

# Older adults' use of, and satisfaction with, electric powered indoor/outdoor wheelchairs

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## Abstract

**Background:** research documenting the experiences of electric powered indoor/outdoor wheelchair (EPIOC) users has generally failed to take into account the specific needs and concerns of older adults. This study sought to qualitatively examine the older EPIOC users' satisfaction with the chair and service providers.

**Method:** eight women and nine men aged between 60 and 81 (mean 69) years were recruited through a specialist wheelchair service database. All had severe mobility disabilities. Analysis was performed using a qualitative framework approach.

**Results:** participants reported a variety of EPIOC uses, including shopping and some social contact. Moderate satisfaction with the chair was reported. Use was compromised by indoor and outdoor environmental barriers; and the chair not meeting users' needs. Accidents were rare, but many users still experienced insecurity in the chair. High levels of satisfaction with the service were reported, although concern was expressed over length of waiting times.

**Conclusions:** EPIOCs proved useful to most older people with disabilities. However, even those who were satisfied reported only moderate use of the chair outdoors. Limited use related to an infrequent need for outings, outdoor barriers, feelings of insecurity over chair safety and lengthy waiting times for chair delivery and required modifications. Service providers should be aware that older EPIOC users may require extra support and the provision of timely adjustments to increase chair use.

**Keywords:** powered wheelchairs, assistive technology, older adults, satisfaction, physical disability, elderly

## Introduction

Limitation to locomotion is the commonest disability in the United Kingdom [1], making studies examining the efficacy of mobility assistance devices important. Electric Powered Indoor/Outdoor Chairs (EPIOCs) are prescribed in the United Kingdom for severe locomotion disabilities [2], and significantly enhance the physical and social lives of young and adult disabled individuals [3–6]. Older adults using powered mobility remain understudied [7] and the experiences of older EPIOC users in Britain are unreported.

The lifespan of the average person continues to grow [8], but not always with optimal functioning [9]. In Britain, 14% of people aged over 65 are unable to walk down a road unassisted [10] and it is estimated that over 400,000 people over the age of 60 use wheelchairs [6]. The key to successful ageing is *selecting* the activities that are worth investing in, working to *optimise* performance in these activities and using aids to *compensate* for losses [11]. EPIOCs assist with successful ageing by compensating the loss of physical functioning, and represent an important resource for older individuals. The main indication for receiving an EPIOC through the National

Health Service (NHS) is an inability to walk effectively around one's home [5]. Thus older people may receive an EPIOC due to a life-long disability, or to assist with age-related changes.

Elderly EPIOC users may have distinctive requirements. High rates of accidents have been reported in wheelchair users, but it is unknown whether this occurs in older adults. Assistive technology is often perceived as inconvenient and a reminder of the individual's disability [12]. It is possible that many older people, due to a negative evaluation of age-related change and disability [13], focus on the chair's disadvantages. Young adults have been found to use their chairs for a variety of social and sporting activities, e.g. playing wheelchair football [4]. Social activity is an important developmental need throughout life, but people typically refine their social networks as they age [14]. Older users may have different social needs. A 'one chair fits all' policy may underestimate the individual needs of the older user.

Stanmore Specialist Wheelchair Service supports a regional population of around 3 million. Of the 631 individuals assessed by this service for EPIOCs from 1997–2006, 130 were aged 65+, 47 were aged 75+ and

8 were aged 85+ years. Thus, the aims of the present study were to document the experiences of older adults using NHS prescribed EPIOCs. Themes explored in interviews included satisfaction with EPIOCs use, safety and satisfaction with service provision.

**Method**

**Procedure**

All EPIOC users 60 years of age and older, identified through a specialist wheelchair service database seen between February and November 2002, were invited to participate in a telephone interview. Of 19 users identified, two declined participation. A total of 17 EPIOC users completed in depth tape-recorded interviews regarding satisfaction with their EPIOC. At the time of interviews, all participants received their chairs 9–19 (mean 14) months previously. Harrow Research Ethics Committee approved the study.

A researcher independent of the NHS wheelchair service carried out the interviews. A priori interview topics were formulated in consultation with users. Topics included frequency and quality of chair activity, safety and satisfaction with the service provided.

