Access to wheelchair maintenance-services in Uganda: Maximizing user’s functioning, safety and prolonged wheelchair duration

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Abstract
The study investigated the availability and effectiveness of repair and maintenance services for wheelchairs in Mukono District – Uganda. It explored the wheelchair repair and maintenance services in terms of routine checks, upgrading, inspection and fixing of parts requiring adjustment, replacement or repair necessary for the prolonged duration of the wheelchair for maximizing the user’s functioning, safety, participation, comfort and independence. The research was based on the World Health Organisation’s 2008 Service-Delivery Model, which provides for the upgrading, maintenance and repair of wheelchairs through evaluating the effectiveness of the wheelchair so as to maximize the user’s functioning. The qualitative study adopted an exploratory research design. The Snowball Sampling technique identified and administered Semi-structured interviews which were grounded in the views and experiences of 6 participants (i.e., 2 females and 3 male wheelchair-users plus one parent of a child who uses a wheelchair for mobility). Different designs of manual wheelchairs including tri-cycles were assessed in relation to their upgrading, repair and maintenance. The results of the study revealed gaps in policy and practice as well as challenges in the repair and maintenance services for wheelchairs thereby generating new knowledge and opportunities for improvement and applicability. Recommendations were provided for intervention by policy makers and service providers toward supporting wheelchair-users regarding improving repair and maintenance services for wheelchairs so as to prolonged the duration of the wheelchairs and maximize the user’s functioning for achieving greater independence, comfort, safety, participation and inclusion generally.

Keywords: Wheelchair-User, Maintenance-Services, Mobility, Functioning, Safety.
Wheelchairs are assistive devices that are valuable for facilitating mobility and doing daily tasks or routines for persons with physical impairment. Failure of proper maintenance of wheelchairs sometimes may lead to frequent break-downs, injuries or accidents. Wheelchairs are expensive so it is important that they are provided with regular maintenance and care. The maintenance of wheelchair and other mobility equipment is emphasized by the World Health Organisation - WHO (2008) Service-Delivery Model which, provides for the upgrading, maintenance and repair of wheelchairs through evaluating the effectiveness of the wheelchair so as to maximize the user’s functioning, participation, comfort, independence, safety and prolonged duration of the wheelchairs. The WHO (2008) Service-Delivery Model is also supported by UN (2006) Convention on the Rights of Persons with Disabilities which provides for the rights of access to services for persons with disabilities and condemns all forms of exclusion. Article 4 (1g) General obligations of UN (2006) CRPD provides for undertaking or promoting research and development towards mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost; while Article 20 (d) Personal mobility provides for ensuring personal mobility and producing of mobility aids for the independence of persons with disabilities. Uganda ratified the UNCRPD without reservations. Accordingly, Section 28 of Persons with Disability Act (2006) stipulates that, the Uganda government shall provide supportive social service to Persons with Disabilities including the acquisition of assistive devices and Section 27 adds that:

> It shall be the duty of the provider of the service to provide auxiliary aid or service where it enables or facilitates Persons with Disabilities to enable use of a service (p.16)

The components of the wheelchair that might require repair and fixing include: Arm and Foot rests, Bearings, Brakes, Seat and Backrest, Tires and wheels. The parts or components of manual wheelchairs can go wrong and may require repairs or fixing.

**Statement of the Problem**

Wheelchairs require regular maintenance to prevent risk of injury and to effectively serve the purpose of providing mobility, freedom, independence and everyday safety of the users as well as prolong the duration of wheelchairs. However, although the maintenance of manual-wheelchairs (mainly used in Uganda) is cheaper and easier (use common tools) than automated-wheelchairs, there is yet no well-established system or services for repair of assistive devices including wheelchairs and tricycles in Uganda (Oderud, SINTEF, Brodtkorb and Hotchkiss, 2004). Many PWD out in the villages do not have any access to repair, and those who have are usually approaching local bicycle shops and artisans for handling the repair (Oderud, et. al, 2004). The situation of lack of wheelchair-repair and maintenance services is sometimes worsened by user’s lack of resources, technical ability or time to personally fix the problem of wheelchairs. A search on Google books reveals that, no research has been done in this part of Uganda regarding repair services for wheelchairs and the challenges faced (by people who use wheelchair for mobility) in accessing repair and maintenance services for their wheelchairs. It was therefore, against this background that the study investigated access to wheelchair-repair and maintenance services by people who use wheelchairs for mobility in Mukono-Uganda.

