HØGSKOLEN I BERGEN

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Fracture management in Malawi: Patients´ and professionals´ experiences with skeletal traction.

"The patients are more or less like prisoners in the hospital ward."

Bruddbehandling i Malawi: Pasienters og fagfolks erfaringer med strekkbehandling.

"Pasientene er nesten som fengslet i sykehusavdelingen."

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“The Patient”

Photo: Sven Young

Woodcarving by Patrick Kaliati,
Mua Mission Art Gallery, Malawi.

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ABSTRACT

Background: Traumatic injuries represent a growing portion of the global burden of disease (GBD), implying death and disability for millions of persons. Injuries cause an unmet need for trauma care, treatment and rehabilitation, in particular in low- and middle-income countries (LMIC). This study explored patients´ and professionals´ experiences with lower limb fracture management by skeletal traction in Malawi. This method has been obsolete in high-income countries for decades, yet a substantial number of patients sustaining fractures in LMIC are still treated with skeletal traction. The method necessitates long-term immobilization in the hospital bed, in most cases between eight to twelve weeks.
Method: Data collection was performed during a ten-week-fieldwork in Malawi. Data were collected at the two largest public hospitals in the country, Queen Elizabeth Central Hospital (QECH) in Blantyre and Kamuzu Central Hospital (KCH) in Lilongwe respectively. To provide a holistic evidence base about the topic, an explorative case-study approach triangulating methods and informants was chosen. This implied participant observation, eight interviews with patients, two multidisciplinary focus group discussions, and individual interviews with two surgeons and a physiotherapist.
Findings: The study demonstrates that patients experienced physical and psychological pain and discomfort from prolonged bed rest, anxiety about future prospects, indignity and emotional distress from the ward environment and little influence on treatment and decision-making. Patients also emphasized the negative impact on guardians and families, and significant economic consequences to households due to prolonged hospital admission. The combination of long admission and cut-off of income generating activities appeared to push less resourced families further into poverty. After discharge from the hospital, informants experienced persistent disability that enforced dependency on others, unpredictable living situations and economic problems. Professionals, on their side, experienced major obstacles in providing quality treatment due to lack of trained personnel, lack of materials and equipment, and lack of specialized knowledge and skills. The outcomes of conservative skeletal traction were considered substandard to modern surgical treatment, but scarce resources allegedly provided no option. Important identified factors to improve fracture management were listed to be multidisciplinary teamwork, enhanced specialized knowledge and skills, readily available equipment, evaluating the methods used and developing standardized procedures for future fracture management. Introducing the Perkins regime of traction that allows more active treatment was also considered to be one step in the right direction. Physiotherapy and

rehabilitation services were identified to be nearly absent, thus efforts to maintain function and enhance recovery during and after long-term bed confinement were at a minimum. Professionals also pointed at the economic burden to the health system following prolonged hospital admission.

Conclusion: The use of obsolete methods in a low-resource setting inflicts devastating impact on patients and their families, and causes major frustrations to professionals involved with fracture management.

SAMMENDRAG

Bakgrunn: Traumatiske skader utgjør en økende del av den global helsebyrden og medfører død og funksjonshemming for millioner av mennesker. Spesielt i lav- og middelinntektsland medfører traumer et udekket behov for pleie, behandling og rehabilitering. Denne studien utforsket pasienters og fagfolks erfaringer med strekkbehandling av underekstremitetsbrudd i Malawi. I høyinntektsland har behandlingsmetoden vært betraktet som utdatert i flere tiår, men strekkbehandling er fortsatt utbredt i en rekke lav- og middelinntektsland. Behandlingsformen medfører lengre tids immobilisering i sykehuset, i mange tilfeller mellom åtte og tolv uker.
Metode: Data ble innsamlet i løpet av et ti uker langt feltarbeid i Malawi. Det ble gjennomført datainnsamling ved de to største offentlige sykehusene i landet, Queen Elizabeth Central hospital (QECH) i Blantyre og Kamuzu Central hospital (KCH) i Lilongwe. Det ble tilstrebet å utforske temaet i et holistisk perspektiv og derfor ble det valgt en eksplorativ tilnærming med case studie design hvor triangulering av metoder og informanter ble benyttet. Temaet ble undersøkt gjennom deltakende observasjon, åtte pasientintervjuer, to tverrfaglige fokusgruppediskusjoner og individuelle intervjuer med to ortopeder og en fysioterapeut.
Funn: Pasientene fortalte om langvarig fysisk og psykisk smerte og ubehag som følge av langtids sengeleie, bekymring for fremtidig utfall, en nedverdigende og følelsesmessig stressende tilværelse i sykehusavdelingen, liten innflytelse på valg av behandling og på egen situasjon, samt negativ innvirkning på ledsager og familie. Det ble fremhevet økonomiske konsekvensene for pasientene og husholdningene deres som følge av lang innleggelse. Kombinasjonen av langvarig sykehusopphold og opphør av inntektsbringende arbeid, så ut til å skyve familier med marginale ressurser ytterligere ut i fattigdom. Etter utskrivelse fra sykehuset erfarte informantene varig funksjonsnedsettelse som medførte avhengighet av andre, en uforutsigbar livssituasjon og vedvarende økonomiske problemer. Fagfolk på sin side, opplevde store utfordringer som følge av manglende kvalifisert personell, mangel på medisinsk materiell og utstyr, samt utilstrekkelig faglig oppdatering og ferdigheter. Fagfolk vurderte at resultatene etter konservativ strekkbehandling var dårligere enn ved moderne kirurgisk behandling av brudd, men mangelfulle ressurser levnet ingen alternativer. Det å utvikle tverrfaglig samarbeid, styrke spesialisert kunnskap og ferdigheter, bedre tilgjengelighet av utstyr, evaluere behandlingsmetodene og utvikle standard prosedyrer for fremtidig bruddbehandling, ble ansett som viktige faktorer til å forbedre behandlingstilbudet. En implementering av Perkins regime som tillater et mer aktiv behandlingsforløp ble også

vurdert til å være et steg i riktig retning. Fysioterapi og rehabiliteringstjenester var tilnærmet fraværende, og intervensjoner for å ivareta og gjenvinne funksjon som følge av lengre tids immobilisering var minimale. Fagfolk påpekte også de økonomiske kostnadene for sykehuset og helsevesenet som følge av langvarige innleggelser.
Konklusjon: Bruken av umoderne behandlingsmetoder i en lavressurssetting medførte store påkjenninger for pasienter og deres familier, og betydelige frustrasjoner for fagfolk som arbeidet med bruddbehandling.

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LIST OF ABBREVIATIONS

GBD	**Global Burden of Disease**
RTA	**Road Traffic Accident**
LMIC	**Low and Middle Income Countries**
LIC	**Low Income Countries**
HIV/AIDS	**Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome**
WHO	**World Health Organization**
DALY	**Disability Adjusted Life Year**
UN	**United Nations**
MDG	**Millennium Development Goal**
WCPT	**World Congress of Physiotherapy**
HDI	**Human Development Index**
NGO	**Non-governmental Organization**
OCO	**Orthopaedic Clinical Officer**
MAP	**Malawi Against Physical Disabilities**
SIGN	**Surgical Implant Generation Network**
QECH	**Queen Elizabeth Central Hospital**
KCH	**Kamuzu Central Hospital**
ORIF	**Open Reduction Internal Fixation**
IM-nailing	**Intramedullary nailing**
POP	**Plaster of Paris**
FGD	**Focus group discussion**
HOD	**Head of Department**
CBR	**Community based rehabilitation**

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1.0 INTRODUCTION

1.1 BACKGROUND

Musculoskeletal injuries make up for a great deal of the global burden of disease (GBD) in all regions of the world (Norton & Kobusingye, 2013; WHO, 2013, p. 1). For every person who dies from injury, somewhere between three to eight people are left with disability (Zirkle, 2008), adding up to an annual figure of between 20 to 50 million survivors of injuries worldwide with temporary or permanent disabilities (Spiegel, 2008). Road traffic accidents (RTAs) are regarded as the ninth leading cause of the GBD (Peden, McGee, & Krug, 2002, p. 9) and 90 % occur in low- and middle-income countries (LMIC) of the world (Zirkle, 2008). Although preventive strategies of RTAs have been developed (Peden, 2004), the rate of injury is projected to rise as the fourth leading cause of death by 2030 (Mathers & Loncar, 2006). The incidents of RTAs seem to be escalating due to expanding migration of people, combined with incompatible road users, poor vehicle conditions and human factors like behaviour and driving capacities (Lagarde, 2007; Zirkle, 2008). In addition, the economic situation in poor countries reduces the enforcement of road traffic safety efforts (Huckstep, 2000). Falls, interpersonal violence, fire and war injuries are other causes of injuries (Krug, Sharma, & Lozano, 2000). There is no doubt that the rising injuries cause an increasing and unmet need for trauma care, injury management and rehabilitation in less resourced countries of the world.

At the same time as Africa carries 24% of the GBD, the continent holds only 3% of the health workers and spends less than 1% of world health expenditure (WHO, 2006, p. 8). Even though musculoskeletal injuries inflict an extensive health threat in LMIC, the problem seems to be overshadowed by infectious diseases such as HIV/AIDS, malaria and tuberculosis (Mock & Cherian, 2008). Some reasons for the historical neglect of traumatic injuries might be the traditional view of accidents as random events (Krug et al., 2000) and the non-communicable nature of injuries (Farmer & Kim, 2008). There is a need for public recognition of patients in need of injury treatment and the health workers trying to provide care for them (Ozgediz & Riviello, 2008). The production of research relevant to the local setting is also essential, and there is a need for different studies reflecting the many facets of

musculoskeletal trauma (Spiegel, 2008). Research production is scarce among health professionals in Africa, especially on musculoskeletal injuries and research priorities also reflect neglect of this topic (ibid). International collaborative research across-boundaries may contribute to positive development (WCPT, 2011) and benefit people in need of health services within the field of orthopaedic trauma care.

Malawi is one of the low-income countries (LIC) in South-eastern Africa where I, as a professional, got to learn more about challenges with injury management in a low-resource setting. During a two-year working experience as a physiotherapist at Queen Elizabeth Central Hospital (QECH) in Blantyre from 2006 to 2008, I saw patients every day who had sustained fractures. Many of the patients with fractures in the orthopaedic hospital wards underwent conservative skeletal traction, especially after femur and hip injuries. This treatment method involved fracture reduction with cords and weights, which is obsolete by modern standards in high-income countries since decades (Swai, 2005; Young, Lie, et al., 2012). The patients are confined to bed rest for at least six weeks while the fracture heals, but in most cases up to twelve weeks (Young, Beniyasi, Munthali, & Banza, 2012). Identified literature about skeletal traction in a historical perspective describes traction as fracture management in combination with physiotherapy to compensate for the loss of mobility (Buxton, 1981; Graham, 1956). For patients in Malawi today, this is not the case, as physiotherapy resources are nearly absent and patients are left in bed most of the time unattended (Young, Beniyasi, et al., 2012). From a Norwegian physiotherapist´s point-of-view, immobilizing patients in bed for such a long period is contradictory to common professional principles of early mobilization. The urge to explore and know more about how people perceive this practice arose from my Malawian experience.

1.2 JUSTIFICATION OF THE STUDY

Given the expected impact for individuals and for the health sector of confining patients to bed for months, it seems important and relevant to explore this practice. Being immobilized in a hospital bed for months may be extremely challenging. It is vital to gain knowledge on how patients experience the treatment, face possible functional and social consequences, and cope with returning to their homes after immobilization in the hospital for a long time. Local professionals' experiences with this treatment method, reasons for using skeletal traction, as

well as perceived challenges and benefits for the patients, health workers and health services may contribute to improved practice.

The focus of this study is on skeletal traction for lower limb fractures, which require longer traction duration as compared to upper limb fractures (Awori et al., 2009b). Lower limb fractures may also cause greater impact on mobility in a population that to a large degree relies on agriculture as the major source of livelihood (UN, 2013). Thus, the population is heavily dependent on physical work and walking during daily duties. Maintaining knee mobility after lower limb fractures is emphasized to be important in societies where people use squatting position in everyday life (Awori et al., 2009b), whether during food preparation and cooking, or when using pit latrines. At the same time there is a lack of social security systems in Malawi (Bach, 2004), indicating that people depend on their own means, family and social network when faced with functional impairment.

1.3 AIMS AND OBJECTIVES

The study aims to contribute to a holistic evidence base about lower limb fracture management in low-income settings, by exploring the perspectives of those experiencing and handling skeletal traction at close hold in Malawi. The qualitative approach is expected to produce knowledge that may enhance understanding of health, health behaviour and health services, which can contribute to improve provision of services (Green & Thorogood, 2009, p. 4).

Specific objectives of the study are:

1. To explore patients´ experiences with long-term immobilization on traction after lower limb fractures, as well as life after returning to their home communities.
2. To explore professionals´ experiences with skeletal traction as a method of fracture treatment in two urban hospitals in Malawi.

1.4 RESEARCH QUESTIONS

In order to define the specific focus of the study two research questions were developed, which were considered to be of equal relevance:

1. How do adult patients experience long-term hospital immobilization on skeletal traction after lower limb fractures and returning to everyday life afterwards?
2. What are the experiences of physicians, nurses, physiotherapists and rehabilitation technicians in two central hospitals in Malawi regarding lower limb skeletal traction?

2.0 THEORY

In this chapter, theory related to the theme and context of the study is presented. According to Carter, Lubinsky and Domholdt (2011, p. 14) theory strongly guides a research study, but may not be absolute, rather acceptable at the time of the research execution.

2.1 GLOBAL HEALTH, INJURIES AND HEALTH SERVICES

Different authors may define global health in different ways, thus revealing that no common definition exists. Koplan et al (2009) suggest that: "Global health is an area of study, research and practice that places a priority on improving health and achieving equity in health for all people worldwide". These authors state that global health is fashionable and derives from the more established disciplines of public health and international health (Koplan et al., 2009). Public health concerns organized community efforts to prevent disease and promote health, while international health refers to health work abroad, mainly professionals from high-income countries in LMIC, and is often limited to tropical diseases (ibid). The global aspect refers to health issues that concern many countries and embrace the full breadth of health threats (Koplan et al., 2009). It also implies recognition of a two-way flow of experience and knowledge for better health approaches between developed and developing countries (ibid).

The idea of global burden of disease (GBD) was introduced in a study published by the World Health Organization (WHO) in 1996, thus drawing attention to non-fatal outcomes and disability when determining the overall health status of a population (Spiegel et al., 2008). The WHO further developed the disability adjusted life year concept (DALY) as a measurement that combines the number of years lost from premature death with the loss of health from disability. One DALY equals one lost year of a healthy life (Spiegel et al., 2008). More than half of the people who are killed by RTAs are aged between 15 and 44 years, representing the income-generating part of the population (Peden, 2004). For the survivors of accidents, injuries of the extremities are considered a significant cause of disability that affects DALYs in a population and accounts for 63 million DALYs worldwide and 10 million DALYs in Africa (Ozgediz & Riviello, 2008; Spiegel et al., 2008). Despite the burden of disease caused by injuries and other surgical conditions, injuries seem to be side-lined with "other diseases" in the United Nations (UN) Millennium Development Goals (MDGs)

(Ozgediz & Riviello, 2008). Some suggest that surgery plays a crucial role in reaching the MDGs, not least the goal of halving the number of poor people, since untreated surgical conditions largely contribute to poverty (PLoSMedicine, 2008). There is no global fund for surgical services and surgery seems to be considered a luxury in LMIC, hence reserved for wealthy people who can pay the required hospital fees (Farmer & Kim, 2008).

