

USERS PERSPECTIVES ON MANUAL WHEELCHAIR – A QUALITATIVE ANALYSIS

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Abstract

According to the 2011 world Report on disability, more than one billion people worldwide are disabled, comprising approximately 15.0% world population, live some form of disability. Among them, they require mobility aids over 1 billion users currently need assistive technology. This number will have climbed to 2 billion by 2050. The Government has invested in a robust system to make mobility devices available to persons with disabilities through the Assistance to Disabled Persons (ADIP) scheme; for purchasing/fitting of aids/appliances, it has established Artificial Limbs Manufacturing Corporation of India (ALIMCO), the largest manufacturer of mobility and rehabilitation aids in South Asia, to provide affordable assistive products. The wheelchair is one of the most generally used mobility devices. It enables community participation, and it has been used to enhance function, improve independence, and allow a person to live at home and in the community successfully. The global wheelchair market size was valued at USD 4.7 billion in 2020 and is expected to grow at a compound annual growth rate (CAGR) of 6.6% from 2021 to 2028. Furthermore, the rising population of geriatrics and the rise in several disorders such as spinal cord injuries growing chronic conditions compared to other diseases are majorly increasing disability, creating demand for wheelchairs. Around the world, it is estimated that 70 million people utilize wheelchairs (World Health Organization [WHO], 2017). Despite the critical role of wheelchairs, the number of wheelchair users is growing, and providers are under increasing pressure to accommodate their needs. There are currently no comprehensive outcome metrics that focus on everyday wheelchair functioning. The present study examines the Users Perspectives on Manual Wheelchair– A Qualitative Analysis. Only those who are using the wheelchair supplied by Tamilnadu Government has taking for this study. The main aim of the study is to understand the wheelchair users socio economic status, to find out modalities in getting the wheelchair, to identify the common challenges faced by the wheelchair users, and to compile the suggestions given by the wheelchair users. The study was conducted at the Dindigul district of Tamilnadu among 50 wheelchair users (28 male, 22 female) by using the purposive sampling method. Interview schedule and observation methods were used for data collection. The analysis revealed that nearly half of the respondents were illiterate, among majority of them were female. The opinion about existing wheelchair one out of two wheelchair users reported that wheelchair has heavyweight, among majority of them were female. Regarding the common challenges faced by the wheelchair users mentioned in home environment and public places. In home environment most of the wheelchair users reported that the an inaccessible ramp, followed by narrow doors, no ample space for using a wheelchair. Whereas in public places most of the wheelchair users reported inadequate road facility, in accessible ramps, inaccessible toilet and parking places. The study concluded that one out of two of the wheelchair users felt the chair

has heavyweight especially women wheelchair users. Chair weight has one of reason for non-use among women wheelchair users and older adults. However the women wheelchair users seemed to face more significant barriers to access than men. Regarding the common challenges faced by wheelchair users has experienced by both home environment and public places. However this shows that wheelchair users have a variety of experiences in their daily lives and also they have face many challenges that, ultimately, impact their ability to move independently. The majority of wheelchair users do not find their wheelchairs to be ideal for them.

Keywords: *Wheelchair, Wheelchair users, Assistance to Disabled Persons (ADIP)*

INTRODUCTION

According to census 2011, there are 2.68 crore persons with disabilities in India. Out of these, 0.82 crores live in urban areas, and 1.86 crores live in rural areas. Around one-fifth of this population has mobility impairments. Over one billion individuals worldwide require one or more assistive items. With the world's population ageing and non communicable diseases on the rise, more than two billion individuals may require at least one assistive product by 2030, with many older people requiring two or more. Only one out of every ten people in need has access to assistive technology today (WHO. 2018)

Assistive technology such as 'Mobility devices, according to WHO 2001, have been designed to facilitate or enhance a user's mobility – this relates to their ability to change and maintain body position and walk and move from one place to another. Assistive technologies such as mobility devices, education devices, and other Disability-friendly devices enable persons with various disabilities to minimize their barriers and maximize their convenience, functional independence, inherent capabilities and work performance resulting in higher dignity, greater productivity and better quality of life (Eide&Oderud 2009).