**Purpose of the Study**

The purpose of the study was to investigate the availability and effectiveness of repair and maintenance services for wheelchairs in Mukono District – Uganda. Specifically, the study tends to:
- Explore how frequent wheelchairs are repaired and maintained in Mukono - Uganda.
- Investigate the challenges faced in accessing repairs, upgrading and maintenance services for wheelchairs in Mukono - Uganda.
- Provide interventions for repair, upgrading and maintenance services for wheelchairs more accessible?

Research Questions
The following research questions guided this study:
1. How frequent are repairs and maintenance carried out on wheelchairs in Mukono - Uganda?
2. What are the challenges faced in accessing repairs, upgrading and maintenance services for wheelchairs in Mukono - Uganda?
3. What should be done to make repair, upgrading and maintenance services for wheelchairs more accessible?

Methodology
The research methodology included the research design, study area, target population, sampling design, sample size, data collection methods used and the rationale behind the choice of the research strategy, analysis of data and ethical considerations.

Research Design
This qualitative study adopted an exploratory research design. The qualitative investigation therefore, carried out exploratory studies in order to explain and understand the activities of wheel chair repair and maintenance services. When little information is available on a topic like wheel chair repair and maintenance services in Uganda, then an exploratory research design becomes suitable for the study (Royse, 2007). The exploratory research design was also suitable for this study because it described the prevalence of the specific social problem, Salkind (2010) concerning lack of wheel chair repair and maintenance services that led to research questions on changing these conditions.

Area of The Study
The research was carried out in Mukono district-Uganda. Mukono District is located in Central Uganda i.e., about 27 kilometers east of Kampala city (Uganda’s largest and capital city). Mukono district lies: 00 20N, 32 45E.

Study Population/ Sample size
Uganda National Bureau of Statistics (2016) provides that, the population of Mukono district in 2014 was 596,804 (i.e., 297,154 male and 299,650 female) of which 23,724 people have mobility problem or physical disabilities. The Religions / Sects found in Mukono district include the following: Catholic 37%; Anglican 33%; Seventh day Adventist – SDA 2%%; Pentecostal 6%; Moslem 21%; Other / None 1%. Major tribes include Batooro, Banyoro, Lugbara Banyarwanda, Banyankole, Bakiga, Bagwere, Bagisu, Basoga and Baganda (Uganda Bureau of Statistics, 2016). Although Luganda is the main language mainly spoken, the official language is English. Lohr (2009) provides for the suitability of Snowball sampling for the desired sample characteristic which is rare (for example participants with physical disabilities who used wheel chairs for mobility in Mukono district. Snowball sampling was also preferred for this study because of the referrals made by persons with physical disabilities to locate more participants with physical disabilities who used wheel chairs for mobility. The Snowball
Sampling technique identified and administered Semi-structured interviews which were grounded in the views and experiences of 6 participants (i.e., 2 females and 3 male wheelchair-users plus one parent of a child who uses a wheelchair for mobility). Royse (2007) justifies the use of a small sample size of 6 participants in this small-scale exploratory study design given the limited resources.

**Data Collection Methods/ Analysis**
The semi-structured interviews permitted the participants to freely narrate and express their feelings regarding upgrading, maintenance and repair of wheelchairs. An interview guide was used as tool or instrument for collecting data. The interview guide contained semi-structured questions arranged according to the specific objectives. Throughout the analysis, the note book was used as a reference. Data was analyzed by organizing and arranging it into categories (by giving codes) and themes for easy interpretation in accordance with each specific objective (Creswell, 2007). The themes and patterns were determined to answer the research questions. In summary, data analysis involved activities i.e., condensation of data, display of data and drawing of conclusion (Miles, Huberman, & Saldaña, 2013).

**Ethical Consideration**
Ethical issues regarding anonymity, confidentiality and access to the research findings was discussed with participants to give an informed consent prior to data collection.

**Results**
The participants provided information on the components of a tri-cycle which usually breakdown and require frequent replacement: chain, nuts, hand-peddel, seat, axle, spokes, shafts, balls and bearings. For wheelchairs need replacement of castor-wheels, spokes, tyres and seat. All the six participants said that they got the wheelchairs through donations. User (A) got a tri-cycle donation from Mukono District Community Based Services; User (B) got donation of a wheelchair in 1999 from; User (C) received a donation of tri-cycle in 2005 from NUDIPU; User (D) got a wheelchair donation in 2013 from visitors who came from Ireland; while the parent of User (F) got a wheelchair donation from a local NGO called Uganda Society of Hidden Talents (HITS).