In addition to preventing disease, global health also involves an interdisciplinary scope that embraces curative, rehabilitative and other medical aspects (Koplan et al., 2009), thus appointing the role of physiotherapy in many functions. The World Confederation for Physical Therapy (WCPT) demonstrates the role of physiotherapy in global health by support and involvement in several health initiatives (WCPT, 2013b). Some of the initiatives relate to injuries, for instance improving health service quality and life for people with musculoskeletal disorders and efforts to improve road safety (ibid). The role of physiotherapy in the global context is also conspicuous in the draft of WHO global disability action plan for 2014 to 2021, where physiotherapists are defined as a group of stake holders (WHO, 2014a). These factors enlighten the significant role of physiotherapy in the context of global health. The World Report on Disability addresses the low quality and productivity of rehabilitation workforce in low-income countries (WHO, 2011, p. 108), thus highlighting an unmet need for physiotherapists among other rehabilitation workers.

2.2 MALAWI: HEALTH PANORAMA AND HEALTH SERVICES

2.2.1 Socio-demographic facts

Malawi is a small, landlocked country in the South-East of Africa. It measures only 118 484 km2 (MalawiGovernment, 2012), but has the large population of 15 million people (TheWorldBank, 2013). The country is ranked 170 out of 187 countries on the Human Development Index (HDI) of the UN, thus indicating severe poverty and poor development level (UN, 2013). The majority of the population live in rural areas and 85% of the population is dependent on agriculture (ibid). The literacy rate is 61% and approximately 62% of the population live below the international poverty line of 1.25 USD per day (Unicef, 2013) There seems to be a decline in urban poverty and at the same time an increase in rural poverty (TheWorldBank, 2013). Although some positive development has been registered regarding economic growth, Malawi is still at risk of severe food insecurity and is not likely to reach the

essential MDGs on eradication of poverty and hunger, on education, gender equality and maternal health by 2015 (ibid). As a multi-ethnic society, Malawi has more than sixteen local languages, but Chichewa is the national language spoken by the majority in the central and southern regions, while English is the official language for government, education and business (Chilora, 2000).

2.2.2 Health status and health service organization

The demographic and socio-economic situation depicted above indicates the vulnerable state of living for the people of Malawi, which has consequences for their health. Malawi is widely affected by epidemic diseases common in LMIC, like HIV/AIDS, tuberculosis and malaria. The HIV prevalence in Malawi has in recent years decreased from 14% to 10,9% (TheWorldBank, 2013) and the life expectancy has increased from 52 to 54 years for both genders combined (UN, 2013). The rate of injury is high and, in accordance with other LMIC, road traffic accidents seem to be a major cause of trauma injuries in Malawi (Dhlamini, Lewis, Mkandawire, & Harrison, 2000). According to estimates by WHO there are 20 road accidents every day and 1000 people die in traffic annually in the country (WHO, 2014c), thus indicating great need of trauma care, surgery and rehabilitation for injury survivors. Yet, Malawi has tremendous challenges when it comes to providing health services.

Malawi is divided into three regions: the northern, central and southern region. The four central hospitals in the country are situated in Mzuzu in the north, the capital Lilongwe in the central region, Blantyre in the south and Zomba in the southeast respectively. The regions are divided into smaller districts with district-level hospitals, counting twenty-six in total (Mkandawire, Ngulube, & Lavy, 2008). In addition, 40 % of the health services are estimated to be provided by mission and private hospitals (Mkandawire et al., 2008).

(DoctorsForMalawi, 2012)

The majority of the health workforce is concentrated in the large central hospitals in towns. Malawi has only 2 physicians and 59 nurses per 100 000 inhabitants (Qureshi et al., 2012) and only one orthopaedic surgeon per 1.500.000 inhabitants (Mkandawire et al., 2008). Malawi has in-country trained nurses at college level since 1979 and clinicians since 1991 (CoM, 2012; KCN, 2012). Nevertheless, the country has been greatly affected by emigration of health professionals to higher-income countries, so-called brain drain (Spiegel, 2008). In the case of physiotherapy and rehabilitation, there is a tremendous need to strengthen the professional field. The number of physiotherapists is only 27 for the total population of 15

million (WCPT, 2013a). However, a BSc program in Physiotherapy was established in 2010 (CoM, 2012) projecting the number of physiotherapists to slowly increase.

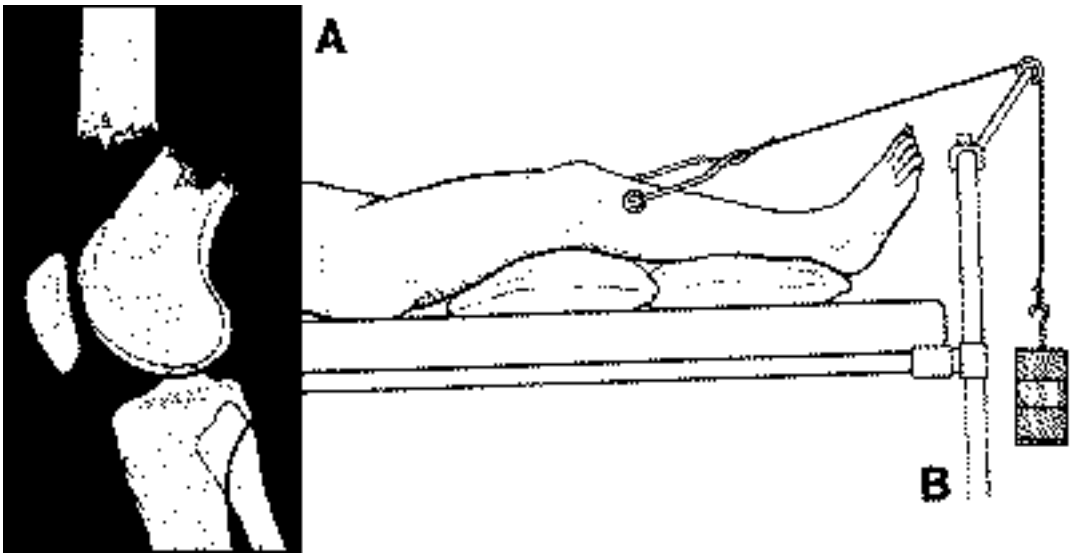
In order to compensate for the lack of trained doctors and physiotherapists, Malawi has a history of training paraprofessionals. The training programs of clinical officers (CO) and medical assistants are providing health workers at a faster pace than the full program of medical clinicians, offering three and two years of training respectively (Mkandawire et al., 2008). In the district hospitals it is mainly clinical officers who are in charge, and they carry great responsibility with minimum support from consultants. In the local health centres medical assistants may be running the clinics alone (ibid). Orthopaedic surgeons are only found at central hospitals. The non-profit organization Malawi Against Physical disabilities (MAP) is training Rehabilitation Technicians, who are rehabilitation workers with diploma-level training (MAP, 2014). Some nurses are also trained as rehabilitation assistants to aid the needs for rehabilitation services (Fielder, Mpezeni, Benjamin, & Cary, 2013). Even so, the lack of health workers is pressing and the vacancy rate of health workers was estimated to be 60% for nurses, 63% for clinicians and 87% for physiotherapists in a report from 2007 (McCoy, 2007). The lack of human resources enforces a system where patients admitted in hospitals need to engage a guardian from their families to assist them with basic needs and care while in the hospital, due to the overwhelming number of sixty to ninety patients per nurse in a ward (Hoffman et al., 2013; Young, Beniyasi, et al., 2012).

2.3 MANAGEMENT OF FRACTURES AND THE USE OF SKELETAL TRACTION

Treating fractures with traction of the bony fragments has a long history in fracture management. The various types of traction methods have been described in literature as far back as the early 19th century (Peltier, 1968). Although the method is as good as ruled out in favour of internal fixation of fractures in industrialised countries, the use of traction still remains extensive in countries with little surgical capacity. Attempting to find statistical estimates on the use of skeletal traction worldwide has not been successful, but some recent studies claim that most countries in Sub-Saharan Africa, as well as other LMIC use skeletal traction as the main treatment for femur fractures (Phillips, Zirkle, & Gosselin, 2012; Young, 2014). Some suggest that probably more than 90% of patients with fractures in developing

countries are treated by conservative methods, synonymous with Plaster of Paris (POP) or traction (Museru & Mcharo, 2002). Traction is considered conservative treatment as opposed to modern surgical intervention by open reduction internal fixation (ORIF), or intramedullary nailing. The various applications of traction range from skin traction to skeletal traction with various devices that add beneficial components, such as gaiters, splints, stirrups, pulleys and frames (Peltier, 1968). Skeletal traction has also been modified through the times in terms of positioning of the patient and the fractured leg (ibid), all in all demonstrating that variations of traction techniques might exist in practice.

The concept of lower limb traction involves a cord attached to the injured body part either by skin traction with strapping and tape or skeletal traction with a pin inserted through the bone, whereby the cord and weights are attached. Skin traction seems to be recommended only as initial management or when skeletal traction is not available or in treatment of children (Awori et al., 2009a, p. 3). When skeletal traction is used a metal pin, usually a Steinman or Denham pin is inserted through the bone, most frequently the proximal part of tibia (ibid). This allows sufficient weight to be attached, approximately 10 % of the patient´s bodyweight, in order to maintain sufficient reduction of the fracture. Skeletal traction might be applied with an extended leg on the bed, or with a slightly flexed hip and knee using a Braun frame (Awori et al., 2009a, p. 3). This is called Böhler-Braun traction and is only recommended for special indications, since it takes longer to achieve union and does not allow exercises and consequently causes muscle atrophies and knee stiffness (ibid).



(Fig. 15.5. Supracondylar fracture of the femur. Fracture (A); skeletal traction (B), Boswick, Cobey, Trias, & Wilson, 1991)

However, the overall recommended traction method appears to be Perkins traction, whereby the patient is allowed to exercise the leg while sitting up in the bed (Awori et al., 2009a, p. 9). The traction is applied using a cord attached to a stirrup that runs in a pulley to secure stable traction, while the bed is tilted to provide counterweight (ibid). A split-bed where the lower end is removable secures the possibility to bend the knee, as well as to put the sound leg down on the floor and weight bear on it (Buxton, 1981; Gosselin & Lavaly, 2007). According to Awori et al (2009, p. 4) the benefits of this regime is that the movement of the limb provides compression and thereby enhance union of the bone ends, prevents stiffness of the knee joint and muscle atrophy, as well as prevents thrombosis and pneumonia.

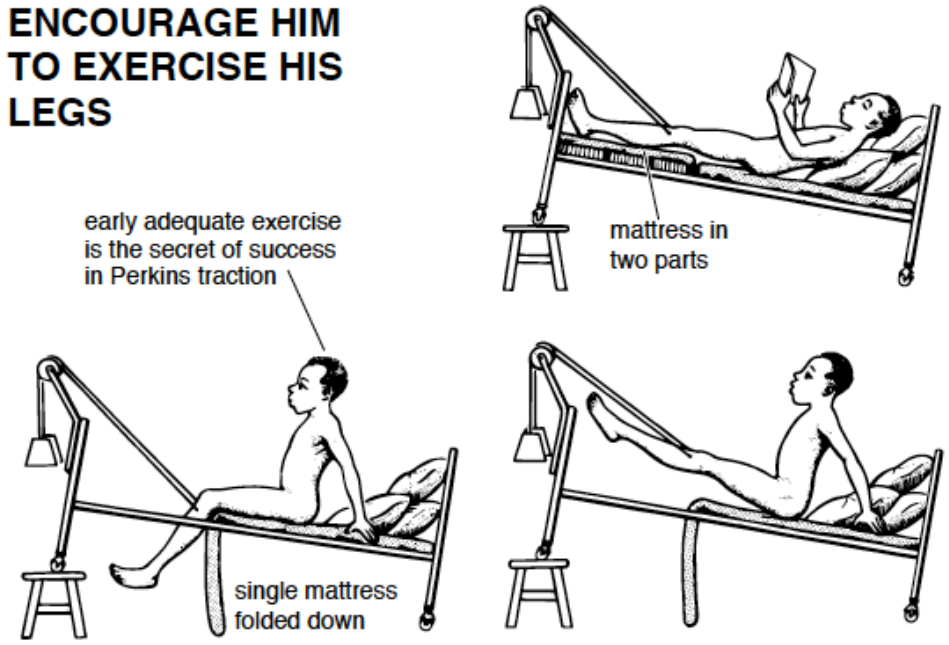


Fig. 78.9: ENCOURAGE HIM TO EXERCISE HIS LEG. Early exercises are the secret of success with Perkins traction. Kindly contributed by Peter Bewes.

(Awori et al., 2009a, p. 9)

2.4 LITERATURE REVIEW OF SKELETAL TRACTION

An initial literature review was conducted in order to examine existing research on the topic. Identified keywords were used in the databases Medline, Embase, Cochrane and Cinahl. The keywords for the search were the following Medical Subject Headings (MeSH): “fractures bone”, “femoral fractures”, “lower extremity”, “traction”, “fracture healing”, “bed rest”, “immobilization”, “hospitalization”, “length of stay”, “early ambulation”, “patient satisfaction”, “attitude of health personnel”, “qualitative research”, “focus groups”, “interview as topic”, “africa”, “malawi” and “developing countries”. Additional subject headings used were “low income countries” and “experiences”. However, local or regional journals may contain research that is more relevant to the local setting and might not be found in Medline or equivalent databases (Spiegel, 2008). Google Scholar, African Index Medicus and African Journals Online were used to identify other journals, using different combinations of the same keywords as above. In order to secure quality, a college librarian supervised the search.

A systematic Cochrane review compared conservative traction to operative treatment for hip fractures in adults (Parker, Handoll, & Bhargava, 2007). This review reported limited evidence for equal outcome between the different treatments. Still, due to prolonged hospital stay, slow rehabilitation and risk of limb deformities, conservative treatment was only recommended when surgery was unavailable (ibid). However, the studies included in this review seemed to be conducted in industrialized countries with elderly patients only, and may not directly compare to low-resource settings.

Research on lower limb fracture management in Africa, including Malawi, seemed to mainly address fracture-healing outcomes. Some studies reported satisfactory outcomes of conservative skeletal traction and pointed to the feasible and safe procedure in the low-resource setting (Doorgakant & Mkandawire, 2012; Gosselin & Lavaly, 2007). However, complications with skeletal traction, such as high rate of pin track infection, mal-union and non-union were reported (Gosselin, Heitto, & Zirkle, 2009; Opondo, Wanzala, & Makokha, 2014). Other studies presented results in favour of surgical intervention in LMIC (Phillips et al., 2012; Sekimpi, Okike, Zirkle, & Jawa, 2011), thus indicating that implants seemed appropriate to use in low-resource settings. A comparative study reported similar outcomes for identical femur implant procedures between South-African and some European hospitals (Gross et al., 2010). However, South-African hospitals may differ from the Malawian set-up.

There was a consistent focus on the risk of infection after surgery in many studies, especially among HIV-positive patients. A systematic review addressing infection risk after surgery in HIV-patients indicated an increased risk, but with lack of good-quality studies and inconsistent results there was still uncertainty (Kigera et al., 2012). However, some recent studies in Malawi did indicate that modern internal fixation was a good option, even with HIV-positive patients, as long as hygienic conditions were secured (Bates, Mkandawire, & Harrison, 2012; Young et al., 2013; Young, Lie, et al., 2012).

The personal aspects of fracture management in Africa seemed almost unaddressed. One identified narrative case study described the story of a young man in Malawi who sustained a femur fracture. This patient was immobilized on traction for 3 months, instead of getting surgery and being discharged after few days (Young, Beniyasi, et al., 2012). The article described how this patient was negatively affected, physically and socially. Another article presented two clinical cases with flare-up of chronic osteomyelitis after childhood skeletal traction twenty years earlier (Courvoisier, Grimaldi, Rubens-Duval, Chaussard, & Saragaglia, 2011).

