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# **Experiences of Providing Prosthetic and Orthotic Services in Sierra Leone — the Local Staff's Perspective**

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## **Experiences of Providing Prosthetic and Orthotic Services in Sierra Leone — the Local Staff's Perspective**

### **ABSTRACT**

In Sierra Leone, West Africa, there are many people with disabilities in need of rehabilitation services after a long civil war.

**Purpose:** The aim of this qualitative study was to explore the experiences of prosthetic and orthotic service delivery in Sierra Leone from the local staff's perspective.

**Method:** Fifteen prosthetic and orthotic technicians working at all the rehabilitation centres providing prosthetic and orthotic services in Sierra Leone were interviewed. The interviews were transcribed and subjected to latent content analysis.

**Results:** One main theme emerged: Sense of inability to deliver high-quality prosthetic and orthotic services. This main theme was generated from eight sub-themes: Desire for professional development; Appraisals of work satisfaction and norms; Patients neglected by family; Limited access to the prosthetic and orthotic services available; Problems with materials and machines; Low public awareness concerning disabilities; Marginalisation in society; Low priority on the part of government.

**Conclusions:** The findings illustrated traditional beliefs about the causes of disability and that the public's attitudes need to change in order to include and value people with disabilities. Support from international organizations was considered necessary as well as educating more prosthetic and orthotic staff to a higher level.

**Keywords:** orthotic, prosthetic, assistive technology, assistive device, Sierra Leone, Africa, low-income country, developing country.

## **INTRODUCTION**

Sierra Leone is a poor country where about 70% of the population are recorded as living below the poverty line. War and corruption together with high unemployment account for the country's poverty.<sup>[1]</sup> The 2004 Population and Housing Census indicated that about 2.4 % of the five million people in Sierra Leone were disabled.<sup>[2]</sup> A survey regarding the types of disabilities indicated that 60% of the disabled were amputees or suffered from paralysis of arms or legs,<sup>[3]</sup> and another study indicates that the majority of people with mobility disabilities in need of prosthetic and orthotic appliance do not have access to appropriate services.<sup>[4]</sup> Sierra Leone has a need for prosthetic and orthotic services after a ten-year civil war that ended in 2002.<sup>[2,3]</sup> During the civil war, machetes were used by rebels to amputate arms and legs to instil fear into the people. Amputations were performed not in order to kill but to humiliate and disable.<sup>[5]</sup> Limited access to medical care also meant that injuries caused by gunshots, fractures and wounds often resulted in amputation. At the time of the war, the number of new polio infection cases rose as access to vaccination programmes became difficult. As a result, there is today a great need for prosthetic and orthotic services.

Previous research<sup>[4]</sup> has indicated that people with a mobility disability in Sierra Leone do not wish to return to their own communities, preferring to live in segregated communities in which they are not made to feel ashamed or alienated. Amputees embody memories of the war and this affects their identity and position in society.<sup>[6]</sup> Poverty and the belief that disease or disability is caused by witchcraft, in combination with a lack of access to health and rehabilitation services, can also lead to exclusion from society.<sup>[4]</sup> Research based in Sierra Leone has for example demonstrated a societal belief that leprosy is caused by witchcraft or that people affected by severe leprosy are witches.<sup>[7]</sup> People with mobility disabilities in

Sierra Leone have a desire to be recognised as equal citizens and be given equal opportunities.<sup>[4]</sup> They also express a desire for economic independence while also having high expectations with regard to various types of assistance such as food, shelter, free medical aid, free prosthetic and orthotic services, vocational training and micro loans.<sup>[4]</sup> A survey on disability in the urban areas of Sierra Leone has indicated that unemployment is higher among people with disabilities, and that 69% of the disabled population have no income at all.<sup>[8]</sup> Access to education and literacy was found to be similar for people with disabilities as for those without any disability. Fifty per cent of disabled females and 34 per cent of disabled males had never attended school. This survey concluded that there was very limited provision of assistive devices such as wheelchairs, spectacles, hearing aids and prosthetic and orthotic devices. Even if assistive devices had been provided free by an organisation, there were associated costs that the disabled persons could not afford.<sup>[8]</sup>

