
Article:
Halpin, SJ orcid.org/0000-0002-0417-8928, Rakotonirainy, R, Chamberlain, MA et al. (1 more author) (2020) Trauma rehabilitation in a teaching hospital in Antananarivo, Madagascar: current provision and patients' perspectives. Disability and Rehabilitation, 42 (13). pp. 1863-1869. ISSN 0963-8288

https://doi.org/10.1080/09638288.2018.1540667

Abstract

Purpose

This study aims to describe the current provision of trauma rehabilitation in Antananarivo, Madagascar and explore the experiences and perspectives of users of this service in order to inform future research and service development.

Materials and Methods

A qualitative study supplemented by a descriptive service review were applied in the central government hospital in Antananarivo. Registers in the rehabilitation department were analysed for a three month period. Semi-structured interviews were conducted with a convenience sample of users of the rehabilitation service and were subject to thematic analysis.

Results

One in six patients treated in the rehabilitation department has survived a traumatic injury, with limb injuries comprising the majority. Analysis of interviews with ten adult patients, following traumatic injuries to the lower limbs (6), upper limbs (3) or polytrauma (1) generated seven broad themes: health seeking behaviour, organisation of services, clinical management, costs and financial impact, effect on function and role, psychological impact, and societal attitudes.

Conclusions

Financial constraints and impact on personal finances pervade the overall picture. The perspectives and experiences elucidated will inform future research into the development of context-specific models of care for people with trauma-related disabilities in Madagascar.

Key words

Rehabilitation, trauma, injury, disability, patient perspectives

Introduction

Injuries and injury-related disability have been referred to as a neglected epidemic in developing countries [1]. The Global Burden of Disease study estimates that 8.5% of all disability adjusted life years are attributable to injuries in low income countries [2]. The World Report on Disability recognises that whilst precise estimates on level of unmet need for rehabilitation are lacking, in many areas of low income countries even basic rehabilitation services are unavailable [3]. Recent data from India [4] suggest a very high prevalence of musculoskeletal impairment, with 32% of this burden being due to trauma, confirming a high unmet need for trauma-related services in low and middle income countries [5,6]. Reflecting the fact that context-appropriate models of trauma care and rehabilitation are currently lacking. The World Bank's Disease control priorities in developing countries recommends research, training, and capacity building in trauma care and rehabilitation as a 'Best Buy' intervention [7].

Madagascar is an island nation with a population of 26 million and a gross national income per capita of $400 (rank 211 out of 216 economies) [8]. Multidisciplinary rehabilitation services exist in Government hospitals in six major cities, and the country has a National Plan for Rehabilitation. To inform expansion of services, the Association de Médecine Physique et de Réadaptation de Madagascar has prioritised research into models of rehabilitation that are contextually appropriate. The perspectives of people using these service must be considered at all stages of development. This study aims to describe the current provision of trauma rehabilitation in Madagascar. We will do this through exploring the perspectives of users of this service in the main teaching hospital in Antananarivo, the capital city of Madagascar.

Materials and methods

Study design

A dual design of a descriptive service review and a qualitative study was applied, to describe the service's structure and utilisation and explore user perspectives, respectively.

Setting

This study was conducted in the rehabilitation department of the main government hospital of Antananarivo, the Hôpital Joseph Ravoahangy Andrianavalona (HJRA). This is the national university teaching hospital with a full range of medical, surgical, maternity and paediatric services located centrally in the capital city. HJRA has over 600 beds and acts as the referral hospital for Antananarivo and the surrounding region, a population of approximately 3 million.

Service structure and utilisation

The existing service structure and trauma rehabilitation pathway is described. This is supplemented by a review of the record for each new patient registered in the department for the 3 month period January to March 2017. Demographic data of service users during this period were collected.

User perspectives

Perspectives of patients using the rehabilitation service following traumatic injuries were obtained through interviews. Rehabilitation clinicians acted as gatekeepers to recruit a convenience sample of participants attending the service. Inclusion criteria were that participants had experienced traumatic injury, were 18 year or over and had the cognitive and language ability to undertake an interview. No limits were set regarding type of injury.

