-house transfers; the introduction of protocols to reduce inappropriate admissions (Kossofsky, Chopard, Filippo and Bolla, 2002).

The introduction of social workers into emergency departments facilitate safe discharge home either directly from the emergency department or following admission. The use of social workers in the emergency department is seen as positive by patients and staff (Bywaters, McLeod and Cooke, 2003).

One temporizing measure to help alleviate the gridlock of patients awaiting admission in the ED is to provide an alternative place for them to go. ED short stay observation units have been shown to relieve ED overcrowding by giving the ED a way to control patient outflow to some extent (Trzeciak and Rivers, 2003). This is advantageous because

solutions for patient outflow from the ED are expected to have the biggest impact on overcrowding (Gordon et al., cited in Trzeciak and Rivers, 2003). An ED managed observation unit has been shown to markedly decrease waiting times and cut the mean monthly hours of ambulance diversion by 40% (Kelen, Scheulen, Hill cited in Trzeciak and Rivers, 2003) Observation units are essential in order to help EDs make room for incoming patients. Similarly Cooke, Higgins and Kidd (2003) documented that, an observation unit has been shown to reduce the workload in the emergency department, thus giving staff better flexibility and improving the flow of patients

For some hospitals the alleviation of overcrowding may involve additional capacity, such as physical space. However, there is a well-developed school of thought, which argues that these extensive and generally costly approaches should not be tried until a hospital has fully evaluated and optimised the flow of patients through the ED and related units. This school emphasises that adding new capacity to an inefficient system may just create larger facilities that remain overcrowded (Greene, 2007). Canadian Association of Emergency Physician (2008) suggests using discharge lounges for patients awaiting discharge. Consider moving the entire inpatient discharge process to a discharge area, so that beds can be made available for patients needing admission. Taylor (2006) study suggested targeting efforts toward injury prevention and data collection on such injuries.

Schafermeyer and Asplin (2003) emphasised that boarding of inpatients in the ED is inappropriate and results in increased risks for patients and providers. These authors encourage avoiding boarding or ambulance diversion as 'solutions' for inadequate

hospital capacity. They suggest that hospitals must move to end such practices through the development of reserve capacity, better use of their critical care beds, discharge holding units, and other best practices. Standards should be developed to ensure compliance.

2.6 Conclusion

Literature review was organised according to the concept framework and objectives of the study. A wide range of articles related to ED's overcrowding was reviewed; unfortunately most of them were conducted in developed countries especially in Canada and United states. Only few studies were conducted in developing countries (Asian countries), no one was found from an African country.

Chapter 3

Methodology

3.1 Research and Paradigm Approach

A positivist paradigm and a quantitative approach were adopted in this proposed study. A positivist paradigm is a traditional paradigm underling the scientific approach, which assumes that there is a fixed, orderly reality that can be objectively studied; often associated with quantitative research (Polit and Beck, 2004, p. 728). A quantitative approach was used in this study. Quantitative research is conducted to describe new situations, events or concepts in the world (Burns and Grove, 1999, p. 23).

3.2 Research Design

The research design is the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process (Polit and Beck, 2008, p. 66). An exploratory descriptive design was used in this study. Like descriptive research, exploratory research begins with a phenomenon of interest; but rather than simply observing and describing it, exploratory research investigates the full nature of the phenomenon, the manner in which it is manifested, and the other factors to which it is related (Polit and Beck, 2008, p. 20). This approach is relevant in this study

because overcrowding in ED has never been explored in Rwanda. This study is therefore a grounded breaking study.

3.3 Study setting

The Rwanda's health system has a pyramidal structure, consisting of three levels; central, intermediary and peripheral. The central level includes the central directorates and programmes of the Ministry of Health and the national referral hospitals. The central level elaborates policies and strategies, ensures monitoring and evaluation, and regulations in the health system, and provides them with administrative, technical and logistical support. The central level has three national referral hospitals including Butare and Kigali Hospital (CHK), which together make up the University Hospital CHU and Ndera mental health hospital. The King Fayçal hospital was created to provide a higher level of technical expertise than that available in the national referral hospitals to both the private and public sector; its role is also to ensure that there is a reduction in the number of transfers abroad (Rwanda's Health Sector Policy, 2005). This Study was conducted in ED at CHUK which is one of the three national referral hospitals. Situated in the centre of the city Kigali, CHUK has a capacity of 515 inpatients beds. It delivers a broad range of health services to almost the whole population of Rwanda and the neighbouring countries such as Burundi and the Democratic Republic of Congo. CHUK Emergency Department, like other departments, offers 24 hours health services, handling medical patients, surgical and trauma patients except Paediatric, obstetric and gynaecological cases that are handled within their appropriate unit. This department is demarcated into

fives areas, the first area for reception and registration of patients, the second area for patients assessment with 5 beds, the third area is emergency and trauma cases, fourth room for resuscitation, and fifth area is high care unity with 7 beds. After major care patients are transferred to inpatient wards (medical, surgical, intensive care unity, theatre, specialities and high care or discharged to home)

According to Carbona, Hurn, Mason, Scanlon, and Veise-Berry (1998, p. 8) three distinct levels of trauma care services were identified, with functional responsibilities, capabilities, and comparable nomenclature outlined for the three levels. These were intended to serve as a guide for assessing an institution's potential for trauma centre designation. A level I trauma care facility is likely to be a teaching hospital of over 500 beds and is usually located in a large metropolitan area. This institution must make a firm but costly commitment in personnel and equipment. Highly sophisticated equipment that is expensive to purchase and to maintain, the availability of skilled and experienced clinicians, and the need for the continuous educational preparation of all professional health care providers. Extensive clinical experience enhances the management of multiple, complicated injuries. The 24-hours availability of staff specialists and skilled clinicians is essential to a level I trauma care facility.

A level II trauma care facility is most likely a tertiary institution that can handle a substantial volume of seriously injured trauma patients in geographical areas that lacks a teaching hospital necessary for level I trauma centre designation. The most significant

difference between a level I and level II institutions are the formal trauma training programs and the research focus (Carbona et al., 1998, p. 8).

A level III facility is most often a community hospital located in an area that lacks level I or level II hospital facilities. It must make a strong commitment to the optimal care of the trauma patient, and clear and concise transfer protocols are essential (Carbona et al., 1998, p. 8).

Based on the above description of trauma centre levels, ED/CHUK may be described as a level I trauma centre because it is a teaching hospital, with a capacity of 500 beds, specialised and experienced physicians, with high technical equipments and committed to continuous education of health professional staff.

3.4. Study Population

Study population is the entire group of persons or objects that is of interest to the researcher (Brink, 2006, p. 123). The research population for this study includes 40 nurses, all working in the Emergency Department (A2 = Enrolled nurses and A1 = registered nurses with Advanced Diploma).

3.5 Sample and Sampling

Sampling is the process of selecting a portion of the population to represent the entire population so that inferences about the population can be made (Polit and Beck, 2008, p.

339). Non-probability sampling requires the researcher to judge and select those subjects who know the most about the phenomenon, and who are able to articulate and explain nuances to him/her (Polit and Beck, 2008, p. 343). A non-probability Convenience sampling technique was used to include all of the 40 nurses working in the ED at CHUK due to limited number of nurses in this particular setting.

3.6 Sample Size

Forty nurses all working in the ED were involved in this study and all were given a questionnaire, but only 38 completed and returned them.

3.7 Instrument description

Fifty one self-administered questionnaires were distributed to 40 ED nurses, these comprised three questions related to demographic data and 48 questions related to overcrowding. In these 48 questions, 4 questions were designed to describe the characteristics of overcrowding in ED/CHUK, 26 questions were designed to explore causes of ED overcrowding, and 18 questions explored outcomes of ED/CHUK overcrowding. Each section ended with an open ended question so as to allow some comments and suggestions for improvement. (Appendices A and B)

3.8 Data Collection Procedure

Permission for collecting data was requested and obtained from the Director of CHUK and the CHUK research committee. After obtaining permission an appointment was made

to meet the ED nurse in charge and the ED nursing staff. An opportunity was given to the researcher to explain the purpose of the study and its relevance. Participants were informed that participation was voluntary and that they were free to withdraw at any stage of the study. Participants were requested to sign consent form. English and French copies were available to facilitate comprehension (Appendices A and B).

Thereafter, the instrument was explained and distributed to participants for completion. The completed questionnaires were dropped in a box and were collected by the researcher.

3.9 Reliability and Validity

3.9.1 Reliability

Reliability refers to the degree to which the instrument can be depended upon to yield consistent results if used repeatedly on the same person or used by two researchers (Brink, 2006, p. 163). Cronbach Alpha test was performed to establish the reliability of the instrument. The instrument had 51 items including demographic data and the Cronbach alpha was .837 which means the instruments is reliable, because the reliability should be greater than .80 (Polit and Beck, 2008, p. 454). The variables of interest in this study were overcrowding, triggers and outcomes. The four variables were measured by 48 items. The Cronbach alpha for these items covering these 3 variables was found to be .840, making the instrument reliable.

3.9.2 Test-retest reliability

Test-retest reliability was conducted. The instrument was administered twice to 10 ED nurses from one of the government hospitals in Kigali. The reliability was completed and found to be .865

Overcrowding had 4 items, their Cronbach alpha was found to be .281 which is far below .80. The low reliability is the low number of overcrowding making up overcrowding. Reliability of items making the triggers variables was .726 and those were 26 items. Of the 18 items making up the outcome variable, the reliability was .908 which means it was reliable because it was above .80

3.9.3 Validity

Validity of an instrument is a determination of how well the instrument reflects the abstract concept being examined (Burns and Grove, 2007 p. 365).

Content validity was ensured by aligning corresponding elements of the instrument with the research objectives and research questions. Secondly, the instrument was subjected to scrutiny of experts in research and health services administration for content validity.

3.9.4 Table highlighting content validity.

.Research objectives	Research questions	Questions	Conceptual Framework
		The first three questions are related to demographic data	
1. To describe overcrowding in CHUK/ED as perceived by nurses.	1.1 What are the characteristics of an overcrowded ED?	Section 1 include question 1 to 4	Characteristics or ED overcrowding definition
2. To explore the causes of overcrowding in ED at CHUK.	2.1 What are the triggers of overcrowding in CHUK/ED	Section 2 include questions 5 to 30	Triggers of ED overcrowding
3. To describe the outcomes of overcrowding in ED/CHUK	3.1 What are the major, immediate and others consequences of overcrowding in ED/CHUK?	Section 3 include question 31 to 48	Outcomes of ED overcrowding
4. To explore interventions to reduce or control overcrowding at ED/CHUK	4.1 What interventions have been implemented to address overcrowding in CHUK/ED? 4.2 What are other interventions may be possible solutions to overcrowding in CHUK/ ED?	Open indeed question About the undertaken interventions and those proposed for improving ED overcrowding.	

3.10 Data Analysis

The SPSS package, Version 15.0 was used to organise and analyse data. Descriptive statistical analysis, as well as multivariate statistical analysis was performed during the

process of analysing data. Pearson correlations were used to calculate and determine the relationships among overcrowding, triggers and outcomes variables.

3.11 Ethical Consideration

The research proposal was presented to the UKZN School of Nursing Research committee for approval before submission to the UKZN Ethics Committee. UKZN ethical clearance was obtained (Appendix I).

A letter for a permission to conduct a study was submitted to the CHUK hospital authority (Appendix H) Informed consent was obtained from nurses after explaining the purpose of the study, the rights of participants and the benefits of participating in this study. The participants were informed that the results of the study will be made available to them and may be presented to them on request. When collecting data the right to anonymity was ensured, by using named code. The subject was informed about the right of withdraw if they want to. They were informed that they were not forced to participate. The questionnaire was translated to French as nurses in ED were more familiar with French than English (Appendices B). Translation was done by two translators so as to protect the integrity of the instrument.

3.12 Data Management, Storage and Disposal

Data was collected by the researcher herself to ensure confidentiality. The researcher kept completed questionnaires under lock and key and they were handled by the researcher only. Electronic data was saved on a computer and the researcher used a special password to gain access to this computer. All data collected will be stored safely up to a period of five years and be disposed of in fire.

Chapter 4

Presentation of the Results

4.1 Introduction

This chapter presents the results of the study, starting with demographic data, followed by data obtained from CHUK/ED nurses who were asked to reflect on ED overcrowding characteristics, causes, consequences of CHUK/ED overcrowding and they were asked to suggest interventions to alleviate crowding. Findings from quantitative data are presented using frequency distributions, percentages and graph, and data regarding proposed interventions obtained through open ended questions are presented as narrative data.

4.2 Population and sample description

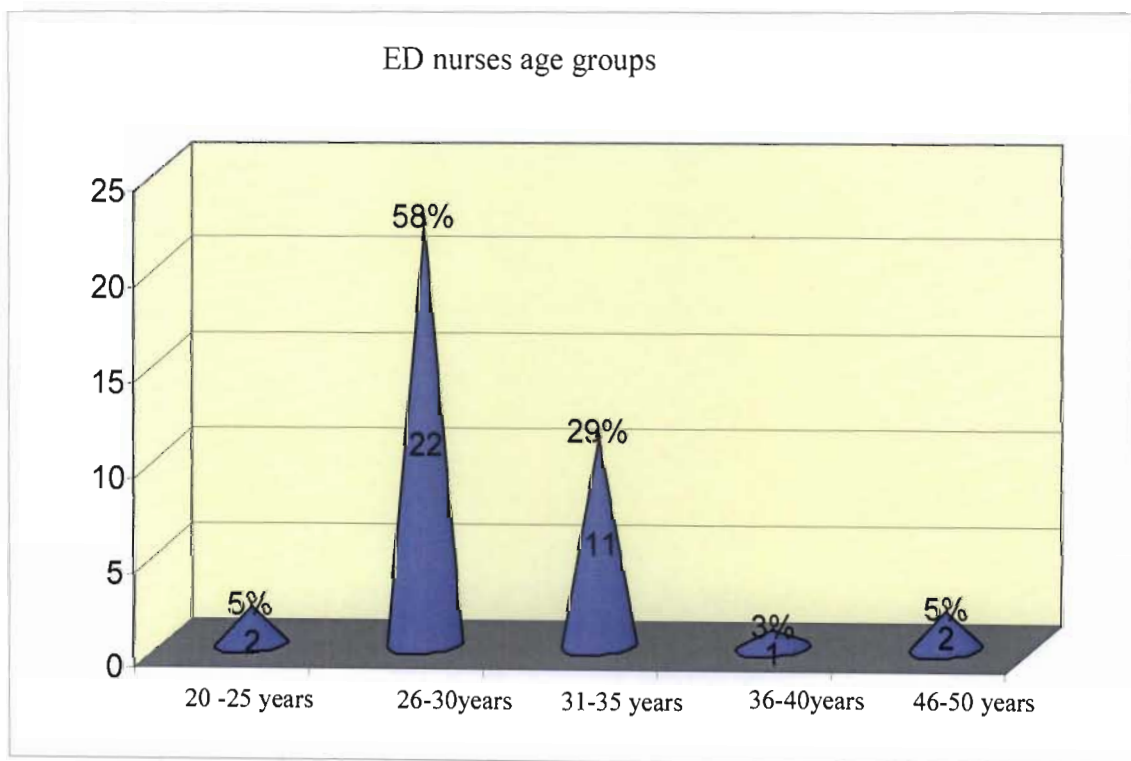
The number of ED nurses who participated in this study was 40. All of which were requested to participate in this study and they volunteered, without coercion, to be part of the study. They were all given questionnaires, however only 38 (95%) returned completed questionnaires. The returned questionnaires were not spoiled.

4.3 Characteristics of the Study Respondents

4.3.1 Age of Nurses

The results of this study show that the youngest group of nurses in ED, 5% (n=2) who participated in this study were aged between 20 and 25 years. The second group 58%

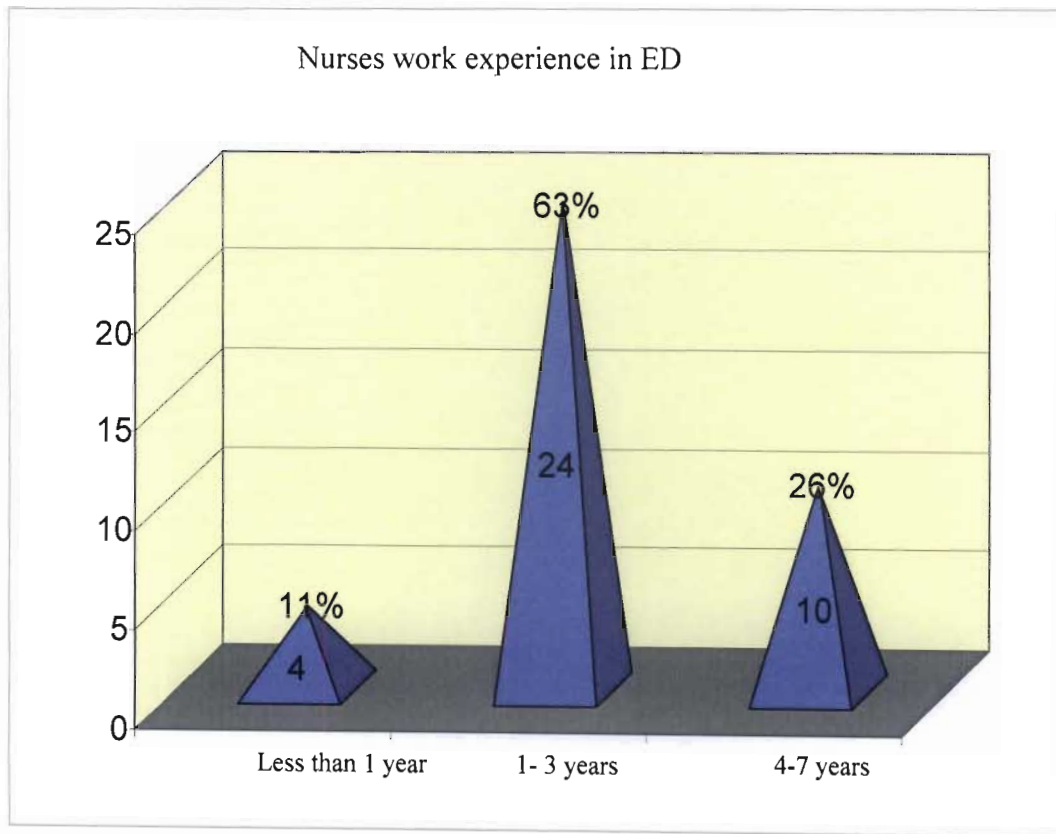
(n=22) ranged between 26 and 30 years; the third group, 29% (n=11) were aged between 31 and 35 years; one nurse, 3%, was between 36 and 40 years, and the oldest in this group, 5% (n=2) were aged between 46 and 50 years.



