Perceptions of Power Mobility Use and Safety within Residential Facilities

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Abstract

Power wheelchairs enhance quality of life by enabling occupation, improving self-esteem and facilitating social interaction. Despite these benefits, there are risks associated with power mobility use; and accidents, which may occur, are a serious concern. As there is no gold standard to assess when a client is unsafe with power mobility, therapists generally rely on their clinical reasoning to make a decision.

This paper presents the findings of the first phase of a two-part study to develop client-centred guidelines for power mobility. In the first phase of the study, 18 in-depth, qualitative interviews were conducted with a variety of stakeholders, including power mobility users, other residents, staff and family members. A thematic analysis of the interviews revealed four main themes: 1) “the meaning of power mobility,” 2) “learning the rules of the road,” 3) “red flags: concerns about safety,” and 4) “solutions.” The findings of this study have important implications for the safe use of power mobility.

Power mobility has a strong impact on the quality of life of its users. Power mobility facilitates participation in self-care, productivity and leisure occupations in adults (Brandt, 2001; Evans, 2000; Frank, Ward, Orwell, McCullagh, & Belcher, 2000; Miles-Tapping & McDonald, 1994) and children (Bottos, Bolcati, Sciuto, Ruggeri, & Feliciangeli, 2001; Butler, 1991). Psychosocial benefits may include improved affect, increased assertiveness and increased autonomy (Evans, 2000; Miles-Tapping & McDonald, 1994). Despite the benefits of power mobility, there remain risks associated with its use.

The prevalence of power wheelchair accidents in Canada generally and within residential facilities specifically is difficult to ascertain, as Statistics Canada, the Insurance Corporation of British Columbia, and the Workers Compensation Board do not keep wheelchair accident statistics. Frank et al. (2000) found that within 4 months of power mobility provision, mishaps, which included tipping from chairs and falls during transfers, were reported by 13% of those surveyed (15 out of 113). The Vancouver Coastal Health (VCH) residential facility with the greatest prevalence of power mobility users (82 out of 142 residents) reported 16 incidents of property damage from July 1999 to July 2000 resulting from power wheelchair use. This report is likely conservative, based on the authors' experiences, as the reporting tool tends to be completed following only serious accidents or a series of escalating incidents tend to be reported; and minor incidents were probably not captured. Within VCH residential facilities, power wheelchair accidents have caused the following: 1) personal injuries that have involved worker's compensation claims, 2) damage to facility and private property, and 3) automobile accidents. In light of these types of incidents, it is perhaps not surprising that Reed, Yochum and Schloss (1993) reported that 30% of long-term care residents surveyed felt that other drivers within the facility drove unsafely.

Power wheelchair use is expected to increase as technological innovations enable more individuals to drive powered wheelchairs (Dawson, Chan, & Kaiserman, 1994) and more individuals have a need for power mobility, particularly the elderly, who are by far the fastest growing (Perreault, 1990) and largest demographic group to use power mobility. Increasing consumer knowledge and visibility of power wheelchair devices in the community and in facilities may also lead to an increase in demand for these devices (Hendrickson, 1999). Logically, an increased prevalence of power mobility use would likely lead to an increased number of accidents.

This research began as a clinical irritant related to the lack of evidence available to inform decisions about power mobility safety and the inconsistency with which judgements were made. Although two standardized power wheelchair assessments have been developed, the Power-Mobility Indoor Driving Assessment (PIDA) (Dawson et al., 1994) and the Power-Mobility Community Driving Assessment (PCDA) (Letts, Dawson, & Kaiserman-Goldenstein, 1998), both were designed to enhance mobility rather than "assist the health care professional in deciding whether or not someone should have access to power mobility" (Letts et al., 1998, p. 124). Assessing power wheelchair safety is a contentious and troubling issue for occupational therapists and their clients, primarily because no gold standard exists to determine when driving becomes unsafe. As a result, the authors, which include occupational therapists from three residential facilities of Vancouver Coastal Health Authority (VCH), created a power mobility research group with the aim of facilitating evidence-based occupational therapy (von Zweck, 1999) in this area. A two phase research project was developed to explore perceptions of power mobility and power mobility safety (phase 1) and to develop guidelines for safe wheelchair use using a modified Delphi technique (phase 2) (Hicks, 1999).

Client-centredness (Canadian Association of Occupational Therapy, 1997) is a model of practice that informed this research. In an attempt to create evidence that was in keeping with occupational therapy practice philosophy, some authors have advocated for client

involvement in the research process (Clarke, Scott, & Krupa, 1993; Hammell, 2001). Although there were not enough interested clients available to create a participatory action research project (French & Swain, 1997), this research was developed to involve clients, recognizing that clients within institutional settings include power mobility users, non-power mobility users and frequently family members (Hobson, 1999a, 1999b; Law, 1998).