Qualitative research on experiences with musculoskeletal injuries in Africa appeared to be limited. Searches for health related interviews and focus group studies revealed numerous studies related to HIV/AIDS or tuberculosis in Africa. These findings on existing qualitative research confirmed the overall impression that more attention was given to the impact of infectious diseases. One interview and observational study on musculoskeletal impairment and the impact on children´s lives in Malawi was found. This study reflected indignity, exclusion, pain and hunger as consequences for the affected children and their families (Alavi et al., 2012). Only one study with similar focus to this thesis was identified. This study explored the experiences and psychosocial needs of patients with various traumatic fractures treated for more than six months at a hospital in the Democratic Republic of Congo (Okonta, Malemo, & Ogunbanjo, 2011). The study showed the negative psychosocial impact on the injured persons and their family, which persisted after six months.

No research at the time of the search was identified about patients' and professionals' experiences with skeletal traction, or about life after having undergone this treatment. Moreover, research addressing qualitative aspects of fracture management in LMIC seems almost non-existent, thus indicating a knowledge gap that needs attention.

3.0 METHODOLOGY AND METHODS

To contribute with a more holistic evidence-base in the field of injuries and multidisciplinary health care, which includes the perspectives from both patients and professionals, a qualitative research approach was chosen. Given the under-researched theme and context, an explorative case study design was opted for, because it involves studying a phenomenon within its context bounded in time and space (Gobo, 2011, p. 16). The case study allows for a pragmatic mix of methods and data sources to be used, such as observation, interviews and documents (ibid). The approach can shed light on various factors and underlying processes that manifest the studied phenomena (Polit & Beck, 2012, p. 18). According to Green and Thorogood (2009, p. 32), qualitative methods can answer questions about the meaning of interventions for the actors involved. The collaborative elements have the potential of sensitizing professionals to patients' views and provide evidence for populations' needs and how to develop and implement appropriate policy (ibid).

In this chapter, methodological theory of science perspectives underlying the study are presented first, where after the specific methods of data collection used during fieldwork are discussed.

3.1 METHODOLOGICAL PERSPECTIVES

3.1.1 Phenomenology

This study is anchored in a phenomenological tradition where an embodied and contextualized nature of experience is essential (Thornquist, 2012, p. 34). This implies that people learn to know the world through bodily experience interrelated to an existential environment (ibid). The study seeks to explore the life-world of the informants, involving experiences and views of patients and professionals. The term "life-world" refers to the world as it is immediately perceived by people (Thornquist, 2012, p. 37). Phenomenological research has the purpose to give voice to the person being studied (Carter, Lubinsky, & Domholdt, 2011, p. 161). The researcher is therefore required to present the views of the subjects. The aim is to understand the essence of phenomena and how the life-world is directly experienced, which is created through talk, interaction and behaviour (Green &

Thorogood, 2009, p. 14). It is implicit that understanding cannot be observed passively, but rather constructed through reflexive interaction and communication. People are often oblivious to the everyday life-world and perceptions and understanding might be taken-for-granted as commonly shared by those involved, for instance in a hospital ward (Green & Thorogood, 2009, p. 15). Hence, the phenomenological approach can contribute to identifying diffuse concepts in everyday practice by exploring and bringing to light taken-for-granted phenomena.

3.1.2 Hermeneutics

In this study there are elements from a hermeneutic tradition, thus referring to the interpretive approach of human conduct that provides a way of understanding everyday practical action (Packer, 1985). The hermeneutic account is also perspectival in the sense of an action to have one meaning from one perspective and another from a different perspective (ibid). From its origin, hermeneutics is linked to textual interpretation of written information, especially biblical texts, and the objects of hermeneutics mainly consist of texts (Packer, 1985; Thornquist, 2008b, p. 139). The hospital files provided an important source of gaining information. First of all, information that assisted in identifying patients as possible informants, and also additional information to gain a better understanding of the informants enrolled in the study. Secondly, hospital files reflect the system in the ward and how different professionals influence treatment, document and communicate their work with each other in a written form (Thornquist, 2008a). In addition, all the recorded verbal information from interviews and FGDs were transcribed and constituted material in a written form for further analyses. The transcriptions were essential texts when analysing and interpreting information obtained. Finally, the field notes comprised important written material that was frequently used throughout the process.

3.1.3 Ethnography

Ethnography has the foremost purpose of describing a culture from the perspective of an insider, yet on a detached level that enables ability to analyse and reflect on observations (Carter et al., 2011, p. 160). This tradition often involves participant observation and also builds on the understanding that the investigator and subjects are interdependent (ibid). Participant observation requires the researcher to stay and participate in the field for a period of time. Ethnography often involves obtaining information from a large range of approaches,

such as spontaneous conversations and taking field notes (Carter et al., 2011, p. 160), which was actively used in this study. The primary source of information in this tradition is observing actions in concrete settings, but also listening to conversations and asking people questions (Gobo, 2011, p. 17). Observation was done at the hospitals, but also in patients' home environment when doing home visits. In this study, the main purpose of these listed activities was to familiarize with the context, enhance an understanding of the case, and also establish networks for further data collection. In addition, knowing the field was important in order to know what to ask for (Kvale & Brinkmann, 2009, p. 107), and participant observation provided a foundation for refining the questions in the interview guides used in this study.

3.2 FIELDWORK SITES AND INFORMANTS

The data were collected during a ten-week-stay in Malawi. Local anchoring of the project was secured before fieldwork through email correspondence. A collaboration agreement between Bergen University College and College of Medicine in Malawi was signed, and a senior Malawian physiotherapist with PhD was appointed co-supervisor (Appendix 1). Data collection was conducted at the two teaching hospitals of Kamuzu Central Hospital (KCH) in Lilongwe and Queen Elizabeth Central Hospital (QECH) in Blantyre respectively. These hospitals were purposefully selected as the largest public and referral hospitals receiving patients from various parts of the country, thus providing a range of different professionals and access to relevant patients. The QECH is the largest central hospital with approximately 1000 beds, while KCH is estimated to have 780 beds, although most of the time the number of patients exceeds the actual number of beds (WHO, 2014b; Wikipedia, 2014). Even though hospital wards are designed for fewer people, there might be sixty to ninety patients admitted at a time in one ward (Young, Beniyasi, et al., 2012). The orthopaedic wards are divided into male and female wards. The female wards have fewer beds, thus reflecting the overweight of men with orthopaedic conditions (Samuel et al., 2009).

Recruitment was based on strategic sampling of informants who were available to participate at the time of the study. In order to grasp the wide range of views, the sample involved a group of participants of different ages, genders and backgrounds. As described by Green and Thorogood (2009, p. 138) the aim of sampling is to maximize the opportunity of producing

enough data to answer the research questions. Women and men have different roles in the family and society and might face diverse challenges, which also vary between socio-economic groups. Also, different age groups have various commitments and tasks to fulfil, and they may provide different perspectives.

3.3 DATA COLLECTION

Altogether, participant observations implying field notes, eight interviews with patients, two multidisciplinary focus group discussions (FGDs), two interviews with orthopaedic surgeons and one interview with a physiotherapist were carried out. Interviews and FGDs were conducted using interview guides with open-ended questions (Appendices 2-3), something that gave participants an opportunity to talk freely, and follow-up questions appeared accordingly. The interviews and FGDs were performed in a random order depending on other planned and unplanned logistics. This required flexibility by conducting interviews whenever informants were available.

3.3.1 Participant observation

Initially, equal time was planned spent at both hospitals, but in order to get to know the field, identify key persons and establish a network, as well as conduct the time-consuming exercise of recruiting patients, it became necessary to spend most of the time at one hospital, which was QECH in Blantyre. Consequently, KCH in Lilongwe was only visited to recruit and interview more professionals, as well as to do some observations in the orthopaedic wards. Participant observation for a longer period of time was mainly done at QECH, and was conducted in various situations, such as during ward rounds or when removing the traction, in theatre when applying traction pins or in the outpatient clinic where patients came for review. Observing such procedures contributed to better understanding of what informants conveyed during the interviews. Observing the patients' function when recruiting and interviewing them, as well as facial expressions and body language during the interview, was also adding depth to understanding the patients' situations. In addition, observing patients in their home environment and surroundings during home visits provided important understanding of the homecoming aspect.

3.3.2 Interviews with patients

Semi-structured in-depth interviews were used to generate information about patients' experiences, because gathering for FGDs would likely have been constrained by transport issues. This is evidenced by the low follow-up rate of patients at the hospitals due to geographic distance and difficulties with travelling from rural areas (Young et al., 2013).

Inclusion criteria were developed with a purpose of including the most appropriate informants while avoiding significant ethical challenges. For the interviews, adult women and men (>18 years old), undergoing or having been treated with skeletal traction for > 5 weeks and being able to give informed consent were recruited. Patients that were not able to give informed consent, children (<18 years old), and patients with obvious psychiatric problems, head injuries or other medical complications were excluded. All enrolled patients were recruited from QECH. Patients were identified through the hospital files with assistance from a rehabilitation technician, and all patients were informed and invited to participate in Chichewa language. Six patients were recruited from the wards and two from the outpatient clinic.

It was desirable to interview an equal number of female and male patients. However, reality on the ground confirmed that more men than women sustain fractures in Malawi (Samuel et al., 2009), hence only two women compared to six men were enrolled in this study. People admitted in public hospitals mainly represented a low socio-economic class, something which was reflected by all the informants being farmers or running micro-scale businesses. The enrolled patients were six men aged 27, 30, 32, 59, 71 and 73 years, and two women aged 26 and 47 years respectively. The patients had *different lengths of experience with traction*, varying from six to eleven weeks. The two women and two of the men were on traction at the time of the interviews. The men were waiting to be scheduled for internal fixation because of non-union of their fractures, after eight and eleven weeks of skeletal traction respectively. Four men were interviewed afterwards, between three to seven weeks after discharge from the hospital. This allowed these patients to have gained some experience with homecoming. Two of these interviews took place at the hospital the same day as they came back for a review, while the other two were carried out during home visits.

Seven out of the total eight patients preferred to do the interview in *Chichewa*, hence only one interview was carried out in *English* by the researcher. A Malawian physiotherapist with MSc degree, who had previous experience with qualitative research, was assigned as a *research assistant* and conducted the interviews with patients in Chichewa. After debating whether or not the researcher should be informed by English translations done during the interview, it was decided that this would be more interrupting than beneficial.

3.3.3 Multidisciplinary focus group discussions

Focus group discussions (FGDs) contribute to obtaining a wide range of views from several professionals through group interaction, and this makes it possible to collect a wider range of data (p.124, Green & Thorogood, 2009).

As for professionals, the *inclusion criteria* for participation in the multidisciplinary FGDs were being a physician, nurse, physiotherapist or rehabilitation technician with experience or knowledge about skeletal traction. Students or interns and professionals with no experience with skeletal traction were excluded from the study. Professionals were recruited through snowball sampling where some of them recruited their colleagues (Polit & Beck, 2012, p. 517), but also through local key persons, such as the Head of Department (HOD) or Sister in Charge. The invitations were presented through a variety of e-mails, verbal and written invitations according to what was most practical in the different situations. As for the FGD at KCH in Lilongwe, recruitment was organized by one of the HODs due to geographic distance since the researcher was mainly based in Blantyre. In general, educated people in Malawi speak fluent English and communicating with professionals was uncomplicated to a foreigner.

Orthopaedic clinical officers (OCOs), nurses from the orthopaedic wards and the available rehabilitation staff such as physiotherapists and rehabilitation technicians, constituted the two focus groups with respectively 11 and 10 participants. One focus group consisted of six OCOs, four nurses and one physiotherapist, while the other group consisted of four OCOs, two nurses, two physiotherapists and two rehabilitation technicians. The professionals were of different gender, age and working experience. In total, eight women and thirteen men were enrolled, with working experience between six months and twenty-three years.
The FGDs were conducted in suitable rooms that provided privacy without interruptions, one in a hospital library and the other one in a conference room. The group members were seated

around a table with the two recorders placed on each side of the table. Since the discussions were carried out during lunchtime, the participants were served food and drinks and given room for small talk before starting the discussion, thus creating a relaxed atmosphere. As a moderator, I facilitated progression and made sure that everybody got to speak, while the research assistant mainly took notes and kept track of the professionals and the specific statements they made.

3.3.4 Interviews with orthopaedic surgeons and a physiotherapist

Semi-structured in-depth interviews were carried out with two orthopaedic surgeons to provide professional expert opinions. Given the limited number of orthopaedic surgeons, and their busy schedule, individual in-depth interviews seemed to be the most appropriate approach. The surgeons were very few and easily identified, thus directly approached and invited to participate. In addition, one physiotherapist was invited for an individual interview after his participation in the FGD. This interview was not pre-planned, but considered beneficial after conducting the FGDs in order to gather more physiotherapy specific perspectives.

Two of the interviews were conducted in offices at the working places and one in a hotel, which secured confidentiality. The orthopaedic surgeons and the physiotherapist had three different countries of origin, but they all had extensive experience with fracture management in a low-resource setting.

3.3.5 Recording and transcription of data

The interviews and FGDs produced 9 hours and 4 minutes of recorded material in total, consisting of 4 hours and 21 minutes with patients, and 4 hours and 43 minutes with professionals. The interviews with patients varied from 20 minutes to 52 minutes, with the mean duration of 32 minutes. The varying duration of interviews reflected that individuals had different openness to talk about experiences, but also that some presented richer descriptions while others gave shorter answers. Individual interviews with professionals varied from 21 minutes to 1 hour and 15 minutes, with the mean duration of 45 minutes. The FGDs lasted for 1 hour and 10 minutes, and 1 hour and 18 minutes respectively.

The researcher transcribed all the recorded material in English, while a Malawian secretary transcribed the remaining interviews in Chichewa and translated them into English. The transcriptions were done in a verbatim style. Sounds that contributed to understanding or underpinned meaning were indicated, such as “mhm” or “mm” indicating confirmation or thoughtfulness, or “eeeh” or “eish” reflecting negative emotions or dissatisfaction. The transcribed material consisted of 253 pages in total. This distributed as 40 pages from FGDs, 34 pages from individual interviews with professionals, 93 pages of English transcriptions and translations of patient interviews, as well as 86 pages from patient interviews in Chichewa. Recording interviews also included note taking and remembering (Kvale & Brinkmann, 2009, p. 178). Note taking was essential in general during the fieldwork. An additional 15 pages of field notes provided useful information supplementing interpretation and understanding of the studied case.

3.4 ETHICAL ASPECTS

The study was approved by the Norwegian Social Science Data Service (NSD) on the 6th of June 2013, and the Malawi College of Medicine Research and Ethics Committee (COMREC) on the 15th of November 2013 (Appendices 4-6). According to Green and Thorogood (2009, p. 77), qualitative research normally represents no potential health risks for patients, except from possible hurt feelings. However, an interview regarding traction treatment could also create emotional discomfort. The informants were encouraged to express their feelings at the end of the interview, thus helping to relieve any negative emotions through debriefing. No major reactions that needed intervention occurred. In general, the proposed topic was not considered to be particularly sensitive to either professionals or patients.

In accordance with the Helsinki Declaration (Green & Thorogood, 2009, p. 69), protecting participants from being identified or feeling forced to participate in the study was a main concern. The recorded interviews and transcriptions did not contain any personal information and contact details were kept separate. Informed consent was secured and it was made clear to all those invited, in their preferred language, that participation was voluntary and that they could withdraw from the study at any time without giving a reason (Appendices 7-8). It was made clear that participation in the study would not affect treatment. In the FGDs, conflicting views and professional hierarchy that constructed legitimacy to speak may influence

interpersonal relations and the social working environment (Green & Thorogood, 2009, p. 144). Hence, the moderator stressed discussions to be carried out in a respectful manner as for different opinions and views.