The SDGs, its aim to "leave no one behind," build on the Millennium Development Goals and strive to fill up the gaps left by the MDGs, especially in terms of reaching the most vulnerable. 'Persons with disabilities or 'disability' is cited eleven times in the 2030 Agenda for Sustainable Development, and 'Persons in Vulnerable Situations' is mentioned six times, emphasizing the importance of excellent health and well-being in a new development vision. It promotes Universal Health Coverage (UHC) as a means of ensuring everyone's long-term development by ensuring that everyone has access to the medical treatment they require without incurring financial hardship. Consider if people can get quality assistive items when and where they need them if Universal Health Coverage is advanced. It is critical to address the unmet need for assistive products.

The SDGs Global Disability Action Plan 2014-2021 is an important step in achieving health and well-being for persons with disabilities, as well as human rights. The WHO Member States endorsed the action plan in 2014, which calls for them to remove barriers to health services and programmes, strengthen and expand rehabilitation, assistive devices and support services, and community-based rehabilitation, and improve the collection of relevant and internationally comparable data on disability and disability-related research. Disabled

people will be able to reach their goals in all parts of life if the action plan's goals are met. (World Health Organization, 2015).

The Indian government has taken great attempts to make assistive devices, including mobility devices, available to persons with disabilities. Mobility devices have been interpreted as a constitutional claim and a precondition for citizens with disabilities to enjoy their rights and freedom of movement. The Government has invested in a robust system to make mobility devices available to persons with disabilities through the Assistance to Disabled Persons (ADIP) scheme for purchasing/fitting of aids/appliances. Finally, it has established Artificial Limbs Manufacturing Corporation of India (ALIMCO), the largest manufacturer of mobility and rehabilitation aids in South Asia, to provide affordable assistive products. Mobility devices in India are mainly available to persons with disabilities through the Government's ADIP scheme (Gupta.S.,Meershoek.A., and Witte.L.D. 2021)

Tebbutt ,Brodmann , Borg , MacLachlan , Khasnabis and Horvath (2012)A wheelchair that fulfils their physical, lifestyle, and environmental needs is a crucial instrument for people to have dramatically enhanced health, social and economic well-being, and for boosting personal mobility, which is a precondition for enjoying human rights and living in dignity. A wheelchair that is appropriate, well-designed, and well-fitted can be the first step toward integration, involvement, and inclusion in society for many people.

It is estimated by **(WHO,2011)** that 65 million people globally would benefit from a wheelchair; yet up to 20 million individual do not currently have access to one. The usage of wheelchair is more common as the population ages. The United Nations and the World Health Organization both recognize that lack of access to assistive equipment, such as wheelchair is a serious concern.

Developing countries such as India has expected to be key revenue generators for wheelchair manufacturers over the forecast period. The Government has one of the highest rates of road accidents globally; several persons have been rendered incapacitated. It also has one of the most populous populations of impaired people. At a worldwide level, in terms of availability and uptake, the country is still in its infancy. However, with rising consumer awareness and supportive government measures, demand for wheelchairs is likely to rise in the coming years(Wheelchair Market Size, Share, and Trends Analysis Report By Product (Manual, Electric), By Class (Adult, Pediatric), and By Application (Homecare, Hospitals, and Others)Ambulatory Surgical Centers), By Region, And Segment Forecasts, 2021)

Manual wheelchairs have to be used to enhance the mobility of individuals with disabilities. India has had a wheelchair-delivery system for several years, but its impact on users is inadequate. Without wheelchairs, people must have been confined to their homes and unable to live a whole inclusive life. It's a vicious circle: people with disabilities are unable to escape poverty due to a lack of personal mobility assistance. They're more likely to have secondary problems, resulting in increased disability and poorer health.

Wheelchair provision under the scheme and examines the wheelchair provision system of the Government. Using wheelchairs as an example of assistive devices, they have commonly used mobility devices expected to increase their socio-economic well-being and participation in community activities. Moreover, India

recognizes the WHO guidelines on the provision of manual wheelchairs in less-resourced settings (Gregory A.T., Denniss 2018)

Mukherjee and Samanth (2011) highlighted in their study that up to 60% of wheelchair users had received wheelchairs in India. Most of them stopped using the wheelchair due to discomfort and unsuitability of the wheelchair design for the environment used it.