The Truth and Reconciliation Commission report<sup>[9]</sup> emphasises a need for recognition of basic human rights in stating that all human beings should be included within society. Sierra Leone has ratified this convention<sup>[10]</sup>, despite this fact there remains no formal support to provide assistive devices such as prosthetics and orthotics, nor any legislated special rights for the disabled population in the country.<sup>[11]</sup> Prosthetics and orthotic devices facilitate mobility and are one important step to accessing the basic needs of food, education and income. During the Sierra Leone civil war the country's only rehabilitation facility housing prosthetic and orthotic services in Makeni was destroyed.<sup>[12]</sup> Since this time international aid organisations have made efforts to re-establish rehabilitation programmes and provide prosthetic and orthotic services using local human resources and international experts. As a result, five rehabilitation centres providing such services have been established. The services were first delivered by international non-governmental organisations, and have gradually been taken over by the

Ministry of Health and Sanitation.<sup>[12,13]</sup> Rehabilitation services were provided free of charge or for a fee. Despite this, the number of patients receiving prosthetic and orthotic services is alarmingly low.

## **PURPOSE**

The aim of the study was to explore the experience of prosthetic and orthotic service delivery in Sierra Leone from the local staff's perspective. Specific research questions were: What are the barriers to providing prosthetic and orthotic services? What improvements do staff feel are necessary in order to facilitate the provision of prosthetic and orthotic services?

## **METHOD**

### *Design*

To address the aim of the study an explorative qualitative design with individual interviews was applied. Participants were interviewed at their workplace in 2006. A second data collection was carried out in 2011. The interviews were transcribed and were subjected to latent content analysis. This study is part of a major research project which further explores patients perceptions of prosthetic and orthotic service delivery, their performance with their device and the extent of their access to human rights.

### *Sampling*

The rehabilitation centres (five in 2006 and four in 2011) providing prosthetic and orthotic services in Sierra Leone were contacted and visited. In 2011, three centres had for the past two years been run by Sierra Leone's Ministry of Health and Sanitation and one centre had closed down. The management of each centre approved the study. Participants included were

prosthetic/orthotic and orthopaedic shoe technicians who fulfilled the requirements concerning category III prosthetic and orthotic technicians according to the WHO/ISPO classification.<sup>[14]</sup> This means that they are technical staff with apprenticeship-style training or they have two years of formal training with a focus on the fabrication of prosthetic and orthotic devices. In total there were 22 technicians (category III) working in Sierra Leone at the start of the study and in 2011, Sierra Leone had fifteen prosthetic and orthotic technicians who had received apprenticeship-style training and four prosthetists/orthotists with a university-level education. Sierra Leone has no formal training for prosthetists/orthotists. Polio virus and amputation caused by conflict or trauma were the most common causes of disability seen at the rehabilitation centres. Most of the materials and components used to manufacture devices were not found locally. These were typically imported and paid for in full by international organizations. The International Committee of the Red Cross polypropylene technology was commonly used in combination with traditional metal orthoses

### ***Participants***

Sixteen technicians were present at the workshops when the study was to be conducted and were asked to participate. One of them declined because he did not have time; informed consent was obtained from the other 15. Eight were interviewed on the first occasion in 2006. Four of these original participants were re-interviewed in 2011, also seven new participants were interviewed. The participants represented in the first case five rehabilitation centres, in the second case four. Their training was varied but thirteen were trained as prosthetic and orthotic technicians in Sierra Leone. Two respondents had been at the Tanzania Training Centre for Orthopaedic Technologists for one year, studying orthotics and wheelchair technology. The average age of the participants was 41 years (range 28–57 years) and the average work experience 13 years (range 2–28 years). The respondents were all male. Ten

were from Sierra Leone and one was from Liberia. Three of the respondents had personal experience of a mobility disability and the use of orthotic or prosthetic devices.

### ***Interviews 1 and 2***

Semi-structured individual interviews were carried out face-to-face in English by the first author (LM) during both sessions. All the participants were able to communicate in English. During the first session an interview guide was used, beginning with specific questions related to professional background, types of patients seen and types of technology used. These questions were followed by broader ones concerning the barriers to providing quality services.