As expressed by Carter, Lubinsky and Domholdt (2011, p. 46), it is important that participants understand the nature of the research. To secure this, a Malawian rehabilitation technician assisted in the recruitment. She was initially briefed on the ethical aspects and provided with a checklist of information that was translated into Chichewa. The challenge of explaining research to people with little education, some illiterate, became apparent in the female ward. Some of the women had heard about research endangering the body, such as causing child abortion and other harmful conditions, a situation that created scepticism towards participation. This issue was addressed by spending more time in the ward explaining in more detail about the meaning of the study, ensuring the women that bodily function would not be affected by participation. In situations like this, there might be a fine line between providing thorough information and talking people into participation. In this case it was handled as sensitively as possible by involving the local co-supervisor, with high research competence, to give better and more complete explanations about research.

The actual role of the researcher was stressed when communicating with patients, to avoid the interview situation being perceived as a treatment session by patients. Insult due to inappropriate behaviour, clothing and body language according to the local culture was avoided. Hospital dress code was followed, as well as decent outfits covering shoulders and knees, and dressing in the local “chitenge” wrapped skirt during home visits in the village. To avoid discomfort and expenses to participants, interviews were conducted when patients already came for review, otherwise the researcher and assistant went for home visits. Patients coming for outpatient reviews were provided food and drinks, as well as a private room for relaxation, while preparing for the interview. In situations where allowances like transport money was provided, it was presented after the interview in a way that did not indicate people being “bribed” into participation. Permission was secured prior to taking any photos.

3.5 ANALYTIC APPROACHES

According to Polit and Beck (2012, p. 556) the purpose of analysis is to organize, provide structure to and elicit meaning from data. Analytic approaches necessarily depend on the actual data. In this study, a pragmatic mix of techniques was used, since meaning and understanding of data derived from triangulation of pre-planned and prepared interviews and FGDs, in addition to observations and written material. This flexible approach where different stages in the research process overlap and inform each other is often referred to by the metaphor "bricolage" (Green & Thorogood, 2009, p. 26). This term involves combining theories, techniques and methods to provide multi-perspectival understanding of a context (Rogers, 2012). The "bricolage" approach draws on multiple analytical methods to show the complexity and plurality that may influence a phenomenon (ibid).

Miller and Glassner (2011, p. 137) pinpoint that rigorous analysis of accounts provides two intertwined sets of findings. One is evidence of the nature of the phenomenon, including the context and situation, and the other is insight into the cultural frames that people use to make sense of the experiences (Miller & Glassner, 2011, p. 137). Due to the cultural differences between the researcher and the informants, it was necessary to be sensitive for local, contextual and cultural aspects throughout the analysis. Accumulated knowledge from my previous working and living experience in Malawi, together with participation and observations in daily life and in the hospital during fieldwork, interaction with neighbours, research assistants, professionals and patients, as well as guidance by a Malawian supervisor, all together provided enhanced critical reflexion and understanding of the cultural setting.

The analysing process of the transcriptions from interviews, FGDs and other textual material can be defined as "thematic content analysis" (Green & Thorogood, 2009, p. 198; Kvale & Brinkmann, 2009, p. 203). This process involved breaking the data into smaller units, coding the units according to the content and grouping the coded material into themes based on shared concepts. Observations, including non-recorded conversations and interactions constituted interconnected meaning with the verbal information from informants. This also accounts for information from written sources, such as hospital files. I strived to draw lines between all sources of information throughout the analysing process.

4.0 FINDINGS AND DISCUSSION

4.1 CONTEXTUALIZING THE TOPIC

4.1.1 Everyday pictures from the orthopaedic wards

During fieldwork, I spent time with professionals and patients in the hospital to enhance my understanding of their experiences. At both Queen Elizabeth Central Hospital (QECH) and Kamuzu Central Hospital (KCH), hospitals wards were large and open, divided into smaller bays or rooms, with sixty to seventy beds arranged in tight lines. The wards constantly displayed overcrowding with patients lying on floor mattresses in between beds and in corridors, the whole resulting in little privacy for the patients. To cope with the scarcity of nursing staff, most patients had guardians, often relatives who were allowed a designated time in the ward, while they stayed outside during ward rounds and other hospital routines, doing their cooking and laundry. At night they would sleep on the floor in the ward. As quite typical in African hospitals, guardians contributed consistently to the day-to-day care of patients with skeletal traction (Hoffman et al., 2013), ranging from covering basic needs with hygiene and assisting with bedpans, to adjusting the traction and transferring patients to x-ray or theatre. It appeared that most guardians were women, and consequently several children were observed amongst the groups of guardians staying around the hospitals.

There were only two orthopaedic surgeons at each hospital. The orthopaedic clinical officers (OCOs) were seven at each hospital, covering the work in the wards, outpatient clinics and in theatre. OCOs mainly administered skeletal traction, while surgeons performed more complicated procedures, such as internal fixation. Nurses seemed to be less involved with traction patients. As illustrated by one surgeon: *"Because the nursing care is also limited, you might find that there is one nurse for sixty to seventy patients, at the most they are two nurses. In terms of day-to-day care of traction, nurses are not involved in the care of these patients, it´s impossible."* The main role of nurses was that of administering medicines, taking blood samples and the like, while guardians handled the everyday care of patients. In addition, shorter-trained assisting staff, like nursing assistants or ward attendants provided basic care, such as wound cleaning or removing POP.

At the time of fieldwork, rehabilitation staff members counted four at QECH and six at KCH, all with different backgrounds and training levels, such as physiotherapists, rehabilitation technicians and physiotherapy assistants. Rehabilitation staff seemed to have a very limited or no role at all in the management of traction patients, and the patients' files confirmed the absence of a rehabilitation focus. For the time being, only United Nations (UN) employed physiotherapists were serving at the two hospitals. Only few rehabilitation technicians and physiotherapy assistants, who were nurses trained on the job as rehabilitation personnel, were permanently employed at the hospitals. None of the current physiotherapists at the stated hospitals were Malawian citizens or permanent residents. To sum up, quite limited numbers of rehabilitation workers were serving the two largest hospitals of Malawi.

A central hospital in Malawi

4.1.2 Choice of fracture treatment: skeletal traction, skin traction and internal fixation

By and large most patients with femur and hip fractures seemed to undergo traction in both hospitals. Surgeons confirmed that patients with more complicated traumas, such as multiple injuries, fractures near joints or patients with non-union after long-term traction were main priorities for surgery.

A main difference in treatment choice between the hospitals seemed to be the high number of patients on skin traction at KCH, while most patients at QECH were treated with skeletal traction. Greater shortage of basic equipment, like hand drills and traction pins to perform traction procedure, was one reason given for less use of skeletal traction at KCH, as most equipment used in fracture management was based on donations. Apparently, when equipment was damaged beyond repair and supplies were finished it was not automatically replaced. In addition, donations of internal fixation material seemed to be given priority. Both QECH and KCH are listed as active in the Surgical Implant Generation Network (SIGN) (Zirkle, 2008). SIGN assists in building surgical capacity in developing countries through in-country training and provision of equipment, and mainly implants for internal fixation like the networks own SIGN-nails are supplied (ibid).

Also, it appeared that professionals at KCH opted for internal fixation, but the needs for fracture treatment greatly exceeded surgical capacity: "*Because we have the SIGN-nail, I just apply a temporary skin traction while the patient is waiting for surgery, but because of the problems we have with limited theatre space and capacity, the patients end up waiting [for surgery] for five weeks. Now the bone is overlapping and surgery is very difficult*."
As such, readiness of patients to undergo intramedullary nailing (IM-nailing) was one important reason to keep patients on skin traction at KCH. As explained by one orthopaedic clinical officer (OCO): "*If we put skeletal traction we are afraid of pin site infection, in which case the patient cannot undergo IM-nailing until the wounds are dry*."

4.1.3 Traction procedures and professional follow-up

Application of skin traction was done in the ward, and adhesive tape was applied directly on the skin of the lower leg, whereby weights were attached at the end by a stretch of bandage. This traction arrangement with tape could only hold 3-5 kg of weights. In the case of skeletal traction, the pin was inserted in theatre by an OCO, with the patient under anaesthesia. Using

a manual hand drill, the pin was inserted through the proximal tibia bone, approximately 2 cm distal to the tibial tuberosity. Bandage material was tied to both sides of the pin forming a triangle, which was covered with Plaster of Paris (POP) to make a solid base. The procedure was quick, and the patient was transported back to the ward within 15-20 minutes. The weights were applied in the ward, again using a bandage to attach items like sandbags, stones or bricks, equivalent to an approximation of 10% of the patient's body weight. In both hospitals skeletal traction was mainly done with the leg straight. The Perkins regime with split-beds that allow active knee movements was not used in either of the hospitals.

Skeletal traction in a hospital ward

In-hospital follow-up consisted mainly of ward rounds done twice every week, while control x-rays were done after 48 hours, after four weeks of traction and possibly later on to confirm union. When the traction period was completed, the pin was pulled out at the ward without any use of anaesthesia. The procedure was usually done without any protection from the gaze

or listening by fellow patients. For instance, I overheard that one older man was asked not to scream by a younger patient who was on traction next to him, waiting to undergo the same procedure. When the pin was removed, the patients were ordinarily discharged the same day and booked for review at the outpatient clinic after one month. Means of transport and arrangement of the travel back home were the responsibility of the guardians, and patients were often observed being carried on the back of their guardians when leaving the hospital.

4.2 PATIENTS´ EXPERIENCES WITH SKELETAL TRACTION

4.2.1 Individual and socio-cultural perceptions of pain, suffering and healing

Patients seemed to perceive treatment by skeletal traction differently. For instance, a male patient aged twenty-seven conveyed the insertion of the traction pin as another injury made to his body: *"The holes they made [to insert the traction pin], they destroyed me"*. In contrast to this, another man aged thirty-two stated the quite opposite as he compared his treatment to surgery: *"I think traction is a good thing, it´s not like they destroy the body by putting things inside. The metal that was put was removed, meaning that you are healed; your body is the same as it was*." An important factor behind his statement seemed to be a conception of implants as foreign substance in the body. Several patients brought up the wish of having internal fixation instead of the long-term skeletal traction due to the prolonged suffering and personal strain this implied. A man aged thirty-two expressed: *"If it can be possible for the hospital or the government, it is better to help people in other ways rather than this traction, there´s need for operation. They must try in such ways, because this traction takes more time, it´s tough, it´s painful."*

Undertreated pain and physical discomfort

The informants expressed that they experienced pain and distress consistently throughout the skeletal traction period. Patients expressed insufficient pain relief in the hospital as they were only offered "Panado", which is a paracetamol-based drug (SAEPI, 2006). As a man aged fifty-nine stated: *"They were helping us, but the support was not enough when it came to medication, because Panado is maybe for headache, but not for bone injury"*. All patients claimed that sufficient pain medication was important to reduce their suffering, both because of the physical agony and awkwardness related to the injury, and because of the traction itself. A patient aged thirty described the sensation like twofold pain: *"You feel pain from the place*

where you´re injured, you feel pain from the place where they put the traction. It´s like double pain..."

In addition, several patients experienced complications such as swelling, secretion and bleeding from often-occurring pin-track infections: *"When it moves it causes blood to come out*. S*ometimes it produces pus…"* (man, 27). Aching and discomposure was further related to immobilization in bed, and the same man expressed: *"Sometimes you can feel pain on the buttocks, you can feel pain on the backbones because you don't have other ways to sleep… you don't have other ways to sit..."* Another man aged thirty described discomfort at a level that disturbed relaxation and sleeping pattern: *"When you stay like this, you can´t sleep like you do at home. Sometimes you can remain like this maybe until midnight, just sitting like this, because you are already tired of lying down."* Some situations increased pain substantially, such as using a bedpan while being on traction. A woman aged forty-seven expressed to suffer severe problems: *"For me to go to the toilet, they have to put it [bedpan] for me, but while I am crying, shouting; "be careful, careful", and when I am done; "remove it carefully, carefully."* Pain and trauma during such intimate situations was probably strengthened by the lack of privacy in overcrowded wards with bed screens as only protection from others' gaze: "*I would cover myself with a blanket while crying, what else can I do?"* (woman, 47).

Studies from African hospitals have demonstrated that pain is often undertreated (Haonga, Makupa, Muhina, & Nungu, 2011; Masigati & Chilonga, 2014), something that seemed to apply to the current situation in Malawi. Despite the fact that all patients expressed persistent pain and needs for better pain relief, professionals rarely addressed pain at all when discussing the topic. Some OCOs addressed the issue of pain during removal of the pin, and conflicting views on its severity appeared. One OCO stated that patients were in quite a lot of pain when removing the pin without anaesthesia. Another OCO expressed that patients only felt a pinch, yet confirmed that pin site infection could cause pain in surrounding soft tissue. Even so, they both concluded that anaesthesia was not necessary for this procedure.

Discrepancy between patients and nurses in perception of pain has been reported in Ghana, in which nurses considered pain levels to be lower than what the patients perceived (Murthy, Antwi-Kusi, & Ofori-Amanfo, 2013). Inadequate knowledge among health workers in Kenya on how to recognize, assess and manage pain has been shown to influence pain management

(Kituyi, Imbaya, Wambani, Sisenda, & Kuremu, 2011). Cultural factors have also shown to influence pain control in Central Africa, such as beliefs that opioids cause addiction and that pain relief interferes negatively with healing (Rampanjato, Mukarugwiza, Ndimubanzi C, & Finucane, 2007). Also, views among nurses that taking pain medication is a sign of weakness and that pain is an expected consequence of injury, made nurses accept high levels of pain in patients, something that caused inadequate pain control (ibid).

Intimate hygiene, embarrassment and perceived indignity

Patients on traction viewed themselves to be different from other patients in the ward, involving greater vulnerability and helplessness, poorer hygiene and greater loss of dignity. Some also felt neglected in terms of attendance by professionals who prioritized other patients. A man aged twenty-seven said: *"The doctors, they may come for the ward rounds, but they don't get to us who have tractions, they just pass by... We who have tractions are in our own line."* Lack of privacy was another disturbing issue, for instance if fellow patients had poor hygiene or were screaming because of the pain, thus enhancing memories of one´s own traumatic injury: *"Some just arrive with a [recent] injury, maybe shouting or crying. They can affect the whole ward because it is loud… I just feel the way I did before. And it affects the guardians also, this is putting pressure on them"* (man, 30).

Patients were also expressing discomfort about cleanliness and sanitation, such as about the fact that they had to eat and do toileting at the very same spot. The issue of intimate hygiene was associated with indignity and embarrassment of being exposed in such intimate situations. *"Toileting there, urinating there, that was painful being a grown-up"* (man, 71). The same man expressed concerns regarding hygiene: *"Two months without bathing, just wiping your body only on this side, but not the other side. The bed sheet that I slept on until I was discharged was the same one".* Being confined to bed was seemingly perceived as a situation of being dependent and vulnerable, compared to other patients who could mobilize: *"If they had not put the traction, I would have been able to do what my friends are doing, even if injured. When they [patients not on traction] want to go to the bathroom, they can sit in a wheelchair and go"* (man, 27).

