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Disability and Rehabilitation: Assistive Technology

ORIGINAL RESEARCH

Adult Scandinavians’ use of powered scooters: user satisfaction, frequency of use, and prediction of daily use

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Key words: Assistive technology, outcomes, mobility devices, rehabilitation, user evaluation

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Abstract

Purpose: To investigate user satisfaction with characteristics of powered scooters (scooters), frequency of use, and factors predicting daily scooter use. Design: Cross-sectional. Sample: Adult scooter users (n=59) in Denmark and Norway, mean age 74.5 (SD 12.3) years.

Methods: Structured face-to-face interviews. The NOMO 1.0, the QUEST 2.0, and a study specific instrument were used to collect data. Descriptive statistics were applied, and regression analyses were used to investigate predictors for daily scooter use. The ICF served as a framework for classifying variables and guiding the investigation.

Results: Satisfaction with the scooter characteristics was high with most participants being very satisfied or quite satisfied (66.1%-91.5%). Most scooters were used daily (36.2%) or several times a week (50.0%). User satisfaction with safety of the scooter (OR=11.76, CI=1.70-81.28) and reduced balance (OR=5.63, CI=0.90-35.39) increased the likelihood of daily use, while reduced function in back and/or legs (OR=0.04, CI=0.00-0.75), tiredness (OR=0.06, CI=0.01-0.51), and increased age (OR=0.93, CI=0.87-1.00) reduced the likelihood of daily use. 52.8% of the variance was explained by these variables. Conclusions: User satisfaction was high, and most scooters were used frequently. User satisfaction with safety, specific functional limitations and age were predictors for daily scooter use.
Introduction

Powered scooters are used by persons with limited walking ability to be able to perform mobility-related activities and to participate in society [1-3]. In this study, powered scooters (hereafter called scooters) are electric-motor-driven wheelchairs with manual steering intended to provide wheeled mobility and body support [4]. In the Nordic countries most assistive devices are provided free of charge for the user if a rehabilitation therapist evaluates that the device will enable the user to perform activities and to participate to a substantially higher degree in a safe manner [5]. In order to justify the provision of devices, knowledge about outcomes is important, especially when the devices are expensive like scooters. In 2015 in Norway, for example, 1.06 Euros per inhabitant was spent on scooters [6]. In addition, the use of scooters may increase in the future due to the fact that they are mostly used by older people and the number of older people (65+ years) is expected to increase worldwide from 841 million in 2013 to more than two billion by 2050 [7]. In fact, an increase in scooter use is already taking place; for example in Norway, the increase has been 90% over the last 10 years, rising from 21.5 scooters in 2006 to 40.9 scooters per 100,000 inhabitants in 2015 [6].

An important outcome dimension is user satisfaction, especially in the context of user-centered interventions where knowledge about user perceptions is necessary in order to be able to deliver the most appropriate interventions. A study has for example shown that regular use of a device is associated with high satisfaction with the device and with related services [8], and it has been suggested that user experiences such as satisfaction determine whether a device is used or not and to what extent [9]. In an assistive technology context – and accordingly in this study – user satisfaction is often understood as the user’s critical
evaluation of different aspects of assistive devices, which is influenced by individual expectations, perceptions, attitudes and personal values [10]. Research concerning powered mobility has mostly found that user satisfaction with the device was high [11-15] to moderate [7, 16]. Most outcome studies, however, include powered wheelchair models with both manual (i.e. scooters) and powered steering, e.g. by means of a joystick [17] even though the characteristics of the devices and users differ. One exception is May et al. (2010) who found that user satisfaction with the scooter derives from enhanced mobility [18].