Graph 4.3.1: Age of nurses

4.3.2 Nurse's Work Experience in the ED

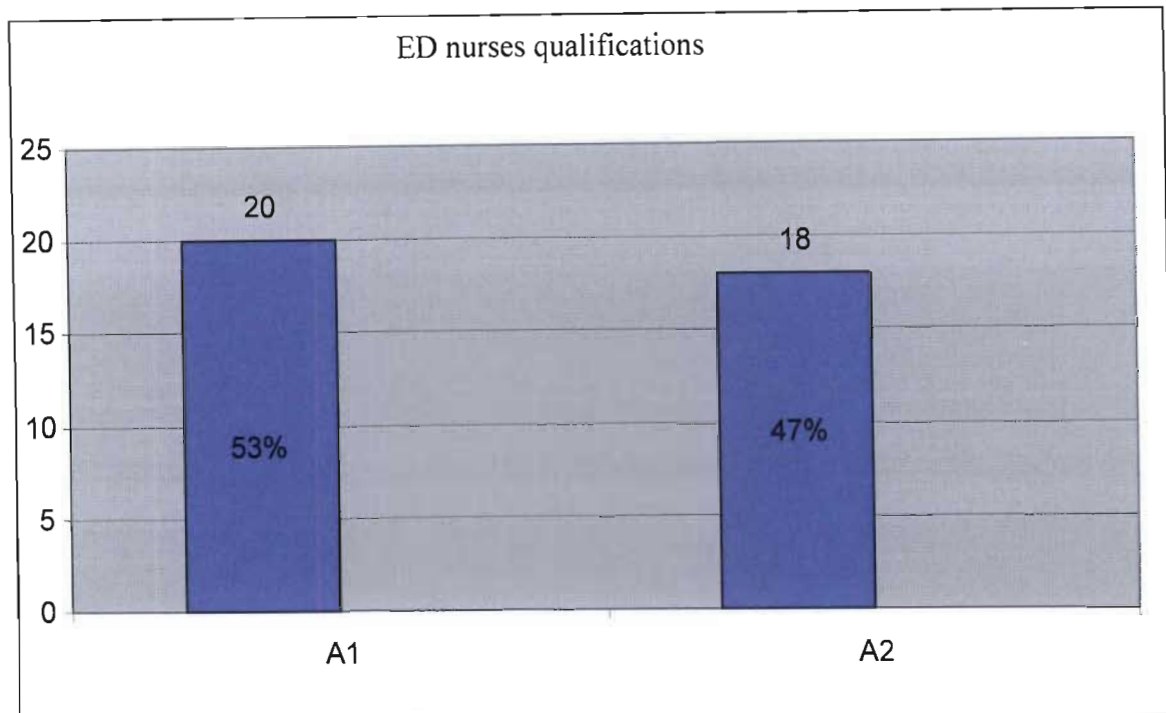
Of the 38 ED nurses who participated in this study, about 11% (n=4) of them had less than 1 years experience in ED, 63% (n=24) had 1-3 years of experiences in ED and 26% (n=10) had 4-7 years of experiences. The bulk of nurses had experience that ranged between 1-3 years.



Graph 4.3.2 Nurse's work experience in the ED

4.3.3: Nurse's qualifications

According to the findings the majority of ED nurses, 53% (n=20) are registered nurses (A1) and 46% (n=18) are enrolled nurses (A2). The majority are therefore registered nurses but with no special training in emergency nursing care.



Graph 4.3.3: Nurse's qualifications

4.4 Correlation

The correlation question is: to what extent are two variables related to each other?

This question can be answered graphically or by calculating an index that describes the magnitude and direction of the relationship (Polit and Beck, 2008, p.568). According to Polit and Beck (2008, p. 571) all correlations that fall between .00 and -1.00 are negative, and ones that fall between .00 and +1.00 are positive. The higher the absolute value of the coefficient, the stronger the relationship. The Correlation between overcrowding and triggers and overcrowding with outcomes were explored in this study.

4.4.1a Overcrowding and Triggers Correlation table

		Overcrowding	Triggers
Overcrowding	Pearson Correlation	1	.047
	Sig. (2-tailed)		.779
	N	38	38
Triggers	Pearson Correlation	.047	1
	Sig. (2-tailed)	.779	
	N	38	38

There is no linear correlation between overcrowding and triggers because (Pearson's) $r=.047$ is above the 0.05 cutoff.

Graph 4.4.1b Overcrowding and triggers Correlation

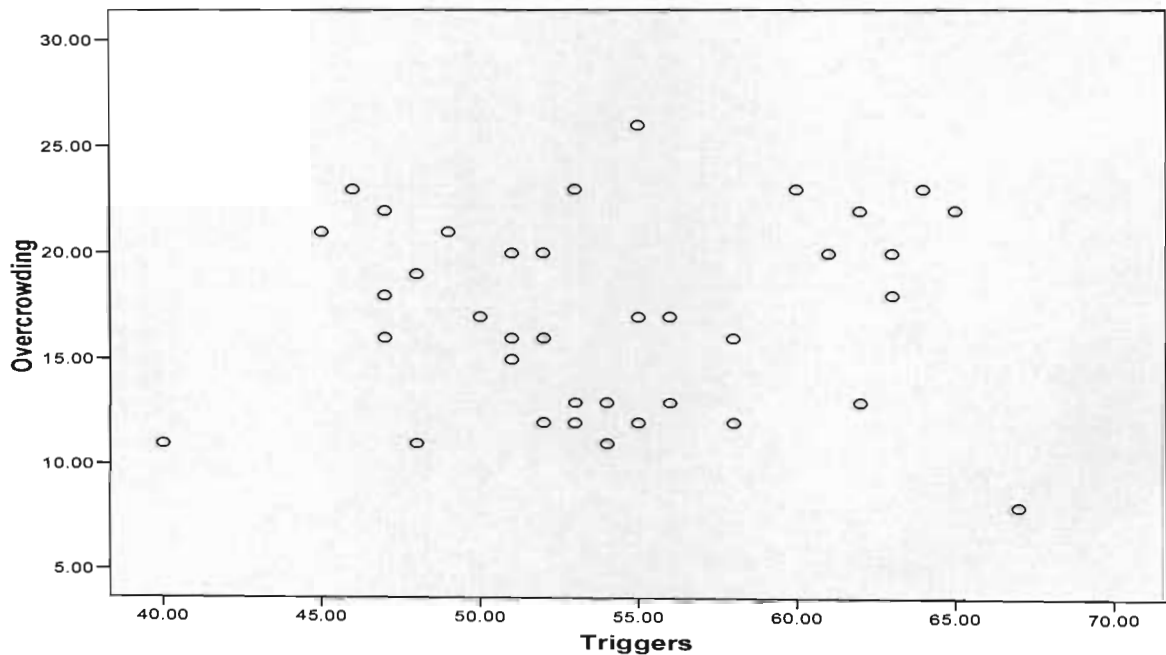


Figure 4.4.1b Overcrowding and triggers correlation

This figure shows that there is no linear correlation between overcrowding and triggers variables. According to Polit and Beck (2008, p. 571), when the points are scattered all over the graph, the relationship is low or nonexistent.

4.4.2a Overcrowding and outcomes correlation table

		Overcrowding	Outcomes
Overcrowding	Pearson Correlation	1	.161
	Sig. (2-tailed)		.336
	N	38	38
outcomes	Pearson Correlation	.161	1
	Sig. (2-tailed)	.336	
	N	38	38

There is also no leaner correlation between overcrowding and outcomes variable because (Pearson's) $r=.161$ is above the 0.05 cutoff.

Graph 4.4.2b overcrowding and outcomes correlation

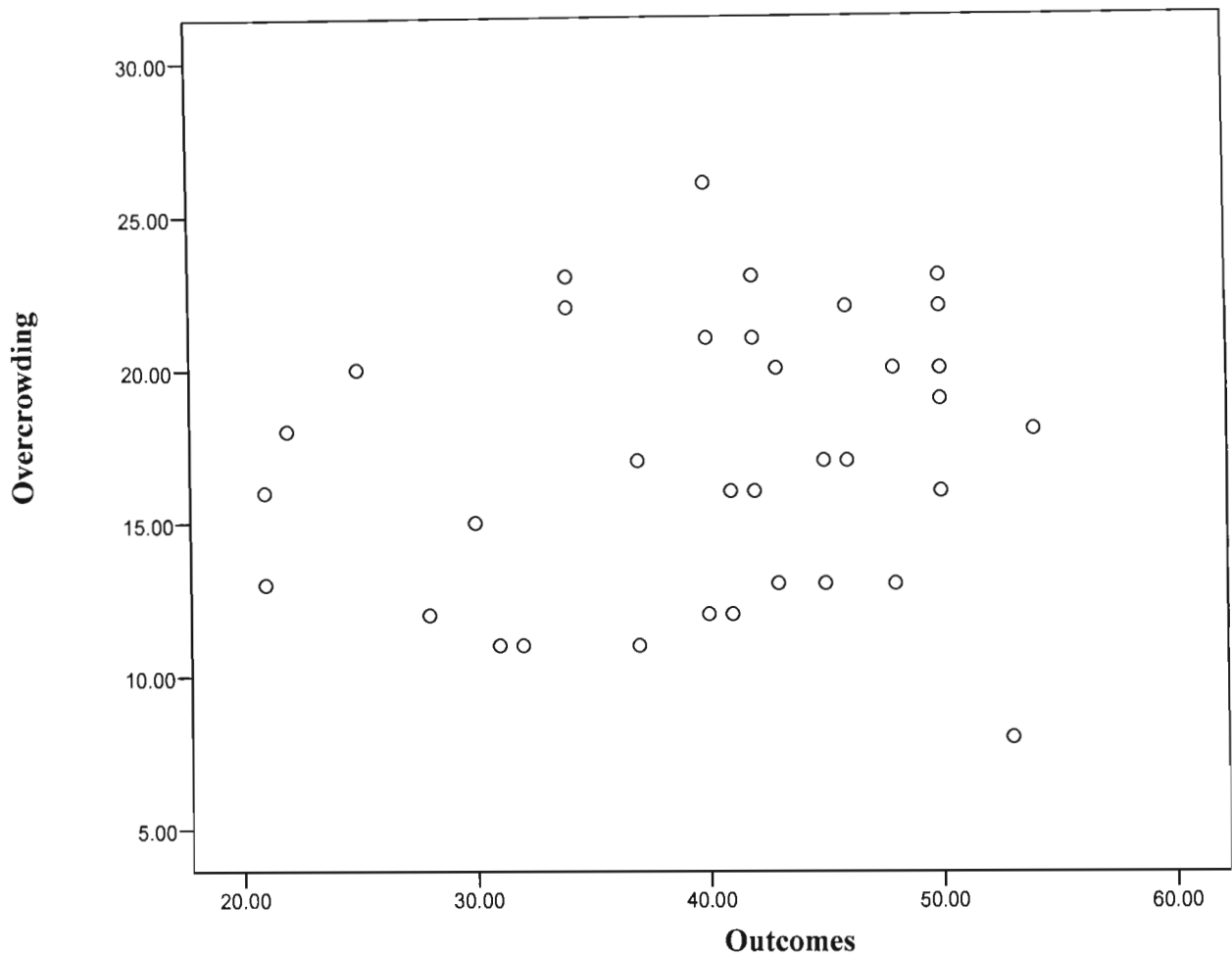


Figure 4.4.2b overcrowding and outcomes Correlation

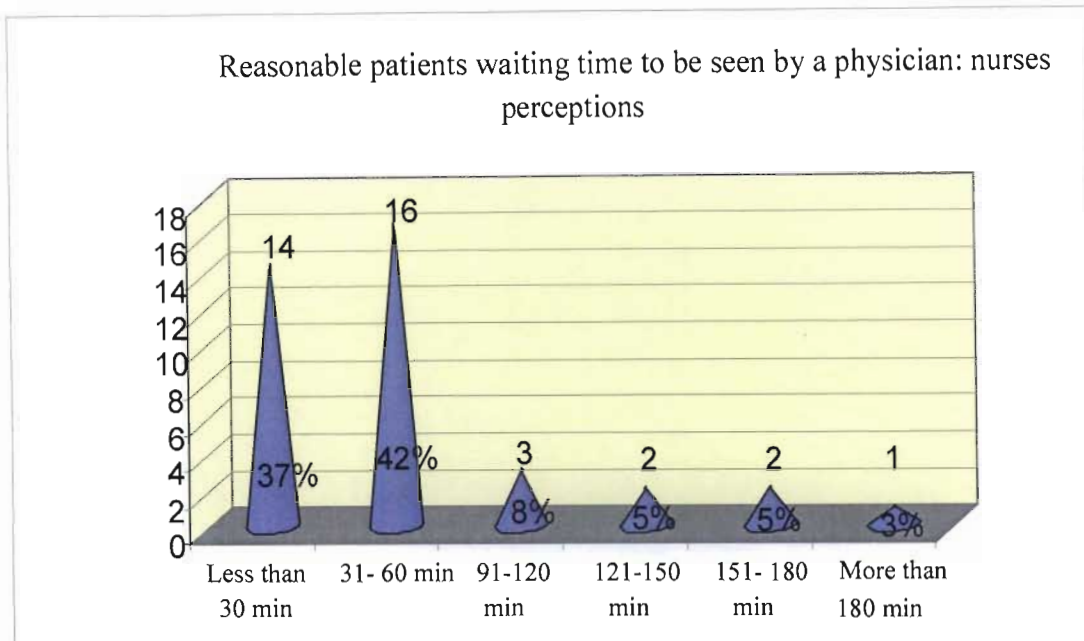
This figure shows that there is no relationship between overcrowding and outcome variables. According to Polit and Beck (2008, p. 571) when the points are scattered all over the graph, the relationship is low or nonexistent.

4.5 Characteristics of CHUK/ED Overcrowding

Four criteria were used to describe overcrowding in CHUK/ED: 1) Reasonable waiting time for a patient to be seen by a Physician, 2) ED beds occupancy, 3) Patient placed in the hallways, 4) Patient waiting room occupancy. These were looked at separately.

4.5.1 Reasonable Patients Waiting Time to be seen by a physician

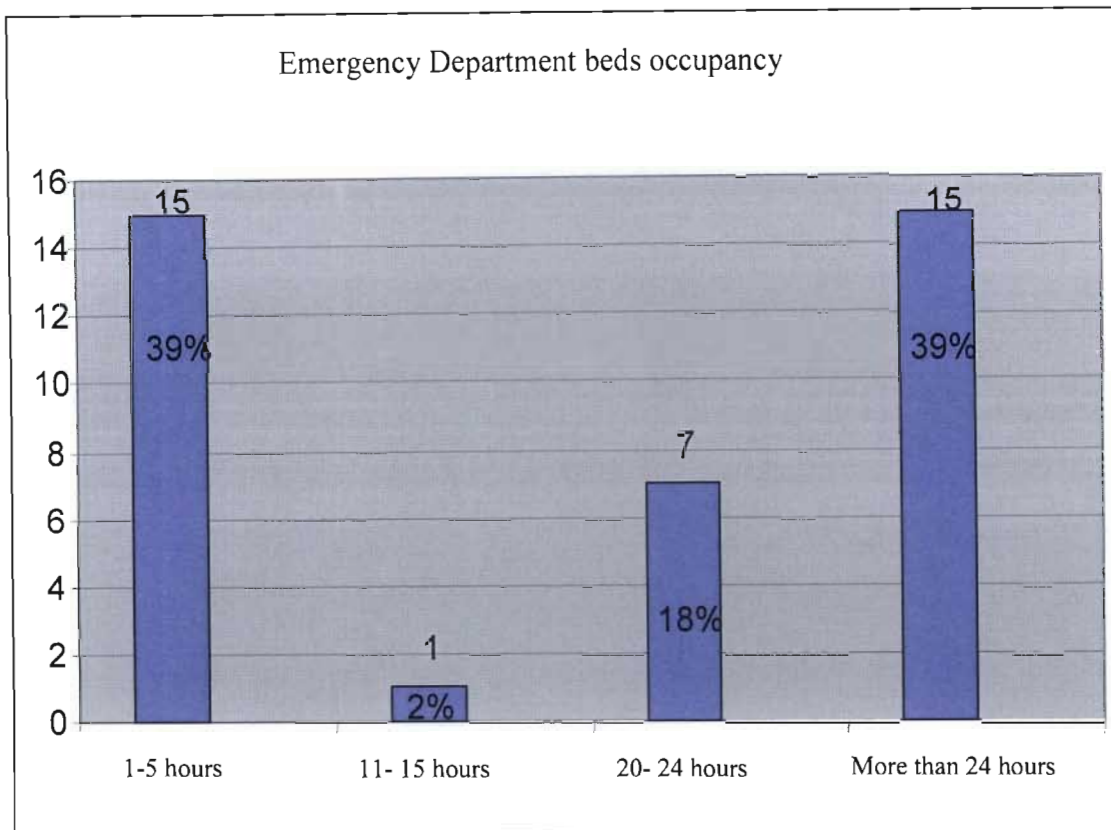
In this study, the reasonable patient waiting time varied. The highest percentage of nurses, 42% (16%) considered reasonable waiting time to be 30-60 minutes. About 37% (n=14) of nurses considered that patient waiting time of less than 30 minutes to be reasonable, 8% (n=3) of nurses considered 91-120 minutes to be reasonable, 5% (n=2) of nurses thought that 121-150 minutes was reasonable, other 5% (n=2) perceived 151-180 minutes to be reasonable, and 3% (n=1) nurse perceived that even more than 180 min is reasonable.