**Participants**

The participants included eight women and nine men ranging in age from 60 to 81 (mean 69) years (Table 1). A variety of ethnicities were represented although the majority were White British ( $n = 12$ ; 71%). Disabilities included spinal cord injuries ( $n = 4$ ), multiple sclerosis ( $n = 4$ ), cerebrovascular disease ( $n = 3$ ), rheumatoid arthritis ( $n = 2$ ), polio ( $n = 1$ ), co-morbid disabilities ( $n = 3$ ). Many were living on their own with little or no support. Eight participants were so disabled they were unable to stand, five participants could stand but not walk, and four were just able to walk and with decreasing mobility.

**Data analysis**

Interviews were transcribed verbatim from tape-recordings. Analyses were conducted using a qualitative framework approach [15, 16]. The method differs from other qualitative methods, in that it is more structured as categories of interest are considered before interviews.

A researcher who was not involved in the interviews reviewed the data. Each transcript was read in detail twice. Data were first studied for familiarisation and then indexed and charted. Tables of responses reflecting key categories were used for interpretation and explanation of findings. All data fitted into the general categories of satisfaction with the chair (sub-categories of satisfaction with use and safety) and satisfaction with the EPIOC service. Closed-ended questions (such as frequency of use) were analysed using descriptive statistics.

**Findings**

**Satisfaction with chair**

*Use*

Satisfaction varied immensely. Many users associated their EPIOC with dramatic positive changes, but others did not feel their life had been significantly enhanced. Three participants never used the chair (Table 2). Reasons included agoraphobia (1 user), and the chair not suiting users' needs (2 users). Fisher's exact tests did not reveal any significant gender or age differences between those who did, or did not, use their chair frequently.

Participants who used their chairs reported difficulties with indoor and outdoor use. Limited indoor use generally involved the chair's bulk: *'I don't use it a lot. It's too big and clumsy for indoor use. I use it basically if I go out without my car and I drive'*. (user 12). Barriers to outdoor use often related to difficulties manoeuvring along footpaths and roads. Staying at home

**Table 1.** Participant demographics

Participant	Age	Gender	Ethnicity	Disability	Marital status	Sources of help in the home
1	72	F	WB	Spinal cord injury	Married	Husband
2	70	M	Arabic	Spinal cord injury	Married	Husband
3	69	F	WB	Multiple sclerosis	Widowed	External carer
4	75	F	WB	Multiple disabilities	Widowed	None
5	76	M	WB	Spinal cord injury	Married	Wife
6	74	F	WB	Multiple disabilities	Married	Husband
7	71	F	White Italian	Multiple sclerosis	Married	Husband and daughter
8	77	M	WB	Spinal cord injury	Married	Wife
9	81	M	WB	Cerebrovascular disease	Married	Wife
10	63	M	WB	Cerebrovascular disease	Married	Wife
11	64	F	WB	Cerebrovascular disease	Widowed	None
12	63	M	White Canadian	Multiple sclerosis	Married	Wife and son
13	60	M	WB	Rheumatoid arthritis	Divorced	None
14	63	F	WB	Multiple sclerosis	Divorced	None
15	61	M	Asian Indian	Multiple disabilities	Married	Wife and children
16	64	M	WB	Polio	Married	Wife
17	64	F	Malaysian	Rheumatoid arthritis	Widowed	None

WB, White British.

## Elders' satisfaction in using electric wheelchairs

**Table 2.** Profile of EPIOC use

	<i>N</i>
Never use it	3
Indoor use	
Less than once/week	6
Few times/week	2
Everyday	8
Outdoor use	
Rarely	4
Few times/week	8
Everyday	4
Uses	
Shopping	12
Park	6
Visiting family and friends	4
Pub	2
GP and hospital	2
Gardening	2
Day centre	2
Church	1
Work	1

was an easier option for many: *'I was trying to go round to one of the local shops the other day and the pavements were in a dreadful state and then you go onto the road, they're an equally bad state. You'd have to have a pretty good reason for going out'* (user 9).

Reasons for infrequent use did not simply relate to dissatisfaction with the chair and environmental barriers. Some users felt a sense of resignation, that their level of disability had superseded any advantages their chair might offer. This sense of helplessness was expressed by the following 61-year-old with multiple disabilities: *'Can't do anything much anyway, so I don't deal with it (the chair)'*.