This paper presents the findings of the first phase of this project. The specific objectives of the first phase were to:

1. Explore driver and non-driver perceptions of the meaning of power mobility use and power mobility safety within three residential facilities in VCH.
2. Explore differences in perception about power mobility safety between clients with progressive conditions and those with other conditions.

Findings from the second phase of the project have been submitted for publication.

Method

Due to the exploratory nature of this study and its focus on participants' experiences and interpretations a qualitative method was employed. In order to obtain rich detailed data about these experiences, in-depth qualitative interviews were selected as the data-gathering tool. The interview guide for these semi-structured interviews (Bernard, 1994; Stanton, 2000) was developed based on themes emerging from in-depth discussion among the co-researchers and from the initial analysis of the first three pilot interviews.

Participants

To develop an understanding of the diversity of beliefs and perceptions about power mobility, participants from eight stakeholder groups representing three residential facilities of VCH were recruited for the study. Stakeholder groups included:

1. power mobility users with progressive illnesses
2. other power mobility users
3. residents who did not use power mobility
4. family members of residents who used power mobility
5. family members of residents who did not use power mobility
6. resident care aids and nurses
7. wheelchair prescribers
8. maintenance and facilities management staff

Key Terms

Individuals with progressive illnesses were identified as those with a potentially progressive disease process, such as multiple sclerosis or Parkinsons disease, which might alter motor and cognitive abilities. Those with other conditions were identified as those with a disease

that was unlikely to further affect cognitive function such as individuals with spinal cord injury, rheumatoid arthritis or closed head injury. Power mobility users were defined as individuals who used power mobility (either a scooter or a power chair) as their primary method of mobility.

Inclusion and Exclusion Criteria

Participants needed to have a minimum of 6 months experience with power mobility, either as a user, staff or family member. Although no formal cognitive or language testing was conducted, participants who were interested in participating in the study needed to have sufficient cognitive ability and English proficiency to be able to contact the principal investigator to arrange for an interview and give consent.

Research Setting

Facility 1 was a single-floor residential care facility built on a hillside, with a younger population and a large number of power mobility users (58% or 82 out of 142 residents). Facilities 2 and 3 were multi-floor, predominantly geriatric, approximately 200 bed, long-term care facilities with a small number of power mobility users (between 3–5% of residents). Facility 1 had an average length of stay of 12.7 years, Facility 2 had an average length of stay of 1.8 years and Facility 3 had an average length of stay of 2 years. Less than 1% of residents in all three settings were ambulatory and the rest used manual wheelchairs as their primary means of mobility. See Table 1 for a comparison by admitting diagnosis of Facility 1 and Facility 2 and 3.

Recruitment

Participants were recruited through posters hung up in the facilities and by word of mouth. Interested participants either contacted the principal investigator directly or the occupational therapists within their facility. At the beginning of each interview, participants were given an explanation of the scope of the interview and told of their right to withdrawal at any time. Informed consent was attained at this time.

Description of Participants

Nineteen participants were enrolled in the first phase of the research project. Eleven of these were from Facility 1. Thirteen participants were residents or family members, and 6 were staff.

Data Collection Methods

Recognizing that our position as occupational therapists who worked with clients regarding issues of power wheelchair use might restrict or even prevent resident participation, the individual researchers did not interview clients at the institution where the researcher worked. The principal investigator, who was an occupational therapist within one of the facilities, conducted most of the interviews. Two interviews, however, were completed for residents who lived within the facility in which the principal investigator worked by one of

the co-researchers. Interviews lasted between 1 to 2 hours and were conducted in a setting of the participant's choice, although the need for a quiet interview space limited the options available for many residents.

The initial interview guide was developed by the authors based on the research questions and review of the literature. This guide was further modified based on the pilot and subsequent interviews. Participants were asked global questions to elicit broad responses. For example:

- a. What are some positive and negative experiences you have had with power mobility?
- b. How do you distinguish between safe and unsafe driving?
- c. What interventions do you consider appropriate for dealing with unsafe driving?

Participants were also asked to provide solutions to problems of power mobility safety posed in two vignettes. These scenarios were developed based on the investigators' experiences. One vignette depicted drinking and driving and the other illustrated an individual with declining ability. As the interviews progressed, probes were refined and additional prompts were added. The local university ethics review board approved the protocol used in the study.