A study in five countries, including India, indicated that about one in five people has difficulty walking or climbing stairs and one in 20 people has a severe problem. Globally, the number of people with disabilities has to be projected to increase because of an ageing population, global increase in diabetes, stroke and conflict, which suggest a corresponding need for mobility devices. In all most all countries, services relating to the provision of mobility devices are often inadequate and of low quality. Wrong service delivery can put people with disabilities at risk or secondary conditions. For example, the wheelchair has provided without an appropriate cushion; pressure sores can develop. All studies performed so far have in common that they report high rates of non-use, and most of the studies express the need to improve the situation.

Seventy million people require wheelchairs worldwide (World Health Organization [WHO], 2017) Despite the critical role of wheelchairs, the number of wheelchair users is growing, and providers are under increasing pressure to accommodate their needs. There are currently no comprehensive outcome metrics that focus on everyday wheelchair functioning.

India has had a wheelchair-delivery system for several years, but its impact on users is inadequate. In all most all countries, services relating to the provision of mobility devices are often insufficient and of low quality. Therefore, conducted this research to how to examine the right to personal mobility can be served better, and the investigator wants to explore the people who need access to either an adequately fitted wheelchair or adequate wheelchair services to meet their users satisfaction. An only a limited study had been conducted in this area of research, so the investigator has to examine the manual wheelchair; it caters for the needs of wheelchair users in the Dindigul district of Tamilnadu. The present study has entitled "**Users Perspectives on Manual Wheelchair- A Qualitative Analysis**".

Through various policies and initiatives, The Government of Tamil Nadu has extended full support to the Differently Abled Persons to pursue full and equal involvement in every aspect of society.

. The policy also provides a mechanism for promoting and protecting the rights of Differently Abled Persons and ensuring equal opportunities for their full participation in social life.

DISTRICT DIFFERENTLY ABLED WELFARE OFFICE

A team of Specialists is working in each of every district under the supervision of the District Differently Abled Welfare Officer to deliver effective rehabilitation services to differently-abled people at the district level.

In the Dindigul district, Tamil Nadu's Disabled Welfare Department has been providing the following schemes to assist the disadvantaged people.

- i. National Identity Card for Disabled Persons
- ii. Scholarship To Disabled Students

- iii. Under this scheme, the visually differently-abled students have paid at the following rate
- iv. Maintenance Allowance Schemes
- v. Loan assistance self-employment programme
- vi. Free Travel Concession to Disabled Persons
- vii. Aids and Appliances
- viii. In order to educate youngsters aged 0 to 6 years old in a setting where they are unable to instruct,

Under welfare scheme for differently abled the aid and appliances scheme, provided of the wheelchair to deserving orthopedically differently-abled and Paraplegic persons for easy mobility. The Eligibility Criteria of the candidate if the persons should be affected with both lower limbs and resident of the District/area and having disability of 75% and above. The Application form is available with the concerned District Differently Abled Welfare Office. When they receive the wheelchair, they should submit Certificates of National Identity Card, Aadhat card and medical certificate to District Differently Abled Welfare Office.

II. OBJECTIVES OF THE STUDY

1. To understand the socio-economic status of the beneficiaries.
2. To find out modalities in getting the wheelchair
3. To identify the common challenges faced by the wheelchair users
4. To compile the suggestions given by the wheelchair users

III. METHODOLOGY

Dindigul is a district in the Tamil Nadu state. It has 362 Village Panchayat and 34 towns in Dindigul District. The area chosen for the study was Athoor, Nilakotai and Dindigul Block of Dindigul District. The list of wheelchair users who received a wheelchair between 2000- 2020 and residing in Nilakottai and Author blocks had collected from DDRO office at Dindigul; among them were available and willing to be studied. The study used the purposive sampling method—interviews with the interview of the respondents. The investigator also observed the respondents while using the wheelchair and recorded the wheelchair users' difficulties. The collected information was coded, analyzed and presented in the table form. Simple statistical measures such as average percentage had used. Data were supplemented with diagrams wherever required.

