



Research article

An exploratory study of the experiences of wheelchair users as aircraft passengers – implications for policy and practice



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ABSTRACT

Air travel has grown steadily in the region of 5–6% every year since 1970 meaning that in the UK alone, around 750,000 people use flying as a means of transport every day. Disability rates are also increasing in the UK, with over 13 million people having at least one. Air travel for the mobility impaired has been relatively unexplored, but with increasing rates of disability and passenger numbers, it is crucial to know what the most severely disabled people think of the current process. This study used qualitative interviews of a semi-structured nature with eight wheelchair-using participants who were invited to discuss their experiences of air travel as well as offering opinions. Key findings showed notable issues when wheelchair users interact with the aircraft. The manual handling, the equipment used, seating, communication and accessing the toilet on the aircraft led to physical pain and discomfort and in turn emotional distress. Recommendations include developing consistency, further disability training and a review of the equipment involved.

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1. Introduction

The International Classification of Functioning, Disability and Health (ICF), which is the World Health Organisation (WHO) framework for measuring health and disability at both individual and population levels, defines disability as “an umbrella term for impairments, activity limitations and participation restrictions”, with over one billion people estimated to have one or more disabilities equating to just over 15% of the global population [1,2].

Accessibility is a particular issue for those with disabilities but as a broader concept it should be thought of as being something that benefits or applies to everybody. Darcy & Dickson [3] estimate that 30% of a population will have access requirements at any point in time, and most people will have a disability at some stage during their lifetime.

1.1. Disability prevalence in the United Kingdom (UK)

The Office of National Statistics (ONS) collects data about disability from the Department of Work and Pensions (DWP), in particular from the Family Resources Survey which is conducted every year. The 2016 survey has found that 13.3 million people in the UK have some sort of disability which represents 21% of the total population. Seven million

people reported a mobility disability or, 52% of the disabled population [4]. Of those that reported a mobility disability, it is estimated that 44% of working age adults, 68% of state aged pensioners and 21% of children have a mobility disability.

1.2. Aviation figures in the UK

The aviation industry is a truly global industry and more people are travelling by air than ever before, whether they have a disability or not. Air transport volume is now five times as large as it was in 1970, with air travel growth rates being on average 5–6% per year in the period 1970–2000 [5].

The Civil Aviation Authority (CAA) is a regulatory body for the UK aviation industry and is responsible for providing air traffic services. The CAA reports statistics of aircraft movement and passenger movement, which is derived from the data of 55 airports. Two geographical regions have been selected to show this data London Area and Other UK [6].

Examining how many flights there are per year will give an indication about the size of the UK aviation industry. Table 1 contains the number of flights that take off and land per year in the UK, including all scheduled and chartered, cargo, commercial and military flights:

A secondary indicator to understanding industry size is how many passengers use the airports per year, but unfortunately data concerning passengers with reduced mobility who travel is not publically available. Table 2 describes how many passengers are flying from UK airports per year by geographical region:

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Table 1
Aircraft Movement in the UK in 2016 [7].

Region	Aircraft movement
London area airports	1,173,196
Other UK airports	2,020,088
Total	3,193,284

To place these numbers in perspective this equates to an average of 8725 aircraft movements and 742,706 passengers taking a flight every day of the year (totals divided by 366 (leap year) and rounded) [7,8]. This is important because the potential volume of people with disabilities could be in the region of 150,000 who may travel per day based on the 21% of the population [4] if they could travel as readily as the rest of the population.

More people are travelling by air than ever before, whether they have a physical condition or not. The freedom to travel should be considered as a right that everyone has, but those with physical disabilities do not enjoy the same access to transport as able-bodied people do [9].

2. Methodology

2.1. Qualitative research design

Creswell [10] has identified five approaches to conducting qualitative research; narrative research, phenomenology, grounded theory, ethnography, and case studies. The research was devised using three of these approaches to qualitative research; narrative research, phenomenology and ethnography. A harmony of these three elements was chosen as narrative research is collecting data as a story, phenomenology is the study of human experiences whilst ethnography is the study of people or cultures to try and understand their values or beliefs.

O'Day & Killeen [11] showed this last method to be recommended for studying disabled groups because there is more to understanding the needs of the people with disabilities than a health issue interacting with an environment. It allows researchers to explore further complexities such as social and economic constraints reflecting the reality of the lived disabled experience to help develop solutions to the challenges they face.