Trustworthiness Strategies

Personal journals and field notes served as self-reflective tools to help the principal investigator maintain authenticity (Hammersley & Atkinson, 1995; Carpenter & Hammell, 2000). These documents served as venues for the principal investigator to explore questions about quality of the data and influence on the research process. To establish consistency in coding, the first three pilot interviews were coded independently by the principal investigator and one of the co-investigators and these themes were used in the initial coding of subsequent interviews. Constant feedback was also sought from the larger study group of co-researchers who appear as authors of this paper. As a form of member checking, two of the participants, a power mobility user and the power mobility prescriber, reviewed the findings. Except in two areas described by the power mobility prescriber and noted in the findings section, the peer reviewers reported that the results resonated strongly with their own experiences of power mobility use and safety.

Analysis

The interviews were analysed based on Hammersley and Atkinson's (1995) process of qualitative analysis, which involved continual analysis of the data throughout the research process. To aid in analysis, completed interviews were entered into Atlas Ti (4.1) © (Muhr, 1997) qualitative analysis software (Lewis, 1997). The transcripts were coded line-by-line, based on categories identified by two of the investigators during the pilot interviews. In this process the principal investigator and the third author independently coded each pilot interview. There was approximately 80% agreement on the content of these codes and any outlying codes were added to the coding matrix. At this point initial coding categories were set and then refined on an ongoing basis through further interviews. Although the remainder

of the interviews was analysed by the principal investigator, continual feedback was provided by the co-investigators throughout the research process, and results were sent to and discussed with the co-researchers on a regular basis. As analysis progressed, these codes evolved; and at the completion of analysis, four overarching themes were identified.

Findings

Analysis of the data revealed four main themes. These were: 1) the meaning of power mobility, 2) learning the rules of the road, 3) red flags: concerns about safety and 4) solutions. These themes are somewhat chronological. They describe how individuals come to want power mobility and learn to use it. Concerns then may arise about power mobility safety and solutions must be identified to resolve these concerns.

The Meaning of Power Mobility

Although this study focused on issues of power mobility safety, this discussion invoked an exploration of the meaning of power mobility in all participants. As discussed in this section, participants indicated that although power mobility could enhance quality of life, it could also be a source of discrimination and frustration.

Eighteen of 19 participants stressed the importance of power mobility in promoting quality of life. Power mobility was identified as an essential enabler that allowed users to have independent mobility within a facility. Gwen, a Facility 1 resident, noted, “[Having a power wheelchair means] freedom. I can do all kinds of things that I wouldn’t be able to do otherwise.” Despite the benefits of power mobility, several participants also described a degree of ambivalence towards it.

Seven of the 19 participants (5 of 10 facility residents, 1 family member and George, a wheelchair prescriber) noted that wheelchair users faced discrimination because of their wheelchairs. Diane, a community-living, power mobility user, noted that she generally encountered two main barriers in her daily life: the first way was environmental, such as lack of curb cuts, and “the second way [...] was the [...] attitude [of] other people. There’s an assumption sometimes. It’s that old [disability] spread that because you have problems walking that you must have problems with your brain.” Seven of the 10 wheelchair users and the wheelchair prescriber described how manual wheelchairs were preferred over power mobility, and scooters were preferred over power wheelchairs, which seemed to represent a hierarchy of mobility. For example, Diane wanted a scooter rather than a power chair, although she noted: The occupational therapist thought it would be a better idea if I had an electric wheelchair, because, since it was a degenerative disease, I was likely to need more lateral support later on. But for me at the time, being recently diagnosed, it was really important for me to have a device I saw as less disabling.

For some participants, there was a perceived loss of independence attributed to giving up ambulation. In this regard, Diane noted, “I think a lot of people with [degenerative diseases] don’t get a scooter soon enough, because you’re seen as being independent if you’re able to walk.” Therefore, despite the benefits of powered mobility, for some users, accepting any alternative form of mobility involved a sense of loss, as Tom (a Facility 2 resident)

emphasized: “We’re not in this damn thing by choice. We’d all like to get out and walk and run and play and do the things we used to do.”

Learning the Rules of the Road

The process whereby users learned how to use power wheelchairs had important implications for mobility safety. When asked who should be considered for power mobility and who should be excluded, most participants described two criteria. First, power mobility users needed to have certain intellectual faculties, such as the ability to learn and respond appropriately, and, second, they needed physical capacities, such as adequate vision and reliable motor function. Despite these notions about who should be considered for power mobility, none of the participants thought that potential drivers should be excluded prejudicially because of a given diagnosis such as Alzheimers or Parkinsons disease. Participants preferred a more teleological approach that allowed most residents to be considered for trial of power mobility.

Safety education was an important part of learning the rules of the road. Liz, a Facility 2 resident, noted:

[The therapist] taught me to how to stay in the centre of the sidewalk, not to get off on the side into the dirt where your wheels can get stuck and you can’t get in the dirt [...where] you’re going to get stuck. Or when a crowd of people come at you. What do you do? You stop and let them pass not try and fight them or get ahead or say “get out of my way” or whatever.