Semi-structured interviews were conducted in the rehabilitation centre when participants were attending for therapy sessions. An interview topic outline was developed in advance and reviewed with clinicians working at the study site and interpreters. Interviews were conducted in Malagasy with professional consecutive interpretation and digitally recorded. They were transcribed verbatim, with longer monologues being transcribed verbatim direct from the Malagasy to retain maximum detail. Interpreters were briefed on the aims of the study and the precise meaning of key terms, establishing a partnership relationship. Debriefing with interpreters after each interview allowed feedback on effectiveness of lines of enquiry and clarification of culturally specific phrases or assumptions. Initial interviews served as pilots, allowing minor modification to maximise the relevance of lines of questioning and clarify terms. Pilot interviews were included in analysis.

Thematic analysis was applied with a 6 stage process of analysis as described by Braun and Clark [9]: familiarisation, generating initial codes, combining codes into themes which support the data, reviewing then defining and naming these themes and finally reporting the findings. Semantic level themes were developed by one researcher with training in qualitative methodologies. An inductive approach with an underlying factist perspective was used to meet the aim of the study of establishing the manifest areas of salience to the participants.

Ethical approval was obtained from Universities of Leeds and Antananarivo (Reference MREC16-127). Informed, written consent was taken and participants were aware that their choice to participate or not would have no impact on their treatment. Their own account of their injuries was recorded only; medical records were not examined.

Results

Service structure and utilisation

The rehabilitation department is structured as an outpatient service for patients discharged from HJRA and other hospitals following trauma. The rehabilitation team also conduct reviews on patients on hospital wards as requested by other clinical teams. Seven doctors and 17 physiotherapists work in the department five mornings and one afternoon per week, hence the service operates for the full working week but with a reduced service in the afternoons. An on-call rota of doctors and physiotherapists can provide inpatient input during weekends. Patients can either be referred to the rehabilitation department by a health care professional or refer themselves. When a new outpatient arrives at the department they are registered and then seen by an intern, followed by a rehabilitation doctor who assesses the patient and prescribes a course of treatment. The patient then goes to the physiotherapists for a pre-determined number of sessions (usually 10) followed by review. This practice is transparently displayed in the department, as well as the cost of each session.

HJRA is the main public hospital providing trauma care in Antananarivo. The pathway for trauma care begins in the emergency department where staff decide where a patient should be managed, if they can afford inpatient care. There are three orthopaedic wards; two adult and one paediatric. As theatre capacity is limited, a patient may typically wait several days for an operation, if one is required. The out-of-pocket cost of an operation probably deters a proportion of trauma patients, although it is not possible to determine precisely how many. Although rehabilitation can begin immediately post-operatively, it is common for members of the orthopaedic team to wait until close to discharge before requesting a review from the rehabilitation department. Most patients who come to the outpatient department for trauma rehabilitation have been told about it whilst they were in hospital, even if an inpatient referral to the rehabilitation team was not made. Rehabilitation clinicians perceive that awareness among other clinicians of the potential for rehabilitation to reduce complications and improve outcome is inconsistent.

Review of the registers revealed that in the 3-month period from January to March 2017 the department saw 367 new outpatients, 60 of whom (16%) had traumatic injuries. The mean age of the trauma group was 38 years and 57% were male. In the same period there were 171 inpatient reviews onto wards in HJRA, 20 of which were for trauma patients (mean age of 49 years, equal numbers of males and females). A brief description of the type of injury as recorded in the register revealed that of the total of 80 patients receiving rehabilitation following trauma, 62 had limb injuries. Table 1 shows the full breakdown of type of injuries for which patients were receiving rehabilitation.

Table 1 to be inserted here

User perspectives

Semi-structured interviews were conducted with 10 users of the rehabilitation service. Participant details are shown in table 2. Thematic analysis generated seven major themes which are defined in table 3.