Distribution of Sample on the Year of Receipt of Wheel Chairs

S.No	Year of receipt of wheelchair	No of wheelchair users	Percentage
1	2000-2005	3	6.0
2	2006-2010	7	14.0
3	2011-2015	14	28.0
4	2016-2020	26	52.0
	Total	50	100.0

Nearly half of them (52 per cent) wheelchair users received their wheelchair during 2016-2020. Twenty-eight per cent of them obtained a wheelchair between the years of 2011-2015. Fourteen per cent of the respondents received in the year of 2006-2010. It has been noted that only a few per cent of them getting wheelchair by the year of 2000-2005. Last two decades, the number of disabled using wheelchairs seems to be increasing in rural areas. It may increase the number of persons who need a wheelchair or raise awareness of the scheme. **Global Disability Action Plan 2014 – 2021** it aims to strengthen and extend assistive technology. They mention that without wheelchairs, people may be confined to their homes and unable to live a whole and inclusive life. For this reason, the study found that more than half (52 %) of the wheelchair users received a wheelchair during the year 2016-2020.

Components of Manual Wheelchair

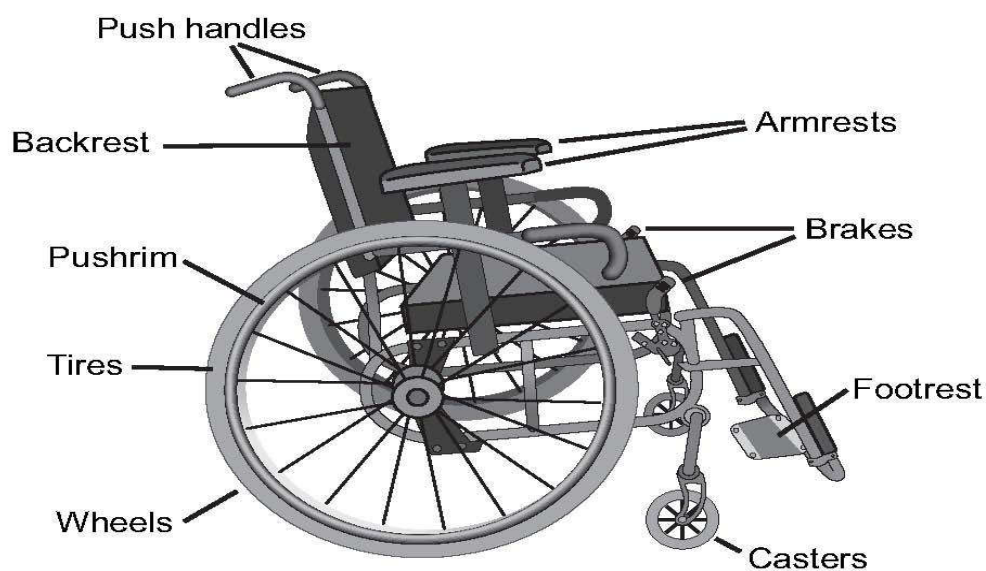


Figure 1. Wheelchair Components

Many parts are required for wheelchair operation. These components come in a range of shapes and sizes, and the one you choose is determined by your needs, tastes, and lifestyle.

Wheelchair weight

A wheelchair is a wheeled chair that is used when walking becomes problematic. Depending on the frame's weight, components, and attachments, a manual wheelchair might weigh anywhere from 15 to 50 pounds. A typical wheelchair weighs between 35 and 40 pounds.

Footrests support your feet and lower legs. They can be fixed, folding, swing-away, and come in many different styles.

Arm rest - When you're not moving, you can rest your arms on armrests. Wraparound, full-length, or desk-length; fixed or height-adjustable; removable or flip-back are all possibilities. It's crucial because the position of your armrest can affect how you propel your wheelchair. Many people choose not to have armrests because they dislike the way they appear or because they obstruct propulsion.

Wheel locks - When you transfer to different seats or wish to stay in a specific location, operate as parking brakes to keep your wheelchair stable. Depending on what the user finds more accessible, They can be push-to-lock or pull-to-lock, mounted low or high on the wheelchair, and retractable or non-retractable.. Wheel locks can obstruct propulsion and add to the weight of the wheelchair. As a result, most people prefer not to use wheel locks, instead depending on their hands to keep their chairs still. However, not having wheel locking can increase the chance of the chair sliding during a transfer, so keep it in mind while you make your decision.