In this way, users became comfortable driving and also learned strategies for safety.

All participants compared power mobility use to car driving: “[It’s] just like driving a car” (Gwen). Despite this common analogy, twelve of 19 participants indicated that there were “different rules” for power mobility driving. One area of controversy was determining on which side of the hallway to drive. Several users complained when people didn’t drive on the right hand side. Diane, however, recommended “[if you’re driving down a hallway and] say there is another hallway [or door] intersecting on your right, you want to go really wide [drive on the left side].” Rather than switching the side of the hallway that she drove on, Liz, a Facility 2 resident drove in the centre of the hallway because of all the doors in the facility where she lived. These different driving strategies sometimes created tension between power mobility users and others within the facility. For example, Richard a Facility 3 power mobility user described his frustration with those who drove on the left side of the hallway. He indicated he repeatedly told them, “I know you’re from England and you drive on the wrong side of the road there, but try to stay on the right.”

Many participants identified different rules inside versus outside the facility: “When you’re outside it’s different you’ve got to learn outside driving” (Liz). Six of 10 power mobility users and George, the wheelchair prescriber, described how power mobility in the community was more difficult than within the facility. Gwen, who was independent in mobility within the facility, would not take her chair across the street near the facility to go shopping: “It’s not worth the risk. I don’t move quick enough.” Because of self-concerns

and concerns of others, some clients therefore only used their wheelchairs within the facility or when accompanied by others.

Part of learning how to drive within a facility involved learning how to share space with others, which was described by all participants. For Gwen, this concept meant it was important to “try to put yourself in the other person’s situation who’s also sharing the same space as you... different people that I share the hallways with have different capabilities and you have to realise that when you’re approaching them.”

For sixteen of 19 participants, sharing space meant showing consideration for others. For example, Liz noted, “I think people in power [mobility...] should at all times be respectful of their surroundings, and of the people around them.” The inability to share space was a cause for concern among participants and represented one of the red flags described in the next theme.

The idea of sharing space extended to everyone within the facility, including walkers (staff and visitors who ambulated). Nine of 19 participants, including power mobility users, staff and family, noted that those who walked needed to be aware of those in wheelchairs. Diane was concerned about how incidents were often assumed to be her fault as she was a power mobility user:

I was driving to the cafeteria in one of the hospitals not too long ago and somebody barrelled out of one of the offices and stopped just before they went over me and they’re like “why are you driving so fast?” And I wasn’t going that fast and I was watching very carefully [...] but that’s a very common thing that it must be the power mobility user’s fault.

Peter, one of the staff from Facility 1, felt that he needed to be aware of the power mobility users around him: “as soon as I come out of the office door into the corridor, well I know that I should be alert rather than getting into the corridor.” In this way, for Peter, sharing space was a shared responsibility.

Red Flags: Concerns about Safety and Consequences

Although safety was a serious concern for participants, 17 of 19 participants acknowledged that not all incidents could be prevented. George supported the idea that individuals should have the opportunity to take risks, as long as the danger to others or themselves was not excessive.

We all break stuff. So, because somebody’s in a power chair I don’t think it automatically means they’re held to a different standard. That’s actually quite unfair. [Although] physical harm to other people or themselves is not acceptable [...] that is still within the context of, we all fall down and cut ourselves. [George]

When the risk becomes intolerable, participants indicated that some kind of intervention was required.

None of the facilities in the study had regularly scheduled, standardized, ongoing testing of power mobility users. Therefore, power mobility users generally continued to use their

chairs unhindered, unless concerns or red flags were raised about their safety. Participants described three general categories of concern: danger to others, danger to self, and concern about property. Although danger to self and others were ideas identified by all participants, fewer participants were concerned about damage to property (identified by 15 out of 19 participants). As Harriet, a resident from Facility 1, explained, “Never harm people. Property can be replaced.” During the member check, however, George emphasised that for him damage to property was a serious concern: “damage to the equipment is not acceptable either [...] because damaged equipment causes us high costs and real inconvenience given that our resources to repair/replace are so limited.”

Rather than having automatic consequences to certain accidents or potential concerns, participants suggested the underlying causes of the problem needed to be explored: “the first thing is to ascertain what the cause is and make [...] sure it’s what you think it is rather than assuming” (Diane). In this way interventions, rather than focusing on the type of accident, could address the underlying cause. Six of the participants spontaneously suggested that the consequences for volitional incidents should be progressive. For example, Chris, a staff member from Facility 1, noted:

If you drive around drunk and you get caught once, you lose your licence for a certain amount of time and if you get caught a second time well it gets longer and once you get up to three for four times, that’s it. You’re not using it anymore.