2.2. Participant recruitment

Participants were recruited through personal contacts of the principal author and expanded by snowball sampling, designed to result in a homogeneous sample as the research centred around participants being full time wheelchair users who have flown recently. Participants were of a variety of ages, but were all over 18 years old. They were approached to participate by means of an email from the principal author and the means to withdraw at any time and without giving a reason from the research was offered. Following participant recruitment, semi structured interviews were conducted with eight participants who agreed to offer their experiences of air travel.

2.3. Topic guide

A semi-structured topic guide was formulated in three sections: 'Individual Characteristics' used an ethnographic approach that obtained

Table 2
Passenger Movement in the UK in 2016 [8].

Region	Aircraft Movement
London area airports	163,209,810
Other UK airports	108,620,685
Total	271,830,495

basic data about the participant whilst allowing time for interviewer and participant to build a rapport whilst establishing that the interviewee was suitable to participate in the study. 'Travel Characteristics' also used an ethnographic approach to establish travel frequencies and to gauge whether the class of travel has an impact on the disabled traveller.

'The Journey' used phenomenological and ethnographical approaches and was the main aspect of the study and was at the core of gathering the experiences. This section was divided into subsections that used a narrative approach as it is the story of someone travelling through an airport: Booking air travel; Getting to the airport; Checking in; Security; Shopping, restaurants and duty free; Getting to the gate; Boarding the plane; On board the plane; Disembarking and Overall experiences of flying. Exiting through the terminal, passport control and baggage reclaim were omitted as most of these elements were already explored in earlier subsections.

The topic guide concluded with the opportunity for participants to suggest to the aviation industry where the experience could be improved upon for wheelchair users and whether they would like to comment on or add any other thoughts and opinions they had.

2.4. Interview analysis

The interviews were analysed using thematic analysis. The transcripts were coded manually into themes and subthemes by the experiences described within the framework of the topic guide manually. Whilst software is available for thematic analysis, a manual approach was taken by the principal author and checked for consistency by the other author because the principal author conducted all the interviews and was familiar with the central themes occurring throughout.

3. Results

3.1. Participants

Three females and five males took part with ages ranging from 24 to 69. The average age of a participant was 48.00 years. Two of the participants were disabled from birth, whereas the other six had acquired their disability, five of them describing themselves as having tetraplegia (a loss of function in all limbs) and one as paraplegic (a loss of function in two limbs, normally the legs) [12]. The average length of disability is 34.31 years including those born with disability and 23.08 years amongst participants with acquired disabilities. Half of the participants described themselves as using a manual wheelchair and the other half use a powered wheelchair; in addition, four of the participants have the need for a full time personal assistant who attends to their care needs (Table 3).

The participants provided a wealth of information about each aspect of 'The Journey' through the airport, however the results below are the key issues that wheelchair users encounter whilst flying.

Table 3
Participant characteristics.

Participant	Age	Gender	Length of disability	Disability type	Personal assistant	Chair type
A	69	Male	69 Years	From birth	No	Powered
B	36	Male	18 Years	Tetraplegia	Yes	Powered
C	45	Female	14 Years	Tetraplegia	Yes	Powered
D	53	Male	40 Years	Paraplegia	No	Manual
E	30	Female	20 Years	Tetraplegia	Yes	Manual
F	67	Male	67 Years	From birth	No	Manual
G	60	Male	40 Years	Tetraplegia	Yes	Powered
H	24	Female	6.5 Years	Tetraplegia	No	Manual

3.2. Manual handling

Manual handling takes place from the door of the aircraft or the scissor lift to the seat, which has caused physical pain to some participants who have felt that this is the worst experience of flying because of the physical pain caused or where physical damage may be caused but could be unrecognised because of the person's disability.

They have to lift me into an aisle chair and then take me down the aisle in this chair then lift you across three seats so you're at the window seat, two people lifting, and it's caused me a lot of pain and problems. It's the worst part. [Participant C, Female, 45, Powered Wheelchair User].

'... then they manhandle me then they get me down through the aircraft up the aisle, and they manhandle me into my seat, lifting again, which is incredibly painful, and that is what happens.' [Participant G, Male, 60, Powered Wheelchair User].

'So yes maybe having an awareness that it is not just about getting you on, but being careful. I am fortunate that I am not really in a lot of pain, but I still don't want my legs being bashed about because I can't feel them, I won't necessarily know straight away if damage has been done.' [Participant E, Female, 30, Manual Wheelchair User].