*What do you perceive as the major barriers to providing prosthetic and orthotic services?*

*What are your suggestions for improvements to the prosthetic and orthotic services?*

The interview guide on the second occasion was generated from the analysis of the data from the first occasion and included questions in relation to preliminary sub-themes which had emerged. *How do you experience the work as a prosthetic/orthotic technician? What are the barriers to providing prosthetic and orthotic services? What are your suggestions for improvements to the provision of prosthetic and orthotic services? What are your suggestions for providing better qualified prosthetic and orthotic staff? Do you have any suggestions as to how to improve knowledge about, or change attitudes towards, disability in Sierra Leone?*

Probing questions and follow-up questions were asked on both the first and second interview occasions. On the second occasion the interviewer strove to be as open-minded as possible with regard to any new issues that might emerge, this in order to identify further sub-themes. All interviews were audio-taped.



### ***Data analysis***

After the first occasion, the interviews were transcribed verbatim. The transcripts were read a number of times to get a sense of the whole. A qualitative latent content analysis was subsequently applied to the text, using principles described by Graneheim and Lundman<sup>[15]</sup> and Downe-Wamboldt.<sup>[16]</sup> The content was analysed by means of first dividing the text into meaning units. The latter were then condensed on a descriptive level, keeping close to the text, and codes were created. Sub-themes were created from the codes. Data from the first interview occasion was assessed not to have sufficient saturation, which is why a second occasion was considered necessary.

The interviews from the second occasion were transcribed and divided into meaning units and codes according the procedure for analysis of the first interviews. These meaning units and codes were then sorted into the preliminary sub-themes generated from the first interviews and two new sub-themes emerged from the new data. The data were analysed primarily by the first author (LM) and trustworthiness was guaranteed through the second author (GA), who is experienced in qualitative analysis within different cultural contexts. Author (GA) examined all the meaning units and codes in order to reduce any bias in the interpretation. The two researchers discussed the interpretation of the underlying meaning, which led to the reformulation of codes and several preliminary sub-themes. Finally, the sub-themes were summarised in a main theme.

## **RESULTS**

The participants' descriptions resulted in one theme, eight sub-themes and 293 codes, presented in Table 1. The sub-themes that emerged from the data represent different levels; individual level, organizational level and society level. The sub-themes represent different

experiences of prosthetic and orthotic services in Sierra Leone and suggestions on how to address barriers.

**Table 1. Overview of the theme, sub-themes, level and number of codes**

| Theme   | Sub-themes   | Level                | Occasion 1<br>8 participants<br>No. codes | Occasion 2<br>11 Participants<br>No. codes | Occasions 1 and 2<br>15 participants<br>No. codes |
|---|--|----------------------|---|--|---|
| Sense of inability to deliver high-quality prosthetic and orthotic services | Desire for professional development  | Individual level     | 18  | 23   | 42  |
|   | Appraisals of work satisfaction and norms<br><i>New sub-theme occasion 2</i> | Individual level     | 3   | 27   | 30  |
|   | Patients neglected by family   | Individual level     | 8   | 16   | 24  |
|   | Limited access to the prosthetic and orthotic services available             | Organisational level | 28  | 28   | 56  |
|   | Problems with materials and machines<br><i>New sub-theme occasion 2</i>      | Organisational level | 6   | 17   | 23  |
|   | Low public awareness concerning disabilities                                 | Societal level       | 10  | 41   | 51  |
|   | Marginalisation in society   | Societal level       | 17  | 20   | 37  |
|   | Low priority on the part of government                                       | Societal level       | 11  | 19   | 30  |

### **Sense of inability to deliver high-quality prosthetic and orthotic services**

The main theme emerging from the data was that the participants felt an inability to deliver high-quality prosthetic and orthotic services. Participants indicated that they had limited education and they expressed a need for professional development in order to increase the quality of prosthetic and orthotic service delivery. The participants were motivated by enabling patients to walk but norms concerning finances such as budget allocation, patients' fees and low transparency was seen as problems. Resources were limited in Sierra Leone and rehabilitation services were not perceived as being prioritised by the government. One major problem was that materials for the fabrication of prosthetics and orthotics had been very limited since the government took over the rehabilitation centres, another was that the patients could not afford transport to the rehabilitation centres. People with disabilities were sometimes neglected by their families because they were unable to contribute and because of traditional beliefs. Discrimination against people with disabilities was described as a feature of everyday life in the society. It was suggested that there should be awareness-raising

activities in order to improve public knowledge concerning disability and to bring about increased acceptance.