Despite this general acceptance of some level of incidents, there was some concern among some wheelchair users about safety measures that were imposed on them. For example, the use of orange flags as a safety measure was controversial among participants. These fluorescent triangular flags on a 3 foot long stick were usually mounted on the rear of the power mobility device as a means of making the chair appear taller and more visible in traffic. Three power mobility users were in favour of their use as a safety device. Four other power mobility users and the wheelchair prescriber were opposed to their obligatory use. Diane stated:

My justification [for not using a flag] is I don’t need to be more visible than I already am. I’m a lot more visible so it’s sort of a self-conscious thing for me. It feels like wearing a big pink elephant suit to have the flag out there.

Thus, for Diane, the orange flag was aversive.

According to all participants, determination of intent was an important part of any accident evaluation process, as participants were generally less tolerant of incidents that had a volitional component, such as speeding or driving while impaired. Seventeen of 19 participants were concerned about drivers whose speed was inappropriate for the situation. Harriet was upset by “[powered mobility users] with brand new high powered [...] wheelchairs. [...] that] drive our hallways like they’re on a highway and people in manual chairs, visitors and staff, we just need to jump aside.” All participants were concerned about power mobility use while intoxicated and the use of a power mobility device as a weapon. Sometimes, these two problems occurred simultaneously. Mitchell, a staff member from Facility 1, noted that “[the use of the wheelchair was a weapon] was an infrequent problem until drugs and alcohol become an issue and then the incidents go up exponentially.”

According to Mitchell, unless the underlying problem of substance abuse was addressed, the problem of the use of the wheelchair as a weapon was unlikely to be solved.

Solutions

The final theme identified by participants was solutions: the interventions to deal with the red flags of the previous theme. Many participants suggested that drivers with safety problems might benefit from additional mobility training, which could stress specific power mobility driving strategies and educate power mobility users about sharing space. Another common suggestion by participants included re-programming chairs so that the resident would drive more safely. Frequently, this intervention involved reducing the top speed of the chair: “you can set the top speed of the wheelchair so that person can not drive so fast” (Harriet). Although this intervention might seem innocuous, these changes had a serious impact on residents.

Two participants from Facility 1 had their top speed decreased. Barbara noted, “go[ing] to the mall... took me an hour and a half ...[and] they cut down the speed so much you couldn’t even go up the ramp of the taxi.” David described how the decision to decrease speed sometimes seemed inequitable:

[One resident] he got stopped by the police, his chair is that fast [and his chair was not adjusted] ...and then there’s me, and I make one wrong move, and their going to bust my drive 1 down to about nothing, till I can’t even get outside.

Although Barbara reported that the process of having her speed reduced and then returning to full speed over time had made her a better driver, David felt this intervention was used to intimidate him because he was disliked by staff: “even now [...] I’m being threatened if I’m ever caught inside in drive 2 [the faster drive intended for outside use...] we’re going to leave you in drive 1 [permanently] which is very slow.” For David, the reduction of the speed of his chair seemed arbitrary, as he reported that other individuals in similar circumstances did not experience similar consequences.

Despite the safety benefits of reducing the speed of some drivers, this solution affected other power mobility users who shared space with them. Three of the 4 power mobility users at Facility 1 questioned whether residents who drove too slowly should be allowed to have power mobility.

I sometimes wonder if a person isn’t a good driver if they should have a chair. The solution here is, if a person isn’t driving good, to turn their chair down, so here they are crawling along. They’re just clogging the hallways up again. (David)

Residents like David were very frustrated by problems they had getting around these slow driving residents. In contrast, however, 3 family members and 2 residents were in favour of trying to facilitate mobility as much as possible. For example, Harriet, who just started to use power mobility noted, “We have some people who have difficulties driving a chair and of course they drive very slow. You should accept it. You should be happy they can still drive the chair.” Although problems sharing space were caused in part by differences in driving

ability, they were exacerbated by narrow facility hallways, which acted as an environmental barrier to safe driving.

Thirteen of 19 participants described how the hospital environment could be modified to improve power mobility safety. Interestingly, although 11 of 13 wheelchair users and family members identified this concern about the hospital environment, only 2 of 6 staff noted it. Ingrid, a Facility 1 family member of a non-power mobility user noted, “one of my concerns is that staff often leave medicine carts and food carts and stuff all over the hallways so you have to manoeuvre around the Arjo lifts and so on and I find it’s hard walking. There’s not room for a wheelchair.” In this way, the problems that some residents experienced with slow drivers were made even worse by narrow hallways cluttered with equipment. During the member checking George reported:

I agree that the halls are cluttered with equipment and that this is a potential barrier. I don’t not see this or value it, I am simply resigned to the fact and have become used to the situation. There is really nothing I as a therapist can do about it, other than to try to keep our area clean and free from clutter.