Graph 4.5.1: Reasonable patients waiting time

4.5.2 Emergency Department Bed Occupancy

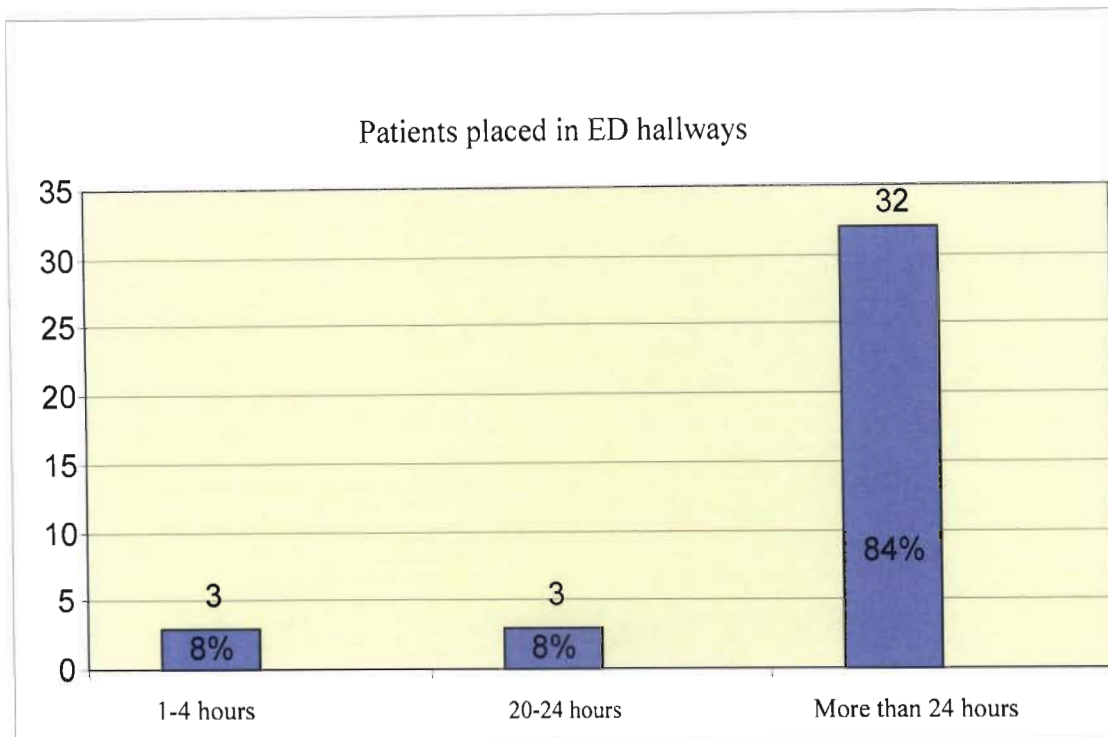
Overcrowding was also looked at in terms of the length of bed occupancy. The findings showed that 39% (n=15) of respondents indicated the occupation of ED beds for 1-5 hours which is a characteristic of overcrowding. While 39% (n=15) viewed occupancy of more than 24 hours as a characteristic of overcrowding.



Graph 4.5.2 Emergency department beds occupancy

4.5.3 Patient Placed in the Hallways

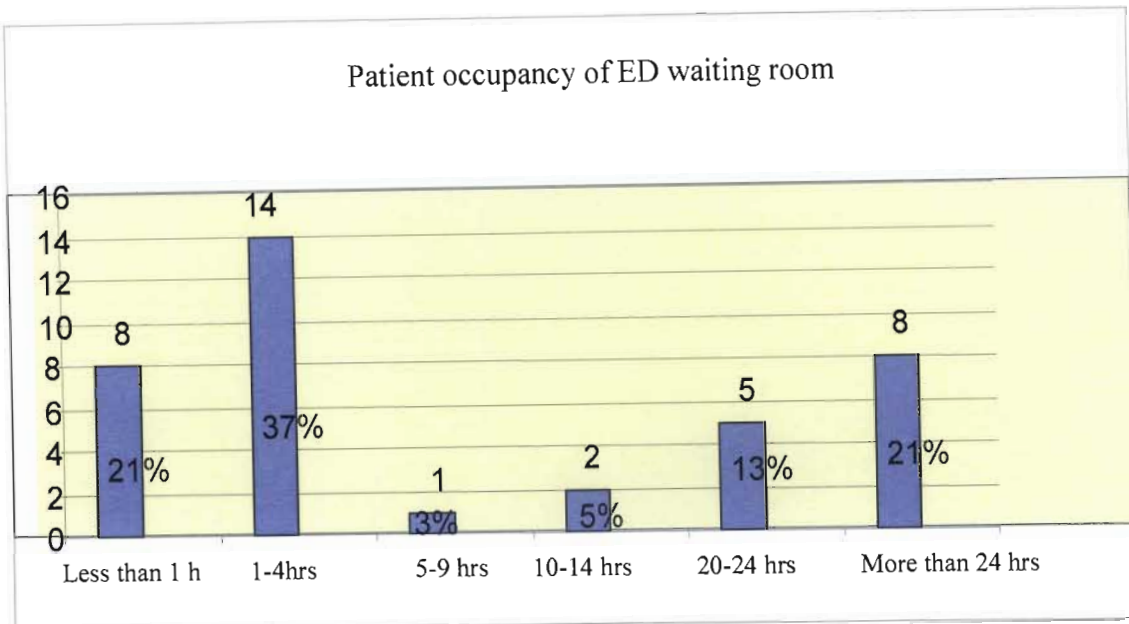
Another characteristic which was explored in this study was the hours spent by patients in hallways. The majority of participants, 84% (n=32) indicated that patients are placed in the hallways for more than 24 hours, which is a characteristic of an overcrowded ED.



Graph 4.5.3 Patient placed in the hallways

4.5.4 Patient Occupancy of ED Waiting Room

The time spent by patients waiting in ED was also considered as a characteristic of overcrowding. The findings revealed that the largest waiting time, 37% (n=14) ranged between 1-4 hours. With 21% (n=8) indicating that the period of less than an hour and another, 21% indicating a period of more than 24 hours



Graph 4.5.4 Patient occupancy of ED waiting room

4.6 Causes of ED/CHUK Overcrowding

The nurse's perceived causes of overcrowding at ED/CHUK are presented in five graphs, according to the study's concept and framework.

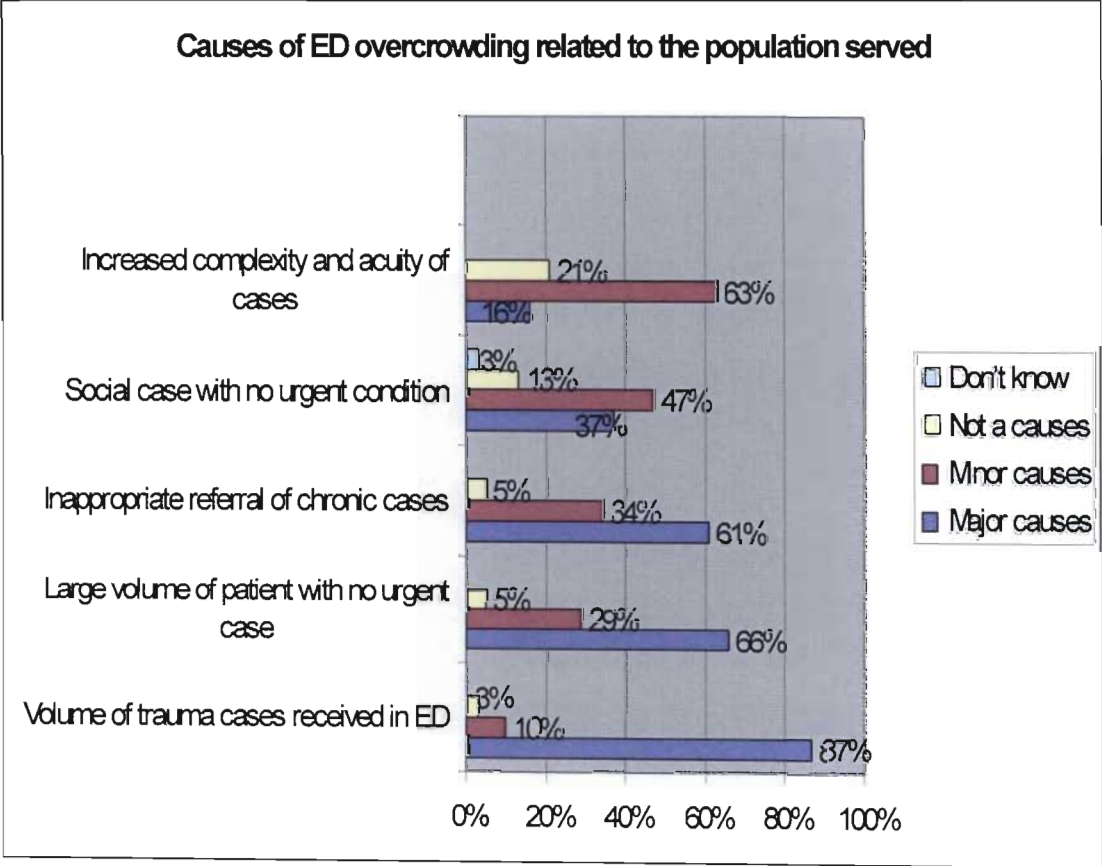
4.6.1 Causes of ED Overcrowding Related To the Population Served

About 90% (n=37) of participants viewed the volume of trauma cases received in ED as the cause of overcrowding. In this study 87% (n=33) of the participants viewed this as a major cause and 10% (n=4) viewed this as a minor cause.

Of the 95% (36%) who viewed large volumes of patients who are not emergencies in ED as a cause of overcrowding 66% (n=25) viewed these as a major cause of overcrowding, while 29% (n=11) perceiving these as a minor cause. About 95% (n=36) reported

inappropriate referral of chronic cases as a cause of overcrowding. However 61% (n=23) of respondent asserted that the inappropriate referral of chronic cases was a major cause of overcrowding, 34% (n=13) thought that it was a minor cause.

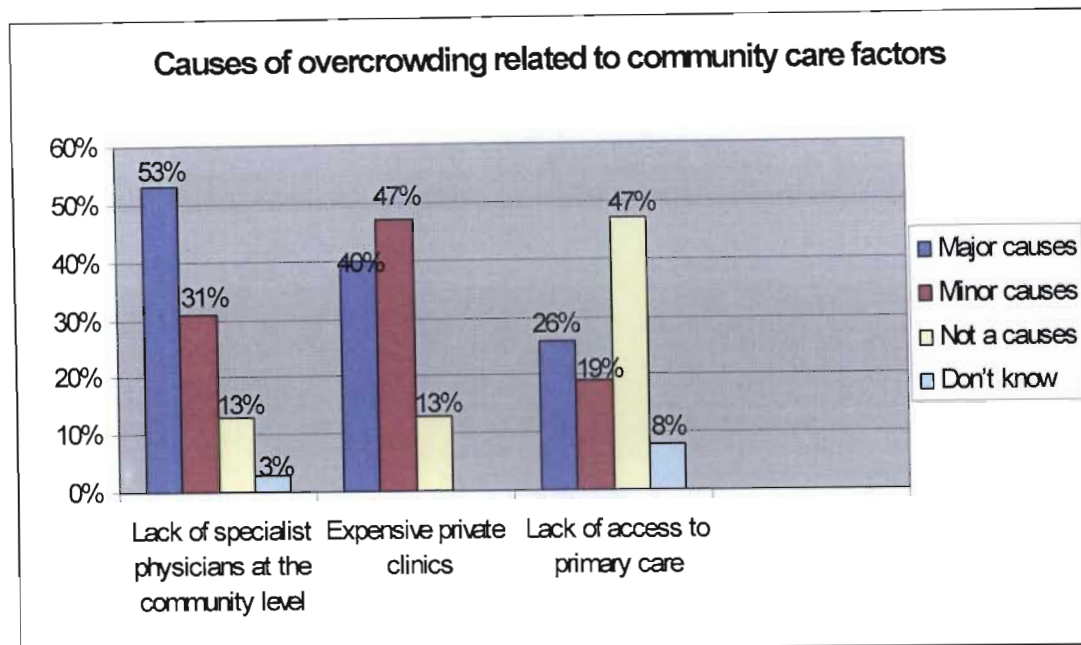
Eighty four percent (n=32) reported referral of non-urgent social cases to ED as one of the causes of overcrowding. While 37% (n=14) viewed this as a major cause and 47% (n=18) as a minor cause. Most of respondents 79% (30) asserted that increased complexity and acuity of cases was one of the causes of overcrowding; 63% (n=24) viewed this as a minor cause and 16% (n=6) perceiving this as a major cause.



Graph 4.6.1: Causes of ED overcrowding related to the population served

4.6.2 Cause of ED Overcrowding Related To Community Care Factors

The lack of specialist physicians at the community level transpired as one of the major causes of overcrowding (53%), followed by expensive private clinics, 40%, and lastly, 26%, lack of access to primary care. Elaborating on each of these causes about 53% (n=20) of respondent thought that the lack of specialist physicians at the community level had a major role in the ED overcrowding, 31% (n=12) affirm that was a minor cause, 13% (n=5) perceived that it was not a cause and 3% (n=1) said that he/she don't know. Of the 87% who highlighted high cost of private clinics as one of the causes, about 40% (n=15) of the respondents thought that the cost of private clinics was a major cause of ED overcrowding and 47% (n=18) of the respondents judged that it was a minor cause, with only 13% (n=5) of respondents viewing it as not a cause. About 26% (n=10) of respondent asserted that limited access to primary care was a major cause of overcrowding; 19% (n=7) thought that it was a minor cause; 47% (n=18) asserted that it was not a cause and 8% (n=3) said that he/she don't know.



Graph 4.6.2: Cause of ED overcrowding related to Community care factors

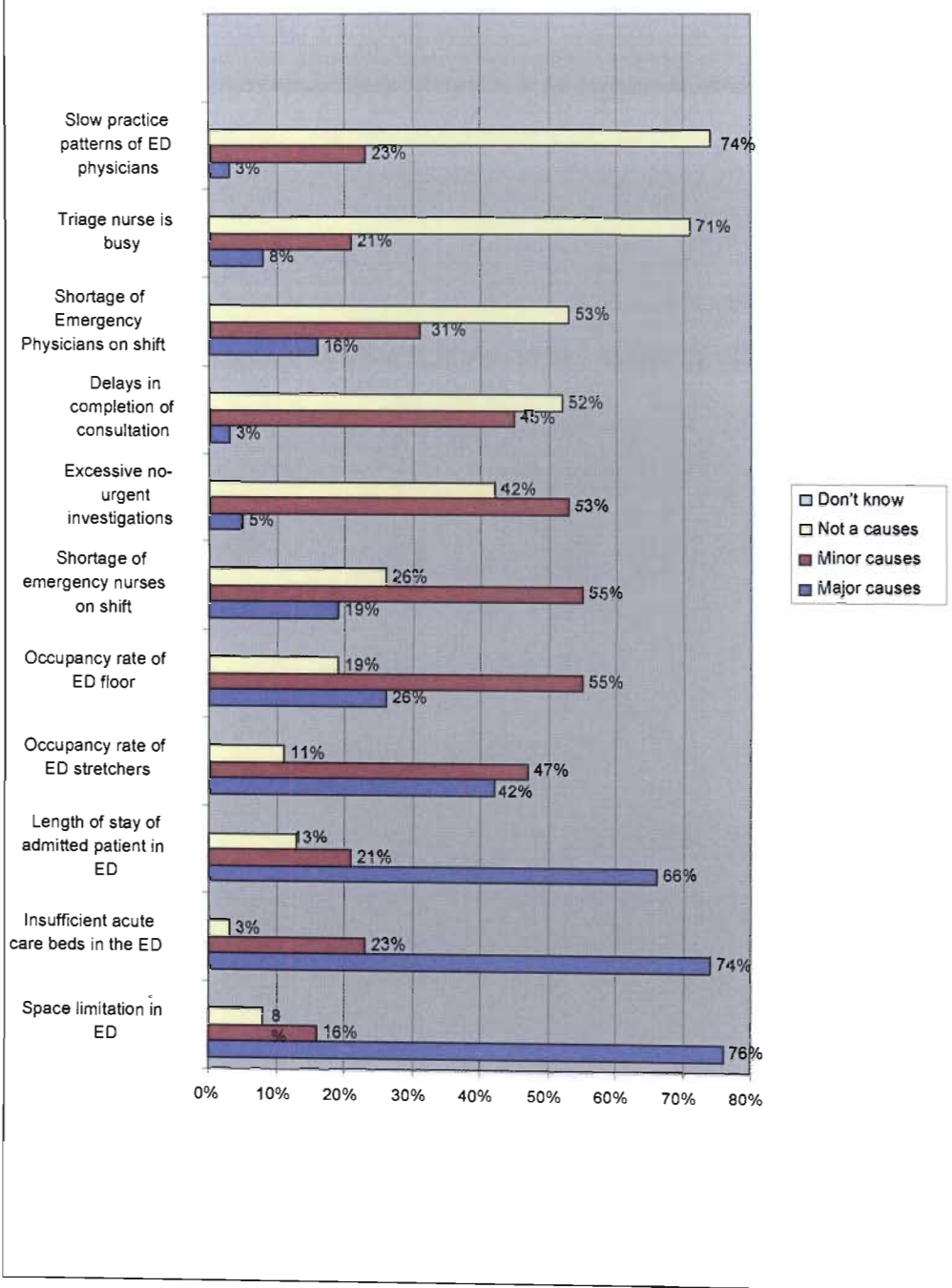
4.6.3 Causes of ED Overcrowding Related to Emergency Department Factors

The causes of ED overcrowding included space limitation (92%) insufficient care beds (97%) and length of stay of admitted patients in ED (87%), occupancy rate of stretchers (81%) shortage of ED nurses on shift (74%) excessive number of non urgent investigations (58%) as well as delays in completion of consultation (48%) and shortage of ED physicians on shifts (47%). Further analysis of the causes revealed that the majority of respondents, 76% (n=29) viewed ED space limitation as a major cause of overcrowding, 16% (n=6) thought that it was a minor cause, with 8% (n=3) not viewing it as a cause. Most of the respondents, 74% (n=28) judged that insufficient acute care beds in ED was a major cause of overcrowding, 23% (n=9) thought that it was a minor cause and 3% (n=1) said that it was not a cause. In the context of ED/CHUK, acute care beds refer to those beds in the high care unity. About 66% (n=25) of respondents asserted that

the length of stay of a patient, admitted in ED high care, constituted a major cause of overcrowding, 21% (n=8) perceived that it was a minor cause and 13% (n=5) thought that it was not a cause. Around 42% (n=16) of respondents asserted that occupancy rate of ED stretchers was a major cause of overcrowding; 47% (n=18) of respondents perceived that it was a minor cause and 11% (n=4) of respondents thought that it was not a cause.