Table 2 to be inserted here

Table 3 to be inserted here

Health seeking behaviour

Health seeking behaviour is taken to mean ‘the sequence of remedial actions that individuals undertake to rectify perceived ill health’ [10]. All participants presented at the main hospital

either straightaway (P1-6, 9, 10) or having come immediately from a smaller clinic near to the scene of the accident where external wounds were dressed (P7) or X-rays taken (P8). They were transported to hospital in taxis or private cars. Participants described HJRA as being an obvious choice for place of care in the case of serious trauma. “Hospital first, it was the obvious response. So even if the clinic staff hadn’t suggested it, I would have come” (P7). “I didn’t think of any other options as the injury was pretty severe” (P1). Importantly, all participants were interviewed in the rehabilitation department of the main public hospital, and freely acknowledged that the sequence of care they had accessed was not available to the population in general.

When asked what other people may do when they experience major injuries, participant 10 explained “some of them go to the doctor but most just go to traditional healers who say they can treat fractures and put bones together, especially those who can’t afford to go to the doctor or pay for operations.” The impression that differential cost was the main reason people use traditional healers was substantiated by two other participants (P2, 4). However, three participants were also actively encouraged by acquaintances to use traditional healers instead of hospital care, seemingly for other reasons. These were described in terms of aversion to hospital care (“People said, ‘Don’t go to the hospital, *don’t let them operate on you’*.” (P4)); lack of knowledge (“there is a big lack of knowledge among people that you need to come to doctors, rather than the traditional cure” (P1)); and belief in the efficacy of traditional healers (“people who visited me advised me to go to the healer, saying ‘they can do this’” (P10)).

Traditional healers were thought by participants to be very commonly used following injuries, and some are particularly well regarded and known about in distant cities. The treatments offered generally involve applying herbs to the injury site and massage. One

participant mentioned that she was concurrently using a herbal treatment on her injured knee (P3).

Organisation of services

The most commonly experienced sequence of care was arrival at the Emergency Department where X-rays were taken and any immediate orthopaedic management performed within a few hours, with the patient then being admitted to a trauma and orthopaedics ward before waiting some 7 to 16 days for an operation. Three participants were managed non-operatively. One participant was able to go home from the emergency department and return to clinic the next day (P7 – upper limb injury).

A minority of participants reported commencing physiotherapy sessions whilst still in hospital. The referral to rehabilitation services was in some cases the stated plan from early on in the inpatient treatment and in other cases was made when later complications emerged.

For each of three participants for whom the time from discharge to arriving at the rehabilitation centre was prolonged (3.5 – 6 months) this was reported to be the intended plan of the orthopaedic surgeon.

Four participants highlighted the difficulty of transport to the rehabilitation centre for frequent therapy sessions. Bus travel is cheap but very crowded and difficult to board due to large crowds with no guarantee of finding a seat. It is therefore perceived as risky or impossible by participants, at least in the early stage of rehabilitation. Taxis are a significant expense; approximately 10 times the cost of an equivalent bus journey. One participant (9) had been able to move on to taking the bus but only with someone accompanying him to ‘protect’ him. The wider problem of the need to travel to a centralised service was expanded upon by participant 6:

> I chatted to other patients whilst waiting for the doctor. There was another *patient who comes from about 2 hours from here … and where he lives there's* no infrastructure like this service. Their life is in that place, their job is in that place so how can they come and go? Commute weekly to get here? They have to earn money, so they will probably have to give up these physio sessions because *they have to work. … Post*-surgery, if you need physio sessions you need to come *twice or three times a week. So if all your life is elsewhere, it's not really* realistic – it involves time, money.

As a consequence, three participants had arranged domiciliary therapy through negotiation with the rehabilitation service, at extra expense. One of these (P1) mentioned that, on reflection, therapy at the outpatient centre may have been preferable as at home she was not able to use the equipment.