Taking chairs away represented the final and generally least preferred solution to problems with power mobility safety. Most participants were loath to remove an individual’s power mobility, because, as Diane asserted, “It’s their legs.” Part of this reluctance was related to awareness of staff time constraints that meant residents without power mobility were often stuck in one spot. For example, Barbara noted, “I hated it because you’re stuck everywhere, because staff won’t push you.” Removal of power mobility represented a two-fold punishment: loss of independent mobility and decreased access to community and facility activities. Two participants from Facility 1 had their power chairs removed for short periods, and both felt this intervention was unjustified. For example, Philip, a power mobility user from Facility 1 described: “I accidentally ran over a care aid’s foot. They took my chair away and I was in bed for 12 days before it was found that the brakes were faulty. If my chair could have been checked sooner, I would not have a gripe.” In this case, Philip’s main concern was the timing of the evaluation process. Fourteen of 19 participants suggested short-term removal of power mobility in two exceptional circumstances: with incidents that occur while under the influence of alcohol (and/or drugs) and the use of the wheelchair as a weapon.

Rather than remove power mobility, participants suggested that power mobility use could be restricted. For example, some residents might only be allowed to use their chairs on the ward in which they lived, and others only within the facility. Two participants suggested that certain power mobility users might be allowed to use power mobility for part of the day when they were most alert and could be attendant-propelled in some circumstances. Diane suggested that for residents who had problems drinking and driving, “perhaps what it looks like is, when they go the pub, they go with someone; and they take a manual chair; or they take a wheelchair accessible taxi.”

Comparing the Opinions of Participants with and without Progressive Conditions

As part of objective two, comparing the responses of power mobility user participants, power mobility participants who had a progressive disease had a similar outlook to those power mobility users who had a relatively static disease progression. The 5 participants with progressive disabilities demonstrated a wide variety of views about power mobility safety, similar to those of other power mobility users. On one hand, Harriet and Diane were strong advocates for maintaining residents in power mobility. On the other hand, Gwen and Barbara thought that power mobility could be removed in a number of circumstances, including drinking and driving, the use of the chair as weapon and, for Barbara, slow driving. These views were similar to those found in other power mobility users.

Discussion

Participants in this study have offered important insights into issues of power mobility use and power mobility safety. Some of these insights were novel, while some supported previous study findings. In general, the informants of the study acknowledged that there are several behaviours that can be considered unsafe. Further, several suggestions were identified as possible consequences or, better yet, solutions to improve power mobility safety. As noted in this study and a number of other studies, power mobility is an essential facilitator of occupation (Brandt, 2001; Evans, 2000; Frank et al., 2000; Miles-Tapping & McDonald, 1994). Although the researchers had anticipated that some stakeholder groups would be less supportive of power mobility use, no such trends were noted in those who participated; and support for the ongoing facilitation of power mobility use was strong.

The hierarchy of mobility described by participants in this study fits with the Matching Person and Technology (MPT) Model of assistive technology (Scherer, 2001), in which a person's use of assistive technology is influenced by the milieu (environment and psychosocial), the person, and the technology in question. The stigma reported by some power mobility participants would be considered part of the milieu, a finding similar to that of many researchers (Gitlin, Luborsky, & Schemm, 1998; Miles-Tapping & MacDonald, 1994) and a wide variety of disability activists (Fine & Asch, 1988; Zola, 1985 & 1991; Oliver, 1990). From the person perspective, some researchers have noted that individuals were reluctant to adopt power mobility, as it could represent a progression of a disease process and might negatively affect their self-image (Gitlin et al., 1998; Miles-Tapping & MacDonald, 1994). This idea was also evident in our data. The findings of this study emphasise the importance of all three components of the MPT model in the prescription of power mobility.

Within the theme of earning the rules of the road, suggestions about who should be considered as a candidate for power mobility seem to support the idea of acceptable risk taking (CAOT, 1997). Rather than exclude residents with certain diagnosis from using power mobility, which represents a form of risk management (Townsend, 1998) that involves institutional processes that eliminate risk, most participants suggested that all residents should be considered for power mobility and a driving assessment should determine whether

or not they were capable. The principle of informed consent would indicate that potential users should be made aware of the possible dangers inherent in learning to use a power mobility device prior to beginning the trial process.