### ***Desire for professional development***

Participants expressed satisfaction with the job training they had received from international prosthetic and orthotic experts and local staff. They had acquired the courage to perform their duties. Despite this, there was a desire for further education and professional development, specifically with regard to rehabilitation practice, prosthetic and orthotic design, modern technologies and rehabilitation and prosthetic and orthotic theory. The justification for the need of further education was expressed as having to do with recognition of the profession, potential for increased work capacity, improvement of patient satisfaction, ability to treat patients with increased respect and less isolation from the international professional community. The participants were worried about the future of the profession in Sierra Leone, pointing out that there were not enough trained staff to serve the country and that Sierra Leone had no local capacity to train staff at university level. People had to be sent to Tanzania for the requisite education. Participants also felt that other health-care professionals had poor knowledge about rehabilitation and prosthetic and orthotic service delivery. One participant said that there was a need for female prosthetic and orthotic technicians.

*“I need education, I’d like to know more about prosthetics and orthotics. I can do the practical work even though the theoretical aspects are difficult for me. Not every time do I understand what to do. I’d like to study anatomy, pathology and physiology”* (Technician with 12 years’ experience, with own experience of disability).

### ***Appraisals of work satisfaction and norms***

The participants indicated that helping patients walk gave them joy, a deep sense of meaning and a deep sense of altruism. Participants were proud of playing a part in establishing rehabilitation centres and providing service. Participants with their own experience of disability felt sympathy and concern for the patients' well-being. They identified with the patients' situation, which meant that they were highly motivated to provide the best possible service. Participants felt that people respected them as professionals who gave the right device. However, they also suggested that services were distributed unequally between different target groups. Furthermore it was reported that there had been difficulties with regard to stopping unprofessional behaviour of staff towards patients. It was the patient's responsibility to double-check that the appointment given was still valid for the technician. A low level of transparency in respect of costs and payment for rehabilitation services and appliances was of concern. The participants explained that there was no official system regarding patient fees. Some centres had no visible price-list and prices were negotiable at management level. One participant spoke of it as being unethical for staff to request extra money from patients. At the same time, the provision of prosthetic and orthotic appliances free of charge was perceived as reducing the worth of such appliances in the eyes of the patient. Giving services free was considered by some participants to be a waste of resources if devices were not used or if the centres did not facilitate follow up on appliances. On the other hand it was emphasised that patients were dependent on appliances to be able to move, and not everyone can afford to pay even a small fee.

*"I love to see people walking with my appliances. I'd like to produce appliances that people are walking with. If I could see that they could do every kind of activity I'd be the happiest man in the world"* (Technician with 13 years' experience).

***Patients neglected by family***

Participants indicated that parents sometimes cared for their disabled children and sought rehabilitation services for them. For other cases there are organisations supporting children with disabilities. It was pointed out, however, that the majority of disabled children were on the streets begging, and some lived with foster-parents. Children with disabilities who had been abandoned by their close family were held in low esteem by people in the village and were sometimes living in dangerous situations. Some of the participants indicated that disabled children were neglected and had no food. They referred to the traditional belief that disabilities such as polio were a result of witchcraft, reason enough for the child's exclusion from the family. A common perception was that a disabled child was being punished for being a witch or for the parents' bad behaviour. Some families did not want to maintain contact with a disabled family member, and there were instances where neighbours and society encouraged the family not to support their disabled child. People with disability were also neglected by their families because they could not contribute to the household. It was difficult to provide rehabilitation services when parents perceived the cause of their child's disability as witchcraft and refused such services. Participants expressed opinions about how to educate people about disability and change attitudes to it by meeting the extended family. They perceived that families were in need of increased knowledge about disability and support in order to be able to take care of their disabled family member. A few good examples were reported where the family had changed their attitude when their disabled child was able to stand up using a prosthetic or orthotic device.

*“In Sierra Leone when you're disabled you no longer belong to the family. They won't leave any food for you, they neglect you, they don't care for you”* (Technician with 6 years' experience, with own experience of disability).

*“Some are sleeping in the street and begging”* (Technician with 12 years’ experience, with own experience of disability).