Another outcome dimension of interest is frequency of use, since high frequency of use may indicate a high activity level [19], especially when the device is used daily or at least weekly. Research has revealed some evidence of adult scooter users’ frequency of scooter use. Hoenig et al reported in a study among scooter users with rheumatoid arthritis that on average 40.9% of the participants used the device daily [20]. May et al. (2010) found that most users made scooter trips between three to five times per week [18]. Löfqvist et al (2012) and Sund et al (2015) showed that frequency of participation increased for some activities after powered mobility provision (71% and 82% were scooter users respectively), but do not conclude on scooter use specifically [21, 22]. However, none of these studies investigated which factors were associated with high frequency of use. Some studies have identified factors associated with other aspects of powered mobility device use, for example several studies have identified physical environmental factors as barriers to mobility, while studies on the association between functional limitations and powered mobility show inconsistent results [23, 24]. These studies did not, however, focus on scooter use, or they had a qualitative design not making it possible to generalize results [25-28].
There is thus a lack of studies on factors predicting daily scooter use such as functional limitations, the physical environment, or satisfaction with scooter characteristics. Such knowledge may be used to improve the scooter service delivery, which in turn may increase the utility of the scooters.

Focusing on adults using a scooter, the aim of this study was to investigate user satisfaction with scooters, frequency of scooter use, and predictors for frequency of use. The specific research questions were:

- How satisfied/dissatisfied are the users with different characteristics of the scooter?
- What is the frequency of use of the scooters?
- Are the users’ functional limitations, environmental factors, user satisfaction, and personal factors predictors for daily use of the scooter?

**Materials and methods**

The data of the present study derives from a one-year follow-up of a larger Nordic prospective project on powered mobility device outcomes and includes adult scooter users from Denmark and Norway [29]. In both countries legislation entitles persons with physical impairments to receive a mobility device mostly free of charge. However, in Denmark, depending on the individual functional ability, some users are given a grant for 50% of the cost of scooters and must pay the rest themselves if the scooter is defined as consumer goods (like e.g. dish washing machines) and not an assistive device [30].

*Sample*
The inclusion criteria were individuals who a) were about to receive a scooter for the first time, with the decision having been made to provide the scooter, but before the scooter had been delivered; b) were 18 years of age or older; c) had sufficient cognitive capacity to participate in interviews (based on case manager’s prior and present knowledge about the participants); d) were living in non-institutionalized settings, including adapted dwellings; e) spoke Danish or Norwegian. Persons who had been exposed to recent injuries or accidents or who had rapid progressing diseases were excluded. For further details of the recruitment of the participants, see [31].

Procedures

The participants were recruited consecutively in both countries: In Norway from eight counties (2.3 million inhabitants) and in Denmark from one municipality (195,000 inhabitants) by the interviewers who in Norway were county rehabilitation therapists and in Denmark municipal case managers - in both countries occupational therapists or physiotherapists. The interviewers attended a one day briefing course before the data collection started. Guidelines for administering the questionnaire were distributed and gone through, and the inclusion/exclusion criteria were discussed in detail. All data were collected face-to-face in the participants’ homes. The demographic data were collected at baseline, and the satisfaction and frequency of use data were collected at follow-up about one year after baseline interview (mean 387 days). Each interview lasted for about 30 minutes. For further details of the procedures, see [31].

Instrumentation
The background data were collected by means of the Nordic Mobility-related Participation Outcome Evaluation of Assistive Device Interventions (NOMO 1.0) instrument. The instrument was constructed to document outcomes in terms of mobility-related participation of mobility device interventions [32], but in the present study only the descriptive Part A of the instrument was used for collecting background data.

The device subscale of the Danish and Norwegian versions of the QUEST 2.0 was used to collect data on user satisfaction with different characteristics of the scooter. The subscale consists of the following items: How satisfied are you with: dimensions, weight, adjustments (ease in adjusting), safety (how safe and secure the scooter is), durability, ease of use, comfort, effectiveness, rated on a 5-point ordinal scale ranging from 1=not satisfied at all to 5=very satisfied. A does not know response alternative was added in the present study. The psychometric properties of the QUEST 2.0 have been investigated and found to be adequate [33] including good test-retest reliability for the device subscale (ICC=0.89) and ability to differentiate among adult users’ satisfaction with assistive devices [16, 34].

Frequency of use of the scooter was rated on a 5-point ordinal scale ranging from =daily to 5=never. The questions and the response alternatives were empirically based and study specific.

Ethical considerations

All principles of ethical guidelines for human research were followed. The study participants were guaranteed anonymity and confidentiality and were informed that participation was voluntary, and that they at any time could withdraw from the study without any consequences.
for future services. Permission to store personal data was granted by the Danish Data Protection Agency, and in Norway the Data Inspectorate was informed.