About 26% (n=10) of respondents observed that the occupancy rate of the ED floor as a major cause of overcrowding; 55% (n=21) asserted that it was a minor cause and 19% (n=7) of respondents thought that it was not a cause. About 19% (n=7) of respondents perceived that shortage of nurses on shift was a major cause of ED overcrowding; 55% (n=21) observed that it was a minor cause and 26% (n=10) of respondent thought that it was not a cause. About 5 % (n=2) of respondents thought that excessive no- urgent investigations was a major cause of overcrowding; 53 % (n= 20) of respondents asserted that it was a minor causes and 42% (n=16) perceived that it was not cause. About 3% (n=1) of respondent thought that delays in completion of consultations was a major cause of overcrowding; 45% (n=17) thought that it was a minor cause and 52% (n=20) of respondents asserted that it was not a cause. About 16% (n=16) of respondents thought that shortage of emergency physicians on shift was a major cause; 31% (n=12) observed that it was a minor cause and 53% (n=20) of respondents asserted that it was not a cause. The majority of respondent 71% (n=27) indicated that triage nurse busy was not a cause of overcrowding, 21% (n=8) thought that it was a minor cause and 8% (n=3) said that it was not a cause. Most of respondent 74% (n=28) thought that slow practice patterns of ED physician was not a cause of overcrowding, 23% (n=9) judged that it was a minor cause and 3% (n=1) observed that it was a major cause.

Causes of ED overcrowding related to emergency department

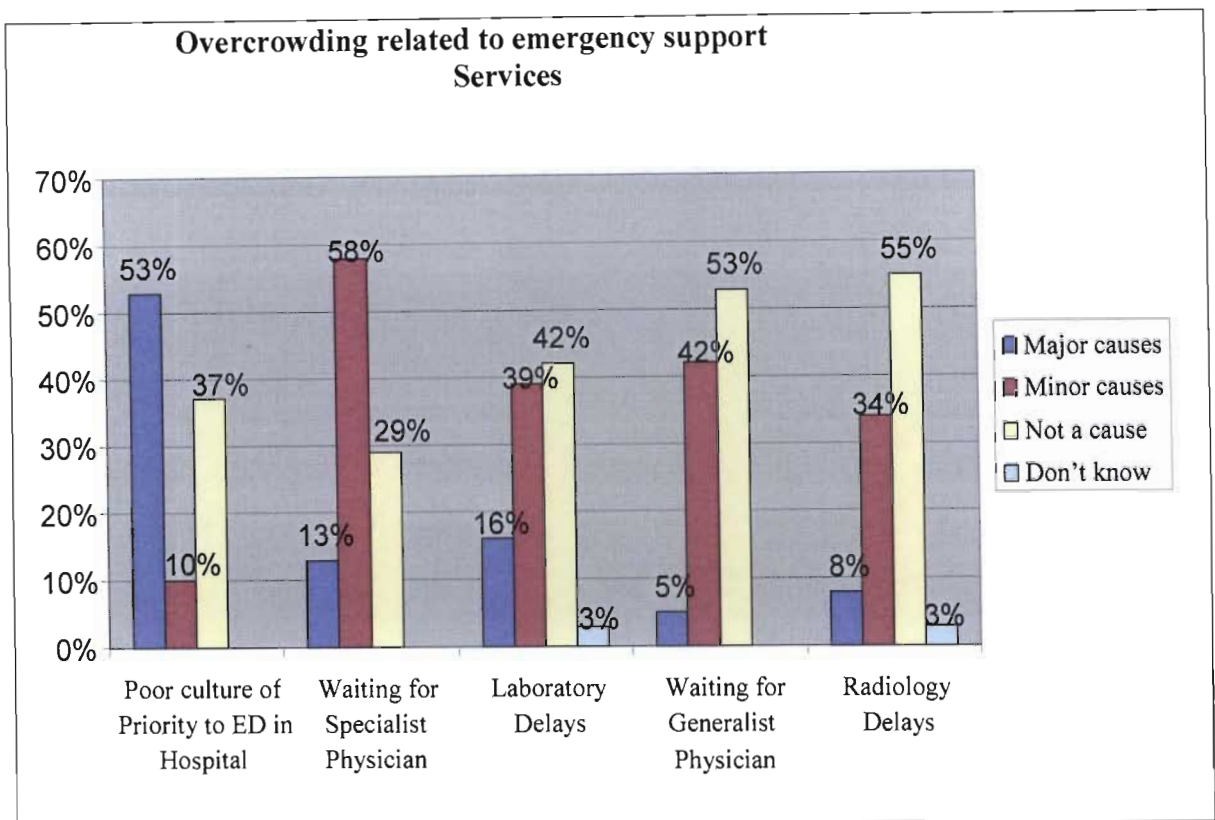


Graph 4.6.3 Causes of ED overcrowding related to Emergency department factors

4.6.4 Causes of ED Overcrowding Related to Emergency Support Services

Approximately 53% (n=20) of respondent perceived that poor culture prioritising cases to ED in CHUK constituted a major cause of overcrowding, 37% (n=14) thought that it was a minor cause and 10% (n=4) observed that it was not a cause. About 13% (n=5) of respondents observed that patient waiting time for specialist physician was a major cause of overcrowding; 58% (n=22) asserted that it was a minor cause of overcrowding and 29% (n=11) thought that it was not a cause.

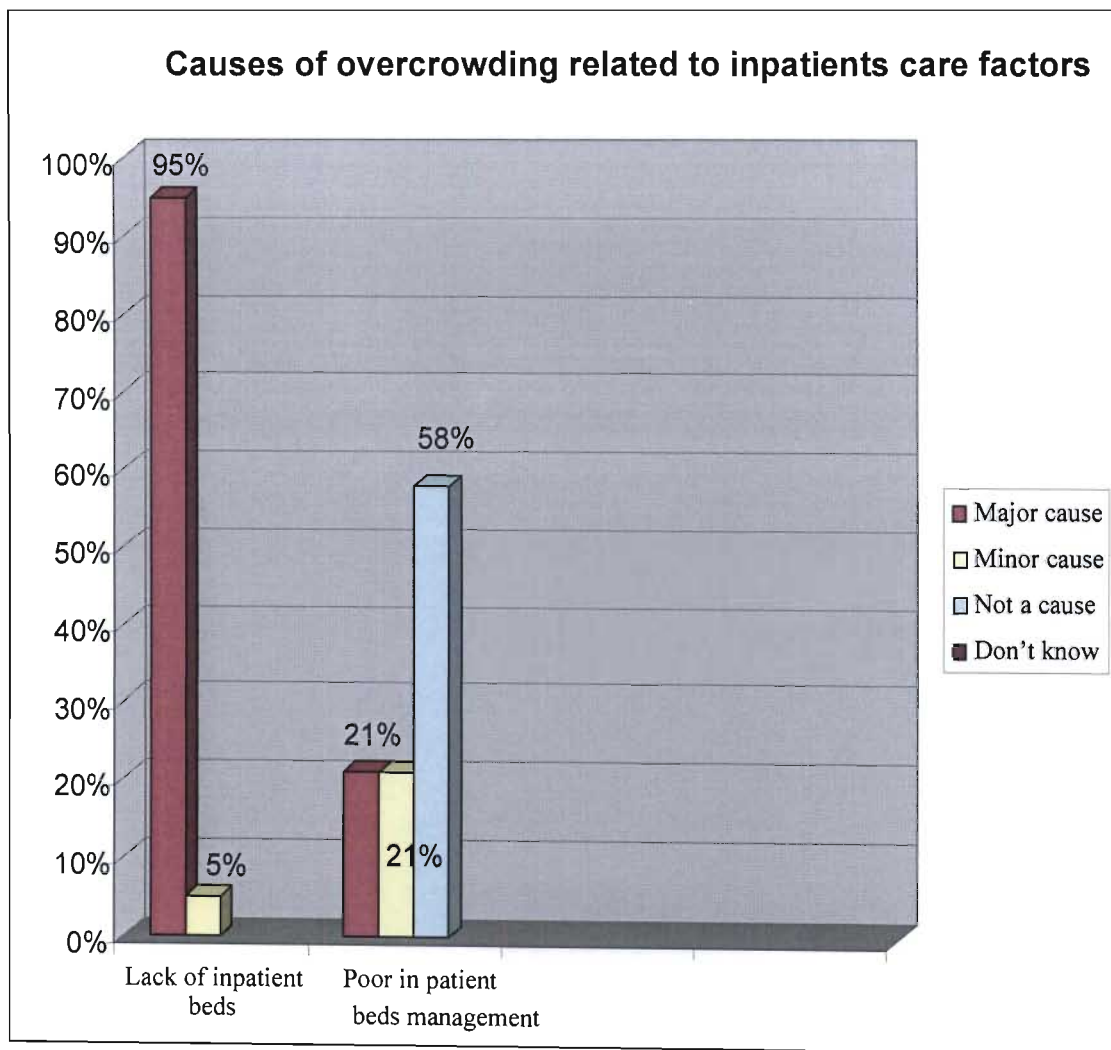
About 16% (n=6) of respondents asserted that laboratory delay was not a cause of overcrowding, 39% (n=15) thought that it was a minor cause, 42% (n=16) affirmed that it was not a cause and 3% (n=1) said that he/she don't know. Around 5% (n=2) of respondents judged that waiting for a generalist physician was a major cause of overcrowding, where 42% (n=16) asserted that it was a minor cause and 53% (n=20) that it was not a cause. Radiology delays was seen by 8% (n=3) as a major cause of ED overcrowding, 34% (n=13) thought that it was a minor cause, 55% (n=21) perceived that it was not a cause and 3% (n=1) said that he/she don't know.



Graph 4.6.4 Causes of ED overcrowding related to Emergency support services

4.6.5 Causes of ED Overcrowding Related to Inpatients Factors

Almost the majority of respondent 95% (n=36) asserted that the lack of inpatient beds constituted a major cause of ED overcrowding, and 5% thought that it was a minor cause. About 58% (n=22) of respondents judged that poor inpatient bed management was not a cause of ED overcrowding, 21% (n=8) asserted that it was a major cause of overcrowding and 21% (n=8) considered that it was a minor cause



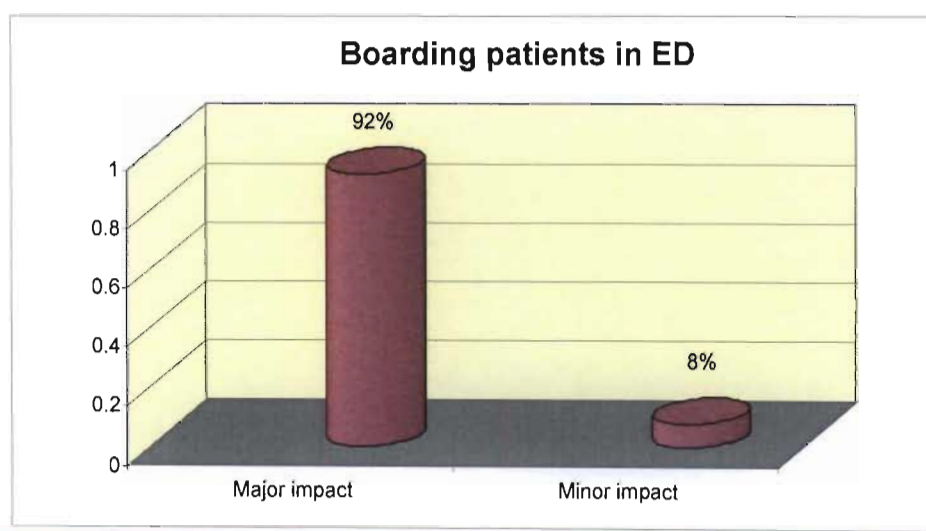
Graph 4.6.5: Causes of ED overcrowding related to inpatients factors

4.7 Outcomes of ED/CHUK Overcrowding

Outcomes of overcrowding were classified into major outcomes, intermediate outcomes and other outcomes.

4.7.1 Major Outcomes

About 92% (n=35) of respondent perceived that boarding patients in ED was a major outcome of hospital overcrowding and 8% (n=3) perceived that it was a minor outcome.



Graph 4.7.1 major outcome

4.7.2 Intermediate Outcomes

About 79% (n=30) perceived stressed nursing staff as major impact of overcrowding while 5% (n=2) viewed this minor impact, 13% (n= 5) judged that it is not an impact and 3% (n=1) said that he/she don't know. Increased stress among physicians was perceived

by 60% (n=23) of respondents as a major outcome, 24% (n=9) thought that it was a minor outcome, 13% (n=5) had no comments and 3% (n=1) said that he/she don't know. Risk of poor outcome is considered a major outcome by 60% (n=23) of respondent, 24% (n=9) perceived that it is a minor outcome and 16% (n=6) had no comments about this.

Staff dissatisfaction was seen as a major outcome of overcrowding by 58% (n=22) of respondent while 21% (n=8) viewed this as a minor outcome, and 21% (n=8) had no comments. About 47% (n=18) of respondents observed that negative impact on teaching and research is major outcome of ED overcrowding, (32% n=12) thought it a minor outcome, 16% (n=6) indicated that they had no comments and 5% (n=2) said that he/she didn't know.

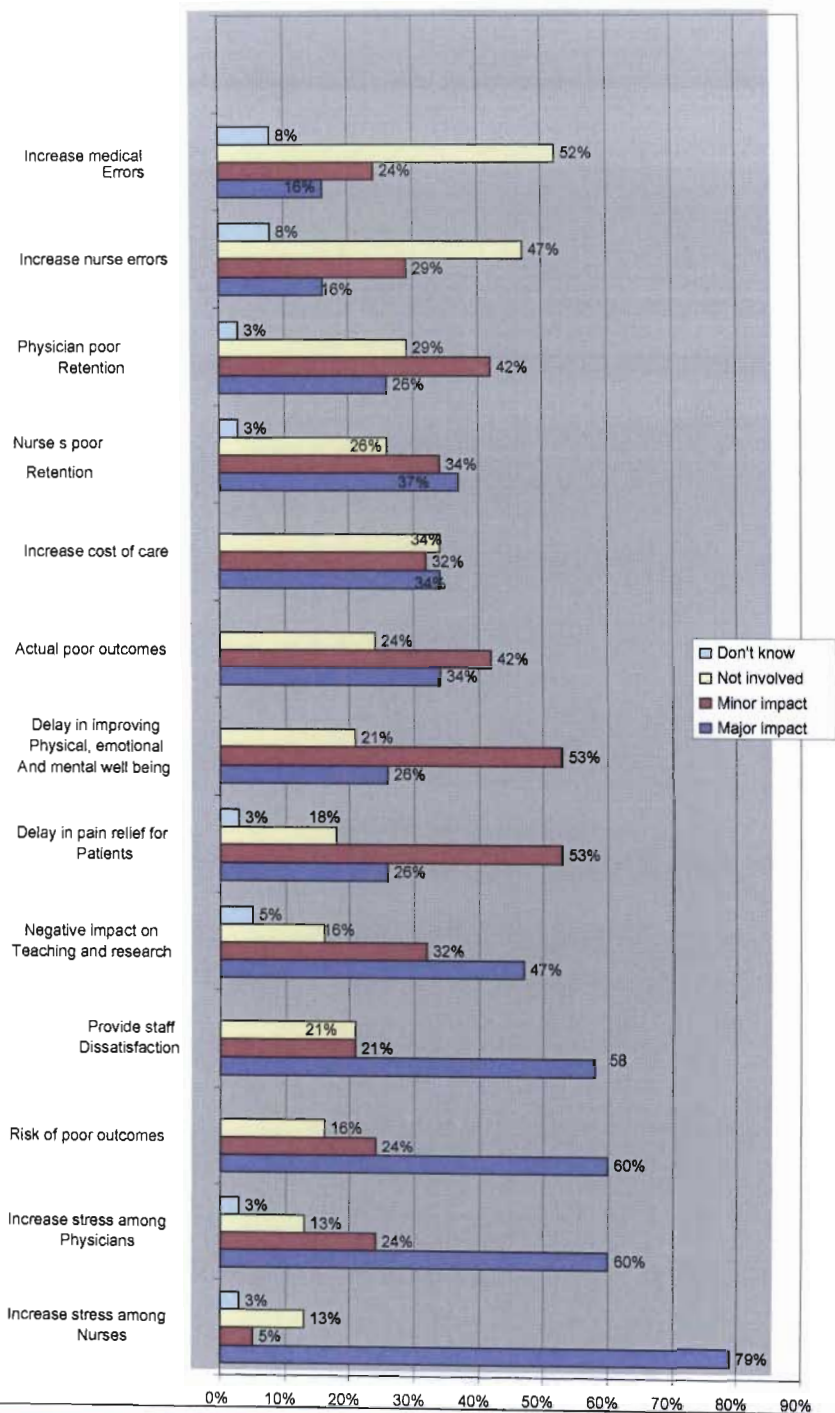
Approximately 26% (n=10) of respondents viewed a delay in pain relief for patients as a major outcome of ED overcrowding, while 53% (n=20) observed it is a minor outcome, 18% (n=7) had no comment on it and 3% (n=1) said that they didn't know. About 26% (n=10) of respondents observed that delays in improving physical, emotional, and mental well being is a major outcome of ED overcrowding, 53% (n=20) thought that it is a minor outcome and 21% (n=21) said that it not involved. About 34% (n=13) of respondents asserted that actual poor outcomes is a major outcome of ED overcrowding; 42% (n=16) thought that it is a minor outcome and 24% (n=9) said that it is not involved.