Clinical management

Six participants commented positively on the perceived value to their recovery of the rehabilitation they had received. It is noted that the researcher was likely to have been perceived as connected to the clinical team providing this care, possibly influencing participants' statements. However these comments were often specific and enthusiastic, which may increase their significance as reflections on the service rather than being required by politeness. For example,

> *The job they are doing here is really good as well, I can see that I'm really improving … They've done an excellent job. Some of the doctors say 'ah you are* healing too fast!*'*. And I will get rid of my crutch at the end of the month.
>
> Participant 4

> *I've been to this rehab service for a year and I'm really satisfied with it. I've seen* people with stroke for example who have almost completely recovered, so the physios are really excellent, they are well trained, competent, professional.
>
> Participant 5

Conversely, two participants felt their therapy was not sufficiently individualised. "The sessions are just general… I wish it was more specific. Sometimes I have to tell them – it hurts! I'm tired!" (P2). This participant and one other (P6) also emphasised that their improvements had been very slow. Two participants also indicated that suboptimal inpatient trauma management may limit people's eventual recovery. "Sometimes it will be that the care they got in hospital was not the best, so it might block their recovery" (P6).

The physical conditions of being a hospital inpatient were described as extremely unpleasant by one participant (P2), mentioning lack of privacy for toileting, presence of mosquitoes and poor sleep. This participant suggested that stable pre-operative patients should not be accommodated alongside acute patients.

The practice of using prolonged periods of bedrest and immobilisation was highlighted recurrently. In some instances the period of bed rest seemed longer than expected for the injury in question, although it was not an intention of the interview to take detailed clinical histories or make clinical judgements, and unknown contributing factors may have been present. Participants' experiences included 4 months bed rest following a femoral fracture in an otherwise well 40 year old (P1) and 2 months bed rest in a 40 year old with only upper limb and chest wall injuries (P7). For three participants rehabilitation was focussed substantially on remedying the musculoskeletal complications resulting from prolonged immobilisation (P2, P3, P7).

Two participants expressed reservations about their treatment, one describing a feeling of "deception" that the immobilisation resulted in this secondary problem (P2) and participant 7 expanding:

> After two months the sling was taken away and it was then that we saw I di*dn't have joint movement anymore… The range didn't come back completely… and it was at that point that I was referred to the rehab service … I discovered that some* doctors choose to immobilise the arm and other just choose to let it go, not to put a sling. *So if I'd have been given a choice I would have said no to the sling and* maybe it would have made the recovery better and the rehabilitation faster.

Similarly, three patients had major fractures managed conservatively for reasons which were either unclear (P5 – displaced tibia and fibular fractures with old polio affecting contralateral limb) or related to the cost and difficulty of the operation (P9 and P10 – both humeral fractures). In participant 5's case the decision for conservative management was contentious, with disagreement among professionals and the participant's impression that "maybe it was because of my polio that they were afraid, I don't know". The non-operative approach necessitated 5 months of bed rest through immobilising her one previously sound leg; a significant functional impact, but the participant agreed with the approach and in retrospect still felt it was the right thing to have done.

Participant 9's experience demonstrates a possible false economy in opting for conservative management:

> I got a cast, in the hope that it would heal. I had some monitoring x-rays and they saw that the bones were moving sideways and never getting straight. This lasted *for 6 months, and the doctors said then we need to get into surgery… It was*

> scheduled in January, but as I had to cover the cost by myself I had to postpone it *... I had to wait until I'd gathered enough money for the second operation. It* happened on the 31st March.

The screws and plates used to eventually fix his humeral fracture cost Ar 400,000 (£100/€115/$125). This corresponds with participant 4's report that the plate and screws used to fix his tibial fracture cost Ar 500,000 (£125/€145/$155).

Regarding the provision of equipment, two participants' expressed surprise at the high cost of a sling from the hospital pharmacy, at Ar 150,000 (£37.50/€44/$48), and the supply of mobility aids such as crutches and wheelchairs is noted to be inconsistent.

> There are some *organisations here and there that provide crutches. It's not a* steady stream, but just drop here and there. I needed a wheelchair – I talked with friends from [an international NGO] and they lent me a wheelchair *that I'm still* using even now.
>
> Participant 5

This participant was an educated professional (a civil servant) with pre-existing connections to disability organisations. In her own words "my case is an exception". Her experience therefore demonstrates that many people would struggle to access the aids they need, including wheelchairs. (This was also corroborated in discussion with the country representative of the same INGO.)

Money

Money was identified as the major problem for people experiencing trauma in Madagascar by a majority of participants, and the financial consequences of major injury pervaded the

overall picture. These relate both to the immediate costs of care and the impact of loss of work.

