Evaluation of Wheelchair Prescription Process and Client Satisfaction with it use in Ghana

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Abstract:

Background

Wheelchair prescription for individuals with mobility impairment is a highly complex and challenging clinical intervention. Evidence exists that successful outcomes are not always achieved for the wheelchair user and that therapist are experiencing increasing pressure to be accountable for and to justify their wheelchair prescription practice (Gallagher et al., 2022: Dimarco et al., 2003).

Unfortunately, only a minority of those who require wheelchairs have access to them, and of these only few have access to appropriate wheelchairs that suit their specific needs. It has been noted that wheelchair prescription has been poorly linked to clients need and environmental conditions affecting client engagement and participation in real life events.

Aim:

The study aimed to evaluate the wheelchair prescription process in Ghana and Client satisfaction with it use.

Methodology:

The study employed a quantitative cross-sectional study. This was to enable the researcher gather data across a wide range of participants with varying backgrounds. The study was conducted at five different places: Orthopedics and Physiotherapy unit of the Korle-Bu Teaching Hospital, Accra Rehabilitation Centre, Mephibosheth special school and New Horizon special school. The study population included all people with disability who are currently using wheelchair and are above the age of ten. Participants recruited for this study were one hundred and ten.

The number of participants that took part in the study was sixty, representing 54% of the proposed sample size. Participants who had their wheelchair from clinician and Therapist topped the chat with 35% representing 21participants. The study showed that the factors that ensured quality prescription were not carefully considered by the clinicians. The percentage of participants who had no training and education on wheelchair use, no involvement in the prescription process and no environmental consideration were 26.7%, 53.3% and 26.7%, respectively. This amounted to their very low participation in activities, with a mean score of 6.237 ±1.85 (on a 0 to 10 rating scale). More than half of the sample size had less than 70 as their mean satisfaction score.

Keywords: Wheelchair, disability, outcome measures, Client Satisfaction, prescription process

Introduction:

There are 600 million people living with disability, of which about 80% live in low income countries, including Ghana (WB, 2010). In most of these developing countries, people with disability constitute minority group, who lack the accessibility to public health, education, assistive devices, prosthetic and orthotics, mobility aids, jobs and other social services that will ideally support and protect them from developing other complications (WHO,

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2013) and participating in daily activities. Studies indicate that 10 % of persons living with disability require wheelchair as assistive device for mobility (WHO, 2010). In this paper, Wheelchair prescription process is defined as the processes involved in obtaining or improving a wheelchair or a wheelchair seating system. Wheelchair seating and mobility is a technical and specialized area of rehabilitation medicine. The wheelchair is one of the most commonly used assistive devices for enhancing personal mobility after mobility impairment. The wheelchair can be independently used (self-propelled wheelchair) or with a carer (attendant propelled wheelchair).

The prescription of a wheelchair is a complex therapy intervention (Di Marco, A., Russell, M. & Masters, M., 2003). This complexity arises from the relationship between the three variables of a wheelchair prescription: (i) the wheelchair user, their needs, abilities, and preferences; (ii) the available technology; and (iii) the demands of the environment in which the wheelchair is to be used (Batavia et al, 2001). The therapist prescribing the wheelchair will also need to consider the dynamic interaction between the client's health condition, activity and participation goals, the client's context as well as the clinical context.

Anecdotal evidence indicates that most Ghanaians wheelchair users prefer the manualdue to cost. Manual wheelchair users in Ghana typically obtain wheelchairs from international organizations, religious groups, social welfare organizations, disabled person organizations (DPO), non-governmental organizations, small welding workshops (locally customized), and retail stores. Regardless, wheelchairs imported from other continents may not be appropriate for the local setting. Despite these limitations, no studies on wheelchair ergonomics have been undertaken in Ghana. It is therefore critical that this study be undertaken to assesst prescription procedure and client satisfaction with the use of wheelchairs.

Methods:

3.1 Study design:

This study employed cross sectional quantitative study. This was to enable the researcher to gather data across a wide range of variables including all age groups and gender.

3.2 Study setting:

The studies took place at the Korle Bu teaching Hospital (KBTH). KBTH is currently the third largest hospital in Africa and the leading national referral Centre; the study will be conducted at the Orthopedics and physiotherapy unit of the hospital.