About 34% (n=13) of respondents viewed increased cost of care as a major outcome of ED overcrowding, while 32% (n=12) viewed this as a minor outcome and 34% (n=13)

had no comments. Approximately 37% (n=14) of respondents asserted that nurse poor retention is a major outcome of ED overcrowding, while 34% (n=13) thought that it was a minor outcome, with 26% (n=10) having no comments and 3% (n=1) indicated that they did not know. Around 26% (n=10) of respondents perceived that physician's poor retention is a major outcome of ED overcrowding, 42% (n=16) thought that it is a minor impact, 29% (n=11) judged that it is not involved and 3% (n=1) said that he/she don't know.

Around 16% (n=6) perceived that increased nurse errors is a major outcome of ED overcrowding, 29% (n=11) asserted that it is a minor outcome, 47% (n=18) thought that it is not involved and 3% (n=1) said that they don't know. Approximately 16% (n=6) of respondent judged that increased medical errors is a major outcome of ED overcrowding, 24% (n=9) perceived that it is a minor cause, 52% (n=20) affirmed that it is not involved and 8% (n=3) said that he/she didn't know.

Intermediate outcomes

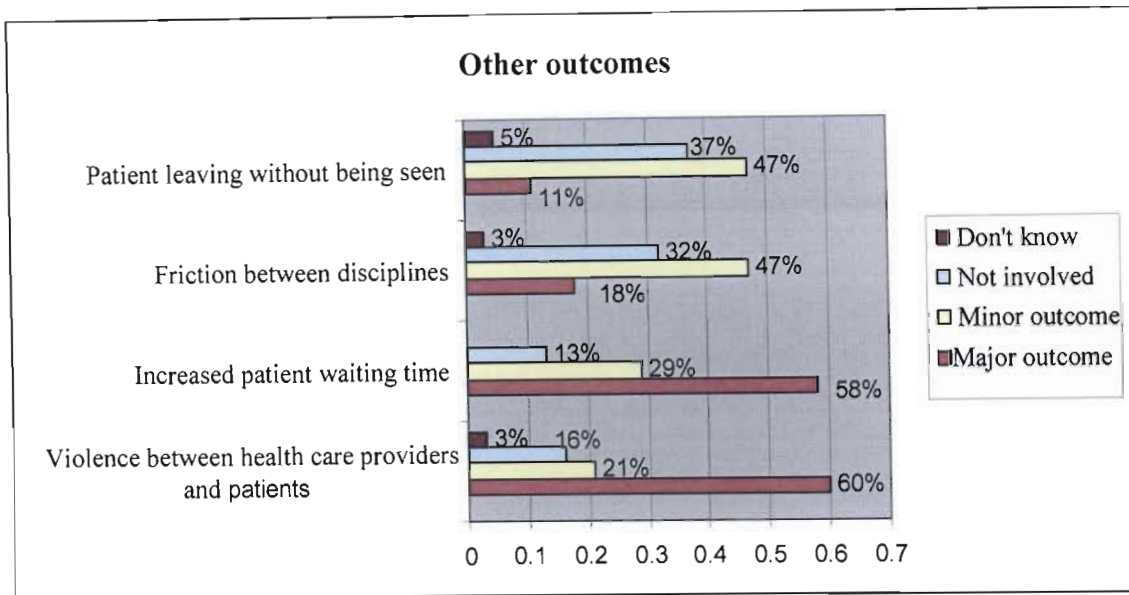


Graph 4.7.2 Intermediate outcomes

4.7.3 Other Outcomes

Violence between health care providers, patients or family members was perceived by the majority of respondent 60% (n=23) as a major impact of ED overcrowding, 21% (n=8) thought it a minor outcome, 16% judged that it is not involved and 3% (n=1) said that he/she didn't know. Increased patient waiting time was considered to be a major outcome of ED overcrowding by 58% (n=22) of respondent, 29% (n=11) perceived that it is a minor outcome and 13% (n=5) that it is not involved.

Approximately 18% (n= 7) of respondents observed that friction between disciplines is a major outcome of ED overcrowding; 47% (n=18) affirmed that it is a minor outcome; 32% (n=12) thought that it is not involved and 3% (n=1) said that he/she didn't know. About 11% (4) of respondents observed that patients leaving without being seen by ED physician is a major outcome of ED overcrowding; 47% (n=18) asserted it as a minor outcome, 37% (n=14) thought that it is not involved and 5% (n=2) said that he/she didn't know.



Graph 4.7.3: Other outcomes

4.8 Interventions to Reduce or Control Overcrowding at ED/CHUK

4.8.1 Attempt Interventions

Regarding interventions used to reduce ED overcrowding, the most common answer was that: no well planned interventions were initiated in the past, but some sporadic actions were taken when severe crisis occur.

Forty seven percent (n=18) of respondents reported that when the emergency department was full, patients were referred, according to their condition, to the nearest district hospital or health centres after initiating treatment.

Thirty nine percent (n=15) of respondents reported that, trying to limit the use of ED by those patients who may be successfully managed at a lower lever, patients were asked to go to the health centres or district hospital before coming to ED/CHUK. If, at that level,

the health professionals judged that patient needed more specialised care, then they were referred to ED/CHUK with a referral letter. Another intervention was that a social worker was deployed in the emergency department to deal with social cases and thus minimise their stay in ED. Furthermore, ED was given more nursing staff so that they could alleviate crowding. Nineteen percent (n=7) of respondents reported that collaboration with the nurses in charge of wards was enhanced; by identifying empty inpatient beds and communicating the number to triages nurse, so that, if possible, patients were moved to inpatient beds as soon as the physician decision was made. The ED nurse in charge also initiated the process of recording the patient length of stay in ED and the excessive patient waiting times was reported to the hospital managers for action.

4.8.2 Emergency Nurse's Suggestions to Alleviate ED Crowding

Fifty three percent (n=20) of respondents proposed the expansion of the Emergency Department. However, it emerged from the data that the process of building a new, spacious and more adapted ED has already started. Twenty six percent (n=10) of respondents proposed the improvement of the referral system in Rwanda was critical. These respondents proposed using Medias to inform the Rwandan population about the use of health care system so that patients could improve their knowledge about the process to follow when looking for health services and to promote efficient use of health services. (Normally patients are supposed to start in the health centres to the district hospital and finally be referred in the referral hospital when necessary). They also proposed sensitising health workers at a lower level to refer patient when it was really

unavoidable, instead of referring according to the patient's wishes, or other irrelevant reasons.

Forty percent (n=15) of respondents suggested adding beds in the inpatient wards, because they asserted that the volume of patients has increased in the last years and that the actual CHUK capacity is no longer adapted. Thirteen percent (n=5) of respondent proposed adding the number of ED nursing staff on shift. Twenty nine percent (n= 11) of respondents proposed hiring new surgeons, because they thought that surgical cases delayed the ED due to surgeons being overloaded. Eleven percent (n=4) of respondents proposed increasing operating rooms, because some time surgeons are available but the theatre rooms are busy.

Sixteen percent (n=6) of respondent proposed improving hospital bed management because they observed that patients are admitted in the hospital and wait too long before being appropriately managed (especially surgical cases). They also claim that chronic cases occupied hospital beds for a long time, instead of being transferred to a lower level of care or sent home. Sixty six percent (n=25) of respondents proposed avoiding boarding patients in ED. Twenty one percent (n=8) of respondents proposed the training of ED nurses in the emergency procedures so as to improve their skills and rapidity in performing emergency procedures.

4.9 Conclusion

The main findings in this chapter are as follows: demographic data shows that CHUK/ED nurses were young and the majority of nurses have a short work experience in ED. Overcrowding in ED/CHUK was characterised by patients lying on the floor and staying in the hallways for more than 24 hours. The main causes of ED overcrowding were Lack of inpatient beds, a large number of non-urgent patients especially trauma cases, space limitation in ED, Insufficient number of nurses on shift. The main outcomes were: patients boarding in the ED for a long period, stress among nurses and physicians, risk of poor outcomes and violence between patients and staff. Findings also show that there were no sustainable interventions initiated to alleviate ED overcrowding.

Chapter 5

Discussions, Conclusion and Recommendations

5.1. Introduction

In this chapter, the results presented in chapter four are discussed and interpreted against the background of the literature reviewed. Even though, each variable contributed to ED overcrowding the discussion is limited to those variables that were perceived by the majority of respondent to be the most contributing to ED overcrowding.

5.2 Demographic Data

The findings of this study showed that the majority (92%) of CHUK/ED nurses were young (aged between 20 and 35 years). These findings are quite different from those of the Unites States where an aging nursing workforce was a major challenge as an average age of 46 years for the nursing workforce, with only 9% of nurses now younger than 30 years of age (Schriver, Talmadge, Chuong and Hedges, 2003). However, this young nursing workforce in Rwanda may be an illustration of the 1994 Rwandan genocide where most of workforces were killed and others exiled. Striving to reconstruct the country, the Rwandan government has put a strong emphasis in the health workers educations.

Most nurses have few years of working experiences in ED, 74% have less than 1- 3 years of work experience in ED. The same issue was highlighted by the American Nurse Association suggesting that hospital ED is among the hospital units where employers are having difficulty finding experienced nurses (Schrivier et al., 2003). To overcome the issue, emergency and critical care nursing “internships” of several months' length are now offered to new graduates in selected institutions (Alban, Coburn and May, 1999) and advanced degree programs in emergency nursing administration are offered.

The result of this study showed that the number of registered nurses (A1) (53%) was high compared to the number of enrolled nurses (A2) (47%). It is encouraging to found that nurses are upgrading their studies in high schools and Universities in the Rwandan, where most of nurses were enrolled nurses, A2 and A3 in the previous years. Schrivier et al., (2003) suggest that today, the complexity of emergency nursing practice has fostered newer and more comprehensive educational preparation, this author documented a range of challenges that require more specialised knowledge and skills to ED nurses that comprise special and evolving skills required of triage nurse performance, evolving patients nursing care; service administration; multitasking driven by moment-to-moment changes in demand; supervision of related health personnel; languages diversity and interpretation; and the broad base of professional skills necessary to provide nursing care to patients of both sexes, all age groups, virtually all diseases, and the range of disease acuity.

5.3 Characteristics of ED/CHUK Overcrowding

The nurse's perception of patient reasonable waiting time for a physician varied greatly between less than 30 minutes to more than 180 minutes, but the majority of nurses (42%) perceived 30-60 minutes to be reasonable. In the context of ED/CHUK the nurses understanding of reasonable waiting time was influenced by 2 variables: first waiting time decreased when a patient was to be seen by a generalist physician because they are accessible 24 hours a day in the ED, in contrast with when a patient was to be seen by a specialist physician, the waiting time increased because specialists come on call when requested by the on site generalist physician.

Unlike ED/CHUK nurses inconsistency of defining reasonable waiting time, a California survey of ED directors defined overcrowding, in part, as waiting more than 1 hour to see a physician, a wait considered likely to result in adverse outcomes (Lambe et al., 2003). According to Birkhahn et al., (2007) an average time to wait before seeing a physician, for all patients, of 90 minutes, would strongly suggest that a mismatch exists between volume and ED capacity.

The result of this study showed that the ED bed occupancy varied "between" 1 hour to more than 24 hours. Nurses refer this high occupancy rate especially to the lack of inpatient beds, but also to the poor management of the high care unit which is one of the Emergency Department rooms. They assert that some patients are admitted in this room for more that one month, and suggested that the length of patients stay in this room be

regulated by international established standards. This is in line with Duic's (2005) recommendation which suggest that the total length of stay in the clinical decision unit should not exceed 24 hours and, preferably, that this unit should be physically distinct from the emergency department.

In this study the majority of respondents (84%) asserted that patients are placed in the hallways for more than 24 hours. Participants revealed that the reasons for remaining in the hallways for a long time were mainly due to the wait for inpatient surgical beds or the wait for surgical intervention to be performed. The findings in this study show that patients are placed in the hallways for a long period, contrary to a study by Richards, Navarro and Derlet (2000). These authors found that in the Canadian's emergencies departments, patients were placed in the hallways for 6 hours a day.

The findings of this study revealed that nurse's perceptions of patient waiting room occupancy varied greatly "between" less than 1 hour to more than 24 hours. Respondents explained that waiting room occupancy depended on different variables: patients who are in critical condition are seen as soon as possible, in contrast, those who are relatively well, wait for a long time. Those who require surgical beds for a chronic condition wait longer than those with acute condition. Also, patients who do not need hospital beds wait longer for the results of investigations to enable physician to establish diagnosis and prescribe drugs before being discharged. Whereas those who are admitted in the hospital are moved to inpatient when physician decision is made (if beds available) and the results of investigations are sent to the unit where the patient is admitted, when available. The

findings of this study are not specific to provide a clear picture of patient waiting time according to admitting specialty and patient status. In contrast to the Canadian Institute for Health Information (2007) findings, which revealed that 4% of patients waited over 24 hours in the ED for an acute care bed once the decision to admit had been made and founded that teaching and large community hospitals had the largest proportion of patients who waited over 24 hours for an acute care bed (5% each).

5.4 Triggers of ED/CHUK Overcrowding

In this study the majority of respondents (87%) reported that the use of ED/CHUK by non urgent trauma cases was a major cause of ED overcrowding. This use of ED by non urgent cases is supported by Nsereko's (2007) study that founded the majority (81, 4%) of trauma cases admitted at ED/CHUK having minor injuries.

In this study, large volume of patients, with no urgent conditions, were seen by 66% of ED nurses as a major cause of overcrowding. Without excluding other factor, the excessive use of ED/CHUK by patients with non urgent conditions, mostly refer to the gap within the Rwandan referral system. This is supported by the Rwandan's Health Sector Policy (2005) that recognised the overlap of activities of the district and national referral hospitals. This policy asserted that there is still an unclear delineation of responsibilities for the central-level national referral hospitals because there are not enough functioning district hospitals, especially in urban areas, and this results in national

referral hospitals often assuming the responsibilities of district hospitals (Rwanda's Health Sector Policy, 2005)

In line with the findings from this study, Hoot et al., (2008) work showed that the commonly studied causes of crowding included non urgent visits. Shactman (2002) founded that 41.3% of patients in New York City emergency departments were non-emergent and that 33.5% were emergent that could have been seen by a Primary Care Provider. Furthermore, they found that 7.3% of patients needed an ED but had a condition that was preventable or avoidable. In some, they found that 75% of ED patients could have been seen by a Primary Care Provider and another 7% of visits prevented or avoided.

Furthermore, in this study, the inappropriate referral of chronic cases was founded by the majority of respondents (61%) as a major cause of overcrowding. Sharing the similar findings, the study by Feras et al., (2007) showed that a great proportion of general practitioner referrals to ED can be streamlined into more efficient pathways, which can potentially decrease the burden on the ED, improve performance and avoid unnecessary use of resources. According to these authors, referral behaviors are affected by the individual skills of the general practitioner, patient demand, and fear of litigation. However, analyses of the referral patterns and introduction of appropriate guidelines may help streamline these referrals. Although the same patterns of referrals can be found in most emergency departments, variation in the available resources and local practice may dictate specific guidelines for individual emergency departments.

Most of the respondents in this study perceived that social cases with non urgent conditions were a major cause of overcrowding. This result may be explained by the increasing rate of social cases in Rwanda due to the 1994 genocide, high poverty rate and sickness related to the spread of HIV/AIDS. A study conducted in Rwanda by Musango, Butera, Inyarubuga and Dujardin (2006) documented that the 1994 genocide resulted in ruin for the country and its health system, with all its infrastructures destroyed, equipment looted and people killed or exiled. As a result, problems of access to healthcare have increased substantially, and the country has not escaped the HIV/AIDS pandemic, which is steadily spreading, particularly in rural areas where the proportion of those who are HIV-positive went up from 1.3% in 1996 to 10.8% in 1999. Poverty is deepening, and current statistics show that 60.4% of the Rwandan population is living below the poverty line (on less than a dollar a day) (Rwandan Ministry of Health cited in Musango et al., 2006).