3.3. Seating

The study revealed that business class could be a better option for disabled travellers because of the extra space available, but the affordability of it is obviously a limitation to this. Modern times have seen a change in economy seating.

'... they upgraded us to business class, and that was the best experience, because there was more space, the seats were comfier, I could raise my seat as well because I also had ... I had DVT, a couple of times, so I am really conscious of flying, that I am at risk of that, so it was really good to have that extra space. Yes it was much comfier.' [Participant E, Female, 30, Manual Wheelchair User].

'You know, when I started flying the economy seats were better than many of the business class seats today in size' [Participant F, Male, 67, Manual Wheelchair User].

3.4. Equipment

In addition to widely reported poor manual handling by the staff, an issue that accompanied this was the equipment that the staff had to use, in particular the aisle trolley and arm rests on the aircraft. The aisle trolley was described as being small, uncomfortable and having poor support from the restraining straps that provide trunk support and balance. Some armrests were described as being fixed on some aircraft, which added another level of complication.

'... we've had a problem where the arm-rests on the plane haven't moved so it's made lifting over more difficult as well.' [Participant C, Female, 45, Powered Wheelchair User].

'Yeah, I mean, actually getting onto the plane, you transfer onto a very, very small chair now. The chair is tiny, you know, it's very often not padded and it opens you up to all kinds of sort of cuts, bruises or sores or whatever just getting onto this little chair.' [Participant D, Male, 53, Manual Wheelchair User].

They lift me into a tiny little metal thing that goes in-between the seats, they strap me onto that with loads of horrible straps' [Participant G, Male, 60, Powered Wheelchair User].

The aisle chairs are horrifically uncomfortable and unflattering and not easy to get onto' [Participant H, Female, 24, Manual Wheelchair User].

3.5. Toilet issues

One of the biggest issues that wheelchair users face whilst travelling by air is going to the toilet. Participants overwhelmingly stated that they had never even tried going to the toilet as they felt it was an impossible task. Due to a lack of accessible toilets on aircraft, some participants

reported methods they used to avoid using the toilet including fasting and catheterisation.

These are real issues. And that's one of the reasons I don't fly more. It's a personal hygiene issue, it's nothing to do with flying here ... the wheelchair accessible toilets on some flights are not accessible to me because I cannot get into them' [Participant A, Male, 69, Powered Wheelchair User].

'Using the toilet is a no go for me, that I can't ... I would need the aisle chair to get to it, which is one thing, but they are so tiny. I am quite little, and ... I am pretty small and I can't get in' [Participant E, Female, 30, Manual Wheelchair User].

'... If I go on a long-haul flight, I have to use an internal catheter, because I just know there is just no way I can get into the toilet.' [Participant E, Female, 30, Manual Wheelchair User].

3.6. Turbulence and landing issues

Turbulence and landing issues were identified as a problem amongst the more disabled participants because of balance issues or because the sudden movements can trigger muscle spasms resulting in awkward involuntary movements and embarrassment. The potential risk of injury is here as wheelchair users may hit the seat in front of them or fall out of their own seat. Carers may also be at risk if they are supporting wheelchair users with poor balance as they are unbalancing themselves.

'... one problem I find is, because I have fairly limited balance, the seatbelts... Because obviously they're only just the normal waist belts, there's no sort of upper body support. I think it would be helpful to have some upper body restraint really because the slightly bit of turbulence and I'm falling forwards.' [Participant C, Female, 45, Powered Wheelchair User].

'... maybe slightly landing, because I don't have balance, but again I am just so used to that, that I will just make sure that I will use my hands and arms to sort of stop me going forward, but that is all.' [Participant E, Female, 30, Manual Wheelchair User].

'... my carer holds my chest if I am landing, in case I go forward and hit my head on the one in front.' [Participant G, Male, 60, Powered Wheelchair User].

'I think landing, well any kind of jolting can put me into spasm, so that can be a little bit embarrassing and I get frequent back spasms.' [Participant H, Female, 24, Manual Wheelchair User].

3.7. Humiliation and embarrassment

Several participants drew attention to a preference for being boarded first, allowing them extra time to get seated comfortably without experiencing embarrassment and humiliation in front of other passengers. When this process is unable to happen because of a lack of ground staff, poor communication or the staff being disorganised it can lead to physical and emotional distress on the part of the wheelchair user.