Accra Rehabilitation Centre is a government institution under the department of social welfare. It is a training centre for persons with disabilities. The facility trains persons with disabilities in carpentry, tailoring, shoe making, and craft work. The facility has about thirty trainees currently undergoing training at the training centre.

New Horizon Special School and Mephibosheth Special School are private institutions which help in the education of children with intellectual and learning disability arising from developmental delays. These children depend on the wheelchair in one way or the other to mobilize.

3.3 Study population:

The study included all persons with disability who are currently using a manual wheelchair. A total number of one hundred and fifty participants were recruited for the study. This included people who are above 10years and are sound.

3.4 Sample size and sample size calculation

From Taro Yamane's formula for sample size calculation:

n=N/(1+Ne^2)

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n=150/(1+150(0.05)^2)
n=110participants
Sample size for the study will be 110participants
Where N= Population size
n= Sample size
e= Margin of Error

3.5 Data collection and instrumentation
This research used a modified version of Wheelchair Outcome Measure (WhOM) and semi structure prescription guide for Wheelchair. The questionnaire is in two sections.
The first section was about the prescription process, it addresses issues with the client's involvement, environment condition and how the wheelchair was acquired. This enabled the researcher to address issues that restricted client with the use of their wheelchair.
The second section also addresses client satisfaction with the use of the wheelchair. The WhOM questionnaire is in two parts. Part of the questionnaire that measures The actual questionnaire is supposed to measure satisfaction after intervention was removed because this is not an interventional study. The assessment was based on the scores the clients give to the activities they really engaged in.

3.6 Data Analysis
Descriptive data was analyzed by SPSS v. 20 (statistical package for social sciences). A descriptive analysis was used to summarize and analysed. The WhOM Scoring was used to calculate and analyzed the mean satisfaction with respect to client participation goals.

3.7 Data Management
All the information obtained was used for the purpose indicated only for the study. Only the researchers have access to the research materials. Issues of confidentiality regarding information provided by participants were safeguarded.

3.8 Inclusion criteria
I. Those who use manual wheelchair and have the ability to provide consent took part in the study.
II. Clients that are not able to verbalize, their carers had the opportunity to answer the questionnaires provided they have been with these clients for more than six months.

3.9 Exclusion criteria
I. Those who do not use manual wheelchair were excluded from this study.

3.10 Ethical issues
1. Approval was sought from the Ethics and Protocol Review Committee of School of Biomedical and Allied Health Sciences (SBAHS) University of Ghana before the study is carried out.
2. Informed written consent was giving to participants' prior to answering of questionnaire.
3. The participants were informed that their information will be kept confidential, and they will have the right to withdraw their consent and discontinue participation at any time

Results:
4.1 Demographics characteristics of the Participants
Out of the one hundred and ten participants that were proposed to be used for the study only sixty consented and participated in it representing 54.5%. The age range of the population with their corresponding percentages are: 10-20years (45%), 21-30years (11.7%), 31-40years (15.0%), 41-50years (5.0%), 51-60years (13.3%) and 61and above (8.3%). Only one participant could not put down his name representing 1.7%. Table 1shows the frequency distribution of the data for the age.

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Age range		Frequency (F)	Percentage (%)	Cumulative percent
	10-20yrs	27	45.0	45.0
	21-30yrs	7	11.7	56.7
	31-40yrs	9	15.0	71.7
	41-50yrs	3	5.0	76.7
	51-60yrs	8	13.3	90.0
	61 and above	5	8.3	98.3
Total		60	100.0	

Table 1: Frequency distribution of participant's age

The diagnoses were grouped under the following headings: Congenital, Neurological, Viral, Trauma and Fracture. From the study five people did not know their diagnosis representing 8.3%. 41.7% were congenital, 10% were neurological, 26.7% were Viral and 13.3% represent Trauma and Fractures. Table 2 shows the frequency distribution of the data for the diagnosis.

Diagnosis		Frequency (f)	Percent (%)	Cumulative Percent
	Congenital	25	41.7	41.7
	Neurological	6	10.0	51.7
	Viral	16	26.7	78.4
	Trauma and Fractures	8	13.3	91.7
Total		60	100.0	

Table 2: Frequency distribution of Participants diagnosis and Percentage

The third item on the demographic, measured the number of months participants have been using their current wheelchair. Among sixty participant, four (6.7%) were not able to remember how long they have been using their current wheelchair. The percentages of those who are currently using wheelchair are: 1-12months were 26.7%, 13-24months were 18.3%, 25-36months were 15%, 37-48months were 5% and 49 and above were 28%. Table 3 shows the frequency distribution of the data.