Sixty three percent of respondents in this study indicated that increased complexity and acuity of case was a cause of overcrowding. Certainly because acuity and complex cases needed more time to be managed. Similar results were reported by Cowan and Trzeciak (2005) suggesting that the most important determinants of ED overcrowding in the US emergency departments were an increasing volume of high-acuity patients. A survey by Rowe, et al., (2006) from the Canadian ED/Directorates founded that 54% of respondents asserted that the increased complexity and acuity of patients' symptoms was a major cause of overcrowding. Furthermore, increased volume and acuity of disease among the

general patient population was also noted in the United State as a cause of EDs overcrowding (Schriver et al., 2003)

In this particular study, 53% of the participants revealed that a lack of specialist physicians, at the community level, was a major cause of overcrowding and expansive private clinics were also considered by 40% of respondents as a major cause of overcrowding. This is supported by the findings from Brim (2006) who documented that the most significant barriers to the clinics care were the cost of care and lack of medical insurances or limitation of some. In the United State, primary care and specialist physicians, responding to financial pressures, were increasingly referring their acutely ill patients to EDs in order to maintain their outpatient schedules (Schriver et al., 2003)

The majority of respondents (76%) in this study suggested that ED space limitations constitute a major cause of overcrowding. Due to Rwandan's growing population, especially in the Kigali city, the actual ED space is no longer adapted. This assertion is supported by the Rwandan national population and housing (2002) survey which revealed that the Kigali city alone had approximately 603.049 habitants in 2002 and today the population is approximated 1 million. According to the Canadian Association of Emergency Physician (2008), having appropriate space and staff, to match the volume of emergency patients, are critical for the proper functioning of the emergency department.

Seventy four percent (n=28) of CHUK/ED nurses viewed an insufficiency of ED beds as a major cause of overcrowding. However, contrary to this findings a study by Han, Zhou,

France (2007) revealed that ED expansion and increasing ED beds was an insufficient solution to improve ED overcrowding without addressing other bottlenecks in the hospital. These authors suggested that instead of improving the situation, the total and admission hold length of stay increased.

Sixty six percent (n=25) of respondents judged that the length of stay of patients admitted in ED constitute a major cause of overcrowding. However, a study by Parkhe, Myles, Leach and Maclean (2002) founded that, despite the problem of overcrowding, the long stay of patients admitted in ED is associated with increased mortality rate.

Forty two percent (n=16) of respondent showed that the occupation rate of ED stretchers was a major cause of overcrowding, whereas forty seven percent thought that it was a minor cause. In a study by Estey et al., (2003) participants perceived that the availability of ED stretchers for incoming patients was often severely limited because of the admitted patients held in the ED while waiting for an available inpatient bed. Occupancy rate of ED floor was also cited by many respondents as an important factor contributing to ED overcrowding. In this particular study, 26% (n=10) of the respondents asserted that occupancy rate of ED floor was a major cause of overcrowding.

The majority of respondents (55%) perceived that the shortage of emergency nurses on shift was a minor cause of overcrowding. ED staffing deserve considerable attention to adapt the patients demand to nurse's ratio, considering that all critical ill patients are admitted in the hospital through ED and stay in the high care unit for a relative long

period. The quality of care may be compromised because of a shortage of nurses in ED, where one or two nurses are caring for 7 critical ill patients. In addition to that, when any disaster occurs, nurses from other department come to support the ED and experience has shown that they were not effective because of unusual environment and activities. According to the international standard, one nurse should be allocated to one critical ill patient. A study by Cowan and Trzeciak (2005) revealed that ED nurse/patient ratios do not typically allow for the focused attention that a patient could receive in a critical care unit because most ED nurses are simultaneously responsible for numerous patients with varying severities of illness. When a nurse is assigned to an ICU patient boarding in the ED, one of two scenarios can be expected to occur; either the nurse patient ratio (1 nurse for 1 patient) for critical care patient will be compromised, or the rest of the ED nursing staff will be required to absorb a greater proportion of ED patients.

In this study excessive non urgent investigations and delays in completion of consultation were considered, by the majority of respondents, as minor causes, but they have a potential of becoming a major cause when providers are not experienced. According to DeLia, Duck, and Cantor, cited in Delia (2007) it has been shown that students often generate inefficiencies by ordering more tests and processing patients slower than experienced physicians.

Fifty three percent (n=20) of respondents in this study considered a poor culture of prioritising patients in ED as a major problem. In support of these findings a survey done in Canada from the ED medical directors (69%) revealed that prioritising ED over other

admission sources was a valuable tool to reduce ED overcrowding (Pines and Kelly, 2008)

Although most of the respondents (58%) (n=22) in this particular study thought that the waiting time for a specialist physician was a minor cause of overcrowding, laboratory and radiology delays were seen by respondents as others factors contributing to ED overcrowding. Measuring the real time a patient can wait for those investigations will provide accurate results. Cooke et al., (2004) stated that ED physicians believe that delays in laboratory, results often in a delay of treatment and admission. Askenasi, Lheureux, and Gillet (1989) study reported that x-ray investigations add an extra 40 minutes to emergency department turnaround time, and approximately 35-50% of emergency department attendees require some form of imaging.

In this study ninety five percent (n=36) of respondents asserted that lack of inpatient beds is a major cause of ED overcrowding. Twanmoh and Cunningham (2006) also reported lack of inpatient capacity as the most commonly blamed cause of overcrowding. Lewin, cited in Shactman (2002) stated that ED personnel frequently report that the chief reason for ED overcrowding is the lack of availability of inpatient beds. According to the United States General Accounting Office (2003) the factor, most commonly associated with crowding, is the inability to transfer emergency patients to inpatient beds once decisions had been made to admit them as hospital patients, rather than to release them after treatment.

Fifty eight percent of respondent perceived that poor management of inpatient beds was not a cause of overcrowding. One can read these results and state that poor management of inpatient beds was rated lower because the major concern is the lack of inpatient beds. Further investigations are needed to evaluate the quality of inpatient bed management.

5.5 Outcomes of ED/CHUK Overcrowding

In this particular study, 92% of respondents perceived that admitted patients are boarding in ED for long periods and this result in an overcrowded ED. This result appears higher than that reported by Pines and Kelly (2008) in a survey conducted in Canada where 81% of emergency directors reported that admitted patients are boarded for long periods in ED. According to Schafermeyer and Asplin (2003), inpatient boarding is the most frequently cited reason for emergency department crowding within the emergency medicine community. Inadequate inpatient capacity for a patient population with increasing severity of illness forces the ED to serve as a holding area for admitted patients. However, boarding in the ED is not only reported to be a barrier to specialised inpatient care, but it also has been identified as a potential high-risk environment for medical errors (Gordon, Billings, Asplin and Rhodes, cited in Trzeciak and Rivers, 2003)

According to these authors, critically ill patients boarding in the ED are physically separated from the watchful eye of the intensivists who are ultimately responsible for their care. All of these factors could potentially lead to delays in recognising the deterioration in a patient's condition and in initiating critical interventions, and may

detract from optimal patient care. The term “boarding” refers to patients who are admitted to the hospital but who remain in the ED, sometimes for more than 24 hours, because of the lack of available beds (Trzeciak and Rivers, 2003)

Seventy nine percent (n=30) of the respondents in this study asserted that increased stress among nurses is a major outcome of ED overcrowding. This finding is supported by Kondro’s (2006) study that revealed that overcrowding has a major impact on the stress levels of nurses. He asserted that stress, caused by overcrowding, is lower among physicians (65%) than nurses (82%). Similarly, findings from this study showed that stress among nurses was high (79%) compared to that of physicians (60%). According to Corley, cited in Kilcoyne and Dowling (2007) when the professional goals of nurses are hindered, they suffer moral distress. Moreover, Rodney and Strazomski, cited in Kilcoyne and Dowling (2007) contend that unresolved moral conflicts can lead to a reduction in quality of care and create burnout, with caregivers leaving their jobs.

Risk of poor outcome was considered as a major outcome of overcrowding by 60% of respondent. Similarly Derlet and Richards (2000) founded that ED overcrowding has an impact of poor patient outcomes. Supporting these views, Pines and Kelly (2008) reported that 77% of Canadian ED medical directors asserted that the quality of care suffers due to overcrowding. Richardson (2006) also documented that it has been shown internationally that where a patient is detained in the ED, clinical outcomes are adversely affected. This relates to the reality that EDs cannot adequately fulfill both their primary

function and also function as an inpatient ward. As a result, both functions are performed sub-optimally with consequent predictable adverse effects on patient outcome.

In this study, patients leaving without being seen by a physician was reported by most respondents 47% (n=18) as a minor outcome of overcrowding and only 11% (n=4) reported this as a major outcome. However, in the actual context of Rwanda, patients are limited in their choice, because of insufficient health facilities, expensive private clinics and lack of capacity in most of health care setting, qualified and specialized personnel, and lack of equipments. These factors may explain why only few patients are leaving without being seen. Indeed, even if this outcome seems to be minor, it deserves careful attention because of its potential negative impact on patients and the hospitals reputation. Rowe, Channan, Bullard, Blitz, Saunders, Rosychuk (2006) study revealed that 44.8%.of patients were leaving without being seen in Canadian emergency departments, because of long waiting times and documented that even though complications occurred rarely; "high-risk" patients, who leave without being seen, do experience adverse health outcomes. Similarly Monzon, Friedman, Clarke, and Arenovich (2005) reported that patients who leave without being seen are generally low acuity, but they are at risk of important and avoidable adverse outcomes.

Fifty eight percent (n=22) of respondent in this study asserted that staff dissatisfaction is a major outcome of ED overcrowding. However the rate of perception is low compared to the Canadian's medical directors at 98% (Pines and Kelly, 2008). Hoot, Nathan and

Aronsky (2008) also reported a widespread frustration and dissatisfaction among both patients and providers in California Emergency departments because of overcrowding.

Forty seven percent (n=18) of respondent thought that poor quality in teaching and research was a major outcome of ED overcrowding. CHUK, as a teaching hospital has all its departments, including ED, used to place students for learning purposes, however the learning environment in the context of ED/CHUK is not conducive because of the large number of patients to be seen and limited space in this particular department. Experience has shown that most of the time CHUK/ED staff is busy looking after patients, which means that they don't have enough time for dealing with students and research. These findings were supported by Kelly et al., (2007) study which documented that academic emergency physicians expressed concern that increased clinical workload and overcrowding adversely affects clinical teaching. According to Berger, Ander, Terrell and Berle (2004) many emergency attending physicians perceive patient care responsibilities to be too time consuming to allow them to be good teachers.

In this study 26% (n=10) of respondent asserted that a delay in pain relief and improving physical, emotional, and mental well being was a major outcome of ED overcrowding. The same concern was observed by 54% of Canadian emergency medical directors, suggesting that delays for improving patients' physical, emotional, and mental well-being was not observed in Canadian ED due to overcrowding. Derlet and Richards (2000) also documented that patient's pain and suffering are unnecessarily prolonged because the emergency department staff are too busy to attend to them.

In this study 34% (n=14) of respondents asserted that actual poor patient outcome was a major impact of ED overcrowding. This finding is supported by Derlet, Richards, and Kravitz. (2001) study which reported that few patients experienced actual poor outcomes as a result of overcrowding in the United States emergency departments.

The result of this study showed that an increased cost of care was considered by 34% of the respondents as a major impact of ED overcrowding. However, literature has shown that the greater a patients wait in the ED, the more increased chance of adverse outcomes.

In this particular study 60% (n=23) of the respondents observed that violence occurred mainly in ED/CHUK because of overcrowding. Similarly, Carmi-Iluz Peleg, Freud and Shvartzman (2005) has documented that in the United States, the rate of violence was even higher between the years 1980–1990, 106 healthcare workers died as a result of violence: 27 pharmacists, 26 physicians, and 53 nurses (Goodman, cited in Carmi-Iluz et al., 2005). Another survey of 170 university hospitals in the US showed that 57% of all emergency room employees had been threatened by weapons over the five-year period prior to the survey (Carmi-Iluz et al., 2005).

In another study conducted by Derazon, cited in Carmi-Iluz et al., (2005), revealed that 70% of physicians and 90% of the support staff working in a hospital emergency room in Israel reported violent acts, mostly verbal abuse. The main reasons for these outbursts were long waiting times and dissatisfaction with treatment. A study by Derlet and

Richards (2000) listed eight effects of Emergency Department Crowding, including violence. A systematic review of violence, in emergency departments, demonstrated the association between increased violence against staff and longer waiting times (Stirling et al., 2001).

In this study 58% (n=22) of the respondents perceived that the patients waiting time increased as an outcome of ED overcrowding. In line with this finding, the Canadian Institute for Health Information (2007) analysis of bed wait times in 2005, across a sample of Canadian hospitals, documented that 4% of patients waited over 24 hours in the ED for an acute care bed, once the decision to admit had been made. Similarly Pines, Hollander and Localio (2006) revealed that the Centers for Disease Control and Prevention founded that for patients judged by the triage nurse to be critical; more than 10% waited more than an hour to be seen by a physician in the emergency department.

The report from the American Hospital Association (Lewin Group, 2002) indicated that the average waiting time for an inpatient, acute or critical care bed, in US EDs is more than 3 hours, but the average waiting time nearly doubles (5.8 hours) in hospitals that consistently have ED overcrowding. Wullink et al., (2007) study revealed that long waiting times for emergency operations increase a patient's risk of postoperative complications and morbidity. They suggested that reserving Operating Room (OR) capacity is a common technique to maximize the responsiveness of an OR in case of arrival of an emergency patient.

5.6 Conclusion:

ED overcrowding is a complex problem that has multiple causes and multiple adverse outcomes and multiple solutions are required. Due to this complexity, all stakeholders need to provide their input in order to improve overcrowding in ED and in the entire hospital.

5.7 Recommendations

Reducing overcrowding in ED/CHUK would be the highest priority of CHUK managers and other stakeholders so as to raise standards of patients care. .

According to Schneider, Zwemer, Doniger, Dick, Czapranski, and Davis (2001) better management of inpatient resources has been shown to be among the most effective ways in which a hospital can reduce ED overcrowding.

This author asserted that the most effective techniques to reduce overcrowding were related to organisational or process changes made external to the ED rather than within the ED. The management of inpatient flow is paramount to avoiding ED flow breakdown. Similarly findings from this particular study revealed that the main causes of ED/CHUK overcrowding were mainly outside the ED. The suggested solution by Schneider et al., (2001) would be applicable in ED/ CHUK.

1) In the context of CHUK the external process changes would consist of improving inpatient beds management; this needs an evaluation of inpatient beds management in each department so as to initiate appropriate interventions.

- 2) Improving referral system by putting a well coordinated system of communication with district hospitals so as they can call at CHUK before referring to make sure that the necessary means are available to receive and care for the patient adequately
- 3) The ministry of health would sensitise district hospitals physicians to refer patient when the case is not at the level of their competence.
- 4) ED/CHUK space must be extended so as to meet the growing demands.
- 5) The number of nurses per shift needs to be adapted to international norms in order to improve patient care.
- 6) Nurses need to be trained in ED care so as to acquire proper competence and confidence to provide quality care in a reasonable time frame.
- 7) Deeper research needs to be done in this domain so as to document more informations about ED overcrowding in CHUK and at a national level
7. Putting more emphasis in Continuous Quality Improvement strategies, can help to continuously monitoring and evaluating quality of care in ED and in the entire hospital.

References (APA Referencing 2007):

- Alban, A., Coburn, M., and May, C. (1999). Addressing the emergency nursing staffing shortage: implementing an internship using a nursing school instructor model. *Journal of Emergency Nursing*, 25, 509–513.
- American college of emergency physicians crowding resources task force (2002). Responding to emergency department crowding. *A guide book for chapters*. Accessed, August 22nd, 2008 from www.medscape.com/viewarticle/500819.
- Askenasi, R., Lheureux, P., and Gillet, J.B. (1989). Influence of tests on patient time in the emergency department. *Reanimation Soins Intensifs Medecine d'Urgence*, 5, 201-202.
- Asplin, B. R., Magid, D. J., Rhodes, K.V., Solberg, L. I., Lurie, N., and Camargo, Jr. (2003). A conceptual model of emergency department crowding. *Annals of Emergency Medicine*, 42, 173-180.
- Berger, T.J., Ander, D.S., Terrell, M.L., and Berle, D.C. (2004). The impact of the demand for clinical productivity on student teaching in academic emergency departments. *Academic Emergency Medical, Journal*, 11(12), 364-1767.
- Birkhahn, R.H., Patel, S., Jensen, G.R., Datillo, P.A., and Bove, J.J. (2007). Emergency department crowding and factors influencing patient flow. *Annals of Emergency Medicine*, 50 (3), 127.
- Bogart, V.L. (2000). Crisis in the emergency department: contributing factors and potential solutions. In hallway medicine. Toronto: Insight Press.
- Burns, N., and Grove, S.K. (2007). *Understanding Nursing Research: Building An Evidence-Based Practice*, 4th Edition, Philadelphia: Saunders.