'... there's been a nasty two or three experiences where I've been boarded last. That is embarrassing to be sort of transferred onto a chair and through the airplane, knocking everybody as you go, and then to have the embarrassment of being lifted into your seat in front of everybody is... I find it embarrassing.' [Participant D, Male, 53, Manual Wheelchair User].

'... when they get me on the plane, sometimes they have to ask people to move out of their seats, or I am going down the aisle and there are people trying to get to their seat and I get knocked a lot. So that is probably the worst bit of the process for me, because I feel like it is quite rushed and I don't feel it is done in the best order' [Participant E, Female, 30, Manual Wheelchair User].

'... no one holds the boarding of the rest of the passengers to wait for you to get on, which is just really embarrassing and humiliating. But no one wants to be stared at while they are just trying to get on a plane, to transfer into a seat, so that is all pretty horrific.' [Participant H, Female, 24, Manual Wheelchair User].

3.8. Nervousness and anxiety

Wheelchair users are completely reliant on their wheelchairs and so to be separated from the wheelchair with no consistency whether it might be brought back to the cabin door or might go to baggage reclaim or whether it will be in working order is a major factor that causes stress and anxiety. Furthermore, participants also reported being unable to leave the seat after landing as another issue as they have been separated from their wheelchairs at this point which can cause nervousness too, particularly as they are always last to leave the plane, often waiting a long time.

'So I am at this point feeling extremely anxious because I've been parted from my chair and I have no idea what's happened to it. Now nine times out of ten it's loaded into the hold along with everything else and off we go. So that's the first thing that happens to me while I'm sitting in my seat.' [Participant A, Male, 69, Powered Wheelchair User].

'... we've had to wait a significant amount of time and, because the airlines have to turn it round quick, I've been sat there and all the cleaners are there' [Participant C, Female, 45, Powered Wheelchair User].

'... but from my perspective, my chair wasn't there, and they couldn't guarantee that they had seen it, so then I was worrying, without my chair I am really stuck, and I don't think they got the enormity of that.' [Participant E, Female, 30, Manual Wheelchair User].

'If the chair is not at the door, then they don't meet my needs at all, because that is my main way of getting about. And even putting me in the standard issue chair is not good enough, because it has not got pressure-relieving qualities, it is not self-propelled so it takes away all my independence, and no one seems to get that.' [Participant H, Female, 24, Manual Wheelchair User].

3.9. Communication

Staff were largely reported as being good or OK, but many participants felt that it did depend upon the member of staff. Time was also identified as an issue because of a lack of knowledge about the wheelchair or being unsure what to do. Wheelchair users also want a greater level of understanding and greater communication from the staff to assist them through the process of air travel.

'The staff generally are always very polite, but you often feel they don't really know what they're doing. They usually have to make at least a couple of phone calls to somebody else to ensure that, you know...so if you find you're the first wheelchair user they've ever seen I find that a bit weird really. But some are better than others but I think there's always this little moment where you think they're not quite sure what to do with me.' [Participant A, Male, 69, Powered Wheelchair User].

'... I guess just understanding their needs a little bit better and that ... yes ... so maybe better training for staff, who are doing the special assistance.' [Participant E, Female, 30, Manual Wheelchair User].

'... the guys who are lifting you on and off the aeroplane, they need to know just how bloody awkward and just how embarrassing it is to be put on last when you're being lifted up and people look up your dress and God knows where else, and it's just lack of dignity. And I don't think these people actually realise the humiliation they put their passengers through because they can't get the bloody system right. So I would say training, guidance, monitoring and awareness.' [Participant F, Male, 67, Manual Wheelchair User].

4. Discussion

The study has indicated that travelling as a wheelchair user by means of aircraft is a negative experience interspersed with some positive ones. The issues identified in the results are from the 'Boarding the plane', 'On board the plane' and 'Disembarking' stages of 'The Journey', which indicates that the problems associated with flying are when wheelchair users interact with the aircraft because accessing the plane leads to physical and emotional distress.

The study also concurs with Poria [13] who interviewed 20 wheelchair users over three years and reported the most problems when boarding and leaving the plane, having to use a small wheelchair that fits down the aisle of the plane and was described as uncomfortable and having a straight back, making transferring difficult. Staff were reported as not always knowing how to appropriately manually handle wheelchair users into their seats and vice versa. Participants reported that poor manual handling can cause severe pain as well as pressure sores. On board the plane, wheelchair users reported that going to the toilet was the biggest problem as getting to the toilet meant using the small wheelchair and reported employing methods to avoid going to the toilet such as fasting or catheters.