Despite these difficulties, eight participants (47%) used the chair frequently. An EPIOC was essential for many participants, as expressed by this 76-year-old with spinal cord injury: *'I use the chair all the time, whenever I need to move'*. Another user equated the chair with the very essence of mobility: *'They're my legs. Without that I wouldn't be able to do anything'* (user 6). For those satisfied with their chair, independence, privacy and enhanced well-being were reported: *'This is the first wheelchair I've got with independence. It's given me back, especially having the dog. It's given me back something I'd lost for five and a half years'* (User 11). For those who used and valued their EPIOCs, life without it was difficult to imagine.

The most popular uses for the chair were shopping, visiting the park and social visits, although only a small number of participants used the chair for socialising. For many, the chair met solitary needs e.g. gardening or walking the dog.

### Safety

All but one user said they had been given safety training, including driving tests and pamphlets. Some users felt insecure in the chair, especially using kerb climbers. Three users had accidents and two minor mishaps. No injuries

resulted, but experiences often left users shaken: *'The state of our pavements and roads, they're not good, and quite honestly it shakes me to hell (using the chair outdoors)'*.

Sixty-five percent of users felt secure in their chairs, although this often related to their caution when in the chair. Weather conditions, crowded pavements, kerbs and uneven terrain were all avoided. Users consistently reported concern over batteries and other people. Battery life was often unknown with the fear that it would run out leaving the user stranded. The social environment was another concern with reports that pedestrians were rarely mindful of the chair.

As expressed by this 64-year-old with arthritis, children were especially prone to colliding with chairs: *'Christmas time is full of people and they all sort of looking up, and mums and dads are not careful with their children. I'm always very, very slow and my hand is always out, and I'm always sort of holding children because parents don't teach their children now, how to walk'*. Users compensated by moving slowly through crowds, but stopping suddenly was associated with risks for users and pedestrians: *'You've got some button to stop, and you do whack people's ankles and it hurts. It's like a car with stopping distance on it, it's not that quick'* (user 13).

### Satisfaction with service

Participants waited on average 3 months to receive their wheelchairs after their clinical assessment. Most were satisfied, but felt that waiting times could be improved. One participant waited 2 years to receive her chair, although this was due in part to her house not fitting the chair's dimensions. When users were warned about lengthy waiting times they were more accepting of delays. *'We didn't push it or anything because we were told that at the very beginning about funding'* (user 7). However, this lack of follow-up meant that some users waited out appointment times despite feeling stressed about needing adjustments or they continued to use an uncomfortable chair.

Users were concerned that they would not be assessed in time for changing needs. Many had illnesses associated with deterioration and increasing immobility. Waiting times were often too laborious, and there was a sense that users would prefer not to use the chair than deal with having their chair adjusted. *'My house has deteriorated and my condition has got worse. Really I could really do with going back and being reassessed again because the one I've got now is no good for what I was assessed for in the first place'* (user 6).

Users listed a range of minor problems, from needing the control box moved, to adding a mirror to compensate for the participant's lack of neck movement. Reviews of the contracted repairer were mostly positive: *'They're very good. I phoned them, I said, "I'm stranded, I'm in the middle of the room. I can't go one way or the other", and they said, "alright, we'll be there as soon as we can" and within half an hour they were here. They've been very good'* (user 6). In contrast, at least one user waited weeks for repairs, going the entire time without a chair. Some users were unhappy with the repair services' response to modifications, and some EPIOCs went unused as a result: *'At the moment I'm waiting for someone to come and look at the electric*



1 wheelchair and I've been waiting for months because it needs adjustment  
2 and I haven't been using it. I only used it for about a week, 8 months  
3 ago' (user 1).

4 The wheelchair service provided information about  
5 dealing with malfunctions and all users were very satisfied  
6 with this. They had access to booklets with problem-solving  
7 tips, and felt it was helpful to refer to this information  
8 rather than immediately calling the contractor. Despite their  
9 satisfaction with most aspects of the service, there was a  
10 feeling that information about the wheelchair service could  
11 be disseminated more effectively. Users wanted to assist  
12 others in a similar situation, and regretted being unable to  
13 access an EPIOC earlier: 'I found it very hard that they don't let  
14 people know about these sort of things. That these chairs are available  
15 for people, because it has made so much difference to us. I would have  
16 seen to this a lot earlier. I would have got an EPIOC a lot earlier if I'd  
17 known about it. I just think disabled people should know about that  
18 sort of thing. . . It does change people's quality of life' (user 7).