A stark choice was outlined by participant 8:

> *Once you are at the hospital, if you don't have soci*al security [e.g. a civil service job] then the main concern will be cost; will be money. Many aspects, no all aspects of the care require money. And if you cannot afford it either you will die or you will have to find a solution, and that may take a long, long time.

It was recognised that hospital care was inaccessible to many due to cost, even at the public hospital, which "is already really cheap if compared to the private clinics but still not many people would be able to afford it if they come from a disadvantaged family." (P7).

The numerous costs of hospitalisation were vividly contrasted to an indicative daily wage by participant 2:

> Imagine all of the expenses at the hospital; whereas the father is like the only financial source of that family. Here in Madagascar, only few of us are paid 20,000 Ariary (£5) per day. And in the hospital, 20,000 Ariary is not significant; it *is just the cost of one injection. Not to mention the other materials … like the doctor's gloves, cotton, alcohol, fluids for your tre*atment, everything, even the electricity.

Participant 5 who had pre-existing disability recognised the situation faced by disabled people was especially precarious: "The first thing people will face is the money issue, especially people with physical disability … they maybe be able to cover the cost for 1 or 2 months, but then it's over." (P5)

The impact of losing work was the most pressing problem for both of the participants who had no immediate route back to employment (P9 and P10). The impact on the wider family was stressed by both of these men who had previously been in a breadwinner role.

> *I haven't worked for 8 months now and at home it is felt*- it is my wife who is in charge now. We have a child and we have fixed expenses- regular like school fees, rent, water and light company bills, and it creates a crisis at home.
>
> Participant 9

It is illustrative that the majority of participants were in some way protected from paying their own hospital fees. This was due to being civil servants (P2, 3, 5) or retired civil servants (P6) or because they sustained their injury whilst working (P4, 8) or because the liable party in a road accident paid the initial hospitalisation costs (P9). One paid out of pocket but was fortunate to have a supportive employer who continued her salary (P7). This is not typical of the population of Antananarivo, and reinforces what the participants themselves stated- that many people are not accessing formal health care at all when they are injured, due primarily to costs. Two participants suggested that the Government should pay for emergency and rehabilitation care for people who have injuries.

Impact on function and role

The most common difficulty with activities of daily living discussed was with toileting, and solutions included a homemade commode. Loss of independence with dressing, washing and cooking required assistance, which came largely from family members but two participants also paid an assistant. Mobility limitations were frequently highlighted as problematic. Crutches had been used by all seven participants with lower limb injuries and two had previously used a wheelchair.

Of the nine working age participants, three had gone back to work, two had resumed some modified activities and a further two were confident of returning to work in the near future. Since participants were those already accessing rehabilitation services, the sample over-represented those in formal employment (eight, including one retired) and public sector employees (four, including one retired) who could afford hospital fees or entitled to have them reimbursed. There was evidence of some useful and supportive responses from both private and government employers, including continued monthly wages, modified duties and relocation of offices to the ground floor. In contrast, there was some perceived job insecurity by participant 2:

> *I've returned [to work] but I have to leave early and I've noticed that my reputation has decreased … I work in a public office so I probably won't be fired,* but I may be demoted and replaced.

Transport was a particular impediment to participant 9 resuming his work as a freelance electrician and car dealer:

> I cannot take my motorbike – *I cannot take the bus … it's impossible, I can't make* my way through the crowds to take a bus. If I want to take a cab- what would be *the point of taking a taxi if it's just to see a car and just consider the idea of* selling it- it would be an extra expense.

Three participants described a change in role at home characterised by other family members (in each case women and children) being required to take over some household duties. In the case of participant 4 this change in dynamic caused relationship difficulties:

> *From the family at home, my wife, I'm the one who brings money in and it's* changed a bit regarding their behaviour towards me. My wife has had to make

> some changes ... since the injury she really has to work hard and there is a bit of re*sentment from my wife's family.*

Psychological impact

Enquiring about psychological impact was part of the planned interview schedule, however it was striking how ready participants were to talk about it and in several instances these perspectives were offered spontaneously. The direct psychological impacts described included fear of going outside alone, to the degree that it had become the major limitation in resuming activities (P1); family tensions and arguments arising from the participant's anxiety regarding his condition (P9); and a feeling of 'emptiness' within the family over the loss of job and breadwinner status (P10). Participant 8 described the emotional difficulty of adjusting to the change in his abilities and role: "I'm used to taking care of my family, I'm used to serving my family, and leading my family. And then I was bedridden, and they were there at my service. So it was really heavy."