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Duration of Wheelchair		Frequency (f)	Percentages (%)	Cumulative Percent
	1-12months	16	26.7	26.7
	13-24months	11	18.3	45.0
	25-36months	9	15.0	60.0
	37-48months	3	5.0	65.0
	49months and above	17	28.3	93.3
Total		60	100.0	

Table 3: Frequency distribution of the how long participants have been using their current wheelchair.

For the demographics, the mean mode and standard deviation were determined. It was noted that the mean age of the population was 2.127 representing the age range of 21-30years. The age with the highest frequency was 10-20 years.

Table 4: The mean, mode, and standard deviation of the demographics

	Diagnosis	Age	Duration of Wheelchair
Mean	2.127	2.542	2.893
Mode	1.0	1.0	5.0
Std. Deviation	1.1556	1.7746	1.6257

Table 5: The mean, mode, and standard deviation of the demographics

4.2 The prescription Variable

A. *How did you get the wheelchair you are using.*

The prescription variables include how the patient had the wheelchair, patient involvement in the wheelchair prescription, environmental accessibility, training, and education on the use of wheelchair, diagnosis, and condition assessment.

How did you get your wheelchair?

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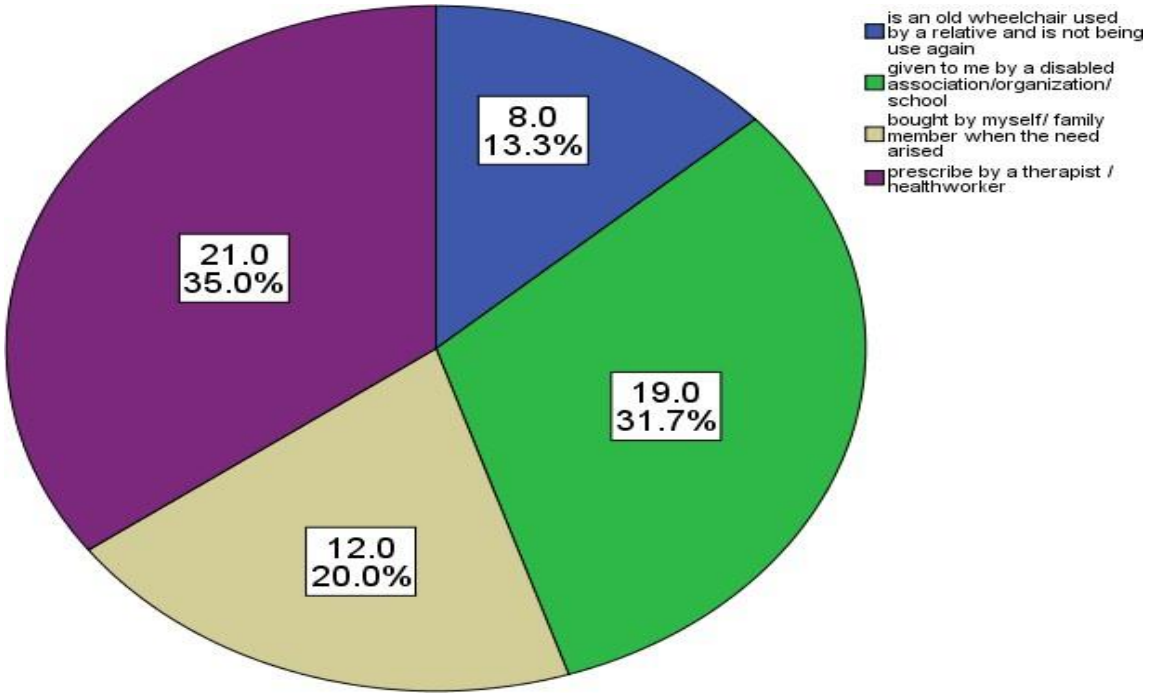

Figure 1: Shows a pie chart representation of how the participant obtains their wheelchair.

B. Environmental Accessibility in prescription

Regarding environmental accessibility, participant whose environment were not accessed had the highest with a percentage mark of 53.3% and the least according to the chat had 21.7% representing participants whose environment was accessed before prescription.