Although all participants compared power mobility use with automobile driving, based on the literature, this analogy is important, but not exact. Like power mobility use, driving is closely linked to independence and enabling occupation (Klavora, Young, & Heslegrave, 2000; Korner-Bitensky, Sofer, Kaizer, Gelinis, & Talbot, 1994; Lloyd et al., 2001). As well, power mobility use, like driving, requires cognitive, visual, perceptual and motor skills that may be impaired by disease processes (Klavora et al., 2000; Lloyd et al., 2001). Unlike power mobility use, however, motor vehicle use is more stringently regulated. For example, drivers must have 120 degrees of horizontal peripheral vision and a minimum of 20/50 visual acuity, corrected, in the best eye and medical practitioners in some jurisdictions are legally required to report individuals who are deemed dangerous to drive (Canadian Medical Association, 2000). Although many of the specific criteria for motor vehicle use may not apply to power mobility, the call for standardized driving evaluation protocol (Lloyd et al. (2001)) is in keeping with the goals of this project about power mobility safety.

The different rules for power mobility use that participants described have important implications for how potential drivers, staff, and family members are educated about safe power mobility use. The different rules that existed inside versus outside the facilities seemed to indicate that specific training should be provided for each situation, an idea suggested by the authors of the PIDA (Dawson et al., 1994) and PCDA (Letts et al., 1998). As well, participants suggested a variety of ways in which safe power mobility use might be facilitated: (a) having all therapists teach power mobility users the same strategies for safe driving and (b) offering education on power mobility safety to staff, visitors, and family members. This latter idea would allow everyone to reinforce the same safe driving strategies with power mobility users (e.g., which side of the hallway to drive on and when) and assist staff, family members, and visitors to understand how their behaviours can facilitate safe mobility (e.g., stopping before they enter a hallway to look for oncoming wheelchairs).

In considering the red flags identified by participants, it was interesting to note that, for some participants, damage to property was considered less important than personal injury, which would indicate that the former issues might require less serious interventions than the latter. As participants were concerned about intentional incidents, perhaps the determination of intent could be part of an accident evaluation process, particularly when there was concern that power mobility device has or could be used as a weapon.

The solutions suggested by participants fit within the context of the Person-Environment-Occupation (PEO) Model (Strong et al., 1999), in which the occupational performance of power mobility is understood to represent an interaction between the person, the environment, and the occupation performed. Within this model, solutions to improve the performance of power mobility could focus on (a) re-education of the person, (b) modification of the occupation (e.g. restricting the settings, times or ways in which the power mobility device was used) and/or (c) altering the environment (e.g. eliminating

potential physical barriers or reprogramming or modifying the power mobility device). Interestingly, concerns about physical barriers varied between stakeholder groups.

The fact that 11 of the 13 residents and family members versus 2 of the 6 staff identified the physical layout of the facility as a barrier to safe mobility seemed to indicate that the physical environment was less important for staff than for residents. This idea is in keeping with a more individual rather than social model of disability, in which environmental barriers are thought to create disability (Oliver, 1991). This may indicate either a tendency for staff to overlook the powerful influence of the environment in shaping activity and participation (World Health Organisation, 2001) or a limited impact of the environment on the staff's mobility within the institution. Concerns about lack of space suggest that future facilities should consider increased space for equipment storage and ensure adequate hallway widths and that current facilities need to evaluate hallway clutter carefully.

Many of the solutions proposed were controversial. The imposition of some safety measures, such as the mandatory use of orange flags, seemed to be based upon and at times compound the stigmatization that many power mobility users already experience. Although the idea of reducing the speed of a client's power mobility device might seem like a quick and simple solution to a safety concern, the participants in this study indicated that this was a very serious intervention that had implications for themselves and others.

The suggestion by some power mobility users that slow, awkward drivers should not be allowed to use power mobility demonstrates the complexity of client-centred practice when dealing with multiple clients. Although therapists may try to address some clients' goals, such as maintaining independent mobility by slowing the speed of and/or reprogramming the client's power mobility, this action may interfere with other clients' goals that might include attending activities on time and having easy movement within the facility.

The most controversial and drastic solution proposed was that of power mobility removal. The potential loss of power mobility was a serious concern for all participants, as it seems to represent a potential biographical disruption (Mattingly, 1998), in which an individual's life story or trajectory is interrupted or altered by a traumatic life event for residents whose lives had already undergone many serious revisions. The removal of mobility often meant residents were dependent on others for mobility and, in the absence of adequate staffing, were extremely limited in their ability to participate in activities, which could create occupational deprivation (Whiteford, 2000). Limiting participation in meaningful activities is discordant with a therapist's *raison d'être*. Most therapists see the potential to overcome or improve rather than the need to create a barrier towards doing. For these reasons, except in a few special cases, it is a relief that participants considered removal of power mobility only after all potential person-environment-occupation interventions had been exhausted.