Acceptance was a recurring motif; the need to learn to accept help from others and to accept a change in situation. Participant 7 described accepting that her family would have to adjust their lives around her needs to be "really the toughest thing I had to face".

> *I have a piece of advice that I'd like to give* – after a major injury you have to *acknowledge that your life will change. You won't reach the 100% of your* previous life anymore. So if I talk of *myself, I've reached 80% of what I could do* before. You have to accept that. And then, even when you accept it you have to find ways to overcome it, and not to be a burden to your family. You have to find ways to overcome it to be able to work again and you really have to push yourself to overcome the consequences of your accident.

The above quotation from participant 8 describing the need for both acceptance and determination to overcome problems may resonate with many people's experiences of recovery from severe injury. However, it is illuminating that this statement was made by a 45 year old man, employed as a motorcycle courier, who sustained a shoulder dislocation and fracture -an injury which in high resource settings would be assumed to carry a very good functional prognosis- who had his hospital care paid for by his employer. This demonstrates that in Madagascar there is potential for treatable injuries to have life changing impacts for individuals and their wider family.

Despite the fact that formal psychological input is unheard of for hospital inpatients in this setting, one participant made the following reflection:

> Something that was missing though was psychological assistance – because what happened to me was really tough and there was moments that I had a gap – I was *really depressed and society didn't really understand me, so I had to prep myself* on my own. I think that was really missing in the care that I got.
>
> Participant 9

This 39 year old man survived multiple injuries following a road traffic crash and required extensive orthopaedic procedures. Nine months post injury he remains significantly physically disabled and unable to return to work. Whilst it is not surprising that he experiences psychological impacts, given his immediate physical and financial problems it is revealing that he should focus unprompted on this aspect. The psychological burden of trauma and its associated impacts should not be overlooked just because pressing physical problems also abound.

Societal attitudes

Five participants described some kind of negative perception or lack of consideration from society at large. Participant 1 previously read the notices at her church, but did not feel comfortable doing this while using crutches, clearly describing a perceived stigma which restricted her return to full participation:

> It may affect the congregation in the church, to see a woman going up in crutches. *It may disturb them to see her inability. It's the image … I just didn't want people* in the church to focus more on my crutch instead of the notices or the news I would have said. You know, my church is downtown and people from there are easily distracted about new things. For instance if they would see a woman wearing high heels, they would make *a big story about it. So I just didn't feel* comfortable to stand up in front of them with my crutches.

Participant 2 felt that people deliberately exploited his poor mobility and found it 'convenient' that they could overtake him to board a bus, whilst participant 9 perceived a schadenfreude-like hostility:

> *If I talk about my place in society then, just to bear the stare of the others it's still* hard to me to accept, because in the Malagasy society people are happy when you fall, when something bad happens to you.

Conversely, although he had many challenges in daily activities, a visible disability and a precarious financial situation, participant 10 felt that he enjoyed "the same relationship as before with my neighbourhood".

Discussion

The results of this study demonstrate that a trauma rehabilitation pathway does exist in HJRA and is currently seeing a moderate volume of patients. One in six of the patients treated in the rehabilitation department have survived a traumatic injury, with limb injuries comprising the majority. Co-ordinated rehabilitation for those requiring inpatient trauma care does not usually begin until after discharge, necessitating adequate mobility to return to the department. Financial constraints and impact, including cost barriers to treatment, pervade the overall picture from the user's perspective. Traditional healers remain a common source of care for traumatic injuries due to the cost of hospital care. Relatively minor trauma which in a high income country would carry an expectation of full recovery has the potential in Madagascar to cause permanent disability, with loss of employment and social status. The psychological impact was highlighted with marked frequency, considering there is no precedent of it being addressed by hospital services.