Tires- Tires are typically air-filled (Pneumatic), making them lightweight. They also need to be maintained and can be punctured. This is usually the best option if you maintain them. Solid tires are inexpensive and low-maintenance, but they provide a bumpy ride and are not normally recommended.

Backrest: The most typical backrest is a sling, which provides little posture support. Backrests with adjustable tension can provide better support and balance over time. Rigid backrests provide the most support, but they also make collapsing the chair more difficult. The backrest's weight and height are critical. The lighter the better in general, with carbon fiber backrests being a great choice. If support is not required, a lower backrest is preferable because it does not obstruct pushing.

Cushions-come in a diverse and ever-changing range of types and materials, and are an important issue in and of themselves. While pressure alleviation is vital when choosing a cushion, you should also consider the firmness of the foundation and the weight of cushion. If you're reaching for something or propelling your chair, a sturdy foundation means feeling stable and not slipping on the cushion.

Push rims -There are a range of push rims available with various friction coatings and forms that can help with propulsion while reducing the danger of hand damage.

Additional features-include anti-tippers, wheels and caster wheels of various styles, push handles and grade-aids (which keep the chair from rolling backwards).

Seat height and width-If the fit is too tight, it can produce pressure sores; if the fit is too wide, it can cause stability, posture, and doorway fit issues. Access to the push rim and transfer surfaces should be simple due to the seat height. Allow your hands to dangle at your sides while sitting in the chair to test this: Just past the axle, your fingertips should extend.

IV. RESULTS

The results of the study have discussed in this chapter under the following headings:

- 4.1 Personal profile of the wheelchair users
- 4.2. Modalities in receiving the wheelchair under the government scheme
- 4.3 Opinion about the wheelchair received by the wheelchair users

4.4 Challenges faced by the wheelchair users

4.5 The suggestions given by the wheelchair users

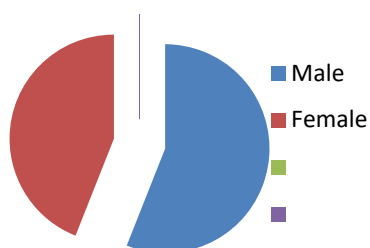
Table – 4.1

Personal Profile of the Selected Wheelchair users

Variable	Male		Female		Total	
	N =28	%	N=22	%	N=50	%
<u>Age in Years</u>						
Below 20	8	16	3	6	11	22
20-40	15	30	8	16	23	46
40-60	5	10	11	22	16	32
<u>Religion</u>						
Hindu	28	56	21	42	49	98
Muslim	0	-	1	2	1	2
<u>Community</u>						
BC/MBC	20	40	16	32	36	72
Sc	8	16	6	12	14	28
<u>Education</u>						
Illiterate	10	20	11	22	21	42
Primary	5	10	7	14	12	24
Secondary	9	18	4	8	13	16
Graduate	4	8	0	0	4	8
<u>Marital status</u>						
Married	8	16	6	12	14	28
Unmarried	20	40	16	32	36	72

<u>Occupation</u>	10	20	14	28	24	48
Unemployed	9	18	7	14	16	32
Cooli	7	14	1	2	08	16
Self-employment	2	4	-	-	02	4
Student						
<u>Monthly Income in Rupees</u>	13	26	15	30	28	56
1000 - 3000	4	8	5	10	09	18
3000 - 5000	9	18	2	4	11	22
5000 – 7000	2	4	-	-	02	4
Above 7000						

Figure-I Gender of the wheelchair users



Fifty-six per cent of the wheelchair users were males, and the remaining 44 per cent of them were female. **Tolerico, Ding, Cooper, Spaeth, Fitzgerald, Cooper and Michael (2011)**, in their study, proved that majority (61.6 per cent) of them male, similar to the present study.

Nearly 80 percent of the wheelchair users, both male and female, were in the age group of 20-40 years and 40 – 60years, respectively. Sixteen percent of the male wheelchair users were in the age group below 20. Only six percent of the female wheelchair users were in the age group of below 20years. Thus the analysis revealed that most of the wheelchair users, both male and female, come under the age group of 20- 60years.