A study from New-Zealand addressed how lack of privacy in hospital wards caused distress to patients, thus constraining information disclosed to health workers (Malcolm, 2005). Another interview and observation study from United Kingdom (UK) revealed that indignity was

related to dependency on others and bodily exposure, especially among elderly patients and in front of opposite-sex patients (Leung, 2009). Due to the high representation of female guardians in Malawian hospitals (Hoffman et al., 2013), bodily exposure in front of opposite sex were especially noticeable in male wards with many female guardians being present. Patients´ perceptions of privacy and loss of dignity in health institutions in LMIC seems to be unaddressed in current literature.

The psychological impact of skeletal traction: "…in the ward they are more or less like prisoners…"

Both patients and professionals viewed long-term immobilization in bed as physically and psychologically challenging. Professionals used words like "prisoners" or "handicapped" to describe the situation and they could not accept the thought of being subjected to skeletal traction if sustaining a fracture themselves. An OCO expressed: *"The patients are psychologically affected, in the ward they are more or less prisoners".* This could lead to severe reactions, according to a physiotherapist: *"An adult being put in bed for eight weeks, he might end up having a psychological breakdown".* Professionals viewed reassurance as vital because of the worries and anxiety that patients commonly displayed, as an OCO described: *"I convince the patients that they will get back to normal, but in my mind I know that what I´m telling the patients is not the truth, but because he´s in anxiety you need to reassure the patient that he´ll get better soon."* Professionals tended to deal with patients' anxiety by conveying an outcome contradicting to actual professional judgements, thus reflecting limited means of helping patients on the psychological level except from giving hope.

The psychological suffering of patients was even more exacerbated when skeletal traction treatment was not successful. Two of the patients had been told by the physician that there was non-union of the fracture, after eight and eleven weeks of traction respectively. They were both waiting for internal fixation. Both expressed negative feelings about going through long-term traction and then having to go for surgery again, as explained by the 27-year-old patient: *"I feel pain in my heart because I was told some weeks, I finished those weeks and beyond, but still it is not joined… So the way I have stayed here…it is like they are delaying me in my life."* The man aged thirty expressed feelings of suffering in vain: *"I´m already two months in the hospital and must now go for operation, it´s like you stay with this traction for nothing, instead of just going [straight] for operation."* The man had already waited two

weeks for internal fixation and foresaw himself staying even longer in the hospital: *" After two months in the hospital, I must have another month because of the operation. It´s tough, it´s like double…like two kinds of treatments. It will be operation times two."* Thus, for those patients where skeletal traction was not effective, the additional burden of going through another treatment after long-term immobilization was substantial.

Patients undergoing more or less successful skeletal traction expressed various forms of psychological distress, involving fear of permanent disability, anxiety about future ability to perform income generating activities, regret about being an injury victim and guilt for negatively affecting family members and social network. All of this was seemingly adding to the suffering experience of "illness" and additional causes of "pain". The woman aged forty-seven put words to her worries regarding her ability to take care of herself: *" I just worry whether I will manage or not at home, whether other people will be cooking nsima [maize porridge] for me or whether I will be struggling since I am injured."* Another patient said: *"I am suffering a lot and I think; "why did I do this?" like if I did it deliberately, forgetting it was an accident"* (man, 27).

These findings were similar to a study conducted in Congo on injury and disability experiences (Okonta et al., 2011) where patients expressed disturbed cognition and mood, and felt disabled. Except for the Congolese study and one older study describing behavioural and emotional reactions among patients treated with skeletal traction in the USA (Putnam & Yager, 1977), psychological aspects of skeletal traction appear un-mentioned in existing literature. More research is needed about emotional and psychosocial impact of long-term immobilization in the hospital in LMICs.

Buzzing city life

Malawian countryside

4.2.2 Communication with hospital personnel

Interaction with hospital staff imposed a variation of positive and negative experiences. Several patients experienced negative reactions on presenting complaints or requesting assistance. Some of the patients expressed fear of posing complaints, for instance fear of being left alone without any support or being refused treatment. The man aged twenty-seven said: *"When I told her [the nurse] to come and look at the wound, she said: "Has the doctor said you should call us?"… then she said that she would not return again. When this happened, I just took some cloths and just wiped myself and bandaged myself…"* Needing help while being confined to bed was described as a particularly defenceless situation, as expressed by the same man: *"A patient who is on a bed like this experiences so many painful things, so when you call somebody to help you, it means that you really are desperate. So she should listen to you, at least come and see you… not responding by walking another way, it is very painful."* The man aged thirty stated: *"We just accept everything, if you fight with them there´s no way you can come here for treatment. If you have complaints there´s no assistance…they can just ignore you"* (man, 30).

At the same time as patients were facing difficulties undergoing skeletal traction, some expressed gratitude and respect: *"If I had not come here, I don't know how it would have been"* (man, 59). Some also displayed trust and understanding of professionals' situation: *"They were doing their job as it was. It was not cruelty or something"* (man, 73). Even though having various complaints, the man aged thirty-two expressed: *"If we are to talk about the hospital, we are just praising the hospital that it healed us."* This patient expressed thankfulness to professionals who treated him empathetically: *"The nurses were good to us so that we could be happy in so many ways, maybe so that we could forget that we were injured."*

Several studies from Africa reflect moral challenges for health workers that consequently adopt negative attitudes towards patients. A qualitative study from South Africa explored the reasons for why some nurses abuse patients verbally and physically, as well as neglecting them (Jewkes, Abrahams, & Mvo, 1998). The findings suggested a complex interplay of organisational issues, professional insecurities, a need to control the environment by punitive measures and an underpinning ideology of patient inferiority. This study suggested that nurses were struggling to assert professional identity, and abuse of patients were means of creating social distance and maintaining power (ibid). A recent study explored the moral distress from

acting in a manner that was perceived to be wrong among nurses in Malawi (Maluwa, Andre, Ndebele, & Chilemba, 2012). Limited capacity, work overload and feelings of not being appreciated by patients and other hospital staff resulted in situations where nurses felt morally distressed and suffered from lack of sleep and appetite, sadness and anger. At the same time they did not perceive that these challenges affected patients and nurses indicated that they provided effective care despite of moral distress. Thus, the authors suggested that nurses were unaware that their negative feelings affected patients (ibid).

Awareness, information and patient involvement

By and large, patients perceived to have little influence on treatment options. For instance, a patient who had been on traction for eight weeks, got confirmed that there was no bony union, and he asked for an operation. However, he was denied surgery in favour of getting added more weight on the traction and extending the traction period until union of the femur would be obtained: *"They said I should still be here because the bones will come back together on their own, they just added another weight"* (man, 59). Another patient's statement also illustrated no option of treatment: *"This treatment of traction, you just have to accept it, just agree. So, you don't have any choice, you need treatment"* (man, 30). The same patient was aware about patients' rights, yet he emphasized professional superiority in decision-making: *"Of course, we have rights, but it´s not 100%, we just accept how they want to help you and when they want to assist you",* thus indicating that he did not perceive himself as an active participant in his treatment. One surgeon articulated that patients were surrendering to whatever treatment they were given in the hospital: *"Patients accept skeletal traction because they don't even know other types of treatments".* This surgeon related this to lack of education and lack of knowledge among patients, and also lack of awareness about patients' rights. He suggested that patients were not aware of complications, thus unawareness of the likelihood of having stiff knee joints and potential functional disabilities contributed to few complaints.

Several nurses had observed some patients who left the ward in a wheelchair to socialize outside the hospital, despite being told about the risk they exposed themselves to. Also, several professionals experienced that some patients would put the weights on the bed when physicians were not around, assumedly to relieve them of the pulling sensation from the traction. Such non-compliant behaviour was considered as a factor that disturbed healing. However, health workers experienced difficulties in patient education, which might be related to lack of time, with compliance seemingly affecting the outcome negatively: *"You tell*

patients to go home non-weight bearing or partial weight bearing, but on review you find that it has not been done. You find a re-fracture or deformities, all sorts of things." (OCO).

Patients on their side, reflected lack of information on their condition and lack of advice on how to contribute to enhancing the healing process: *"They [health personnel] should come just to give you an answer, like "this is happening because of this…"* (man, 27). The older man aged seventy-one said: *"When we are sick we don't know anything, we expect the doctors to give us advice, but maybe they just say that you should be on this bed, that's all. What can we say, what do we know?"* The patients expressed difficulties to act or to make decisions due to lack of knowledge and feeling disempowered. Strengthening patient and guardian education and counselling seems important for active involvement of patients in their own treatment. Patients' statements reflects that providing good quality health care meant providing care in line with the needs of the patients, not only in order to enhance fracture healing as a stand-alone goal, but also to enhance all aspects of good health.

Lack of influence on decision-making processes as experienced by my informants, is in line with the study from Congo regarding experiences with traumatic injuries (Okonta et al., 2011). Unawareness was brought to light as reducing patients' abilities to influence or act on their own treatment, thus disclosing great needs for counselling. A study regarding adherence to cancer treatment in Malawi showed that being informed about the positive effects of treatment, as well as addressing any concerns that patients and guardians might have, were important to enhance compliance and motivation during treatment (Israëls et al., 2008). Several studies demonstrated that patients´ participation in decision-making is important for the treatment process (Charles, Gafni, & Whelan, 1997; Gafni, Charles, & Whelan, 1998; Guadagnoli & Ward, 1998). However, a review showed that variations within different cultural groups regarding preferences for patient-involvement in decision-making, were still unknown (Charles, Gafni, Whelan, & O'Brien, 2006).

4.2.3 The social burden of long hospitalization on guardian and family

Both patients and professionals enlightened the individual and social burden on guardians and families due to the long-term hospital stay. Long hospitalization and separation from the family was detrimental for patients. Professionals had witnessed that some couples divorced because the spouse at home had no means of taking care of children while the breadwinner was hospitalized: *"Some they are divorced because the man is admitted here and the wife has to find another man, so that she can at least feed her children"* (OCO). Guardians were also affected by the living conditions at the hospital, as pointed out by a physiotherapist: *"Because of the long stay at the hospital, the guardians get very, very tired with caregiving of the patient"*. Moreover, the long-term stay in the hospital put the family at risk of acquiring various diseases, thus endangering the health of family members: *"The children run around in the hospital and they acquire infections, it´s difficult to control"* (OCO). Professionals further explained that some patients came with the entire family, because the injured person was the one providing for them.

A female patient explained that it was a double burden to the carer of being responsible both at home and at the hospital: *"My family is no longer at peace, now it´s like my husband is looking after two households, looking after me in the hospital and the children at home"* (woman, 26). At some point the guardian could be forced to leave and find replacement, as highlighted by the man aged thirty: *"My wife was here for two whole months, she had to go and check on the children, so now it´s my brother´s son who is a guardian"*. Some patients were concerned with the burden put on their children: *"My children were very worried because of their father being injured. When somebody went to the hospital [to see me], they would be crying to see their dad"* (man, 32). Prolonged stay in the hospital also caused patients to miss out important events in their life: *"I left a wife at home and my second child was born while I was here"* (man, 27). Being incapacitated as a caregiver of one´s family was perceived as major factor of suffering: *"I had thoughts like I was sick twice; suffering from having broken my leg, but also suffering about the home"* (man, 71). Another factor affecting the family was diminished security at home with wife and children being vulnerable to burglars: *"The home is not safe; people may come at night and steal from you. At my home they have chased thieves two times"* (man, 27).

Patient-guardians in Malawi are mainly represented by women of low literacy (Hoffman et al., 2013). Hoffman et al (2013) has described that overcrowding of wards, lack of understanding of hospital regulations and lack of respect of the guardian role by hospital employees caused conflicts between guardians and hospital staff. Despite the variety of tasks performed by guardians, they received little support from the hospital and the necessity of a clear guardian-patient policy and education was detected (ibid). Thus, guardians and families of admitted patients face various challenges that add consistently to the burden of individual suffering during and after treatment. The social burden and disturbed relations and family dynamics correlates with findings from the study on experiences with traumatic injuries from Congo (Okonta et al., 2011).

4.2.4 Economic impact on households: "There is no way we can earn money…"

All informants expressed that long-term hospital stay strained an already impoverished household financially. Patients suffered economically from increased out-of-pocket expenditure at the hospital, thus adding expenses to an already strained budget because of hindered income generation: *"It can make the family suffer more than you suffer, because they spend more money for supporting you in the hospital, which will take away things your family needs"* (man, 30). Another economic consequence was loss of employment for patients and guardians: *"Some even loose their jobs. If a woman works in a company and spends twelve weeks as a guardian in the hospital while she´s not actually sick, she may loose her job"* (OCO). The hospital stay was often told to affect food-production: *"We have planted a garden in the village, but we won't be able to farm. The maize was planted, but we didn't weed because of the [broken] leg"* (woman, 26). All patients enrolled described financial problems leading to constrained nutritional state, lack of basic supplies to maintain hygiene or less means to provide education for children, thus consequently enforcing dependency on others: *"I just ask well-wishers to support my family until I am better. I´ve stayed long here [in the hospital], starting on the third month. There´s no way we can earn money"* (man, 30).

Professionals described how long-term hospital stay drained resources from guardians as well, thus affecting the entire household. *"The guardian has to feed himself because the hospital only provides food for the patient, it´s a burden to them. Most of the patients end up with the guardian running away from the hospital…"* (OCO). Several of the patients were breadwinners of their families, such as a man aged fifty-nine: *"When you become sick*

unexpectedly, it affects a lot of people that you support. I take care of three girls, they should go to school, have soap and even food. I worry about what these people will eat?" One male patient expressed that an injured man affected the household differently compared to when women were injured: *"A man sorts out everything, the woman cannot go and find money, a woman just receives... If the woman was injured, the man would be able to run around and look for money"* (man, 30). This pointed towards how different genders may carry different responsibilities and roles in the household and in income generation. The fact that most patients sustaining fractures and undergoing skeletal traction are male, with a main role as "breadwinner" in the family, adds to the importance of securing treatment methods that reduces hospital length-of-stay (Sekimpi et al., 2011).

Most patients undergoing skeletal traction in public hospitals belong to fragile socio-economic classes, because health services at governmental institutions are provided for free (Mkandawire et al., 2008). Out-of-pocket health expenditure during hospital stay, even when using public health services, has been shown to cause indebtedness and increase poverty in low-resources settings (Damme, Leemput, Hardeman, & Meessen, 2004; McIntyre, Thiede, Dahlgren, & Whitehead, 2006). A study from South-Africa demonstrated how households were pushed deeper into poverty, particularly when faced with medical expenses combined with loss of income (McIntyre et al., 2006). This underpins the significant economic burden for a patient and the family after sustaining injuries followed by prolonged hospitalization.

4.3 PATIENTS´ EXPERIENCES WITH RETURNING TO EVERYDAY LIFE

On the way to home visits in rural Malawi

4.3.1 Physical weakness, hampered function and limited participation

All informants interviewed after homecoming reported poor functional state related to lack of instructions or gait training with crutches, disabling muscle weakness, pain, swelling, poor balance and fear of falling. Poor gait and mobility caused numerous hindrances. All interviewed informants were discharged from the hospital on the same day as the traction was removed. They were not being helped with mobilizing or instructed on how to use crutches, which caused problems after homecoming: *"Since I was not taught how to use the crutches, I have had problems. The doctor just said; "Go home, you´ll learn there"* (man, 73). Another man aged fifty-nine described: *"I was carried on my brother´s back up to his home*." Especially older informants experienced increased risk of falling: *"The boys hold me to prevent that I may slip and fall, they should catch me if I do"* (man, 71). This man perceived higher risk of sustaining another injury due to his condition.