Transport is a significant issue with the present model of rehabilitation delivery. A recent geospatial analysis across sub-Saharan Africa shows Madagascar to have the 6th most hindered access to emergency hospital care [11] (defined by proportion of the population within 2 hours travel time of a hospital; the figure is <50% for Madagascar). This has serious implications for a specialist service which requires regular outpatient attendance. The community-based rehabilitation model is not well developed in Madagascar, and current practices do not include any major element of task-shifting, for example to family members, as a way of overcoming this, but this is something that could certainly be developed.

A detailed qualitative investigation into patients' experiences of traumatic injury in a high income country, the UK, was reported by Sleney et al in 2004 [12]. In this study widespread emotional and psychological impacts were highlighted, as was borne out in the present study. The high rate of mental health sequalae following traumatic injury has been highlighted elsewhere in the literature, with recommendation for routine screening for post-traumatic

stress disorder, depression and anxiety [13]. Specialist psychological and psychiatric services ready respond to the findings of such screening do not exist in Madagascar, but other approaches to treatment such as provision of information to the individual and family to aid self-management could be investigated further. Psychological counselling is listed as 'Essential' at general, specialist and tertiary level hospitals in the WHO's Guidelines for Essential Trauma Care [14].

The area of pain was found to be a difference between these studies. Despite similar time periods since injury, in contrast to the findings of Sleney et al pain was almost unmentioned in the present study, apart from one instance of chronic pain in the context of a nerve injury. Given that all medications need to be purchased from the pharmacy (where a single capsule of morphine is listed as costing £0.65/€0.76/$0.81) and such costs were frequently emphasised as problematic, it can be inferred that analgesia would be less readily accessible in Madagascar. Why pain was so infrequently referred to may relate to the focus of interviews on the post-acute rehabilitation period, and adequate acute pain management cannot necessarily be assumed from these findings, but it was not mentioned spontaneously by the majority of participants in this study.

This study was limited by the inclusion only of participants already accessing rehabilitation services. The findings nevertheless remain relevant since any intervention would likely be delivered through these services and therefore must be grounded in the present reality. The sample size of ten is small, however it is judged that the key concerns of users of the service are reflected in the themes generated. As rehabilitation clinicians acted as gatekeepers there is the possibility of selection bias. The need for interpreters is a further limitation, mitigated against by verbatim translation of longer monologues and interpreter training in the aims and purpose of the study and frequent feedback with the researcher.

We have demonstrated very substantial need for an accessible, structured rehabilitation pathway for survivors of trauma in a low-income setting that begins at the point of initial trauma management and follows the person through recovery. This work should inform the development of this trauma pathway and ground future research in the reality of people's experiences.

Acknowledgements

This research is supported by the National Institute for Health Research (NIHR) infrastructure at Leeds. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health and Social Care. The authors would like to thank the participants for sharing their time and perspectives, the staff who facilitated the study and the interpreters Cédric Randrianjatovonala and Liantsoa Ratsimbason. We would also like to thank Professor Luc Samison, Dean of the Faculty of Medicine at the University of Antananarivo for his support and Dr Jennifer Parr of the Leeds Institute of Health Sciences for her support and advice.

Declaration of interests statement

The authors report no conflicts of interest.

References

[1] Gosselin RA, Spiegel DA, Coughlin R, et al. Injuries: The neglected burden in developing countries. Bull. World Health Organ. 2009;87:246.

[2] GBD Compare Data Visualization [Internet]. Inst. Heal. Metrics Eval. (IHME), Univ. Washingt. 2016 [cited 2018 Feb 16]. Available from: http://vizhub.healthdata.org/gbd-compare.

[3] World Report on Disability. Geneva: World Health Organization and The World Bank; 2011.

[4] Smythe T, Mactaggart I, Kuper H, et al. Prevalence and causes of musculoskeletal impairment in Mahabubnagar District, Telangana State, India: Results of a population-based survey. Trans. R. Soc. Trop. Med. Hyg. 2017;111:512–519.