- Burns, N., and Grove, S.K. (1999), *Understanding Nursing Research: Building an Evidence-Based Practice*, 2th Edition, Philadelphia: Saunders.
- Bradley, V. (2005). Placing emergency department crowding on the decision agenda. *Journal of Emergency Nursing*, 31(3), 247 – 258.
- Brewster, L. R., Rudell, L., and Lesser, C. S. (2001). Emergency room diversions: A symptom of hospitals under stress. Issue Brief Number 38. Washington, DC: Center for Studying Health System Change. Available at www.blackwell-synergy.com/doi/abs/10.1111/j.1468-0009.2006.00448.x.
- Brim, B.C. (2006). A descriptive analysis of non-urgent emergency department utilization. Electronic these. Accessed, November 22nd, 2008 from <http://hdl.handle.net/2376/461>.
- Brink, H. (2006). *Fundamentals of research methodology for health care professionals*, 2nd Edition, Cape Town: Juta.
- Bywaters, P., and McLeod, E. (2003). ‘Social care’s impact on emergency medicine: A model to test’. *Emergency Medicine Journal*, 20, 134-137.
- Canadian institute for health information. (2007). Understanding emergency department Wait Times: Access to Inpatient Beds and Patient Flow. Ottawa.
- Canadian association of emergency physicians (CAEP) (2008). Position statement on emergency department overcrowding. Accessed, November 21st, 2008 from http://www.caep.ca/CMS/get_file.asp?id=c3a68d63aa5c462e9689c17175f7c6ba&ext=.pdf&name=CAEP_ED_Overcrowding.pdf.
- Canadian Association of Emergency Physicians (2007) Position Statement on Emergency Department overcrowding. Accessed, October 1st, 2008 from

<http://www.google.co.za/search?hl=en&q=Position+Statement+on+Emergency+Department+Overcrowding&btnG=Google+Search&meta=>

Canadian Physician hospital care committee Report (2006). Improving access to emergency care: Addressing system Issues. Report of the Physician Hospital Care Committee a tripartite Committee of the Ontario Medical association and the Ontario Ministry of Health and long-term Care. Accessed, November 22nd, 2008, from http://www.health.gov.on.ca/english/public/pub/ministry_reports/improving_access/improving_access.pdf.

Canadian association of emergency physicians (2005). Taking action on the issue of overcrowding in Canada's emergency departments. Accessed, May 16th, 2008 from <http://www.waittimealliance.ca/waittimes/CAEP.pdf>.

Carbana, V.D, Hurn, P.D., Mason, P., Scanlon. A.M., and Veise-Berry, S.W. (1998). *Trauma Nursing: From resuscitation through rehabilitation*. 2nd Edition, WB Saunders Company London.

Carmi-Iluz, T <http://www.biomedcentral.com/logon/logon.asp?msg=ce>., Peleg, R., Freud, T., and Shvartzman, P. (2005). Verbal and physical violence towards hospital- and community-based physicians in the Negev: An observational study. *Health Services Research*, 5, 54.

Cooke, M., Fisher, J., Dale, J., McLeod, E., Szczepura, A., and Walley, P. (2004). Report to the national coordinating centre for national health service. Service delivery and organization (NCCSDO). Accessed, April 25th, 2008 from <http://www.lshtm.ac.uk/hsru/sdo/files/project/29-final-report.pdf>.

Cooke, M.W., Higgins, J., and Kidd, P. (2003). Use of emergency observation and assessment wards: a systematic literature review. *Emergency Medicine Journal*, 20 (2), 138-142.

- Coleman, P, Irons, R., and Nicholl, J. (2001). 'Will alternative immediate care services reduce demands for non urgent treatment at accident and emergency? *Emergency Medical Jjournal*, 18, 482-487.
- Cowan, R.M., and Trzeciak, S. (2005). Clinical review: emergency department overcrowding and the potential impact on the critically ill. *Critical Care*, 9(3), 291-295.
- Chalfin, D.B., Trzeciak, S., and Likourezos, A. (2007). Impact of delayed transfer of critically ill patients from the emergency department to the intensive care unit. *Critical Care Medicime*, 35(6), 1477-1483.
- Cherry, D. K., Burt, W., and Woodwell, D.A. (2001). "National Ambulatory Medical Care. Survey: 1999 Summary" Accessed at www.cdc.gov/papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID700921_code337399.pdf?abstractid=700921&mirid=1.
- Chung (2005) Emergency department overcrowding Hong Kong. *Journal of Emergency medicine*. 2(3), 11-14.
- Definition of Emergency department (2008). Accessed, May 20th, 2008, from <http://www.medterms.com/script/main/art.asp?articlekey=12156> .
- DeLia, D. (2007). Hospital Capacity, Patient Flow, and Emergency Department Use in New Jersey. New Brunswick: *Rutgers Center for State Health Policy*. Accessed, September 14th 2008 from <http://www.cshp.rutgers.edu/Downloads/7670.pdf> .
- Derlet, W. R., and Richards, R. J. (2008). Ten Solutions for Emergency Department Crowding. *Western Journal of Emergency Medicine*, 9(1), 6.
- Derlet , R.W. (2000). Overcrowding in emergency departments: Effects on Patients. *Western Journal of Emergency Medicine*, 1(1), 4.

- Derlet, R.W., and Richards, J.R. (2002). Emergency overcrowding in Florida, New York, and Texas, *Southern Medical Journal*, 95(8), 846-849.
- Derlet, R. W., Richards, R., and Kravitz, R. (2001). Frequent overcrowding in United States emergency departments. *Academy of emergency medicine*, 8(74), 1019-1021.
- Derlet, R.W., and Richards, J.R. (2000). Overcrowding in the nation's emergency departments: complex causes and disturbing effects. *Annals of Emergency Medicine*, 35, 63-68.
- Duic, M. (2005). Bed allocation, special units and other strategies for managing overflow and wait times. 4th Edition, Canada, Toronto.
- Estey, A., Ness, K., Saunders, D., Alibhai, A., and Bear, R.A. (2003). Understanding the causes of overcrowding in emergency departments in the capital health region in Alberta focus group study. *Canadian Journal of Emergency Medicine*, 5, 87-94.
- Fatovich, Nagree, Y., and Sprivulis, P. (2005) Access block causes emergency department crowding and ambulance diversion in Perth, Western Australia. *Emergency Medical Journal*, 22(5), 351-354.
- Fatovich, D.M., and Hirsch, R.L. (2003). Entry Overload, Emergency Department overcrowding, and Ambulance Bypass. *Emergency medicine journal*, 20 (5), 406-409.
- Feras, M., Ya'ish, Rana, R. Bitar and Howard M. (2007). Streamlining GP referrals to the emergency department: Optimizing Patient Care Pathways. Accessed, September 25th, 2008 from www.ispub.com/ostia/index.php?xmlFilePath=journals/ijeicm/vol10n2/gp.xml - 28k.
- Gillespie, M., and Melby, V. (2003). Burnout among nursing staff in accident and emergency and acute medicine: A comparative study. *Journal of Clinical Nursing*, 12(6), 842 – 851.

- Greene, J. (2007). Emergency department flow and the boarded patient: how to get admitted patients upstairs." *Annals of Emergency Medicine*, 49 (1), 68-70.
- Han, J.H., Zhou, C., and France, D.J. (2007). The effect of emergency department expansion on emergency department overcrowding. *Annals of Emergency Medicine*, 14(4), 338-343.
- Hoot., Nathan, R., and Aronsky, D. (2008). Systematic review of emergency department crowding: causes, effects, and solutions. *Annals of Emergency Medicine*, 52(2), 126–136.
- Howard, P. K. (2005). Hospital overcrowding: An emergency department challenge. *Business Briefing: Emergency Medicine Review*, 19-20. Available at [www.touchbriefings.com/cdps/cditem.cfm?NID=1334 - 102k](http://www.touchbriefings.com/cdps/cditem.cfm?NID=1334-102k).
- Jones, S.S., Allen., T.L., Flottemesch., T.J., and Welch, S.J. (2007). An independent evaluation of four quantitative emergency department crowding scales. *Academic Emergency Medicine* 13 (11), 1204 – 1211.
- Kelly, S.P., Shapiro, N., Woodruff, M., Corrigan, K., Sanchez, L.D., and Wolfe (2007). The effects of clinical workload on teaching in the emergency department. *Academic Emergency Medicine*, 14(6), 526-531.
- Kilcoyne, M., and Dowling, M. (2007). Working in an overcrowded accident and emergency department: nurses' narratives. *Australian Journal of Advanced Nursing*, available at http://findarticles.com/p/articles/mi_m1AID/is_2_25/ai_n25017572/pg_5.
- Kondro, W. (2006) No simple solutions to emergency log-jam. *Canadian Medical Association Journal*. 175 (1), 20.
- Kossovsky, M.P., Chopard, P., Filippo and Bolla (2002). Evaluation of quality improvement interventions to reduce inappropriate hospital use: *International Journal for Quality in Health Care* 14(3), 227-232.

- Knapp, J.F., Bojko, T., Dolan, M.A., Frush, K.S., Ronald, A., and Furnival, R.A. (2004) overcrowding crisis in our nation's emergency departments: Is our safety net unraveling? *pediatrics*, 114(3), 878-888.
- Lambe, Susan., Donna, L., Washington., Fink., A. and Laouri, M. (2003). Waiting times in California emergency departments. *Annals of Emergency Medicine*, 41(1), 35–43.
- Lavelly, R. (2002). Emergency medicine: managing the emergency department: managing patient flow. Emedicine: instant access to the minds of medicine. Accessed on 2nd October 2008 <http://www.google.co.za/search?hl=en&q=Lavelly+R.+Emergency+Medicine%3A+Managing+the+Emergency+Department%3A&btnG=Search&meta=>.
- Lewin Group (2002). Emergency department overload: A growing crisis. Chicago, IL: American Hospital Association. Accessed, May 16th, 2008, from <http://www.aha.org/ahapolicyforum/reports/index.html>.
- Liew, D., and Kennedy, M.P. (2003). Emergency department length of stay independently predicts excess inpatient length of stay. *Medical Journal*, 179(10), 524-526.
- Malone, R.E. (2003). Nurse staffing ratios: Progressive policy changes. *Journal of Emergency Nursing*, 29(2), 180-182.
- Maryland Health Care Commission and Health Services Cost Review Commission (2003). Trends in Maryland hospital emergency department utilization: an analysis of issues and recommended strategies to address crowding. *Academic Emergency Medical*, 8,1024–1029.
- Monzon, J., Friedman, S.M., Clarke. C., and Arenovich, T. (2005). Patients who leave the emergency department without being seen by a physician: a control-matched study. *Canadian Journal of Emergency Medicine*. 7(2), 107-13.

- Musango, L., Butera, J. D., Inyarubuga, H., and Dujardin, B. (2006). Rwanda's health system and sickness insurance schemes. *International Social Security Review*, 59(1), 93–103.
- Nsereko, E. (2007). Injury profile in a casualty unit of (CHUK) in Rwanda. Unpublished thesis.
- Parkhe, M., Myles, P.S., Leach, D.S., and Maclean, A.V. (2002). Outcome of emergency department patients with delayed admission to an intensive care unit. *Department of Emergency Medicine, Australia*, 14(1), 50-57.
- Pines, J.M., Hollander, J.E., and Localio, A.R. (2006). The association between emergency department crowding and hospital performance on antibiotic timing for pneumonia and percutaneous intervention for myocardial infarction. *Academic Emergency Medicine*, 13(8), 873-878.
- Pines, J.M. and Hollander, J.E. (2007). Association between cardiovascular complications and ED crowding. American college of emergency physicians. Scientific Assembly, Seattle, WA. Accessed, November 27th, 2008, from www.medscape.com/viewarticle/564333.
- Pines, J.M., and Kelly, J.J. (2008). Emergency Department Crowding in the Commonwealth of Pennsylvania University of Pennsylvania, Philadelphia, PA. *Annals of Emergency Medicine. Journal of the American College of Physicians*, 52(6), available at <http://www2.us.elsevierhealth.com/inst/serve?action=searchDB&searchDBfor=home&id=em>.
- Polit, D.F., and Beck, C.T. (2008). *Nursing research: generating and assessing evidence for nursing practice*. 8th Edition, Philadelphia: Wolters Kluwer. Lippincott Williams and Wilkins.
- Polit, D.F., and Beck, C.T. (2004). *Nursing Research: Principals and Methods* 7th edition. Philadelphia: Lippincott Williams & Wilkins.

Quan, K. (2008). What is a Nurse? Accessed, May 20th, 2008, from http://healthfieldmedicare.suite101.com/article.cfm/what_is_a_nurse.

Richards, J., Navarro, M., and Derlet, R. (2000). Survey of Directors of emergency departments: complex causes and disturbing effects, Ann emergency departments in California on overcrowding *West Journal of Medecine*, 172 (6), 385-388

Richardson, D.B. (2006). Increase in patient mortality at 10 days associated with emergency department overcrowding. *Medical Journal*, 184 (5), 213-206.

Richardson, D.B. (2001). Association of access block with decreased ED performance, *Academic Emergency Medicine* 8, 575-576.

Richardson, D.B. (2006). Increase in patient mortality at 10 days associated with emergency department overcrowding. *Medical journal Australia*, 184(5), 213-216.

Rondeau, K.V., and Francescutti, L.H. (2005). Emergency Department Overcrowding: The Impact of Resource Scarcity on Physician Job Satisfaction. *Journal of healthcare management*, 50 (5), 327-340.

Rowe, B.H., Channan, P., Bullard, M., Blitz, S., Saunders., L.D., and Rosychuk, R.J. (2006) Characteristics of patients who leave emergency departments without being seen. *Academic Emergency Medicine*. 13(8), 848-52.

Rowe, B., Bond, K., Ospina, M., Blitz, S., Afilalo, M., Campbell, S., and Schull, M. (2008) Frequency, determinants, and impact of overcrowding in emergency departments in Canada: a national survey of emergency department directors. Accessed, November 27th, 2008, from <http://caep.ca/template.asp?id=5A4C6127F8DC4AB0BE7615EFA8317B15>.

Rwanda's Health Sector Policy (2005). Rwanda / Kigali. Government Printers

Rwanda National Population and housing (2002). Rwanda / Kigali: Government Printers.

Ryan, D., and Maguire, J. (2006). Aggression and violence – a problem in Irish Accident and Emergency departments? Irish association for emergency medicine, position paper on overcrowding. *Journal of Nursing management*, 14(2), 106-115.

Sammy, A. (2003), Emergency department overcrowding: A universal problem. Accessed, March 23rd, 2008 from <http://emj.bmj.com/cgi/eletters/20/5/400>.

Schafermeyer, R. W., and Asplin, B. R. (2003). Hospital and emergency department crowding in the United States. *Emergency Medicine*, 15(1), 22-27.

Schull, M., and Cooke, M. (2008). Emergency Department Overcrowding. BLBK064-Rowe 0:56 Evidence-based Emergency Medicine. Accessed, November 27th, 2008, from http://www.canadianprioritysetting.ca/html/documents/cc_bmj%20_ch08.pdf.

Schull, M.J., Lazier, K., and Vermeulen, M. (2003). Emergency department contributors to ambulance diversion: A quantitative analysis, *Annals of Emergency medicine*. 41, 467-476

Schull, M.J., Morrison, L.J., Vermeulen, M., & Redelmeier, D.A. (2003). Emergency department overcrowding and ambulance transport delays for patients with chest pain. *Canadian Medical Association Journal*, 168(3), 277-283

Schneider, S., Zwemer, F., Doniger, A., Dick, R., Czapranski, T., and Davis, E. (2001). 'Rochester, New York: A decade of emergency department overcrowding'. *Academic Emergency Medicine*, 8 (11), 1056-1063.

Schrivver, J.A., Talmadge, R., Chuong, R., and Hedges, J. R. (2003). Emergency nursing Historical, current, and future roles. *Journal of Emergency Nursing*, 29(5), 431-439.

- Shactman, D., and Altman, S.H. (2002). Utilization and overcrowding of hospital emergency departments. Available at www.ahrq.gov/qual/nhdr04/fullreport/Ch2Ref.htm - 16k -
- Slater, R.R. (2008). Triage Nurse in the Emergency Department. *The American Journal of Nursing*, 70(1), 127-129.
- Spetz, J., Seago, J., Coffman, J., Rosenoff, E., and O'Neil, E. (2000). Minimum nurse staffing ratios in California acute care hospitals. Oakland, CA: California Health Care Foundation. *Journal of Nursing Administration*, 30(6), 309-15.
- Sprivulis, P.C., Da Silva, J.A., Jacobs, I.G., Frazer, A.R., and Jelinek, G.A. (2006). The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments. *Medical Journal of Australia*, 184(5), 208-212.
- Stirling, G., Higgins, J., and Cooke, M.W. (2001). 'Violence in A&E departments: A systematic review of the literature'. *Accident and Emergency Nursing*, 9(28), 77-85.
- Taylor, J. (2006). "Don't Bring Me Your Tired, Your Poor: The Crowded State of America's Emergency Departments," National Health Policy Forum, Issue Brief Number. 811, George Washington University, Washington D.C. Available at www.nhpf.org/pdfs_ib/IB811_EDCcrowding_07-07-06.pdf -
- Trout, A., Magnusson, A.R., and Hedges, J.R. (2000). Patient satisfaction investigations and the emergency department'. *Academic Emergency Medicine*, 7, 695-709.
- Trzeciak, S., and Rivers, E.P. (2003). Safety net research in emergency medicine: proceedings of the academic emergency medicine consensus conference on 'The Unraveling Safety Net'. *Emergency Medicine Journal*, 20(5), 402-405.