Regarding the wheelchair users religion, 56 percent of the male and 42 percent of the female wheelchair users belonged to Hindu. Only two percent of female wheelchair users belonged to Muslims. Thus, the analysis revealed that most wheelchair users (98 percent) belonged to the Hindu religion.

Forty per cent of the male wheelchair users belonged to the backward class. Thirty-two percent of the female wheelchair users belonged to the backwards class. Sixteen percent and 12 percent of the wheelchair users belonged to the Scheduled caste.

The educational status of the wheelchair users were (20 % male) and (22% percent female) illiterates. Ten percent of the male and 14 percent of the female wheelchair users had completed their primary education. Eighteen percent and 16 percent of female wheelchair users had completed higher secondary. Only 8 percent of the male were graduates. Thus the analysis reveal that nearly half of the wheelchair users, both male and female, were illiterate, which means they are not read and write, and no one in female wheelchair users in degree level.

Forty percent of the male wheelchair users and 32 percent of the female wheelchair users were unmarried. Sixteen percent of the male and 12 percent of the female wheelchair users were married. Thus the analysis reveals that the majority, 72 per cent of the wheelchair users, both male and female, were not married because of their disability condition.

Occupational status of the wheelchair users nearly half of the wheelchair users were unemployed, among them (20%) male and (28%) female. cooli 32 (18% male and 14%female). Self employed (22 %),(16 percent 14% male and % female). Only 4 percent of the male wheelchair users were students.

Fifty-six percent of the wheelchair users have their monthly income between 1000- 3000. (26% male 30% female) Between 3000- 5000 (18%) . (8% male , 10 % female). Between 5000- 7000 (22%) (18% male 4% female). Only 4 percent of the male wheelchair users have an income above 7000.

Thus, the analysis reveals that most of the male and female wheelchair users were unemployed. The majority of the wheelchair users have a monthly income between 1000- 3000.

Table -4.2.

Modalities in receiving the wheelchair under the government scheme

Sl.No	Variables	Male		Female		Total	
		No=28	%	N=22	%	No=50	%
1	<u>Wheelchair schemes intimation received by the respondents</u>						
1	DDRO	24	48	20	40	44	88.0
2	Panchayat office	4	8	2	4	6	12.0

II	<u>Distribution of application form</u>						
1	Collector office	24	48	10	20	34	68.0
2	Panchayat office	4	8	12	24	16	32.0
III	<u>Authentication proof submitted*</u>						
1	Ration card	24	48	20	40	44	88
2	Disability ID card	24	48	19	38	43	86
3.	Medical certificate	24	48	20	40	44	88
4.	Aadhar card	20	40	15	36	35	76
5.	Voter ID	16	30	12	26	23	56
IV	<u>Duration of the days getting wheelchair from submission of application</u>						
1	5-10 Days	14	28	5	10	19	38
2.	11-20Days	12	24	7	14	19	38
2.	21-30 days	2	4	10	20	12	24

Multiple responses*

Table 4.2 depicts the modalities in receiving the wheelchair under the government scheme .Forty-eight per cent of male wheelchair users 40 percent of the female wheelchair users expressed that the intimation about the scheme has been received from DDRO. The remaining eight percent of the male and four percent of the female wheelchair users revealed that they received the intimation received from the panchayat office.

Regarding the application details, 48 percent of the male wheelchair users and 20 percent of the female wheelchair users received the application form from the collector office. Twenty-four percent of the female wheelchair users received their application form from the panchayat office, whereas only 8 percent of the male wheelchair users received an application in the penchant office. Thus, the analysis reveals that most male wheelchair users received the form from the collector office whereas most female wheelchair users received it from the panchayat office.

Must submit identification proof along with the application form for getting wheelchair. Eighty-eight percent of the wheelchair users produced a Ration card, among them (48%) male (40%) female. Disability ID cards (84 %) among them (48%) of them were male, and (38%) of them were female. Medical certificate (88%) among them male (48%) and (40 %). Aadhar card (76%) among them (40%) male and (36 % female. Voter ID (56%) among them (30%) male and (26 %) female. It is mandatory for applying a aids and appliances scheme for both males and females.