[5] Chokotho L, Mulwafu W, Jacobsen KH, et al. The burden of trauma in four rural district hospitals in Malawi: A retrospective review of medical records. Injury. 2014;45:2065–2070.

[6] Ameratunga S, Hijar M, Norton R. Road-traffic injuries: confronting disparities to address a global-health problem. Lancet. 2006;367:1533–1540.

[7] Bloom BR, Michaud CM, La Montagne JR, et al. Priorities for global research and development of interventions. In: Jamison D., Breman J., Measham A., et al., editors. Dis. Control priorities Dev. Ctries. 2nd ed. World Bank Publications; 2006.

[8] The World Bank. World Development Indicators [Internet]. [cited 2018 Feb 16]. Available from: http://databank.worldbank.org/data/download/GNIPC.pdf.

[9] Braun V, Clarke V. Using thematic analysis in psychology. Qual. Res. Psychol. 2006;3:77–101.

[10] Ahmed SM, Adams AM, Chowdhury M, et al. Gender, socioeconomic development and health-seeking behaviour in Bangladesh. Soc. Sci. Med. 2000;51:361–371.

[11] Paul M, Ouma O, Ouma PO, et al. Access to emergency hospital care provided by the public sector in sub-Saharan Africa in 2015: a geocoded inventory and spatial analysis. Lancet Glob Heal. 2018;2214–109.

[12] Sleney J, Christie N, Earthy S, et al. Improving recovery—Learning from patients'

experiences after injury: A qualitative study. Injury. 2014;45:312–319.

[13] Wiseman T, Foster K, Curtis K. Mental health following traumatic physical injury: An integrative literature review. Injury. 2013;44:1383–1390.

[14] Mock C, Lormand J, Goosen J, et al. Guidelines for Essential Trauma Care. Geneva: World Health Organization; 2004.

Tables

Table 1. Type of injury in patients receiving rehabilitation after trauma

Type of injury	Number
Lower limb	35
Upper limb	27
Chest	9
Burn	4
Spine	2
Head	1
Unknown	2

Table 2. Participant details. #, fracture.

Participant	M/F, Age	Details of injury	Months since injury	Cause	Return to pre-injury employment?
1	F 40	# femur	15	Pedestrian hit by minibus	No
2	M 54	# tibia, knee injury	6	Fall (high energy)	Partly
3	F 21	# femur, knee contracture	4	Motorbike accident	Not yet
4	M 33	# tibia	3	Fall (high energy)	Partly
5	F 57	# tibia, # fibula, old polio affecting other leg	24	Fall (low energy)	Yes
6	M 69	# neck of femur	8	Fall (low energy)	Retired
7	F 40	# scapula, # clavicle, # ribs x 4	6	Motorbike accident	Yes
8	M 45	# -dislocation shoulder	4	Motorbike accident	Not yet
9	M 38	# femur, # radius, # ulna, # humerus	9	Motorbike accident	No
10	M 55	# humerus, # radius, #ulna, brachial plexus injury	4	Motorbike accident	No

Table 3. Definition of themes

Health seeking behaviour	Concerned with decision making around where and when to seek care in either the formal health care sector or elsewhere. It includes perspectives on traditional healers, their role, how they are used and by whom.
Organisation of services	Related to the sequence of care accessed, delays, length of stay, mechanism and timing of referral to rehabilitation, place of rehabilitation including travel implications and perspectives on these.
Clinical management	Perspectives on specific clinical practices encountered, aspects of management highlighted due to their significance to the participant and views on their own recovery. Includes thoughts on equipment and aids- their use, availability and condition.
Money	Direct or indirect costs as a potential or actual barrier to care, how care was paid for, perspectives on what the situation would be otherwise, the impact on household finances and the impact of losing work.
Impact on function and role	Impact on daily activities, role within the household and in society, impact on work including attitude and behaviour of employer.
Psychological impact	Described medium to long term effects on mood, confidence, psychological wellbeing, psychological reliance on others and reflections on the psychological aspects of adapting to or accepting the new situation.
Societal attitudes	Attitudes or perceptions encountered in others by the participant regarding their disability or change in situation.