## 20 Discussion

21 This is the first study of an older population of British people  
22 using powered wheelchairs. The findings suggest benefits  
23 associated with EPIOCs, including increased independence  
24 and well-being. Although most users were satisfied, EPIOCs  
25 were not regarded by everyone as helpful. Those reporting  
26 limited use seemed to comprise two groups: (i) individuals  
27 with minimal socialising and mobility motivations, and (ii)  
28 people who desired mobility, but felt the EPIOC was incon-  
29 venient to use due to physical barriers and ill-fitting chairs.

30 Satisfaction with the service was usually high once users  
31 received their chair, but dissatisfaction with waiting times and  
32 concerns about the chair continuing to meet needs were also  
33 reported. Times for appointments and chair modifications  
34 were lengthy, and users were often not reassessed in time  
35 to accommodate changing needs. This is an unfortunate  
36 consequence of a well used but under-funded wheelchair  
37 service, and is not limited to this sample (4).

38 Older users found substantial benefit in their EPIOCs,  
39 shopping being reported by almost three-quarters of them.  
40 For many, EPIOCs assisted with the compensation of age-  
41 related decline, boding well for their future mental and phys-  
42 ical health [11]. Participants in this study were rarely involved  
43 in accidents although many felt insecure in their chair.

44 Despite the advantages EPIOCs offer, some participants  
45 rarely used their chairs, usually due to the difficulties of a  
46 wheelchair-unfriendly environment. From small doorframes,  
47 to uneven outdoor terrain and pedestrians, wheelchair use  
48 was felt to be a difficult task. Future work needs to explore  
49 the characteristics that distinguish who gets maximum use  
50 and enjoyment from their chairs. Given the substantial costs  
51 of EPIOC prescription (about £2,163 or €3,300, \$4260  
52 excluding a cushion) it is important to understand who will  
53 benefit most.

54 As family, activities and other social contacts are the most  
55 important factors providing 'quality' to life and health in  
56 old age [17, 18], many older EPIOC users could benefit

1 from increased chair use. Only four users reported visiting  
2 friends and family in the EPIOC. Service providers should  
3 ensure that the chair is comfortable and convenient to  
4 use. Improvements to the chair, such as a horn for safety  
5 may increase social use. Providers also need to be realistic  
6 about older adults' mobility needs. Simply doing the weekly  
7 shopping may enhance quality of life and many participants  
8 reported increased life satisfaction attributed to their EPIOC.

9 EPIOCs were found to be an important resource for the  
10 severely disabled older adults in this study. However, it is  
11 questionable whether the findings can be extended to the  
12 mobility issues of a general elderly population. Further work  
13 is required addressing the efficacy of other powered devices  
14 for less severe mobility problems. For example, scooters (not  
15 available from the NHS) may greatly enhance quality of life  
16 for those needing minor assistance with mobility.

## 18 Key points

- 19 • Wheelchair use should be viewed from a developmental  
20 perspective; how do users' needs and concerns change  
21 with age? Do health professionals consider wheelchairs  
22 often enough to compensate for age-related immobility?  
23
- 24 • Not all disabled older adults use EPIOCs to full advantage;  
25 social use may be especially compromised.
- 26 • Barriers to use include environmental obstacles such as  
27 stairs and uneven terrain, perceptions of questionable  
28 chair safety for user and other pedestrians, battery  
29 concerns, and waiting times for provision of chair and  
30 modifications.
- 31 • Further resources are required to ensure older disabled  
32 persons receive EPIOCs that meet individual needs  
33 without lengthy delay; for example, warning horns may  
34 be needed for some, while others may require additional  
35 training around manoeuvring across difficult terrain.

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## 46 Conflict of Interest Statement

47 Andrew Frank is Medical Director of Kynixa—a rehabilita-  
48 tion case management company.

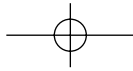
49 (This company has no relationship to any wheelchair  
50 companies but is included for transparency and you may  
51 quote as you feel is appropriate).

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## Elders' satisfaction in using electric wheelchairs

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