**Data analysis**

Descriptive statistics were applied to all data. Characteristics of the Danish and Norwegian participants were compared using the Student’s t-test for analysis of continuous data given the assumptions were met, while the Mann-Whitney or the Kruskal-Wallis test was used for non-parametric data.

Binary logistic regression analysis was used to identify predictors for daily scooter use, and components of the International Classification of Functioning, Disability and Health (ICF) model were used as a basis to structure the analysis. Activity and participation was the outcome, and predictor variables were: body functions and structures; environmental factors; personal factors. Since the ICF is a classification and thus has an outsider’s perspective, which does not encompass satisfaction that has an insider’s perspective, the model for analysis was supplemented with a satisfaction component (Figure 1) [35].

Insert figure 1 about here.

To establish a valid estimate of the effect of the different variables, a two level model using binary logistic regression, wald backward stepwise, was applied. In the first level model, the following variables were analyzed block-wise: body functions; environmental factors; and satisfaction. Each block was controlled for the personal factors age and gender. Statistically significant variables from each block were transferred to the second level model and a new
binary logistic regression analysis was performed in order to determine which variables predicted daily use of the scooter. The blocks of the first level model included:

**Block 1, Body functions:** reduced balance and/or vertigo, reduced endurance, reduced function in arms, reduced function in back and/or legs, and tiredness. They were all dichotomized into 1=yes and 0=no/sometimes.

**Block 2, Environmental factors 1:** place of living (1=city; 0=suburb/rural areas), living alone (1=yes; 0=no), and necessary to walk stairs (one or several steps) when going in and out of the dwelling (stairs in and out of the dwelling) (1=yes; 0=no).

**Block 3, Satisfaction:** Prior to analyses the percentage of does not know responses of the QUEST 2.0 items were examined. Most were low (below 8.5%), except for weight (22.0%) and durability (16.9%). According to de Vet et al. [36] missing scores above 15% are not acceptable, and, therefore, the two items were excluded from further analysis leaving six variables for the analyses. Since the number of independent variables in a regression analysis should not exceed the number of cases divided by 10, one variable had to be excluded and we decided that satisfaction with dimension best could be left out of the analysis [37]. Hence the block encompassed Satisfaction with: adjustments, safety, ease of use, comfort, and effectiveness. The data were all dichotomized into 1=high satisfaction (very satisfied, score 5); 0=lower satisfaction (the scores of all other response alternatives).

The personal factors gender (1=male; 0=women) and age (continuous variable) were included in analyses of all blocks whether first or second level.

For the analyses frequency of use was dichotomized into 1=daily and 0=less frequent.

The Omnibus tests of model coefficients were carried out in order to identify how well the model performed in the analysis. A p<0.05 indicates that the model with our set of variables
used as predictors is better than a guess. Also, the same applies for the Hosmer and Lemeshow test with \( p > 0.05 \).

The Statistical Package for Social Sciences, SPSS edition 21 was used for all statistical analysis [38]. The level of statistical significance was set to \( p \leq 0.05 \).

**Results**

In all, 181 users of scooters participated at baseline in the Nordic project, while 135 users participated at follow-up. The main reasons for dropping out at this stage were *did not want to*, *too ill*, *hospitalized*, *deceased*, *other reasons* or no reason given. Of the 135 participants, 76 did not answer the frequency of use question, leaving 59 participants. No differences between the participants in the present study and the original sample were identified. See table 1 and figure 2.

Insert figure 2 about here.

In all, 54.2% of the participants were men, and most of the participants lived alone (60.3%), in ordinary dwellings (91.5%), in a suburb to a city (49.1%). Their mean age was 74.4 years. Reduced function of the back/legs (84.7%) was the most frequent functional limitation reported by the participants. Apart from the mean age (\( p = 0.034 \)) and reduced hearing/deafness (\( p = 0.040 \)), no other differences between the Danish and Norwegian samples were found. For further details, see table 1.