- Twanmoh, J.R., and Cunningham, G. P. (2006). When Overcrowding Paralyzes an Emergency Department: Changing the process and mindset of health care professionals was the key to reducing emergency department overcrowding. Accessed, August 15th, 2008 from http://www.managedcaremag.com/archives/0606/0606.peer_ER.pdf.
- United States General Accounting Office (2003). *Hospital emergency departments: Overcrowded conditions vary among hospitals and communities*. A United States government report prepared in order to provide national data on issues of emergency department overcrowding. Number GAO-03-460, 1-71. Available at <http://www.ihl.org/IHI/Topics/Flow/PatientFlow/Literature/HospitalEmergencyDepartmentsCrowdedconditionsvaryamonghospitalsandcommunities.htm>.
- Velianoff, G. (2002). Overcrowding and diversions in the emergency department: The health care safety net unravels. In Holleran, R. (Ed.) *Nursing clinics of North America: Emergency nursing*. Philadelphia: Saunders.
- Vicellio, P., Schneider, M.S., and Asplin (2008). Emergency Department Crowding: High-Impact Solutions. Accessed, November 27th, 2008, from www.amedeo.com/medicine/emg/academm.htm.
- Weinick, R., Billings, J., and Burstin, H. (2007). What is the role of primary care in emergency department overcrowding. Accessed, September 10th, 2008, from ccpa.binghamton.edu/academics/mpa/pdfs/Melissa%20Pantano.pdf.
- Weinick, R., Billings J., and Burstin, H. (2002). What is the role of primary care in emergency department overcrowding? Accessed, August 10th, 2008 from <http://council.brandeis.edu/pubs/WeinickED.pdf>.
- Weiss, S.J., Derlet, R., Arndahl, J., Amy, A., Ernst, A.A., Richards, J. (2004). Estimating The Degree Of Emergency Department Overcrowding In Academic Medical Centers. *Academic Emergency Medicine*, 11(1), 38-50.

- Weiss, S.J., Ernst, A.A., and Nick, T.G. (2005). Relationship between the National ED overcrowding scale and the number of patients who leave without being seen in an academic ED. *American Journal of Emergency Medicine*, 23, 288-294.
- Weissman, J.S., Rothschild, J.M., Bendavid, E., Sprivulis, P., Cook, E.F., and Evans, R.S. (2007). Hospital workload and adverse events. *Medical Care*, 45(5), 448-455.
- Wullink, G., Houdenhoven, M.V., Hans, E.W., van Oostrum, J.M., van der Lans, M., and Kazemier, G. (2007). Closing emergency operating rooms improves efficiency *Journal of Medicine* 31(6), 543-6.
- Zun, (2001). Scheduling and Coverage in Emergency Medicine: Managing the Emergency Department Medicine. Accessed, August 30th, 2008 from mhcc.maryland.gov/health_care_expenditures/extramural/emergdept.pdf -

APPENDIX A

Questionnaires: English Version

Demographic data:

1. Please indicate your age.....

2. Please indicate the length of your working experience in the ED

.....

3. Please indicate your category

1. Enrolled Nurse (A₂) 2. Advanced Diploma Nurse (A₁)

Section 1

1.1 Definitions of ED Overcrowding

When do you consider the ED overcrowded? Tick (v) all that apply, and complete the description where necessary. 1. When demand for emergency services exceeds the ability to provide care in a reasonable amount of time, where “reasonable” means patients wait more than.....(Please complete) minutes to see a physician.

2. All ED beds are filled more than (please fill in) hours/day

3. Patients are placed in hallways more than (please complete) hours/day

4. Waiting room is filled more than..... (please complete) hours/day

Please list other definitions of overcrowding that you might use.....

.....

.....

Section 2

2.1 Triggers of overcrowding

Please rate each of the following causes of overcrowding on the scale provided. Check (v) the option that applies best.

Items	Responses			
	Not a cause	Minor cause	Major cause	Don't know
5. Lack of admitting beds in the wards				
6. Insufficient acute-care beds in ED				
7. Lack of access to primary care,				
8. Lack of specialist physicians at community level				
9. Expensive private clinics				
10. Shortage of emergency physicians on shift				
11. Shortage of emergency nurses on shift				
12. Increased complexity and acuity of cases				
13. Large volumes of patients with no-urgent problems.				
14. Social cases with no urgent condition				
15. All trauma case come in ED regardless of gravity				
16. Radiology delays				
17. Laboratory delays				
18. Delays in completion of consultations				
19. Length of stay of admitted patients in ED				
20. Space limitations in ED				
21. Occupancy rate of ED stretchers				
22. Occupancy rate of ED floor				
23. Excessive time before being seen by generalist Physician				
24. Excessive time before being seen by specialist Physician				
24. Triage nurse too busy				

25. Poor inpatient beds management				
26. Poor culture of priority to ED in hospital				
27. Slow practice patterns of ED physicians				
28. Excessive non-urgent investigations				
29. Inappropriate referral of social cases to ED.				
30. Inappropriate referral of chronic cases to ED				

2.2 please choose the most important triggers and indicate how they contribute to overcrowding in ED/CHUK

.....

.....

Section 3

3.1 Impact of Overcrowding

Please rate the following ways in which overcrowding might have affected your ED on the scale provided. Check

(v) the option that applies best.

Items	Responses			
	No impact	Minor impact	Major impact	Don't know
31. Increased stress among physicians				
32. Physician recruitment and retention				
33. Increased stress among nurses				
34. Nurse recruitment and retention				
35. Increased medical errors				
36. Increased nurses error Errors				
37. Increased patients wait times				
38. Patient leave ED before being seen by physician				
39. Delay in patient pain relief				
40. Delay in improving physical, emotional, and mental well-being of Patient				

41. Provider staff dissatisfaction				
42. Negative impact on teaching, learning and research				
43. Increased cost of care				
44. Violence between patients, family and staff in ED				
45. Boarding patients in ED while waiting for inpatient beds				
46. Risk of poor outcomes				
47. Actual poor outcomes				
48. Friction between disciplines undermining "team" approach to health care				

If other (Please specify).

.....

Section 4

Interventions to Reduce or Control Overcrowding

4.1. Were some interventions implemented to alleviate ED overcrowding? Yes No

4.2 Were any of those interventions successful? Yes No

4.3 Please describe those interventions that were successful at the time they were implemented. Please note if your ED established a standard or benchmark for any of the interventions (e.g., a maximum wait time of one hour for any patient in the waiting room). If possible, record when the intervention was implemented, and whether the intervention is still effective.

Intervention	When Implemented?	Still in use?
	MM/YYYY	
4.3.1.....	Yes <input type="checkbox"/> No <input type="checkbox"/>
4.3.2.....	MM/YYYY	Yes <input type="checkbox"/> No <input type="checkbox"/>

MM/YYYY

4.3.3..... Yes No

MM/YYYY

4.3.4..... Yes No

4.4 Please describe those interventions that were implemented, but were ineffective in reducing overcrowding in your ED.....

.....
.....

4.5 Please use the space below to suggest others interventions that may be possible solutions to alleviate overcrowding in ED CHUK.

.....
.....

Tank You for participation

APPENDIS B

Questionnaires : version française

Donnes démographique

1. Veuillez indiquer votre âge.....

2. Veuillez indiquer la durée que vous venez de faire dans le service des urgences.
.....

3. Veuillez indiquer votre qualification

1. Infirmier (es) (A₂) 2. Infirmier(es) (A₁)

Section 1

1.1 Définitions de l'encombrement du département d'urgence

Quand considérez-vous que le département d'urgence est encombre ? Cochez toutes les réponses qui s'appliquent et décrivez lorsque nécessaire.

1. Lorsque la demande de services d'urgence dépasse la capacité a prodiguer des soins dans un temps raisonnable, ``raisonnable'' signifie que les patients attendent plus de.....(veuillez compléter) minutes avant de voir un médecin

2. Tous les lits prévus sont occupés pendant plus de.....heures/jour

3. Les patients sont placés dans les corridors pendant plus deheures/jour

4. La salle d'attente est remplie pendant plus deminutes/heures

Veuillez ajouter toute autre définition d'encombrement que vous utilisez

.....

Section 2 Causes de l'encombrement

2.1 Veuillez classer chacune des causes d'encombrement suivantes sur l'échelle. Cochez (v) l'option la plus appropriée.

	Response			
	pas une cause	cause miner	cause majeure	Ne connais pas
5. Insuffisance de lits pour les patients admis au service d'urgence				
6. Manque des lits dans les services d'hospitalisation				
7. Manque d'accès aux soins primaire				
8. Manque des médecins dans les centres de santé				
9. Soins coûteux dans les cliniques prive				
10. Nombre de médecin insuffisant par shift				
11. Nombre d'infirmiers insuffisant par shift				
12. Complexité et sévérité de l'état du patient				
13. Grand nombre de patients avec des problèmes non urgents qui pourraient être soigné dans les centre de sante ou hôpitaux de district				
14. Cas sociaux (non urgent)				
15. Tout les accidentes même les non urgents viennent au CHUK/ED				
16. Retard des examens radiologique				
17. Retard des examens de Laboratoire				
18. Retard pour compléter les consultations				
19. Long séjour par les patients admis aux urgences				
20. Espace limite au service des urgences				
21. Taux d'occupation des brancards				
22. Taux d'occupation du pavement				
23. Excessif temps avant d'être examiner par le médecin généraliste				

24. Excessif temps avant d'être examiner par le médecin spécialiste				
25. Infirmier à la réception très occupé				
26. Gestion des lits insuffisant en hospitalisation				
27. Philosophie de hôpital ne prioritisant pas le service d'urgence				
28. Forme de pratique lente des médecins de l'urgence				
29. Nombre excessif d'investigations non urgentes				
30. Référence incorrecte des cas chronique au service des urgences				

2.2 veuillez indiquer les causes les plus responsables de l'encombrement et justifier comment ils contribuent a l'encombrement du service D'urgence /CHUK

.....

.....

.....

Section 3

3.1 les repercussions de l'encombrement

Veuillez indiquer sur l'échelle suivante l'impact e l'encombrement sur votre service d'urgence. Cochez avec (v) l'option la plus adéquate pour chacune des cas.

Item	Response			
	Pas d'impact	impact Miner	impact majeure	Ne connais pas
31. Augmentation du niveau de stress chez les médecins				
32. Augmentation du niveau de stress chez les infirmiers				
33. Recrutement et rétention de médecins				
34. Recrutement et rétention des infirmiers				
35. Augmentation du nombre d'erreurs médical				

36. Augmentation du nombre d'erreurs infirmier				
37. Temps d'attente des patients augmente				
38. Patients qui quittent les urgences avant d'être vu par le médecin				
39. Retard pour soulager les douleurs des patients				
40. Retard avant l'amélioration du bien-être physique, émotif et mental du patient.				
41. Provoque l'insatisfaction chez le personnel soignant				
42. Impact négative sur l'enseignement et la recherche				
43. Augmentation des coûts des soins de santé				
44. Violence et confrontation entre patients, famille et personnel d'urgence				
45. Patients internes aux en attente d'un lit d'hôpital				
46. Risque d'effets indésirables pour les patients				
47. Présence d'effets indésirables pour les patients				
48. Friction entre disciplines (contre esprit d'équipe)				

Autres (veuillez spécifier

.....

.....

.....

.....

.....

Section 4

Interventions Faites pour diminuer l'encombrement

4.1 Avez-vous déjà implante des interventions afin d'alléger l'encombrement? Oui Non

4.2 Ces interventions ont-elles bien réussi? Oui Non

4.3 Veuillez décrire les interventions qui ont bien réussi au moment de leur implantation. Veuillez indiquer si votre service des urgences a établi des critères ou des standards pour ces interventions (ex. un temps maximal d'attente d'une heure pour tout patient dans la salle d'attente). Si possible, veuillez aussi inscrire la date de l'implantation de l'intervention et si cette intervention est encore effective au moment présent.

Interventions	date d'implantation	Encore effective?	
4.3.1.....	MM/YYYY	Oui <input type="checkbox"/>	Non <input type="checkbox"/>
4.3.2.....	MM/YYYY	Oui <input type="checkbox"/>	Non <input type="checkbox"/>
4.3.3.....	MM/YYYY	Oui <input type="checkbox"/>	Non <input type="checkbox"/>
4.3.4.....	MM/YYYY	Oui <input type="checkbox"/>	Non <input type="checkbox"/>

4.4 Veuillez décrire les interventions implantées mais qui se sont avérées inefficaces dans la réduction de l'encombrement de votre service d'urgence.

.....

4.5 Veuillez vous servir de l'espace suivante pour suggérer les interventions possibles pouvant soulager l'encombrement dans votre service des urgences.

.....

Nous vous remercions pour votre participation.

APPENDIX C: Information document

Dear colleague,

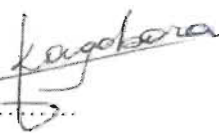
Re: Participation in a study on: exploring phenomena overcrowding in the context of CHUK emergency department in Rwanda “Nurses perspective.”

I, Kagobora Pascasie, a masters student in nursing management at the University of KwaZulu-Natal, South Africa. As part of the qualification for my program, I am required to conduct a research project in an area of interest. My area of interest is “Exploring phenomena overcrowding in the context of CHUK emergency department in Rwanda. “Nurses perspective”

This information document aim to invite you to participate in this study, by responding to the questionnaires that will take about 15min to fill. Your participation is voluntary and you are free to withdraw at any stage of the study. The purpose of this study is to explore the major causes of Emergency department overcrowding and it consequences. Hope the findings from this study will provide data for Continua’s Quality Improvement in the ED/CHUK and in the entire hospital. If you have any question you are free to ask.

Thank you

Signature.....



Kagobora Pascasie

University of Kwazulu Natal, South Africa

Student No: 203502935; Tel 0736559187

E-mail: kagoborapascasie@yahoo.fr

Supervisor: Prof. NG Mtshali

UKZN, Howard College

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mtshalin@ukzn.ac.za

APPENDIX D : Document d'information

Cher Collègues

Objet : Demande de participer dans un travail de recherche

Je m'appelle Kagobora Pascasie, je suis entrain de faire mon troisième cycle en Nursing Management à l'Université de Kwazulu-Nata en Afrique du Sud. Dans le cadre de mes études, je dois conduire un travail de recherche dont le titre est : **Exploring phenomena overcrowding in the context of CHUK Emergency Department in Rwanda: Nurses perspective.**

L'objet de ce document est de vous inviter à participer dans cette étude dans laquelle vous allez recevoir un questionnaire et le remplir pendant au moins 15 minutes, et le glisser dans une boîte prévue. Seuls les infirmiers travaillant au service des urgences seront invités à participer. Nous vous rappelons que votre participation est volontaire et que vous pouvez abandonner quand vous voudrez, si vous n'êtes pas confortable. Les informations obtenues seront gardées confidentiellement. Les questions seront codées afin que le nom du répondant ne figure pas sur les réponses. Avant et pendant l'analyse des données, les questionnaires seront gardés dans une boîte fermée que seul le chercheur pourra ouvrir. Les résultats seront publiés après l'analyse. Pour assurer la confidentialité, le nom du répondant et de l'institut ne seront pas cités.

Espérant que les résultats de cette étude pourront générer des informations qui serviront à l'amélioration de la qualité de services offert à nos clients dans le service des urgences en particulier et le CHUK en général.

Veillez agréer cher participants nos remerciements anticipés.

Signature.....

Kagobora Pascasie
University of Kwazulu Natal, South Africa
Student No: 203502935; Tel 0736559187
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Superviseur: Prof. NG Mtshali
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APPENDIX E: Consent form

Declaration

I, (Full names of participant)

By signing this document, I give my consent to participate in this study titled: Exploring phenomena overcrowding in the context of CHUK emergency department in Rwanda: “Nurses perspective.”

I have read the information document, and I understood its contents, the nature of the research project was explained clearly to me, and I was made aware that participation is voluntary. I am also aware that I can withdraw at any time of the project if I do not feel comfortable. I am informed that anonymity will be maintained.

Signature of participant:

Date:

A handwritten signature in black ink, consisting of a single, fluid, cursive stroke that starts with a small loop and ends with a short horizontal tail.

APPENDIX F : Déclaration du participant

Moi.....Je déclare avoir compris le contenu du document et la nature de ce projet de recherche et accepte de participer librement. Je sais que je suis libre de me retirer dans la participation de cette étude à n'importe quel moment.

Signature du participant

Date.....

APPENDIX G: Acceptance to collect data



PROTOCOL AUTHORIZATION

Research Title: EXPLORING PHENOMENA OVERCROWDING IN THE CONTEXT OF CHUK EMERGENCY DEPARTMENT IN RWANDA: NURSES PERSPECTIVE

Principal Investigator Address

Name : KAGOBORA Pascasie
University of Kwazulu-Natal
Tel : + 27736559187
Email : kagoborapascasie@yahoo.fr

Acceptance of Responsibility and Ethics considerations

If this application is accepted, I (we) declare that I (we) shall be actively engaged in, and shall be in day - to - day control of the project and I grant to supply in the CHUK a copy of my work after publication of my research.

Signature of principal investigator

date : 26/06/2008

KAGOBORA Pascasie

Authorization

We have the pleasure to announce to you that the research unit and the Director of CHUK analysed and considered relevant your entitled project and authorise you to conduct your study in CHUK.

Signature of chair person of CHUK research unit,
Dr. MUGANGA Narcisse

date: 30/06/08

Signature of Director of CHUK
Dr. HATEGEKIMANA Théobald

date: 26/06/08



Email : chuk.hospital@chukigali.org
Tel :00(250) 575555
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APPENDIX H: Ethical clearance



RESEARCH OFFICE (GOVAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 - 2603587
EMAIL : ximba@ukzn.ac.za

9 SEPTEMBER 2008

MS. P KAGOBORA (203502935)
NURSING

Dear Ms. Kagobora

ETHICAL CLEARANCE APPROVAL NUMBER: HSS/0389/08M

I wish to confirm that ethical clearance has been approved for the following project:

"Exploring the phenomena overcrowding in the context of Kigali University of Teaching Hospital (CHUK) Emergency Department in Rwanda"

PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years

Yours faithfully

MS. PHUMELELE XIMBA

cc: Supervisor (Prof. NG Mtshali)
cc: Mr. S Reddy