**Frequency of Repairs and Maintenance of Wheelchairs**
While Wheelchair checkups and maintenance can help to prevent accidents Batavia (2010), the study found out that the users were not keen to know whether the wheelchair needed service and none of the users had a tool box or repair-kit for basic maintenance because as User (A) said, he was not given any repair-kit. All the users admitted that, they didn’t know of any technical and experienced mechanic in Mukono District who could repair wheelchairs or tri-cycles. The study therefore agrees with Oderud, et. al (2004) who argue that in Uganda:

> “a severe lack of skills is reported among local stakeholders and community artisans for proper repair of assistive devices although CBR programmes endeavour to provide low cost appropriate aids in the communities” (p.30).

The participants also confirmed that, it is after their wheelchairs or tri-cycles breakdown that they start searching for anybody who can help to fix the problem like welders, bicycle-repairers and motorcycle mechanics or motor-vehicle mechanics. User (C) confirmed that:

> “Those mechanics don’t know how to repair a tri-cycle”
Gada (2012) provides that, the repair and maintenance of wheelchairs sometime require approved repairer/maintenance service as it might require expertise to manage complex seating problem of some people with physical impairment. Yet the study revealed that no expertise existed in this area as lamented by User (A) thus:

“Those mechanics only gamble to repair a tri-cycle. I use my tri-cycle until it breaks-down then I search for anybody who can fix it.”

Donnelly (2015) provides for quality reviews and audits regarding the maintenance services of wheelchairs to ensure that adjustments, repairs and maintenance are done correctly. The study also identified that the wheelchairs and tri-cycles were quite dirty. This was because the Users were not keen on the simple and basic maintenance of their wheelchairs and tri-cycles e.g did not do the wiping of wheelchairs with a damp soft cloth to keep the dirt out of these Assistive devices and make them good looking. The findings also indicate that, apart from User (A) and User (E) who regularly oiled the parts of the tri-cycle and wheelchair respectively, the rest of the Users did not. It was easy for these two Users (A) and (E) to lubricated their Assistive devices because User (E) works on a sewing machine and uses oil for the sewing-machine to lubricate her wheelchair; while User (A)’s Tri-cycle is always exposed to harsh weather conditions like rain and sunshine and therefore requires frequent lubrication. User (A) said thus:

“I only add oil or grease especially when rain falls on it and water has entered the parts”.

Yet it is very important to regularly carry out the maintenance of the wheelchair by lubricating the detachable parts and chassis, filling or replacing flat tyres, fastening of screws and bolts, making adjustments of wheels and casters and cleaning the entire wheelchair (Todd, 1992).

**Challenges in Accessing Repairs, Upgrading and Maintenance Services for Wheelchairs**

The research indicates that, the Users face several challenges regarding the repairs, upgrading and maintenance of their tri-cycle and wheel-chairs. The research found out that, the Users knew only one wheelchair-workshop which used to provide repair services for wheelchairs and tri-cycles at Old Mulago Hospital Orthopedics in Kampala located about 30 KMs from Mukono Town. However, in addition to the challenge of transporting the wheelchair or tri-cycle Mulago Hospital Orthopedic by public transport, User (E) cited another problem thus:

“My wheelchair broke-down. I went to Mulago Hospital Orthopedic but found the workshop closed”

WHO/ International Spinal Cord Society (2013) supports the provision of manual wheelchairs in less-resourced settings, useful information as well as supporting and training on device use; following-up to ensure safe and efficient use; and ongoing maintenance, repair and replacement.

The following challenges were also cite by the Users:

- When wheelchairs and tri-cycles breaks-down it necessitates hiring a vehicle to transport it to where the repair is to be done which is very expensive. Transporting the wheelchair or tri-cycle by public transport is very difficult.
- Mechanics of bicycles, motor-cycles and motor-vehicles are not skilled in repairing wheelchairs and tri-cycles.
• Wheelchairs and tri-cycles break-down frequently because they were repaired by unskilled mechanics.
• Those mechanics of bicycles, motor-cycles and motor-vehicles charge a lot of money for even simple repairs and spare parts are very expensive. Yet Todd (1992) provides for the supplier’s provision of reliable repair and maintenance service at a reasonable cost.
• Lack of money to pay for maintenance, repair and replacement as User (D) lamented: “A wheelchair is costly to repair. I don’t have money. When even buying a blanket is problem, sometimes my wheelchair gets spoilt, I fear to ask for help!” “I was thinking if I was doing small business I would get money for repair”.
• Some Spare parts are scarce or not readily available especially for imported foldable wheelchairs.
• Lack of tool-box for wheelchairs and tri-cycles
• It is tiresome to push a manual wheelchair. I need an electrical wheelchair which does not need physical effort for pushing.
• The seats of wheelchairs and tri-cycles wear and tear easily allowing in water in the sponge.

What should be done to make repairs, upgrading and maintenance services for wheelchairs more accessible?