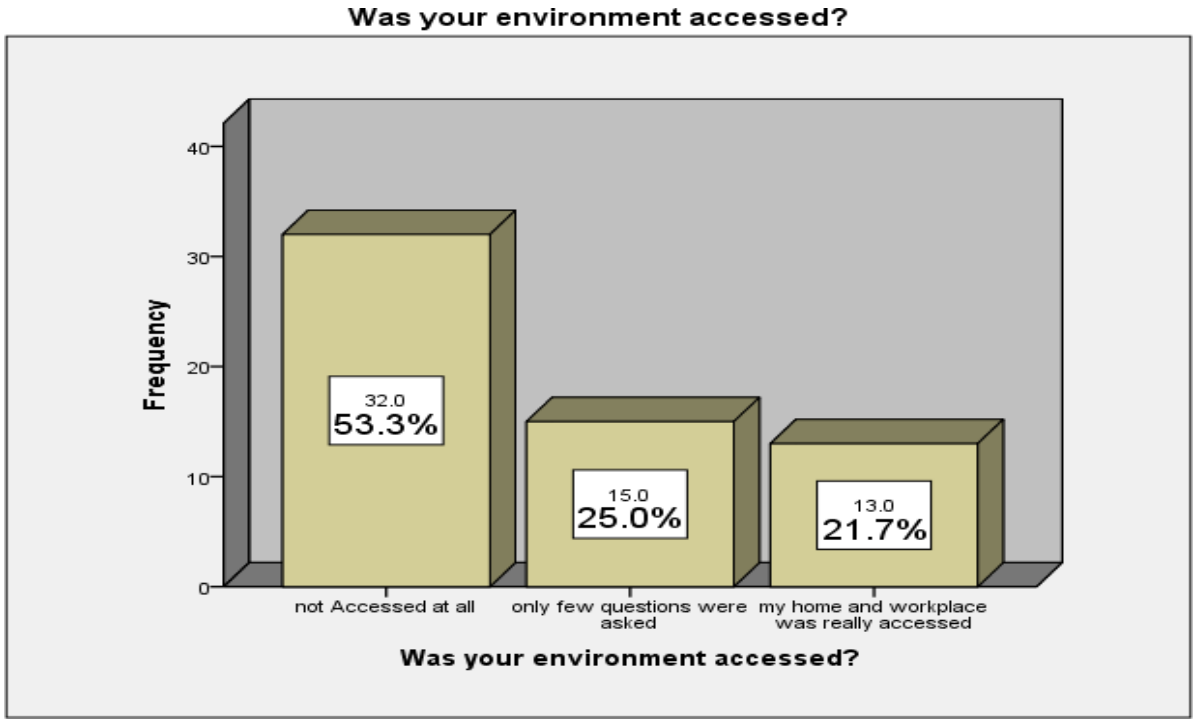

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Figure 2: Environmental accessibility before prescription.

C. Training and Education on Wheelchair use

Training and education are essential in the prescription process of any assistive device. From the study it was revealed that 26.7% of study participants were not trained or educated at all on the use of the wheelchairs they were provided with. The rest of the participants reported that therapist trained them or their carer or both.