None of the informants had any follow-up by health professionals, except the standard review at the central hospital. Debilitation and weakness due to the long immobilization was a reappearing theme: *"My body was not strong since I just stayed two months in a bed, so when I tried to stand I was just shaking. The healing has been very difficult because the leg is very heavy for me to pull now"* (man, 73). A younger man said: *"When I was discharged from the*

hospital my leg wasn´t bending, it was stiff. The leg was numb and had no strength" (man, 32). Poor function meant challenges to mobilize even inside the house: *"When I wanted to get out of the bedroom, I would sit on a chair and push myself to the sitting room"* (man, 59). Reduced mobility inflicted dependency on others for assistance with personal hygiene and transfer at home: *"My complaint is that I am not able to walk, I cannot go to the toilet, it is done inside the house. I bath on the bed, it makes me really sad"* (man, 73). Poor function was also expressed to affect food consumption, thus constituting a vicious threat to recovery and regaining strength. The man aged thirty-two said: *"Right now I just stay like a domestic animal. Whatever is found that day I just eat, since I am not able to walk."*

All informants interviewed after homecoming were incapacitated to participate in social tasks: *"The injury has taken me aback because there is a lot of work that I did in groups where I am the chairman, in other groups I am a treasurer, but that work stopped when I got injured"* (man, 71). Poor function and long distance to hospitals prevented some patients from returning to their home villages even after discharge, thus prolonging the separation from their families. The man aged fifty-nine expressed difficulties with using public transport as means of travelling: *"In the minibus the seats are close together, so the leg becomes painful."* A recent study from Mozambique demonstrated how patients in need of surgical care were forced to travel longer distances compared to those with medical needs, since surgical services were mainly provided at larger hospitals (Faierman et al., 2014).

Poor recovery and persisting pain left some patients with a feeling of not being healed. The man aged fifty-nine said: *"Something I learnt there, is that a person is not completely healed when discharged. I was discharged while still feeling a lot of pain."* This man expressed that functional outcome diverged from his expectations after hospital treatment: *"I was just thinking that [given that] I was in a hospital, I should come out properly*." Another patient summed up his total situation in this way: *"The life that we used to have when I was okay and doing my work cannot be compared with now"* (man, 71), thus expressing great impact on his life from being injured and long-term bedridden in the hospital. These findings are in line with the interview study from Congo, where patients reported loss of pre-injury function and mobility even one year after trauma (Okonta et al., 2011). However, more enquiries on long-term functional state after skeletal traction are needed.

Conducting interview during a home visit with my research assistant

4.3.2 Persisting socio-economic distress after homecoming: "…what will I eat tomorrow?"

Informants expressed persistent economic problems after being discharged from the hospital. All four men were dependent on well-wishers like their own children, parents or in-laws, siblings or neighbours. A man aged fifty-nine communicated his economic dependency: *"I have a sister whom I stay with, she is the one who provides transport and food"*. This also seemed to strain the economy of those supporting discharged family members: *"I am grateful to my children, it is like they have thrown away money from their businesses, taking food and coming here to give me, so their wealth is also endangered"* (man, 71).

None of the informants were able to start with income-generating work when returning home, and they did not anticipate being able to do so for a long while. The man aged thirty-two explained: *"When I stand for a long time, the leg may go numb and I need to sit down. When I can start working, I´ll not be working for long days."* He also expressed fear of not becoming able to manage physical work as he did before: *"It will take a number of months. I may be able to walk properly then, but the numbness can also start again since I may not be completely healed."* The 71-year-old man expressed a similar situation: *"I am just waiting for the leg to heal. When I am able to step down I´ll start to do some small work, but now there´s nothing I can do, I just sit outside"*. The lack of income created an unpredictable situation for the informants, as illustrated by the man aged thirty-two: *"The main worry is*

taking care of myself, my body and my life, so that I should be able to eat and be strong. I still have worries about what will I eat tomorrow?"

The findings suggest that negative consequences to households and unpredictable living conditions mostly persisted after hospital discharge. Moreover, most of the injured informants' perceived that they would not return to normal work in a long time. In a low-income country like Malawi, lack of social security systems means that people are depending on their own means, their family and social network when facing impairment (Bach, 2004). As demonstrated in a survey from Ghana, injured family members imply great economic costs on households, especially in rural areas (Mock, Gloyd, Adjei, Acheampong, & Gish, 2003). Lost productivity and strained economy involve decline in food consumption and enforce compensating strategies like borrowing money and selling consumables (ibid). A report from Kenya claims that 80% of total lifetime economic costs of injuries relates to lost work and household activities (Blincoe et al., 2002).

Bodily strength during daily duties

4.4 WEIGHTING THE PROS AND CONTRAS OF SKELETAL TRACTION: VIEWS OF PROFESSIONALS

4.4.1 Skeletal traction as a more viable option in contexts of scarcity

All professionals enrolled in the study expressed in unison that internal fixation was the optimal and first choice of treatment. However, the low-resourced environment imposed continued use of skeletal traction because of lack of facilities and equipment, and a limited number of trained professionals. Also, this simple and safe technique, claiming less time and less advanced theatre facilities, allegedly allowed paramedics to apply it in district hospitals. One orthopaedic surgeon expressed: *"The theatre capacity in our hospitals does not allow it [internal fixation] at the district level. It would be risky to subject patients to surgery in district hospitals which are not equipped to do it."* Poor staffing in hospitals was considered a hindrance for expanding surgical treatment in the country. A survey addressing surgery in Malawi demonstrated that all district hospitals had operating theatres, but none of them had permanent surgeons employed (Lavy, Tindall, Steinlechner, Mkandawire, & Chimangeni, 2007). The total extent of skeletal traction performed in the districts remains uncertain, but it might be considerable. Indeed, as the same survey indicated, clinical officers inserted traction pins outside of the theatre and this was consequently not captured statistically (ibid). This may explain the preference for skeletal traction as treatment option, as it can be performed by OCOs, as opposed to internal fixation, which requires surgeons. (Lavy et al., 2007).

While professionals at KCH opted for internal fixation, skin traction unintentionally became definite treatment because of limited theatre capacity. According to the surgeon, skeletal traction would have been a preferred option in this situation as delayed surgery allegedly resulted in more complicated surgery, increased workload and caused poorer outcome than what was possibly achieved with skeletal traction: "*To remove the entire callus and put the bone back in good alignment takes you more than four hours… If this patient was on skeletal traction he could already have healed in a good position*." Such complications demonstrate the need for sufficient supply of IM equipment, and of surgical capacity and expertise for internal fixation to be successful. In comparison, well-applied skeletal traction, which requires fewer resources, was suggested to result in fewer complications.

4.4.2 The challenges of skeletal traction

Complications and poor treatment outcome

Professionals voiced a number of disadvantages with skeletal traction treatment at both hospitals. Pin track infections were viewed to be common, which could evolve into more serious and even lifelong conditions of chronic osteomyelitis. Also, high frequency of contracted knee joints, limb shortening and mal-unions, such as rotational deformities was reported. Dealing with contractures seemingly resulted in a circle of referrals, in the hope that another professional had something better to offer. As an orthopaedic surgeon commented: *"The OCOs would tell the patients to go and see the consultant. Now, what am I going to do with this stiff knee? I tell them to go for physiotherapy and see what they can do, but it might be too late…"* Research from Cambodia and Sierra Leone has shown high rates of complications following skeletal traction, with estimations of 42 % pin track infections, 22 % non-unions and 14 % mal-unions in some studies (Gosselin et al., 2009; Gosselin & Lavaly, 2007). Non-union fractures after conservative treatment represent higher risk of infections and complications in itself, and increased operating time in theatre that indicates prolonged hospitalization and recovery time, thus leads to increased strain on hospital resources (Young et al., 2013; Young, Lie, et al., 2012).

Professionals expressed that poor follow-up rates of patients and lack of long-term research caused uncertainty on how patients *actually* recovered. A surgeon uttered: *"The major problem we have is follow-up [after discharge], so we can´t do a long term outcome like two years or five years post-treatment, so it´s an area where we cannot say much."* The same surgeon expressed that patients were likely to accept deformities after fracture injuries: *"In our setting people don't tend to be aggressive in demanding correction of the shortening or deformity, so I am sure there are patients out there who need corrective surgery, but they are not coming forth to seek treatment."* Hence, an unknown number of patients might be living with permanent disability after injury and non-optimal treatment. According to the surgeons, patients were not likely to achieve normal range of motion of the knee after weeks of immobilization. It was considered to take months before patients could reach ninety degrees of knee flexion. This underpinned the need for more research, such as on infection rates and long-term outcomes, for example, and documenting how many actually need surgery after skeletal traction.

Coping with skeletal traction challenges: "Reviving" the Perkins regime?

When discussing treatment approach the informants kept coming back to Perkins method of traction, in spite of the fact that most nurses had never heard about it. One of the two hospitals had previously adopted the Perkins regime for a shorter time. At this hospital, different views were shared on why it was not practiced anymore. One point of view was: *"It just died naturally, but it was a very good regime in terms of rehabilitation"* (OCO). The limited resources and facilities were brought up as contributing factors: *"I think we didn´t have the capacity to follow up these patients with Perkins traction, but we should have encouraged each other to continue with that type of regime"* (OCO). Another aspect was uttered by another OCO: *"I recall the Perkins method died naturally, but it was just a matter of attitude. Had staff members had a positive attitude to continue with Perkins, that method could have been here up to this date*."

Several professionals considered that introducing Perkins regime would be beneficial. This in order to prevent contractures and muscle atrophy, as well as increase blood circulation and hasten fracture healing, since Perkins traction implies early onset of active rehabilitation to compensate for immobilization. In relation to this, several professionals expressed that good results could possibly be achieved by skeletal traction given more optimal conditions. Improving procedures of skeletal traction was suggested to reduce complications. Developing standard regimes of management was proposed as means to simplify such tasks in a hectic workday. Previous research from similar settings demonstrated beneficial results of Perkins regime as for knee mobility and good alignment of the leg (Bezabeh & Wamisho, 2010; Gosselin & Lavaly, 2007). Yet, the mean admission length was 45 days, thus introducing Perkins regime still inflicts prolonged hospital stay.

Vulnerable groups and treatment prioritization: the case of the elderly

The use of skeletal traction in elderly patients was addressed as a complicating factor in fracture management. Aging patients were perceived to be more vulnerable to complications such as infections, co-morbidity, poor fracture healing and poor recovery. It was also perceived more difficult mobilizing older people after traction. A nurse explained: *"In elderly patients skeletal traction is a dangerous procedure because they get very weak and have difficulties in walking*." Old age was also viewed as an obstacle to mobilize with crutches and other mobility devices according to a physiotherapist: *"Even eighty or ninety-year-old patients are trying to use crutches, but it´s very difficult. And providing wheelchairs for them*

is difficult…and even if we do it, it is difficult to use a wheelchair properly in the village." Older fracture patients have demonstrated to have higher incidence of comorbidities from long hospital admissions, such as vein and pulmonary thrombosis, poor nutritional state, delirium, pressure sores and urinary retention that predispose them to complications, disability and death (Cassim, Lipschitz, Paruk, & Tipping, 2013).

In spite of greater complications and disabilities, these patients were not prioritized for surgery. As another physiotherapist elaborated, poor outcome after a fracture in older people was more easily given up on: *"If there is a non-union after checking the x-ray they are just being left like that, they are given crutches and they go home and wait for their faith… Though ethically you are not supposed to deny somebody treatment, even if he is hundred years old…*." According to the same physiotherapist, accepting failed healing in elderly patients left both patients and rehabilitation staff with substantial problems: *"When somebody comes here and the fracture is not healed, what do you expect from physiotherapy? It means that this person is disabled."* This physiotherapist explained that accepting failed fracture healing in aging patients was justified by the fact that the elderly were expected to have fewer responsibilities and being less productive in daily life.

The proportion of the population aged 60 years or older is rapidly increasing in sub-Saharan Africa, but the elderly patients are not considered a health policy priority in African countries (Kimokoti & Hamer, 2008). In Malawi, rates of fracture patients that return to the hospital for review are shown to be consistent in all age-groups and then drop in people over 50 years, thus demonstrating that aging patients are less likely to be followed up after discharge (Young et al., 2011). While the incidence of hip fractures in elderly people appears to be stabilising in industrialised countries, it is projected to rise in Latin America, Asia and Africa where populations are aging, estimated to make up for 70 % of over 6 million predicted fractures by the year 2050 (Cassim et al., 2013). These estimates indicate increased future challenges within fractures management in low- and middle-income countries (LMIC), thus pointing at the vital needs to strengthen health services accordingly.

The costs of conservative traction: health system- and public health point of views

There were different views among professionals on whether skeletal traction or internal fixation was more expensive to the health-system. Avoiding costs of implants and resources spent in theatre with IM-nailing was pointed out by some of the professionals: *"Skeletal*

traction is cheaper comparing the prices of the Denham pin and IM-nail, and you can see the deviation without even adding the anaesthetics and all the stuff used in theatre" (OCO). Yet, other professionals expressed that skeletal traction caused great expenses to the hospitals due to the long hospital stay: *"It´s a burden to the hospital, the patient has to be fed for the entire period"* (OCO). In addition, it appeared that several patients required surgery after all due to non-union after skeletal traction, thus spending more resources on the very same patient, something that was expressed by another OCO: *"When we switch patients from skeletal traction to internal fixation we use two treatment resources for the same patient"*. Hence, likeliness of poor outcomes following skeletal traction was pointed out to increase costs to the hospital. In addition, the long hospital stay following skeletal traction was causing the orthopaedic wards to be overburdened, thus exhausting available resources. As a nurse explained: *"Every day we have new patients coming and if those beds are filled for several weeks it´s a disadvantage. We keep patients in the corridor or some on floor mattresses and the ward gets crowded."*

Cost calculations from UK on elderly patients with hip fractures demonstrated that investigations and operations accounted for 7% and 9% respectively of the total hospital costs, while ward costs related to the length of hospital stay involved the high figure of 84% (Lawrence, White, Wenn, & Moran, 2005). Thus, long-term hospital admissions imply significantly increased expenses. A study from Cambodia concluded that replacing skeletal traction with internal nailing was actually cost-effective, and at the same time this produced better treatment outcomes (Gosselin et al., 2009). These findings were supported by a recent study from Kenya demonstrating cost advantage with surgery and less complications compared to skeletal traction (Opondo et al., 2014). In addition, the average duration of hospital stay was thirty days in the surgery group and sixty days in the traction group (ibid). Young et al (2013) suggest that increased surgical workforce and facilitating early mobilization could reduce the length of hospital stay from 30 days to 10 days (Young et al., 2013). In this regard, available research appears to support the argument that prolonged hospital stay due to skeletal traction imposes greater costs to the health system. However, the total economic impact on continuing skeletal traction versus internal fixation and early discharge, including loss of income and employment to patients and guardians in Malawi needs more evidence.

4.4.3 Coping with shortage of human resources and equipment: "All the time you end up improvising…"

Coping with lack of equipment

The professionals identified several factors contributing to complications and substandard outcomes with skeletal traction. Lack of proper equipment was one factor, such as appropriate beds and necessary materials like traction pins, hand drills, ropes, pulleys and stirrups. Lack of equipment forced physicians to use whatever materials they had in hand, like one OCO expressed: *"All the time you end up improvising. Instead of traction cord you use bandage, instead of pulleys you put the POP to act like a pulley."* Availability of appropriate equipment was consistently pointed out as vital to improve skeletal traction: *"If we had good beds, ropes, pulleys, stirrups and those things we would get better outcomes"* (orthopaedic surgeon). Lack of equipment and facilities has been identified major obstacles to develop surgical services in LMIC (Bickler & Spiegel, 2010; Hofman, Primack, Keusch, & Hrynkow, 2005). Lack of supplies and drugs in health facilities has been recognized as a challenge in the "Malawi Health Sector Strategy Plan 2011-2016". This report suggests that lengthy procurement processes and pilferage are contributing to weak supply chain management (Ministry of Health, 2011, p. 55). Strategies to improve access to medical supplies include strengthening collaboration in the pharmaceutical sector, strengthening security systems, building capacity for procurements and improving financial mechanisms (ibid).