Basing on their own experiences, the users suggested ideas which they thought would address their problem of lack of repairs, upgrading and maintenance services in their area. The ideas of users include the following:
• The need for training people in skills of wheelchairs and tri-cycles repairs, upgrading and maintenance
• Repair and maintenance service centres or workshops should be set-up in Mukono and other parts of the country.
• Charges for repair, upgrading and maintenance service should be low and affordable as suggested by the FOURTH ALL AFRICA WHEELCHAIR CONGRESS REPORT (2007) thus:

“A wheelchair is appropriate when it is safe, durable and maintainable ………and sustained at the most economical and affordable price” (p.2).

• The study revealed that wheelchairs and tri-cycles sometimes need adjusting and upgrading as the User grows or increases in weight as mentioned by the Parent of User (F) that:

“the time when I got the wheelchair my son was still young now he has grown and is heavy, squeezes and does not fit in the plastic seat of the wheelchair. One day the plastic seat broke and he fell and nearly died”.

Tweedy (2014) provide that, poor or lack of wheelchair maintenance may result into failure or wear of the components causing the user’s unexpected change of position which can lead to tipping over or falling. This is the reason why users should strictly follow the manufacturer's maintenance instructions and often use qualified technicians in repairing or servicing their wheelchairs (Tweedy, 2014).
The research also found out that User (C) had similar problem like User (F). User (C) said that, since she got the tri-cycle in 2005, she has put on lot of weight that she no longer fits in the little space of the seat. The seat did not have a cushion.

“I am asking for help to enlarge the seat of my tri-cycle. I am also looking for help to repair my tri-cycle, many parts were spoilt, and the last repair was done with support from the sub-county”.

Scaffa and Reitz (2013) provide that, Users should be provided with information and knowledge of access to the wheelchair supplier and funding sources to assist them. Similarly, Uganda National Bureau of Standards - UNBS (2015) emphasizes that:

“Wheelchair services providers are encouraged to partner with organizations that offer CBR service so that users are followed-up and wheelchairs are maintained “(p.4).

The government, donors, civil society organizations and well-wishers should help to provide new wheelchairs and tri-cycles as well as promote income generating activities for the Users. Past research also suggests that, some repair and maintenance service can be established where the users cannot afford to do it themselves and where their safety is jeopardized (Aït-Kadi, Chouinard and Marcotte, 2012).

Conclusion
The research explored and evaluated the upgrading, maintenance and repair services for wheelchairs in Mukono district. The study revealed that, upgrading, maintenance and repair services were lacking to the extent that Users resorted to taking their wheelchairs and tri-cycles to welders, bicycle-repairers and motorcycle mechanics or motor-vehicle mechanics for maintenance. The study found out that, in addition to being very expensive, these mechanics lacked the skills, experience and technical expertise for fixing the Assistive devices appropriately.

The study was able to identify that all the 6 Users got their wheelchairs and tri-cycles through donation because they could not afford to buy them as well as sustain or maintain them due to poverty or lack of minimal income. However the researcher identified some kind of negligence among the Users whose wheelchairs and tri-cycles were very dirty because of not cleaning them. The research revealed that, the Users expected mercy and help all the time from government and other well-wishers but were not keen on sustaining the wheelchairs and tri-cycles they already had. One example was that, before the researcher initiated the interview, User (B) expressed the following words:

“I thought you have brought me a new wheelchair! Don’t you see that I am using an old wheelchair?”

Recommendations
The Uganda government should establish Service centres with well trained and skilled mechanics in wheelchairs and tri-cycles repair and maintenance in all districts of Uganda to enable users to access maintenance Service for their wheelchairs and tri-cycles.

Wheelchairs and tri-cycles need to be regularly maintained because when they break down, the safety and health of the user can be endangered and mobility towards socialization can be
limited thus the importance of repair or maintenance to maximize the chair's usefulness and lifetime.

In 2008, the government of Uganda appended its signature on the UN (2006) Convention on the Rights of Persons with Disabilities with an obligation to provide for the specific needs of Persons with disabilities including wheelchair-users. This is supported by World Health Organisation - The Uganda government should come-up with an affirmative action geared towards implementing the WHO (2008) Service-Delivery Model of upgrading, maintenance and repair of wheelchairs so as to maximize the user’s functioning as supported by WHO/International Spinal Cord Society (2013) pertaining to the provision of manual wheelchairs in less-resourced settings, useful information as well as supporting and training on device use; following-up to ensure safe and efficient use; and ongoing maintenance, repair and replacement. The government of Uganda should also come-up with an enrichment plan for alleviating poverty to enable income generation and sustenance among Persons with Disabilities.

References


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