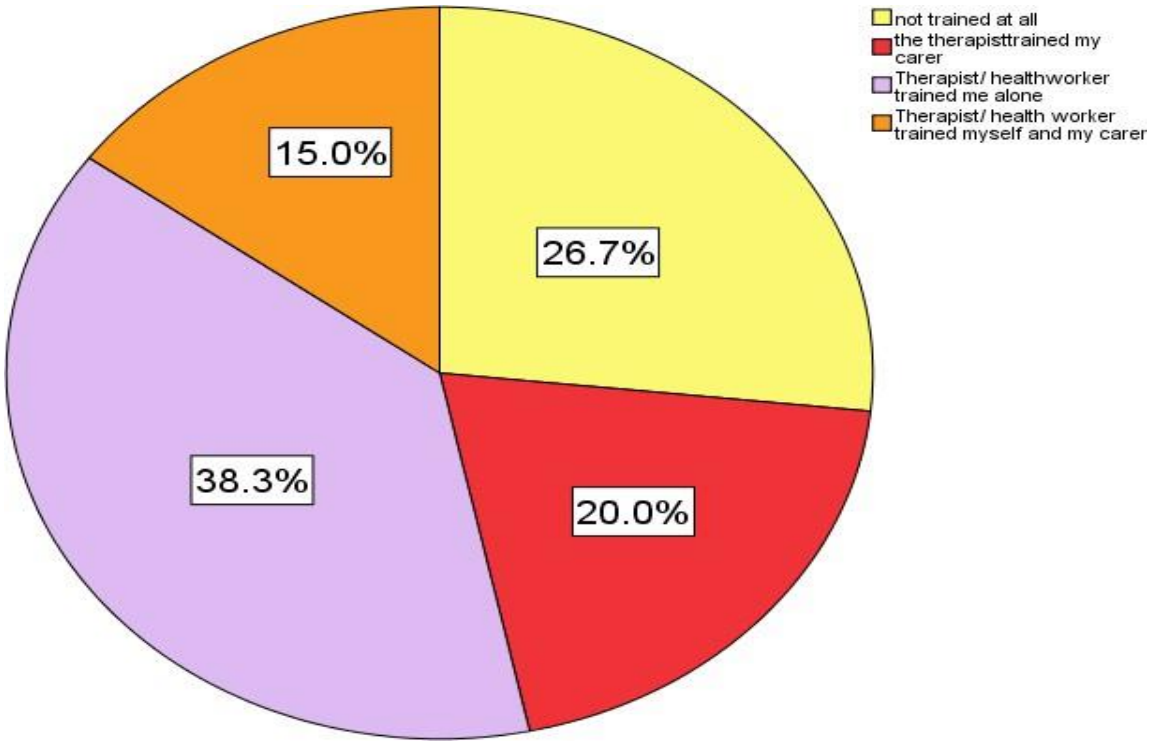

Figure 3: Shows a graphical representation of participants trained and educated on the use of wheelchair.

Table 6a: Frequency distribution of Posture, comfort, and skin breakdown severity with their corresponding percentages

	Rate of Posture	**Rate of Comfort**	**Rate of skin breakdown**
Ratings	**Frequency (Percentage %)**	**Frequency (Percentage %)**	**Frequency (Percentage %)**
0		**1 (1.7)**	**46 (76.7)**
1		**0 (0.0)**	**3 (5.0)**
2	**2 (3.3)**	**3 (5.0)**	**6 (10.0)**

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	Rate of body posture	Rate your level of comfort	Severity of skin breakdown
Mean	**7.250**	**7.367**	**.583**
Mode	**8.0**	**8.0[a]**	**.0**
Std. Deviation	**2.0305**	**2.3140**	**1.2391**

3	**1 (1.7)**	**2 (3.3)**	**2 (3.3)**
4	**5 (8.3)**	**1(1.7)**	**1 (1.7)**
5	**3 (5.0)**	**3 (5.0)**	**2 (3.3)**
6	**7 (11.7)**	**5 (8.3)**	
7	**9 (15.0)**	**9 (15.0)**	
8	**15 (25.0)**	**14 (23.3)**	
9	**12 (20)**	**14 (23.3)**	
10	**6 (10)**	**8 (13.3)**	

Table 7: Determination of mean, mode, and standard deviation of the rate of Posture, Comfort and Skin Breakdown Severity

D. Posture, Comfort, and severity of Skin breakdown

From the table 7a and 7b, Participants were asked to rate how they feel about their posture, their comfort and issue of skin breakdown. It was realized that the average score for posture for posture and comfort was 7.25 and 7.36, respectively. Severity of skin breakdown had a very low score with a lot of participants reporting skin breakdown in one form or the other.

Table 7b, mean and mode of body posture, comfort and severity of skin

From the Fig 4, Most participants were moderately satisfied, fifteen of these participants scored 60-69 and the second group scored 70-79 out of100