***Limited access to the prosthetic and orthotic services available***

Participants indicated that potential patients were often unaware that rehabilitation services existed, especially in rural areas. They called for increased dissemination of information regarding services available through referral systems and community-based rehabilitation workers. Participants reported that information campaigns had increased the number of people seeking help at the workshop, but that it was difficult to reach the specific target groups living in rural areas. Participants reported problems experienced by patients in accessing the rehabilitation services. Of concern was that patients could not afford transport to the centres. This included not only people living in the provinces but also some who lived locally. Reasons mentioned were no vehicles available, only motorbikes that patients were not capable of riding or a fear of travelling a long way, especially where the roads were bad. Women were often dependent on their husbands when it came to funding for transport and therefore had less access to the services than men.. The participants were satisfied when accommodation could be provided for patients travelling long distances by the rehabilitation centres. Participants reported that they were hesitant to start fabricate assistive devices for someone from far away, as they might not be able to come back to the rehabilitation centre to receive the assistive device or for a follow-up appointment. Participants felt frustration when they were not able to provide high-quality service. Besides improved dissemination of information, outreach services and follow-up programmes were suggested by the participants as means of improving access to services for rural patients. Participants indicated that outreach programmes worked well and were welcomed in the chiefdoms if the aim of the programme was clearly communicated. Some participants were satisfied with the service delivery chain

that includes outreach programmes in the conditions given, while others were dissatisfied especially regarding the possibilities of following up patients and the quality of prosthetic and orthotic services delivered within outreach services. Participants who worked at some of the centres reported that outreach services had stopped since the government took over, because of lack of funding. This elicited a feeling of resignation.

*“We have a lot of problems! One problem is money, transportation is another problem and it’s very hard for them to come to the centre, to reach this facility”*

(Technician with two years’ experience).

### ***Problems with materials and machines***

On the second interview occasion an urgent need for materials and financial support for materials was emphasised by the participants. There was frustration at not being able to provide services because of lack of materials. There was also sympathy for patients who could no longer access services because these were no longer included in the programme or were no longer free of charge. Participants were not satisfied with the quality of local materials for fabricating prosthetic and orthotic devices. There was a need for more adequate machines and increased availability of electricity in order to provide high-quality service. One participant expressed a need for protective equipment for the workshop and free medical care for staff. A further point expressed was that sometimes patients did not accept prosthetic and orthotic appliances for cosmetic reasons. They experienced that the International Committee of the Red Cross polypropylene technology worked well, and the technicians with a university education shared their knowledge and ideas on how to produce assistive devices.

*“We need support for now, so we can have the chance to give better-quality prostheses to our patients. The materials, these materials need to be available”* (Technician with six years’ experience, with own experience of disability).

***Low public awareness concerning disabilities***

The perception of participants was that it was common that the public agreed with the traditional beliefs that disability is caused by witchcraft, comes from evil or is the will of God. Polio and leprosy are commonly seen as being the result of witchcraft while amputations are set in relation to war or accidents. Most participants did not themselves share the traditional beliefs but acknowledged them as being part of the society. Such beliefs were a barrier to seeking medical care. Participants also observed a delay in patients' health-seeking behaviour in that native treatment was often the first port of call. Participants reported low acceptance of deformities in rural areas, where secret societies could also complicate service delivery. It was perceived that education about the underlying cause of disability could help to increase acceptance that disability is a medical problem. There were various ideas concerning how to improve public knowledge about disability and bring about a change in attitude: radio campaigns and education for children about disability in order to increase human respect; training of health-care workers, workshops, distribution of information using pictures and discussions under the aegis of the health centres; and home visits to families of people with disabilities. Some of these things have already been attempted, and participants perceived an increasing acceptance of people with disability. Assistive devices were seen as giving patients the opportunity to contribute productively to society, and examples were given of patients who managed to gain the respect of their community through being able to contribute. Participants also perceive that patients experience shame when using appliances.

*“Some of them believe that if you're disabled you might be a witch or a wizard, or related to some kind of devilish thing. When we do radio sensitisation we tell them that polio is a disease that affects somebody”* (Technician with 13 years' experience).