Insert table 1 about here.
User satisfaction with the different scooter characteristics was high as most of the participants scored very satisfied or quite satisfied. The very satisfied scores varied between 22.0% and 55.9%, while the quite satisfied scores varied between 33.9% and 45.8%. Not satisfied at all scores were only given to the items of durability (3.4%), comfort (1.7%), and effectiveness (1.7%). For further details, see table 2.

In all, 36.2% (n=21) used their scooter daily, while another 50.0% (n=29) used it several times a week. The results showed that 6.9% (n=4) used the scooter less frequently, and that 1.7% (n=1) never used the scooter. See figure 3 for details.

In the regression analysis of the first block of the first level model, reduced balance and/or vertigo (p=0.036; OR: 5.63), reduced functions in back and/or legs (p=0.021; OR=0.07), and tiredness (p=0.011; OR=0.09) were all significant. The block constituted 35.9% of the variance. None of the variables in block 2 of the first level model were significant. For the variables of block 3 of the first level model, satisfaction with the safety of the scooter was significant (p=0.019; OR=86.55), constituting 48.2% of the variance. When these significant variables were included in the second level model, the regression analysis gave the following results: reduced function in back and/or legs (p=0.032; OR=0.04), tiredness (p=0.011; OR=0.06), satisfaction with safety (p=0.012; OR=11.76), and age (p=0.047; OR=0.93).
spite of being non-significant, we included the *reduced balance and/or vertigo* because of the high odds ratio (p=0.065; OR=5.63) [39]. The model constituted 52.8% of the variance. See Table 3. Interpreting the results, *reduced balance* and high *satisfaction with safety* increase the likelihood of daily use of the scooter, i.e. predict daily use, while *reduced function in back and/or legs, tiredness,* and *increased age* reduce the likelihood.

Concerning the regression analyses, the Omnibus tests were significant, and all the Hosmer and Lemeshow tests were non-significant, which means that our results are better than a guess.

**Discussion**

The main contribution of this study is the findings that satisfaction with different characteristics of the scooter and frequency of use were high, and that most used the scooter frequently, which indicates that the scooter is beneficial to the user. It is also noteworthy that variables that explain more than half of the variation in daily use were identified. It is especially interesting that satisfaction with the safety of the scooter was the factor that best predicted daily use of the scooter.

The fact that satisfaction with characteristics of the scooter was high is in line with other studies within powered mobility [3, 40]. Likewise we found that in spite of the high levels of satisfaction the level of satisfaction varied somewhat among the users and to a certain extent between the different device characteristics [40, 41]. The participants were most satisfied with the scooter’s ease of use and its effectiveness with 55.9% and 50.0% of the participants
respectively being very satisfied. The results probably mean that there is a good match between the scooter, the user and the environment in which the scooters are being used, which encourages the use of the mobility device as described by the Matching Person and Technology Model [42]. In our study, we did not find that effectiveness and ease of use predicted daily use of the scooter. However, we believe it is important that the users are satisfied with these items.

It is an essential finding that satisfaction with the safety of using the scooter was high, with 78% of the participants being either very satisfied or quite satisfied, since this variable was identified as the most essential predictor of daily use of the scooter. Previous research has reported concerns about safety/insecurity over safety of powered wheelchair use, resulting in limited use of powered mobility supporting our results [41, 43]. Feeling unsafe when using the scooter may also explain why 13.8% of the participants reported to use the scooter only several times a month, more seldom or never, but more studies on the feeling of safety/insecurity and its impact on scooter use are required. The issue of safety is of considerable importance, as scooter accidents seem to be rather high ranging from 1.54 to 15 per person per year [44]. In addition, in the process of constructing the QUEST 2.0 instrument, 92% of international experts rated safety as a very important item [45] underpinning that safety must be taken into account.

The finding that user satisfaction with safety is a predominant predictor for scooter use underlines the importance of securing the scooter user’s subjective feeling of safety during the service delivery process and confirms the suggestion that user experiences may determine the extent of device use [9]. A method to increase user satisfaction with safety/feeling of
safety could be scooter skills training; for instance Sakakibara et al have found that wheelchair users’ self-efficacy can be increased by wheelchair skills training [46], and that self-efficacy and community participation are associated [47]. Further, Cooper at al. (2008) have discussed the importance of knowing a wheelchair’s reliability and life expectancy for users who rely on these devices [48], which probably is also the case for scooter users.