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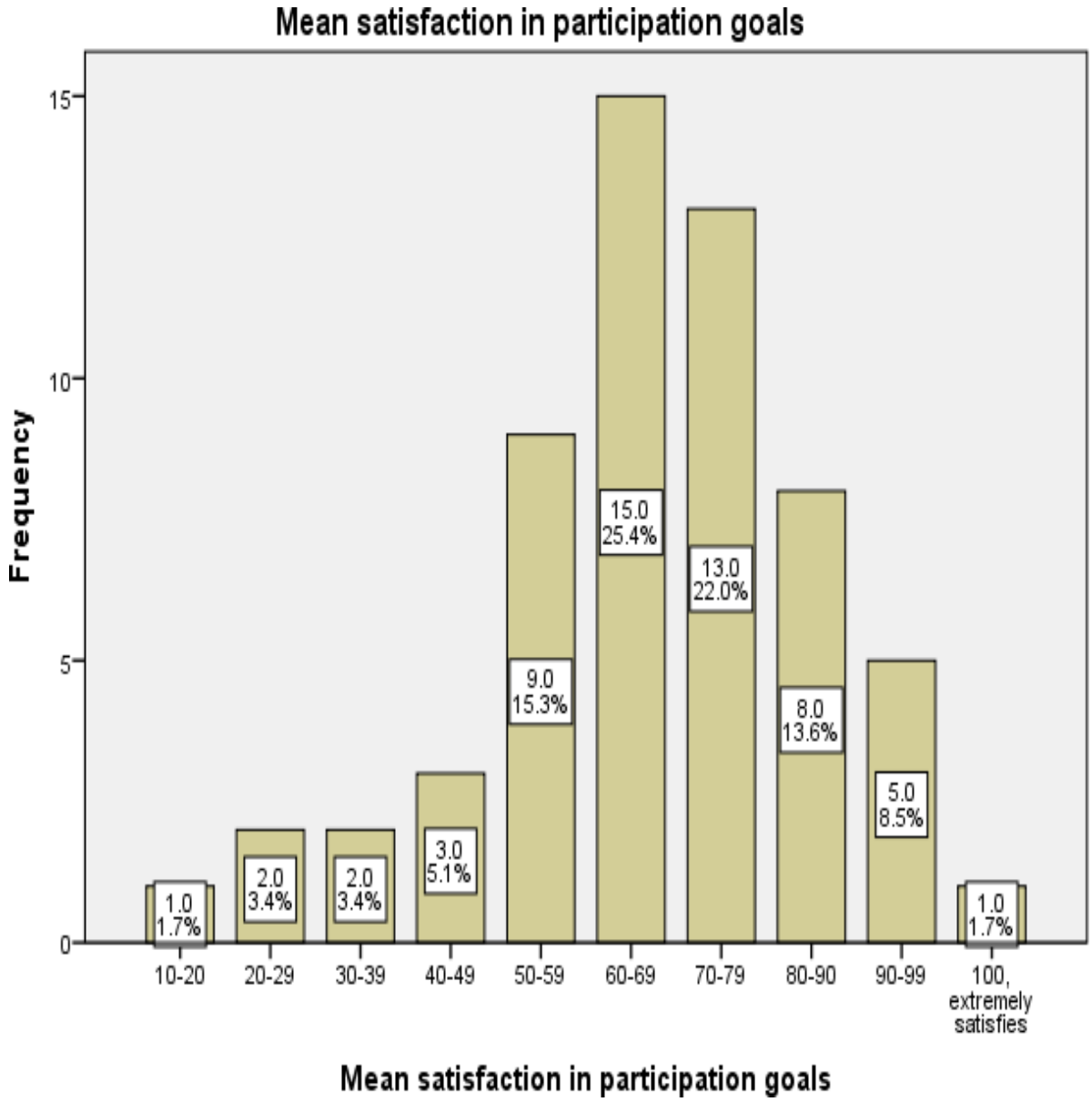

Figure 4: Bar chat presentation of mean satisfaction in participation goals

Chapter Five
Discussion:
5.1 Demographics

The number of participants initially proposed decreased because most of the participants stayed far from the study site and could not make it to the centre to partake in the survey. The participants in the various settings were not institutionalized hence due to transportation and economic difficulties, most could not partake in the study. This confirms the study by World Health Organization (2008) which reported that 80% of the people with disabilities in the world live in low-income countries. The majority of them are poor and do not have access to basic services, including rehabilitation facilities and also World Bank (2013) their study on disability reports 10% to 12% of the Ghana's population are disabled, and out of the number over half of the population lives in extreme poverty. This factor caused the

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researcher to gather information from sixty participants out of the proposed 110 participants.