Coping with shortage of professionals: work overload and task-shifting

Lack of human resources was a reappearing theme. As expressed by a surgeon: *"Staff shortage is really, really serious. There is a huge shortage across the whole board, it´s not only surgeons, it´s not just doctors; it´s nurses, it´s rehabilitation workers, its pharmacists, it´s everybody."* One nurse described the consequences of scarce personnel and overwhelming workload: *"Patients are being mismanaged. They stay long in the ward before being assisted, some have been rescheduled and rescheduled for theatre for weeks, but still wait for treatment."* Shortage of human and material resources has been demonstrated elsewhere to cause frustrating and demotivating situations to African health workers (Mathauer & Imhoff, 2006). As previously mentioned, "brain drain" has been one contributing factor to the lack of health professionals in Africa (Qureshi et al., 2012). Only half of all doctors in Malawi are Malawians, while non-national specialists outnumber Malawian specialists by over two and a half time (Muula, 2006). A survey conducted among health workers in the districts revealed that excessive workload forced them to delegate tasks like suturing and dispensing drugs to

unqualified staff, such as ward assistants and cleaners (Manafa et al., 2009). Even though the enrolled hospitals were the largest central hospitals in the country, lack of material and human resources seemed to be major obstacles to provide quality fracture treatment.

In order to tackle shortage of health workers, task shifting from fully-trained professionals such as physicians, to new cadres, such as clinical officers and medical assistants, has been determined as important policy options in Malawi and other LMIC, due to its cost effectiveness (Fulton et al., 2011; Zachariah et al., 2009). Another advantage is that auxiliary cadres are less employable abroad due to incompatible qualifications in high-income countries and tend to remain in the country (Hongoro & McPake, 2004). However, some challenges regarding quality and safety concerns have been identified (Fulton et al., 2011). Moreover, new cadres have been met with resistance and not all LMIC accept paraprofessionals, even when fully-trained health workers are completely absent (McPake & Mensah, 2008; Mkandawire et al., 2008). According to Fulton et al (2011), available research tends to only compare task shifting from higher to lower-trained workers, while there is a lack of research comparing results of new cadres with the care provided if these cadres were not available (ibid). In the case of fracture management in Malawi, absence of shorter-trained cadres probably means no treatment at all for the majority of patients, especially in rural districts. This suggests that task-shifting is necessary to compensate for the shortage of health personnel.

Lack of specialized skills and of continuous education

Insufficient knowledge and skills among available staff was another central theme. The importance of professionals being exposed to clinical practice in orthopaedics as subspecialist areas was highlighted. *"In advanced countries there are orthopaedic nurses. Here you find that after six months these nurses are transferred to another ward and a new set is coming in without knowledge of orthopaedic care"* (OCO). The OCO pointed out that nursing staff should preferably be permanently allocated to certain wards in order to specialize their knowledge and skills. At the hospital that previously applied Perkins regime, some professionals claimed that insufficient training of new staff was actually one reason for why they stopped using it: *"...Another reason why Perkins disappeared was lack of preparation of new staff members. Previously, nurses were trained to teach the guardians how to do knee exercises with patients, but rotation of staff meant that new nurses were not oriented"* (OCO). Inheriting and applying non-appropriate working routines was also considered an obstructing

element: *"If we still continue with this improvisation it means that the rest of the staff, like newly qualified OCOs and nurses, they´ll also be improvising and there´ll be no improvement."* (OCO).

Professionals´ need for continuous education was identified as a major factor to improved health services. This is underpinned by research in Malawian health centres demonstrating that only 21 % of health professionals were satisfied with their own clinical knowledge, thus demonstrating significant discrepancy between competence and requirements in the clinical setting (Muula et al., 2005). A survey and interview study among mid-cadre district health workers in Malawi, showed that continuous education and career progression were substantially important to motivation, however this was not recognized as important by district health management (Manafa et al., 2009). According to the authors, inadequate supervision with no feedback at all, while performing tasks beyond the scope of training and job descriptions, contributed to frustrating and demotivating situations (ibid).

Multidisciplinary approach and empowerment

Although organised multidisciplinary interaction turned out to be a new experience for several professionals, multidisciplinary teamwork was a reappearing theme. One nurse said: *"I don't remember whether we´ve ever had a meeting like this, with the nurses, the physiotherapists and the OCOs all together to discuss about the patients… If this keeps on happening we can come to conclusions that would benefit the patients."* Teamwork was considered important, because it was viewed to promote exchange of knowledge, to improve procedures within fracture management and to secure development. As expressed by the same nurse: *"I learnt something [during the FGD] that I had no idea of, like Perkins regime. This is now a multidisciplinary approach and we need to have these kinds of meetings to share knowledge. It can help us to properly manage our patients."* It appeared that organized teamwork was not established as part of orthopaedic management, in spite of its recognized importance: *"We work in a situation where everybody comes at his or her own time. If we would see the patient together we could discuss"* (OCO).

An important aspect voiced was the value of multidisciplinary interaction to identify problems in order to deal with them, as another nurse commented: *"This meeting has been an eye-opener because we have seen the things we are not doing, maybe we can do it as a team. We are appreciating the gathering and the multidisciplinary approach, and with this meeting*

other things can be changed in the ward." In fact, the FGDs resulted in concrete initiatives, as in one focus group where the professionals concluded that they would try to introduce the Perkins regime with one or two patients in the ward. Moreover, during the FGD, participants agreed that professionals with particular competence on the method would organize ward teaching. Generating knowledge through the process of sharing experiences that provide foundation for actions is recognized within participatory research (Green & Thorogood, 2009, p. 20). This approach produces understanding that is useful for the group, which encourage development of solutions and empower those involved (ibid). The World Bank defines *empowerment* as "the process of increasing the capacity of individuals or groups to make choices and to transform those choices into desired actions and outcomes" (TheWorldBank, 2011), and multidisciplinary dialogue seemed to be experienced as empowering by participants in the FGDs.

Multidisciplinary collaboration contributes to mobilize the full range of resources needed to achieve the intended results, which has been demonstrated to have an empowering effect on health workers in South Africa (El Ansari & Phillips, 2001). The different roles and cadres that construct the health workforce might influence multidisciplinary work in various ways. Regarding orthopaedic care in Malawi, this applies for different levels of cadres, like orthopaedic surgeons, doctors, OCOs, nurses, physiotherapists, rehabilitation technicians, as well as nursing and rehabilitation assistants. The success depends on how the concept and roles of the cadres are integrated in the health sector, also because task shifting among these groups changes the roles, skills and workloads of other professions (Lehmann, Van Damme, Barten, & Sanders, 2009). Power imbalance and hierarchical constructions may negatively affect multidisciplinary team spirit, such as demonstrated in a survey where nurses in Malawi reported lack of respect and being badly treated by other professionals, especially in the relationship between seniors and juniors (Maluwa et al., 2012). Although shorter-trained cadres may not be new in Malawi, there might still be needs of acknowledgement and integration and, if carried out with respect and recognition, multidisciplinary teamwork might be contributory and beneficial.

4.4.4 The need for physiotherapy and rehabilitation: "…after 16 weeks, this leg is like a piece of wood…"

Lack of rehabilitation services

By and large, most of the patients interviewed had not been offered any rehabilitation service and some of them had not even heard of physiotherapy. Only one of the eight patients enrolled, a twenty-six-year-old woman, had been seen by a physiotherapist and described significant benefits of reduced oedema, pain relief, improved wellbeing and empowerment regarding how to facilitate good recovery: *"Now we are waiting for physiotherapists to come and treat us, so that the leg can be lighter. Before, the leg was swollen, so they told me that I should be doing [exercises] like this. Now that they are making me do this I can see it is better."* However, she experienced that the timing was not ideal: *"I feel like they started late to do that, if they had started in the beginning, by now I would have been healed, because after that they came I started feeling better."*

Absence of physiotherapy and rehabilitative services were seen as major obstacles to adequate treatment outcomes at both hospitals. One OCO stated: *"There is quite a need to not only look at how the traction works, but also the rehabilitation part of it. When the patient is discharged he should not have problems with weight bearing due to muscle atrophy or knee stiffness*." In spite of relatively high awareness and knowledge about the need for exercises, active rehabilitation seemed not to be well implemented in skeletal traction. As a physiotherapist said: *"We reach out to very few of them [patients in need of rehabilitation], so as far as physiotherapy is concerned, we are leaving them [those with ST] alone."*

Perceived potential roles of physiotherapists

In cases where physiotherapy was initiated, the time of onset of rehabilitation was another major concern, as pointed by a physiotherapist: *"Physiotherapy is supposed to be done from day one, but here physiotherapy comes after removal of the traction. They come after eight weeks in bed plus another eight weeks at home, so after sixteen weeks this leg is like a piece of wood."* Properly supervised gait training was considered important to enhance independence after hospital discharge, as emphasised by a rehabilitation technician: *"When we train them and when they do it properly all day with the guardian they become okay, but if they don't get it clearly from us it becomes a problem."*

Rehabilitation professionals viewed themselves to have an important role after hospital discharge, for instance in consultancy of employers and the social networks of patients. As expressed by a physiotherapist: *"The physiotherapist can be used as a connection between patient and employer, or with families to help them understand what is happening."* However, real involvement of such services was minimal due to understaffed physiotherapy departments, as well as lack of community based rehabilitation services. The same physiotherapist explained the need for services to be provided also after discharge from the hospital: *"If there was a physiotherapist in the community there would be a follow-up afterwards. That means a physiotherapist would see the patients in their homes after removal of the traction, to see how they cope and to advise them."* In rural areas, providers are often rehabilitation technicians or physiotherapy assistants (Fielder et al., 2013; MAP, 2014). This underpins the need for more physiotherapists, not only in hospitals, but also in community-based rehabilitation (CBR).

Physiotherapy represents a young profession in Africa and consequently still has a long way to go in order to gain public attention and recognition. As for physiotherapy, Africa is the most under-served region in the world (WCPT, 2014). In Malawi, the vacancy rate was reported to be 87 % in 2007 (McCoy, 2007) and the official registered number counts 27 physiotherapists for the total population of approximately 15 million people (WCPT, 2013a). The official numbers of rehabilitation technicians and assistants have not been possible to identify. Scarce available rehabilitation personnel restrict service provision, something that was demonstrated at both central hospitals involved in this study. A disability survey from Malawi indicated that only 23 % of those who expressed that they need rehabilitation actually received it (Loeb & Eide, 2004). As stated by various professionals, there is a need to educate more physiotherapists, and other rehabilitation workers, in order to fill the different roles and functions required in treatment and rehabilitation after injuries among other conditions.

4.5 PROSPECTS AND NEEDS FOR FRACTURE MANAGEMENT IN MALAWI AND LOW-INCOME SETTINGS

Although professionals viewed internal fixation as the best treatment, lack of capacity in both hospitals indicated continued use of traction for many years to come, in spite of the likeliness of complications and substandard outcomes. As one surgeon stated: *"In our setting in*

Malawi, skeletal traction is how we are going to do things for quite some time". From a personal point of view, this surgeon also uttered that skeletal traction was not an attractive treatment at all: *"If I was a patient I wouldn't want to be on skeletal traction, I would not be treated that way myself…"*

After discharge from the hospital there was no routine of patients being followed-up in their home districts. One reason given was lack of competence to manage musculoskeletal conditions in district health centres. The mainstay of health workers in the districts are generalist clinical officers, nurses or medical assistants (Manafa et al., 2009; Mkandawire et al., 2008). Deploying health workers to rural districts where the majority of people live, might be a mean to improve access to health services (Mkandawire et al., 2008). Using available modern technology like smartphones to take images in the districts, has been suggested a possible tool to link patients in rural areas to specialist competence in central hospitals (UiB, 2014). Moreover, it was assumed that rural health centres were already burdened with more acute infectious and medical conditions. The "Malawi Health Sector Strategy Plan 2011-2016" indicates that the human resource crisis in the country is acute and complex, and with the current output levels of trained health workers it will take many years to come near to providing minimum standards of health services (Ministry of Health, 2011, p. 30).

The rates of injuries in LMIC have been projected to increase in the future (Lagarde, 2007; Zirkle, 2008). Also, the rapidly aging populations in African countries forecast growing needs within fracture management (Cassim et al., 2013; Kimokoti & Hamer, 2008). Prevention of injuries must still be a main goal (Peden, 2004), yet the major impact on peoples´ health and economy implies negative effects on population health and disability adjusted life years (DALYs) (Ozgediz & Riviello, 2008; Spiegel et al., 2008), which require reinforcement of good health practices. Surgery in LMIC has been showed to lag far behind higher-income countries and there is also a misdistribution to urban areas (Ozgediz et al., 2008). The same applies for physiotherapy services in African countries (WCPT, 2014). Unfortunately, the burden of musculoskeletal injuries appears neglected compared to infectious diseases in global health (Krug et al., 2000; Mock & Cherian, 2008). Trauma and fracture injuries undoubtedly cause significant impact on human beings and populations as a whole, and as for policymaking, funding and research deserve increased global attention.

4.6 STRENGTHS AND LIMITATIONS OF THE STUDY

The explorative case study approach generated material covering the topic broadly. Yet, to embrace all aspects would be impossible within the limiting frames of this thesis. Multi-sited fieldwork in two hospitals, the perspectives of service users and service providers, and multi-professional views allowed for comparison, thus increasing the study's relevance. As described by Green and Thorogood (2009, p. 242), triangulation provides other perspectives and "fills in the gaps". The interviews and FGDs came to a point where no new information was generated or informants simply did not have more to say, thus indicating a degree of saturation (Green & Thorogood, 2009, p. 119). The overall data collected contained overlapping and repeated categories and themes. Also, by presenting different and conflicting views and not only unison information, validity was strengthened.

One limiting factor was the tight time frame, which did not allow the researcher to study both central hospitals thoroughly. For instance, the arrangements at Kamuzu Central Hospital (KCH) happened through mail correspondence with one of the Head of Departments (HoDs) and relevant professionals may have been left out in the recruitment process. The time limitation did not allow for inclusion of district hospitals, where traction is performed mainly by OCOs who work alone with limited support from consultants. It would have been relevant to compare the challenges at central and at district hospitals, and this needs future attention. Shortage of time also limited the number of interviews with patients having longer experience of coping at home after skeletal traction, which would have been relevant. However, post-hospital follow-up has proven to be a challenging exercise (Young et al., 2013), and it was not feasible to localize previously treated patients within the time frame of ten weeks.

Some of the methodological "good practice" guidelines described by Green and Thorogood (2009, p. 219) contributed to increase internal validity, such as transparency about procedures used, securing evidence of raw data and using comprehensive analysis of the whole data set. Transcription errors can weaken internal validity (Kvale & Brinkmann, 2009, p. 179), which is likely with translations from Chichewa to English. Sending sound recordings to Malawi for validation after fieldwork was not possible due to confidentiality requirements. Therefore, crosschecking transcriptions with recordings was not possible. Understanding the cultural frame strengthens authenticity, which refers to the world of participants as it is lived (Miller & Glassner, 2011, p. 131). Involvement of a Malawian research assistant and of my local

co-supervisor is considered to have increased reflexivity and sensibility to contextual and cultural aspects, thus strengthening validity. The general shortcomings of interviews are that body language and local meaning of words are lost in the transcription process, and they only give access to what people say and not what they actually do (Green & Thorogood, 2009, p. 102). However, participant observation enhanced understanding of the material generated through interviews and FGDs, which represent the bulk of the data in this study.