The fact that the majority of the scooters were used either daily or several times a week, indicates that the devices increase mobility-related participation in daily life, which has been concluded in previous research [17, 18, 20]. Given how much money is spent on providing scooters to people with restricted mobility [6] knowledge about high frequency of use is important, since frequent use probably indicates that the users benefit from the device. In fact, that scooter users consider the device to be beneficial was also shown in a qualitative study by Pettersson et al. on powered mobility (included scooters) use [27] and in a recent literature review [17].

Our study did not identify physical environmental barriers to be a barrier for scooter use, which is opposed to other studies, which have found that environmental barriers caused accessibility problems for powered mobility users, possibly explaining why some participants used the mobility device infrequently [18, 23, 27, 49]. On the other hand, Brandt et al. (2004) and Evans et al. (2007) reported that reasons for infrequent use of powered mobility was not associated with environmental barriers [23, 41]. One explanation may be that the users have adapted their behavior by using routes without physical barriers or by going to accessible places instead, which does not influence on the frequency of use of the scooter [23, 50]. Another explanation may be that we only included variables concerning place of living, living
alone/not living alone, and necessary to walk stairs in and out of the dwelling, while reported barriers often are inaccessible buildings, lack of space in public toilets, obstacles in using footpaths, poor and uneven surface on pavements and roads, difficulties in accessing public transport like buses and trains. Even unpleasant behavior by non-scooter users has been reported [18, 27].

Our results show that scooter use decreases with increased age, which is in line with other studies [24, 34, 44]. The result probably mirrors the fact that the activity level in general decreases with increasing age [51, 52].

We have not found research explaining why the reduced balance and/or vertigo increased the likelihood of daily use of the scooters, and why reduced function in back and/or legs and tiredness decreased the likelihood. There may several possible explanations, and further studies are required that in turn may result in information to be used to improve the scooter service delivery process.

The study had a number of limitations. First, the participants were recruited from eight counties in Norway and only one municipality in Denmark, and therefore our results may not be generalized to other geographical areas. Second, upon inclusion in the study, for practical reasons no standardized assessment was used to evaluate cognitive function of the participants. However, the case managers had good knowledge about the potential participants, and with their longstanding professional experience, we believe their assessment was valid. Another limitation is the fact that of 135 persons who participated in the follow-up interviews, in all, 59 (43.7%) answered the frequency of use questions. The study was part of
a larger prospective study, and for some unknown reason the frequency of use question was not asked by some of the interviewers. Yet, the lacking responses do not seem to induce bias, since the participants lost in this study did not differ from the sample followed regarding the investigated characteristics. See Table 1.

Finally, as there were many does not know responses to the satisfaction with weight (22.0%) and durability (16.9%) items, one can argue the validity of these items of the QUEST regarding satisfaction with the scooters [36]. Concerning durability and according to Wang et al. (2010) durability of a powered wheelchair, including the scooter, should be sufficient and not fail within a 3 to 5 year period. They have also shown that scooters have better durability than manual wheelchairs and power-assisted wheelchairs [53]. In this study, the participants were asked about their satisfaction with the durability of the scooter about one year after receiving it, which may be too short time for a failure to happen. Consequently, many of the participants probably had difficulty stating whether the durability was satisfying or not and therefore gave a does not know response. Hence, in future studies the scooters need to be used for more than one year before users are asked about satisfaction with the durability of the device. Regarding the weight, as the scooter is propelled by an electric motor, and the user never has to lift it or move it by hand, he/she may not be concerned with how heavy the scooter is. Consequently, one should consider if a question on satisfaction with the weight should be asked in future surveys on scooters.

Conclusions

- User satisfaction with the scooters was high with most users being either very satisfied or quite satisfied.
• Most scooters were used frequently: either daily or several times a week.

• Satisfaction with the safety of the scooter and reduced balance and/or vertigo increased the likelihood of daily use of the scooter.