### ***Marginalisation in society***

Participants found that poverty was a hindrance when supporting people with disabilities. These people are the poorest of all. They were held in lower esteem, being seen as not useful or as being evil. Amputees were held in higher esteem than people with polio. Men with disabilities had a higher status than women with disabilities. It was perceived that knowledge empowers people with disabilities and that disabled men were treated differently when they had a job and a wife. The general feeling was that people with disabilities who beg tend to have more success when they do not wear prosthetic and orthotic devices and that this hinders rehabilitation. It was also suggested that, out of desperation, some people with disabilities did not behave well in the community. Participants indicated that people with disabilities need to change their behaviour when begging. It was perceived that amputees have had more opportunities to access services than other groups of people with disabilities such as polio. Participants thought that people with disabilities would appreciate assistance to improve their living conditions and the functioning of devices they have received in order to increase mobility. People with disabilities should have the right to access schools and be able to make a living, in order to be able to leave the streets and live in a house. Skill training for persons with disabilities was suggested in order to reduce the poverty and increase access to services. However, even people with disabilities who had a high level of education were described as insecure and as sometimes refusing to go back to work. Polio patients were described as having very limited opportunities to use public transport and to gain employment. Increased attention by authorities to making schools and government buildings more accessible was reported. Participants felt empathy for people with disabilities. They expressed concern that such people were not protected by the law, and said that people with disabilities in rural areas also deserved access to services and encouragement.

*“Sierra Leone is a developing country, and even for normal people it’s not much of a standard. The disabled people have the worst in terms of living situation and living conditions”* (Technician with two years’ experience).

*”We give the appliances for free. They go and think that if I have this appliance on, people will think I am better off, so they remove the appliance when they’re on the street begging”* (Technician with 13 years’ experience).

### ***Low priority on the part of government***

Participants expressed distrust of the government’s ability to alone provide rehabilitation services that include poor people. They also expressed disappointment that the government showed so little interest in issues related to disability and rehabilitation. They complained that the budget allocated for rehabilitation services was too low. The participants doubted that the government could provide funding for appropriate material, staff with the appropriate skills to monitor the rehabilitation centres, or the capacity for empowering people with disabilities.

Concerns were also raised regarding charges imposed upon patients for the provision of prosthetic and orthotic devices, low salaries for staff and the low level of transparency offered by the management of rehabilitation centres. Participants thought non-governmental organisations were needed to provide financial support, materials and assistance in monitoring. The participants indicated that since the government had taken over the services, these were not working as well as before; and some participants said that they now had less motivation for their work. Outreach services had stopped and some patients needed to pay for services.

*“The government is not showing too much interest in disability”* (Technician with 13 years’ experience).

*“If it’s only the government providing rehabilitation services there’ll be a lot of problems.... The government will ask for money for cost recovery. I know most of the disabled in Sierra Leone are poor”* (Technician with six years’ experience, with own experience of disability).

## **DISCUSSION**

In taking account of the staff’s experiences and perceptions in Sierra Leone, this study has identified numerous barriers to the delivery of a high-quality prosthetic and orthotic service. On the basis of the findings several recommendations can be made to improve service delivery and facilitate improvement at different levels (individual, organisational and societal) of the rehabilitation system. The barriers identified appeared mainly before the patients even reached the rehabilitation services, hindering a large number of patients from accessing these services. The suggestions for improvements to address issues at different levels were: change of attitude towards people with disabilities, provision of education for staff at a higher level, awareness-raising activities, transport to services, poverty reduction and implementation of the Convention for the Rights of Persons with Disability.<sup>[17]</sup>

The findings of the present study indicate that people with disability are stigmatised and find it very difficult to integrate into society because of discrimination and because of lack of resources. A previous study on disability and participation in post-conflict Sierra Leone established that people with disabilities prefer to live in segregated communities to avoid feeling ashamed and being provoked. They wanted to be treated as equal citizens but at the same time they had high expectations regarding assistance in various areas, including prosthetic and orthotic services.<sup>[4]</sup> Trani et al.<sup>[8]</sup> found that people with disabilities were unemployed to a greater extent than the normal population. However, their literacy rate was

similar to that of the normal population, which indicates that the efforts made have given results.