The duration of days from the submission of the application of getting wheelchairs shows that between 5-10 days (38%) among them (28 %) male (10%) female. Between 11-20 days (38%) among them (24%) male and(14%) female. Between 21-30 days (24%) among the four percent male and (12%) female. Thus, the analysis revealed that most male wheelchair users received their wheelchair between 5- 10 days, whereas most female wheelchair users received their wheelchair between 21- 30 days.

Table No 4.3

Opinion about the wheelchair Received by the wheelchair users

S.No	Variable	Male		Female		Total	
		NO= 28	%	NO=22	%	NO=50	%
I	<u>Weight of the wheelchair</u>						
1	Heavy	10	20	15	30	25	50
2	Moderate	10	20	5	10	15	30
3	Low	8	16	2	4	10	20
II	<u>Energy Spent in Propelling the Wheelchair</u>						
1	Low energy	5	10	2	4	7	14
2	Moderate	5	10	5	10	10	20
3	Heavy	18	36	15	30	33	66
III	<u>Push rims</u>						
1	Easily accessible	10	20	5	10	15	30
2	Moderately accessible	7	14	3	6	10	20
3	Heavily accessible	11	22	14	28	25	5
IV	<u>Seat height and width</u>						
1	Too fit	13	26	10	10	23	46
2	To wide	10	20	8	8	18	36
3	Comfortable	5	10	4	4	9	18

Table 4.3 revealed that the opinion about the wheelchair received by the wheelchair users. Regarding the overall weight of the wheelchair, one out of two of the wheelchair users reported heavyweight; among them,20 percent were male remaining 30 percent were female. Thirty per cent of them had reported as moderate weight among them 20 and 10 percent of them male and female respectively. Only 20 percent of the wheelchair users said low weight; among them, 16 percent were male, and only 4 percent were female. Twenty percent and 10 percent of the wheelchair users, both male and female, reported that moderate weight, respectively. Sixteen percent of the male and 4 per of the female wheelchair users said as low weight.

Thus the analysis revealed that half of the wheelchair users reported that heavyweight among a majority of them female. Chair weight has been reported as a reason for non-use among older adults. The investigator

suggests that the Government develop appropriate screening and assessment tools for designing wheelchairs. It has found by the investigator that all the wheelchair users wanted to use the lightweight parachute (plastic) material wheelchair for their comfort.

Regarding energy spent in propelling the wheelchair, 14 percent of the wheelchair users reported the low energy spent for propelling, among them (10% male, 4% female). Twenty percent of the wheelchair users reported a moderate level of energy spent for propelling the wheelchair among (10% male, 10 % female). Sixty-six percent of the wheelchair users reported that they were spent heavy energy on wheelchair propelling. (36% male 30% female) .

Thus the analysis reveals that the majority of the wheelchair users reported that they spent heavy energy on wheelchair propelling .Must monitor the proper inflation of pneumatic tires regularly to minimize energy expenditure and facilitate higher physical activity and participation levels. (Ebrahimi.A., Kazemi.A. Ebrahim .A. 2016)

Regarding the push rim design of the wheelchair, 30 percent of the respondents reported that the easily accessible push rim (20 % male and 10% female).Twenty percent of the respondents said they moderately accessible push rim, (14%) male and (6%) female. Half of the wheelchair users reported that heavily accessible push rim (22% male and 28 % female). Thus, the analysis revealed that the majority of the male and female wheelchair users reported the heavily accessible push rim. Hand rims are circular tubes, which individuals use to move the wheelchair forward. Despite high mechanical load and low efficiency, push rim propulsion remains the most common form of wheelchair ambulation. A considerable amount of research, with large potential ergonomic implications, has been dedicated to the push rim design and its biomechanical aspects to optimize the propulsion efficiency and users 'satisfaction.