The diagnosis was grouped under the following headings: Congenital (Cerebral Palsy, Autism and Muscular dystrophy), Neurological (Stroke, Spinal cord injuries, Multiple sclerosis, and Traumatic brain injuries), Viral (Poliomyelitis) and Fractures and Traumas (Amputations, gunshots, and traumas). Congenital deformities had the highest participants getting twenty-five people out of the 66participants representing 41.7%. This could be deduced from the fact that congenital deformities are not easily curable. The mean age was 2.542 ± 1.774 representing age range from 20-30 years. The modal age range was 10-20 years with a scoring 45.7% of the total study population. All this ranges are found among the working class of the country's population. From the study it has been realized that most of the participants have been using their wheelchair for more than four year. These wheelchairs contribute immensely to their participation in real life activities. Hence confirming what Bell &Hinojosa (1995) stated, that for many without a manual wheelchair it is impossible to take part in social, leisure and community activities.

5.2 Prescription Process

I would like to combine the first three items on the prescription process which is: How they got their wheelchair, how well they were involved in the prescription process and environmental consideration before the wheelchair was given to them. From the study it was realized that most of the participant had their wheelchairs through prescription by a therapist or a health worker, representing 35% which is twenty-one participants and those who had it from disabled association or organization came second representing 31.7% of the participants.

From the study, 53.3% representing thirty-eight participants did not have their environment (homes, schools, and workplace) accessed before the wheelchair was given to them. This makes us understand that in Ghana during prescription most health workers and Therapist do not access the living environment of the patient. Without environmental assessment it will be difficult for patients to actively participate in their daily activities.

According to Table 4, it was realized that about 40% of participants were not adequately involved in the prescription process. The reason most patients chose that they were little bit involved throughout the prescription process was because some were asked by therapist to get a wheelchair without further enquiry on their needs and wants. With those who had theirs from the disabled organization or association most of them stated that they only registered for the chair and when it comes, they hoped it suited their conditions. The finding in this study confirms and extends the study by Batavia *et al*, (2001) and (Di Marco, A., Russell, M. & Masters, M., 2003) on the complexity of the prescription process that needs to consider client wants and needs and their environmental situations.

5.3 Education and training on Transfers and Mobility

This study shows that 38.3% of the participants were trained by therapist alone and 26.7% were not trained at all. In relation to training of carers 20% reported that health workers train both the participant and the carer while 15% reports that health workers only trained their carers on how to use the wheelchair. The huge percentage of untrained participant could result in people abandoning their wheelchair immediately after prescription. This support the claims of Kilby et al (2004) that mobility skills training in a controlled environment is important to improve the client's safety and independent

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functioning in the home, school, workplace, and other environments.

5.4 Posture and Comfort

Posture and comfort are instrumental when it comes to patient satisfaction. The interpretation of the result is listed and explained below: zero means you are not at all satisfied, 1-3 means you have low level of satisfaction, 4-6 means you are moderately satisfied, 7-9 means you are quite satisfied and 10 means you are extremely satisfied. The mean for the posture and comfort are 7.25 ± 2.03 and 7.637 ± 2.314 respectively. The highest score for both posture and comfort was eight. These numbers indicate that patients are quite satisfied, but because this is an interventional strategy and a rehabilitation technique to participate in daily activities, complete precision and efficiency are required. This study support the study by Sheldon,et al (2006) which talks about only a minority of those who require wheelchairs have access to them, and of these only few have access to appropriate wheelchairs that suit their specific needs. It also supports that all wheelchair mobility require a seating system that uniquely meets the needs of the user (Johnson, 2008).

5.5 Skin Breakdown

From the study, the percentage of participants that have not suffered from any skin breakdown in their current wheelchair was 73.3%. The percentage individual with sores (wounds) due to wheelchair use was 26.3%, according to the rating most of the participants stated that their injuries were not that severe. The mean severity was not so significant representing 0.584 ± 1.239.

5.6 Mean Participation in Satisfaction Goals

The mean participation was also calculated using the Wheelchair Outcome Measure (WhOM) scale. This was calculated as the sum of the individual importance x satisfaction of all goals ÷ number of goals. Out of this calculation a bar chart was drawn. According to the chat in fig. 6, it was realized that fifteen participants representing 25.4% scored 60-69. Also, from the figure more than half of the participants had less than 70 as their mean satisfaction. This shows that participant's satisfaction was just a little above average with a mean satisfaction of 6.237 (SD= 1.85) reported on a self-rating scale of 1–10.The result correlate with Post et al (1997) report on the satisfaction with prescribed wheelchairs.

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