• Reduced function in the back and/or legs, tiredness, and increased age decreased the likelihood of daily use of the scooter.

• More research about factors that predict frequent or infrequent scooter use is required.

Acknowledgements

The authors wish to thank all the study participants and data collectors.

Declaration of interest

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Implications for Rehabilitation

- Scooters seem to be a beneficial intervention for people with mobility impairment: user satisfaction and frequency of use are high
- Users’ subjective feeling of safety should be secured in the service delivery process in order to support safe and frequent scooter use
- Training of scooter skills should be considered in the service delivery process
Table 1. Characteristics of the national samples and the total sample of powered scooter users (n=59) and subjects not possible to follow (n=76).

<table>
<thead>
<tr>
<th></th>
<th>Danish sample, n=24</th>
<th>Norwegian sample, n=35</th>
<th>Difference between the national samples, p-value¹</th>
<th>Total sample, n=59</th>
<th>Subjects not possible to follow, n=76</th>
<th>Differences between the total sample and subjects not possible to follow, p-value¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age in years (SD)</td>
<td>70.7 (13.3)</td>
<td>77.3 (11.0)</td>
<td>0.034</td>
<td>74.5 (12.3)</td>
<td>72.8 (14.2)</td>
<td>ns</td>
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<tr>
<td>Age, range in years</td>
<td>36-91</td>
<td>52-96</td>
<td>ns</td>
<td>36-96</td>
<td>25-92</td>
<td>ns</td>
</tr>
<tr>
<td>Men, n (%)</td>
<td>15 (62.5)</td>
<td>17 (48.6)</td>
<td>ns</td>
<td>32 (54.2)</td>
<td>38 (50.0)</td>
<td>ns</td>
</tr>
<tr>
<td>Place of living, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>12 (52.2)</td>
<td>11 (32.4)</td>
<td>23 (40.4)</td>
<td>28 (36.8)</td>
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<tr>
<td>Suburb</td>
<td>10 (43.5)</td>
<td>18 (52.9)</td>
<td>28 (49.1)</td>
<td>39 (51.3)</td>
<td></td>
<td></td>
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<tr>
<td>Rural areas</td>
<td>1 (4.3)</td>
<td>5 (14.7)</td>
<td>6 (10.5)</td>
<td>9 (11.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living in ordinary housing, n (%)</td>
<td>24 (100.0)</td>
<td>30 (85.7)</td>
<td>54 (91.5)</td>
<td>69 (90.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living alone, n (%)</td>
<td>19 (79.2)</td>
<td>17 (48.6)</td>
<td>36 (61.0)</td>
<td>45 (59.2)</td>
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<td></td>
</tr>
<tr>
<td>Other mobility devices (manual wheelchairs, wheeled walkers, crutches etc; yes, n (%))</td>
<td>22 (91.7)</td>
<td>27 (77.1)</td>
<td>49 (83.1)</td>
<td>59 (77.6)</td>
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<td></td>
</tr>
<tr>
<td>Stairs (one or several steps) when going in and out of the dwelling; yes, n (%)</td>
<td>10 (41.7)</td>
<td>21 (60.0)</td>
<td>31 (52.1)</td>
<td>35 (46.1)</td>
<td></td>
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<td>Functional limitations, n (%)</td>
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<td></td>
<td></td>
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<tr>
<td>Reduced vision²</td>
<td>6 (25.0)</td>
<td>10 (28.6)</td>
<td>16 (27.1)</td>
<td>15 (19.7)</td>
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<td>ns</td>
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<tr>
<td>Reduced hearing/deafness²</td>
<td>1 (4.2)</td>
<td>13 (37.1)</td>
<td>14 (23.7)</td>
<td>15 (19.7)</td>
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<td>ns</td>
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<tr>
<td>Reduced balance and/or vertigo³</td>
<td>9 (37.5)</td>
<td>15 (42.9)</td>
<td>24 (40.7)</td>
<td>34 (45.3)</td>
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<td>ns</td>
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<tr>
<td>Reduced endurance³</td>
<td>15 (62.5)</td>
<td>19 (54.3)</td>
<td>34 (57.6)</td>
<td>36 (47.4)</td>
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</tr>
<tr>
<td>Reduced function in arms³</td>
<td>14 (58.3)</td>
<td>16 (45.7)</td>
<td>30 (50.8)</td>
<td>38 (50.7)</td>
<td></td>
<td>ns</td>
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<tr>
<td>Reduced function in back and/or legs³</td>
<td>23 (95.8)</td>
<td>29 (82.9)</td>
<td>52 (88.1)</td>
<td>59 (77.6)</td>
<td></td>
<td>ns</td>
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<tr>
<td>Problems with coordination of movements³</td>
<td>5 (20.8)</td>
<td>2 (5.7)</td>
<td>7 (11.9)</td>
<td>15 (20.0)</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Problems with movements of the head/neck³</td>
<td>1 (4.2)</td>
<td>5 (14.7)</td>
<td>6 (10.3)</td>
<td>13 (17.4)</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Memory problems³</td>
<td>3 (12.5)</td>
<td>6 (17.1)</td>
<td>9 (15.3)</td>
<td>17 (22.4)</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Tiredness³</td>
<td>11 (45.8)</td>
<td>12 (34.3)</td>
<td>23 (39.0)</td>
<td>40 (52.6)</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Self-reported health, median (IQR)⁴</td>
<td>3.0 (3.0-4.0)</td>
<td>4.0 (3.0-4.0)</td>
<td>4.0 (3.0-4.0)</td>
<td>4.0 (3.0-4.0)</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Self-reported physical mobility, median (IQR)⁴</td>
<td>4.0 (4.0-5.0)</td>
<td>4.0 (4.0-5.0)</td>
<td>4.0 (4.0-5.0)</td>
<td>4.0 (4.0-5.0)</td>
<td></td>
<td>ns</td>
</tr>
</tbody>
</table>
1 Level of significance: p≤0.05, ns=a non significant value.
2 Reduced vision and reduced hearing /deafness rated on a 2-point scale: 1=yes; 2=No
3 Functional limitations rated on a 3-point scale; 1=yes; 2=No; 3=Some times.
4 Self-reported health and physical mobility rated on a 5-point scale: 1=Excellent; 2=Very good; 3=Good; 4=Poor; 5=Very poor.