Although we had anticipated that participants with progressive illnesses might have different perception of power mobility safety than other residents, this speculation appears ungrounded. The similarities about the perceptions of power mobility safety between power mobility users with and without progressive conditions might reflect the small number of participants involved in the study; however, it seemed that the resident's world view, rather

than their condition, had the greatest impact on their ideas about power mobility safety. Generally, participants who were more libertarians tended to oppose restrictions to power mobility use, whereas participants who were more concerned about risk tended to favour regulation of power mobility use. Thus, it did not seem that power mobility users with progressive illnesses supported fewer restrictions on power mobility for their own self-interest. Restricting wheelchair use would allow some power mobility users to continue some degree of independent mobility and enable users to participate in activities while maintaining their safety and the safety of those around them.

The findings of this study identify many of the controversies surrounding the provision and use of power mobility within residential facilities including:

1. Who should have access to power mobility?
2. How do therapists balance the rights of clients for mobility with the rights of others within the facility for a safe working and living environment?
3. When, if ever, should power mobility removal be contemplated?

In considering the implications of this research, it is important to note that the limited number of participants and geographical location of this study may limit the transferability of these findings within these facilities specifically and to other facilities within Canada and other countries generally. Although we had originally planned to recruit someone from hospital administration as a representative of a ninth stakeholder group, none volunteered to participate. As well, the facilities involved in the study provided extended care; therefore, power mobility issues may be different from those found in intermediate care facilities or in community settings.

Given the limitations of this study, a number of future research projects could be considered. To explore more broadly power mobility safety, a study that included the perceptions of those within the community could be conducted. As well, a study that included participants from other cities, provinces and countries could investigate regional variation in perceptions of safety. It might be a natural progression to evolve the work to a quantitative study to find out if this is a national perspective shared through various communities across Canada.

Conclusion

This is the first attempt to examine this highly controversial area of power mobility safety from a variety of stakeholders' perspectives. The findings of this study have a number of important clinical implications and applications. Although this exploration reinforced the value of power mobility in facilitating quality of life among power mobility users, the hierarchy of mobility indicated that therapists required sensitivity and timing when introducing the possibility power mobility use. The study suggests that eligibility for power mobility should be based on competency and that trial is necessary to determine ability. The findings reinforce the need for investigation to identify the underlying cause of incidents and the importance of appropriate intervention. As imposed safety measures have implications to the user and their surrounding community, both risks and benefits need to be considered carefully. This study emphasises the importance of the environment in both limiting and

facilitating power mobility safety. Although the work is preliminary, it provides foundational evidence about power mobility safety that will be more thoroughly explored in the second phase of the study in which client-centred power mobility safety guidelines are developed.

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Table 1

Comparison by Admitting Diagnosis of Facility 1 and Facility 2/3

Admitting Diagnosis	Percentage of Residents in Facility 1 (%)	Percentage of Residents in Facility 2 &3 (%)
Multiple Sclerosis	25	3
Brain Injury	18	3
Cerebral Palsy	14	0
Spinal Cord Injury	12	1
Cerebral Vascular Accident	8	17
Post Polio	4	0
Alzheimers	0	35
Fractures	0	10
Parkinsons	0	6
Chronic Obstructive Pulmonary Disease	0	4
Other Diagnosis	20	21

Table 2

Description of Participants

Number	Pseudonym	Age	Description	Experience	Facility
1	Gwen	55	PMU with progressive condition	5 years PM use	1
2	Barbara	47	PMU with progressive condition	3 years PM use	1
3	Harriet	63	Non PMU with progressive condition that might affect wheelchair use. Starting to trial PM.	Resident for 10 years	1
4	David	42	Other PMU	10 years PM use	1
5	Phillip	55	Other PMU	20 years PM use	1
6	Liz	70	Other PMU	6 months PM use	2
7	Tom	77	Other PMU	6 months PM use	2
8	Richard	61	Other PMU	14 years PM use	3
9	Mary	91	Other PMU	6 months PM use	3
10	Diane	41	Community living PMU ¹ with progressive condition	5 years PM use	N/A
11	Frank	67	Parent of non PMU	20 years experience with the facility	1
12	Phyllis	73	Parent on non PMU	20 years experience with the facility	1
13	Ingrid	57	Sister with progressive condition of a PMU with a progressive condition	10 years experience with the facility	1
14	George	37	Power mobility prescriber	8 years experience	N/A
15	Sofie	27	Allied health team member	1 year in facility	3
16	Peter	43	Facility staff	8 years experience	1
17	Chris	43	Facility staff	15 years experience	1
18	Susan	54	Care aid	15 years experience	2
19	Mitchell	41	Nurse	10 years experience	1

¹ Diane was the only scooter user in the study

Note. PMU = power mobility user; PM = power mobility; N/A = non applicable (i.e., not directly