The finding that people with disabilities were held in less esteem in society was partly related to the common view in Sierra Leone that disability is caused by witchcraft. A study conducted with one of the tribes in Sierra Leone, the Limba people, investigated perceptions of leprosy and showed, similarly, that witchcraft was perceived by the people as a common cause of the disease.<sup>[8]</sup>

A number of suggestions for improving service delivery were made by participants. The local prosthetic and orthotic staff would like increased theoretical knowledge so as to be able to provide high-quality services. Sierra Leone requires an increased number of well-trained prosthetists/orthotists, category I or II in line with WHO/ISPO goals.<sup>[14,18]</sup> At the time of this investigation Sierra Leone had no female prosthetic/orthotic staff, which potentially excludes groups of women from gaining access to the rehabilitation services. Non-governmental organisations are needed because low transparency is a problem in the existing government health services and complicates the rebuilding of the health system. People with disabilities need to know that the rehabilitation services are available, and the associated costs need to be manageable. Community-based rehabilitation programmes were suggested as a means of improving service delivery and could increase awareness about the causes of disability and about the availability of rehabilitation and follow-up services.<sup>[19]</sup>

The findings of the present study revealed that patients could not afford transport to rehabilitation centres. According to the UNDP Sierra Leone human development report,<sup>[1]</sup> 70% of the population live under the poverty line and Sierra Leone is one of the poorest

countries in the world, therefore it is understandable that transport emerged as a problem in our study. Non-government organisations recognise inaccessibility as a major problem and are in the process of putting more emphasis on promoting the rights of the people with disability.<sup>[20]</sup> In order to increase access to rehabilitation in this context, either outreach services or transportation needs to be provided. However, the disabled themselves must play their part in rendering the service estimable and sustainable. Poverty greatly influences the prosthetic and orthotic services, and this study indicates that afflicted people can “beg more successfully” without prosthetics and orthotics. Disabled people that are amputees or polio patients develop contractures if they do not wear prosthetic and orthotic devices on a regular basis.

Sierra Leone’s ratification in 2007 of the new Convention for Rights of Persons with Disability has created an opportunity to improve the situation through implementation of the Convention in legislation and programmes.<sup>[17]</sup> The WHO action plan for 2006–2011 requires the promotion development, production, distribution and servicing of assistive technologies in line with the Convention.<sup>[18]</sup> Community-Based Rehabilitation,<sup>[21]</sup> in conjunction with prosthetic and orthotic services carried out in a respectful and professional manner, can play a part in this. The Sierra Leone Truth and Reconciliation Report emphasises that in order to prevent new conflict there must be a dissemination of knowledge and a recognition of basic rights from which people with disabilities are not excluded.<sup>[9]</sup> There have been reports from other African countries where persons with disabilities are often excluded from general health-care services. The reasons for such exclusion are lack of training of health-care professionals, physical inaccessibility and communication barriers.<sup>[22]</sup> Ghana, for instance, has no laws that protect the people with disability and hardly any medical rehabilitation for them.<sup>[23]</sup> The use of assistive technology has proved to be a successful means of increasing

work participation and maintaining health. United Nations indicates that “states should ensure the development and supply of support services, including assistive technology for persons with disabilities to assist them to increase their level of independence in their daily living and to exercise their rights”.<sup>[18]</sup> Despite these positive outcomes assistive technology is available to very few in the developing countries, thus there is a real challenge in making it available, accessible and affordable.<sup>[24-26]</sup>

All the sub-themes that were generated from the data collection on the first occasion were simply enriched with more data from the second occasion. Two new sub-themes (Table 1) did however emerge from the second occasion: Problems with materials and machines, Appraisals of work satisfaction and norms. These sub-themes were extracted from data collected at the three centres which had been handed over to the government between 2006 and 2011. The former non-governmental organisations responsible for the service had handed over the administration of importing materials for the production of prosthetic and orthotic devices and staff had become employees of the government.

Prolonged engagement<sup>[27]</sup> extending over two interview occasions provided the opportunity to explore and acquire a greater understanding of a culture that is not the authors’ own. This design was chosen with a view to increasing the credibility of the study. Both authors examined every meaning unit and code and were involved in creating the final sub-themes.

## **CONCLUSIONS**

The local staff had a sense of inability to deliver high-quality prosthetic and orthotic services. Support at all levels ranging from the individual level, where the families of the people with disability play an important role, to the organisational level involving local communities,

government and international organizations is necessary in order to provide effective rehabilitation services. There was a desire for a higher level of education for the staff providing prosthetic and orthotic services. At the societal level, people with disability were marginalised. The findings of the present study highlights the need to address both traditional beliefs about the causes of disability and difficulty of access to the services available. The study contributes to the understanding of the complexity of delivering prosthetic and orthotic rehabilitation services in a developing country.

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