As for external validity, the main goal of qualitative research is not to secure reproducible findings (Green & Thorogood, 2009, p. 221). Information from interviewees is context specific, and one might expect other answers from interviewees in a different setting. In FGDs group dynamics and relations between participants might influence on the outcome. Polit and Beck (2012, p. 525) use the term *transferability* about to which extent findings can have applicability in other settings. It is by far up to the reader to decide whether knowledge drawn from this study can be applied elsewhere. Considering previously presented estimates of the growing burden of injuries and of the extensive use of conservative skeletal traction globally (Museru & Mcharo, 2002; Phillips et al., 2012; Young, 2014), the findings of this study in Malawi appear to have international relevance, especially for similar low- and middle-income countries (LMIC).

5.0 CONCLUSION

This study revealed longstanding physical, psychological and existential pain and discomfort to patients treated with conservative skeletal traction after sustaining lower limb fractures. Patients' need for sufficient pain relief appeared essential to improve treatment. Discrepancy in power-relations between professionals and patients constructed low influence on decision-making and fear among patients of posing complaints or requests towards professionals. Patients on traction viewed themselves as particularly vulnerable and helpless in the hospital setting due to bed confinement, and they heavily depended on guardians' care. The need to empower patients and guardians, and strengthen influence on own healing to ensure active participation in treatment, seemed important.

Long-term hospital immobilization caused debilitation and poor function after discharge. In combination with lack of follow-up services and rehabilitation, delayed recovery after homecoming enforced dependency on others and inability to reassume normal duties. Prolonged hospital admission combined with cut-off of income generating activities pushed less resourced families further into poverty. Economically strained households struggled with covering basic needs, such as sufficient food and hygiene, and with providing education for children.

Professionals expressed major challenges in providing adequate fracture care because of lacking human and material capacity. Professionals defined the most important factors to improve fracture management to be multidisciplinary teamwork, enhanced specialized knowledge and skills, improved access to readily available equipment and developing standardized procedures for fracture management. Opting for Perkins regime of traction, which offers active rehabilitation throughout the treatment period, was determined to be one step towards improvement of fracture management for these patients in Malawi.

Supported by limited existing research on the topic, this qualitative study underpins that obsolete methods commonly used in LMIC negatively impact on injury victims and their families. Hence, people are adversely affected physically, psychologically, socially and economically. Even though the enrolled professionals worked at the largest central hospitals in the country, shortage of material and human resources were major obstacles to provide

quality fracture treatment. In a time and context where the burden of injuries is growing, these findings confirm that injury management should not be overshadowed by other diseases in global health initiatives towards improvement of public health.

This study also enlightened the need for more research concerning skeletal traction and fracture management in LMIC; in urban central hospitals, as in rural district hospitals and health centres. Especially, the long-term effects of treatment methods need enquiry, and economic impact to individuals and society, as well as the psychosocial impact on patients, guardians and families.

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APPENDIX 1

HØGSKOLEN I BERGEN

Collaboration agreement document
Masters' thesis

Document owner: Controller/body responsible for research	**Responsible for document:** Director of research management	**Valid from:** 11.06.13
Applies to: Project administrator, project manager, dean, head of department, supervisors, students		**Version:** 2.0*

Area of agreement
This agreement commits the participants in the supervision/ research collaboration with regards to Lise Haug's research project towards her master thesis at Bergen University College (BUC)/ Høgskolen i Bergen (HIB). The agreement concerns collaboration between *Bergen University College* and *University of Malawi*, College of Medicine (CoM).
The ethical clearance formalities in Norway have been fulfilled, and the Data Protection Official for research (Norwegian Social Science Data Services (NSD) was notified on May 13, 2013 and approved on June 6, 2013. Registration number from the Data Protection Official for research is: 34524.
The proposal is about to be submitted for ethical clearance in Malawi

Name of degree: *Master in Clinical Physiotherapy*

Name of student: *Lise Haug*

Title of Master Thesis project: ***Lower Limb Fracture Management in Malawi: Views of Professionals and Patients' Experiences with Skeletal Traction, during Hospital Immobilization and afterwards.***

Name of main supervisor: *Associate Professor Graziella Van den Bergh (BUC)*

Name of co-supervisor: *Dr Margaret Wazakili (UoM)*

The research protocol and ethical approval documents are attached to this agreement.

This agreement is valid until December 31, 2014, to allow for publication work that will emanate from this thesis. (June 20, 2014 is the expiry date provided by the Data protection official for research).

Project management
The manager of the research project is: *Graziella Van den Bergh, BUC/HIB.*

Storage and access to research data
The data will be stored at the research server at BUC. Student and supervisors will have access to the research data via Internet on the research server until expiry of the agreement on June 20, 2014. BUC is responsible for deleting/anonymization of the data as agreed upon or advised by Data Protection Offical for Research.

** Custom version based on the internal control system developed by Health Bergen HF / Haukeland University Hospital and University of Bergen*

APPENDIX 1

HØGSKOLEN I BERGEN

Collaboration agreement document
Masters' thesis

Document owner: Controller/body responsible for research	**Responsible for document:** Director of research management	**Valid from:** 11.06.13
Applies to: Project administrator, project manager, dean, head of department, supervisors, students		**Version:** 2.0*

Research results and publications
In addition to the master thesis, the data material may be used for publishing in international or accredited journals.

Co- authorship should follow the rules and regulations for the academic discipline in question. The parties agree that master student Lise Haug, the main supervisor and head of the project Graziella Van den Bergh and Margaret Wazakili can be co-authors to publications that result from the project, as far as their contribution is in line with the rules and regulations for co-authorship. The project manager is responsible for making such agreements. Such agreements should also address co-authorship and potential sequence of authors.

If neither student nor supervisors desire to publish the results beyond the master thesis, they should inform the project manager within six months after the master's thesis is accepted. In that case, the right to publish the results is transferred to the project manager.

Contract parties

Date: 26 06 2013

For: University of Malawi, CoM

Dean of Postgraduate Studies

Date: 11.06.13

For Bergen University College

Vice dean for research

** Custom version based on the internal control system developed by Health Bergen HF / Haukeland University Hospital and University of Bergen*

APPENDIX 2

Interview guide for patients

Q: Can you tell me about yourself and what you do in normal life?

Q: Can you tell me about how you sustained a fracture?

Q: How did you experiences being admitted in the hospital?

Q: What is/was your experiences of being treated with skeletal traction?

Q: How do/did you experience being away from your home environment?

Q: Can you tell me about how the hospital stay affects/affected your life?

Q: How do/did you experience being attended to by hospital staff?

Q: What is your main concern at present?

Q: In what ways can/could the treatment be improved?

(Q: Is there anything else you would like to say?)

Additional questions for patients interviewed after discharge from the hospital:

Q: How did you experience being discharged from the hospital?

Q: In what ways could the hospital stay have been better?

Q: How did you experience returning to your home environment?

Q: How have you been recovering after homecoming?

(Q: Is there anything else you would like to say?)

APPENDIX 3

Interview guide for surgeons

Q: Can you tell me about your professional background, working field and your general experience with fracture management?
Q: Can you tell me about your experience with the use of skeletal traction for lower limb fractures?
Q: Can you tell me about the main challenges and benefits of using skeletal traction?
Q: What other options for treatment are there for these kinds of fractures?
Q: How do you view the reasons for choosing skeletal traction instead of other treatment techniques?
Q: How do you consider professional follow-up of patients during and after skeletal traction treatment?
Q: How do you view the availability and necessity of rehabilitation services for skeletal traction patients?
Q: How do you consider the results of skeletal traction for lower limb fractures?
Q: How do you consider fracture management can be improved?
Q: Is there anything else you can say about skeletal traction?

Interview guide for physiotherapist

Q: Can you tell me about experiences you have with skeletal traction?
Q: How do you view skeletal traction as fracture management?
Q: How can physiotherapy services contribute to skeletal traction treatment?
Q: What are the main challenges when it comes to rehabilitation of skeletal traction patients?
Q: How do you consider a patient´s ability to mobilize and cope at home after this treatment?
Q: How can physiotherapy contribute to recovery at home?
Q: In what ways can physiotherapy services to skeletal traction patients improve?
Q: Is there anything else you would like to say about this topic?

APPENDIX 3

Interview guide for multidisciplinary FGDs

Q: Can each one of you say a little about your professional background and working experience within fracture management?
Q: Can you tell about your experiences with skeletal traction as fracture treatment?
Q: What are the benefits and disadvantages with skeletal traction?
Q: How does skeletal traction affect patients undergoing this treatment?
Q: How do you view the follow-up of patients being treated with skeletal traction, during and after the treatment?
Q: In what ways can the fracture management at the hospital improve?
Q: In your opinion, what are the most important elements of this topic?
Q: Do you have any other views to share?

APPENDIX 4

Norsk samfunnsvitenskapelig datatjeneste AS
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Møllendalsveien 6
5009 BERGEN

Vår dato: 06.06.2013 Vår ref:34524 / 3 / LMR Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 13.05.2013. Meldingen gjelder prosjektet:

34524	*Perspectives on Lower Limb Fracture Management in Malawi: Professionals´ Views and Patients´ Experiences with Skeletal Traction, during long Hospital Immobilization and afterwards*
Behandlingsansvarlig	*Høgskolen i Bergen, ved institusjonens øverste leder*
Daglig ansvarlig	*Graziella Van den Bergh*
Student	*Lise Haug*

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 20.06.2014, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Vigdis Namtvedt Kvalheim

Linn-Merethe Rød

Kontaktperson: Linn-Merethe Rød tlf: 55 58 89 11
Vedlegg: Prosjektvurdering
Kopi: Lise Haug, Tårnveien 4, 8516 NARVIK

APPENDIX 5

Norsk samfunnsvitenskapelig datatjeneste AS
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Date: 18 June 2013 Ref: 34524 LMR/LR

AFFIRMATION

The Data Protection Official for Research at the Norwegian Social Science Data Services (NSD) finds that the processing of personal data in relation to the project "Perspectives on Lower Limb Fracture Management in Malawi" is in accordance with the Norwegian Personal Data Act, ref. our letter to Graziella Van den Bergh (supervisor) and Lise Haug 6 June 2013.

Sincerely,

Bjørn Henrichsen

Linn-Merethe Rød

Avdelingskontorer / *District Offices:*
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CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.07/13/1412 – Lower limb Fracture Management in Malawi: Views of Professionals and Patients' Experiences with Skeletal Traction, during Hospital Immobilization and Afterwards by Lise Haug

On 15th November 2013

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Approved by College of Medicine
15 NOV 2013
(COMREC)
Research and Ethics Committee

Dr. G. Kalanda- Chairperson (COMREC)

15 November 2013
Date

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INFORMATION SHEET

Dear Participant,

My name is Lise Haug, a Masters student at Bergen University College in Norway. I am a physiotherapist by profession. As part of my degree I am conducting a research project, this according to the requirements of the degree program. This study in Malawi is based on collaboration between College of Medicine, University of Malawi and Bergen University College in Norway.

The working title for this project is: **"Lower Limb Fracture Management in Malawi: Patients' and Professionals´ Experiences with Skeletal Traction."**

What is this study about?

This is a research project being conducted by **Lise Haug** at Bergen University College in Norway. We are inviting you to participate in this research project because you are one of the participants who meet the inclusion criteria for this research study.

The purpose of this research project is to establish the knowledge on how professionals view skeletal traction as fracture management and how patients experience this treatment in the hospital, as well as returning to the home environment after being immobilized in the hospital for a long time.

What will I be asked to do if I agree to participate?

You will be asked to sign up an agreement form for participation, and then you will be asked to participate in (an interview with a time frame of approximately one hour)/(a focus group discussion with a time frame of approximately one and a half hour). The interview/FGD will be recorded and transcribed.

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Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, the interview transcriptions will not have your name on it and the recorded interview will be deleted after the transcription is completed. If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

What are the risks of this research?

There are no known risks associated with participating in this research project.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator and other health professionals learn more about the studied topic. We hope that, in the future, other people might benefit from your participation through the findings of this study.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time without giving a reason. If you decide not to participate in this study or if you stop participating at any time there will not be any consequences.

Is any assistance available if I am negatively affected by participating in this study?

Any sensitive issues or questions that may arise from the study and could negatively affect the participant will be carefully observed and intervened accordingly.

What if I have questions?

If you have any questions about the research study itself, please contact:

Lise Haug
Faculty of Health and Social Sciences,
Bergen University College
Mollendalsveien 6
5009 Bergen

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NORWAY
Cell: +47 909 70231 Email: haug.lise@hotmail.com
Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Study Coordinator's Name: Dr Graziella van Den Bergh
Faculty of Health and Social Sciences,
Bergen University College
Mollendalsveien 6
5009 Bergen
NORWAY
Telephone: +47 555 85639
Email: graziella.van.den.bergh@hib.no OR

Dr G Kalanda,
Chair person,
College of Medicine Research and Ethics Committee,
College of Medicine,
Private Bag 360,
Chichiri- Blantyre3.
Malawi.
Tel: +265 (0) 1877 245
Email: comrec@medicol.mw

This study has been approved by the Norwegian Social Science Data Service and Research and Ethics committee of College of Medicine of University of Malawi.

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CONSENT FORM

Request for participation in the research project:

"Lower Limb Fracture Management in Malawi: Patients' and Professionals´ Experiences with Skeletal Traction."

Masters student Lise Haug from Bergen University College, is conducting the research project.

The study is supervised by main supervisor Dr Graziella van den Bergh, Bergen University College and co-supervisor Dr Margaret Wazakili, College of Medicine, University of Malawi.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……..

Participant's signature…… Date……

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Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact:

Study Coordinator's Name: Dr Graziella van Den Bergh
Faculty of Health and Social Sciences,
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Malawi.
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FOLOMU YOBVOMEREZA

Dzina la Kafukufuku:

“Lower Limb Fracture Management in Malawi: Patients’ and Professionals´ Experiences with Skeletal Traction.”

Kafuku fu kuyu akupangidwa ndi ophunzira wapa sukulu yotchedwa Bergen University College. Ophunzirayu dzina lake ndi Lise Haug. Wankulu wakafuku fukuyu ndi a Dr Graziella Van den Bergh, ochokera ku Unuversity ya ophunzira yu komanso Dr Margaret Wazakili ku College of Medicine.

Zochitika za mukafukufukuyu za fotokezedwa kwa ine muchilankhulo choti ndi machimva ndipo ndabvomereza mwa ine ndekha mwakufuna kwanga kutenga nawo mbali mukafukufukuyu. Mafunso onse amene ndinali nawo okhudzana ndi kafukufukuyu ayanhkidwa. Ndamvetsa kuti zotenga nawo mbali mukafukufukuyu zidzakhala za chinsis, anthu ena sadzadziwa zoti ndikutenga nawo mbali mukafukufukuyu komanso ndauzidwa kuti ndili ndi ufulu wosiya kutenga nawo mbali mukafukufukuyu nthawi iliyonse posapereka chifukwa chilichonse ndipo kusapiliza kutenga nawo mbali mukafukufukuyu sikuti sikuti ndizalandila ndidzalandla nako chilango kapena kutaya mwawi wopeza zilizonse zomwe ndinayenera kupeza potenga nawo mbali mukafukufukuyu.

Dzina la wotenga nawo mbali .....

Chidindo cha wotenga nawo mbali ..... Tsiku.....

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Ngati mutakhala kuti muli ndi mafunso, chonde pititsani mafunso anu kwa mkulu wofufuza zakafukufukuyu kapena kadaulo/katakwe wa kafukufukuyu ma keyala awo alembedwa pamusipa pa chikalatachi.

Study Coordinator's Name: Dr Graziella van Den Bergh

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