Seat height and wide of the wheelchair 46 percent of the wheelchair users reported that the too fit among them (26 %, male 20% female). Too wide of wheelchair 36 percent among them (20 % male 16 percent female). Comfortable of seat height and width of the wheelchair 18 percent among them, (10% male, 8 % female). Thus the analysis reveals that the 82 percent of the wheelchair users reported that the existing wheelchair were too fit and too wide . If the fit is too tight, it can produce pressure sores; if the fit is too wide, it can cause stability, posture, and doorway fit issues

Table No 4.4.
Challenges Faced by the Wheelchair Users

S.NO	Variables	Male		Female		Total	
		N=28	%	N=22	%	N=50	%
I	<u>Wheelchair usage in the home environment</u>						
1.	Inaccessible Ramp	12	24	8	16	20	40
2.	Narrow door	7	14	10	20	17	34
3.	No ample space for using a wheelchair	7	12	2	4	9	18
4.	Inaccessible working height	2	4	2	4	4	8
II	<u>Public places</u>						
1	Inadequate road facilities	11	22	8	16	19	38
2	Inaccessible ramp	8	16	5	10	13	26
3	Inaccessible toilet	2	4	7	14	9	18
4.	Inaccessible parking place	7	14	2	4	9	18

The common challenges faced using the wheelchair inside the house include an inaccessible ramp, narrow doors, stairs, ample space for wheelchairs etc. 40 percent of the respondents reported that the common challenges faced wheelchair usage in inaccessible ramp, among (24% male and 16% female), regarding narrow doors, 34 percent, among (14% male and 20% female). No ample space has said 18 % (12% male, 6% female). Only 8 percent of respondents said inaccessible height in the workplace in the home; among them, 4% was male, and 4 % were female.

The common challenges faced by the wheelchair users in public places, (38 %) of them reported inadequate road facilities, among them (22 % male and 16% female). Twenty-six percent of the respondents said that the inadequate ramp facilities in public places (16 % male and 10% female). The inaccessible toilet 18 percent, among them (4% male 14% female). Inaccessible parking places are 18 percent (14 % male and 4% female).

Thus the analysis reveals that the majority of the wheelchair users reported the common problem in usage of the wheelchair in inaccessible ramp and inadequate road facilities. This finding suggests that the inability to independently move in such situations and transfer from the inaccessible chair ramp and inadequate road facilities may contribute to the restricted mobility among manual wheelchair users. Therefore, in order to improve manual

wheelchair mobility, the improvement of both home and public places accessibility and mobility performance of manual wheelchairs (mainly in ramps and road) should be targeted.

4.5 The suggestion given by the wheelchair users

1. A pressure relief cushion should be attached in to the wheelchair to reducing the pressures at the high-risk areas for pressure sore development
2. One out of two wheelchair users reported that they were not satisfied with the scheme and product. Nevertheless, the usage of wheel chair was very limited. In this connection, the Government can evaluate the system and design to provide a user-friendly and light weighted wheelchair is a basic necessity of the respondents.
3. Further requirements needed by the wheelchair users reported that financial assistance from the Government for maintenance allowance of a wheelchair.

RECOMMENDATION

1. Before being provided to services, wheelchairs should be tested by users in the context and environment in which they will be utilised.
- 2.

CONCLUSION

This study assessed the user's perspectives on manual wheelchairs supplied by the Government. One out of two of the wheelchair users reported that the heavyweight of the wheelchair among most of them was female. Chair weight has been reported to be a reason for non-use among older adults. The common challenges faced by wheelchair users in the home environment such as an inaccessible ramp, no ample space for using a wheelchair and inadequate working height. Whereas in public places, they have faced challenges like inadequate road facilities, inaccessible ramps, toilets and parking places. The results of this study indicate that, in daily routine, wheelchair users' experience a number of challenges that, ultimately, impact their ability to move independently. Women wheelchair users seemed to face more significant barriers to access as compared to men. For the majority of the users, their wheelchairs are not ideally suitable to them. Such problems evidence the existing gap between the wheelchairs current design and the optimal equipment concept. Improving the usability of manual wheelchairs requires designers, manufacturers and modification of existing infrastructure, such as improving the quality of pavements, adding kerb cuts and installing ramps, elevators, wider doors and various methods of signaling and guiding, can enable wheelchair users to utilize their wheelchair effectively. In order to improve mobility and usability and, as a result, benefit users' functionality, independence and satisfaction with the equipment, a user-friendly and light weighted wheelchair is a basic necessity of the wheelchair user's. The established government-aided wheelchair is inappropriate in terms of usage of the home environment and public places. Therefore, there is a need to improve the design and modification of existing infrastructure users friendly and location-friendly appropriate wheelchair is needed to improve the accessibility of using a wheelchair.

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