Saari [14] used a mixed method approach via a survey and questionnaire through social media, which canvassed the data and opinions of 34 wheelchair users and seven people who travel with them. Problems identified were similar to this research in that wheelchair passengers are unable to get to the toilet which has resulted in respondents using tactics to avoid using the toilet. Seating was described as uncomfortable and a source of pain. Manual handling also caused pain through poor lifting techniques and the equipment used for transferring being unsuitable. Saari also found communication issues between the staff and the wheelchair user that led to negative experiences.

The themes and issues identified by Poria and Saari are still present in this study suggesting that the problems encountered by wheelchair users are in no way limited to the UK and no improvements have been made in this field.

4.1. Strengths and weaknesses

This study included a variety of wheelchair users from different geographical areas of England with varied sociodemographic characteristics, including different causes of being in a wheelchair. The group interviewed was largely severely disabled people with over half describing themselves as tetraplegic (quadriplegic) and so the sample focused on those with the greatest needs. The average time the sample had been disabled was 34.31 years and that the experiences they described will have been encountered across the wheelchair user population, however it is possible to suggest that the sample are acutely aware of difficulties encountered and different experiences may be offered by a sample with a smaller average number of years being disabled. Whilst relevant to the British population, there could be cultural differences between other countries although this is proving more unlikely given the results identified in previous studies in different countries [13,15, 14].

The sample was recruited through three personal contacts of the principal author, one of them being a specialist disability travel agent whose contacts represented half of the sample. This could imply a bias towards those who enjoy travelling and are familiar with the processes involved and have many experiences, however, their views and experiences largely concur with the other half of the sample suggesting that there is not a bias.

5. Recommendations to the aviation industry

The experience of boarding the aircraft was regarded as being a negative experience, and the following recommendations are suggested to make it easier for the wheelchair user.

5.1. Standardising procedures

1. The airlines should agree where wheelchair users should sit. From a safety perspective sitting next to the window makes sense however, it is impractical for the manual handling team to lift over three seats.
- The airlines should collaborate to agree upon a preferred seating choice for wheelchair users.

- Upgrade them to a business class seat if some of these are unsold as those seats are larger and offer a greater degree of flexibility in terms of seat manipulation.
2. Staff need to enforce the policy that wheelchair users should board the plane first and return the wheelchair to the door of the aircraft during disembarkation.
 - Staff need to take a greater deal of care and have a greater understanding by attending regular awareness training of the humiliation and embarrassment that is caused.
 - Airports should source specialist disability teams with extensive training so that the procedure of boarding and disembarking the aircraft is standardised across all UK airports.
 3. A set of standardised guidelines that each airport should follow should be formulated in consultation with wheelchair users so that the procedure for wheelchair users is streamlined and the same service can be expected across the board.
- 5.2. Toilet issues

Access to the toilet on aircraft or a perceived lack of access to it needs to be addressed by the aviation industry and should be considered in the design of new aircraft, long haul in particular

5.3. Manual handling and equipment

1. The equipment used to aid wheelchair users on and off the aircraft should be examined. Equipment should meet certain standards:
 - The seat should be padded and/or have pressure relieving qualities so it is comfortable.
 - Staff should be able to lower and raise the aisle trolley so that it can match the height of a wheelchair or the seats on the plane.
2. New methods of manual handling should be investigated as an alternative to manual lifting such as the Eagle 2, which is a medical grade hoist that allows people with reduced mobility to be taken on and off the plane with the assistance of two people using limited physical manual handling [16].

The interventions suggested should be implemented to mitigate and where possible remove the struggles that wheelchair users encounter whilst travelling by air.

6. Implications for future research

There is scope for further research in this field. It is vital to establish the difficulties the aviation industry has in aiding wheelchair users in order to understand the issues faced by both groups so that the best possible solution can be found. Observational research should be carried out to establish the strengths and weaknesses of staff that help those with disabilities in real time. To overcome the toilet issues, a series of

laboratory experiments or computer aided modelling should be undertaken in collaboration with wheelchair users. Ultimately, it is crucial to do further research in all aspects of air travel by people with disabilities as very little has been carried out to date.

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