Table 2. User satisfaction¹ with different characteristics of the powered scooter (n=59).

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied % (n)</th>
<th>Quite satisfied % (n)</th>
<th>More or less satisfied % (n)</th>
<th>Not very satisfied % (n)</th>
<th>Not satisfied at all % (n)</th>
<th>Does not know % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dimensions</td>
<td>40.7 (24)</td>
<td>40.7 (24)</td>
<td>10.2 (6)</td>
<td>3.4 (2)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>2</td>
<td>Weight</td>
<td>22.0 (13)</td>
<td>44.1 (26)</td>
<td>8.5 (6)</td>
<td>3.4 (2)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>3</td>
<td>Adjustment</td>
<td>39.0 (23)</td>
<td>37.3 (22)</td>
<td>10.2 (6)</td>
<td>5.1 (3)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>4</td>
<td>Safety</td>
<td>33.9 (20)</td>
<td>44.1 (26)</td>
<td>8.5 (5)</td>
<td>5.1 (3)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>5</td>
<td>Durability</td>
<td>40.7 (24)</td>
<td>33.9 (20)</td>
<td>5.1 (3)</td>
<td>0.0 (0)</td>
<td>3.4 (2)</td>
</tr>
<tr>
<td>6</td>
<td>Ease of use</td>
<td>55.9 (33)</td>
<td>35.6 (21)</td>
<td>3.4 (2)</td>
<td>5.1 (3)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>7</td>
<td>Comfort</td>
<td>42.4 (25)</td>
<td>45.8 (27)</td>
<td>1.7 (1)</td>
<td>6.8 (4)</td>
<td>1.7 (1)</td>
</tr>
<tr>
<td>8</td>
<td>Effectiveness</td>
<td>50.0 (30)</td>
<td>36.2 (21)</td>
<td>6.9 (4)</td>
<td>3.4 (2)</td>
<td>1.7 (1)</td>
</tr>
</tbody>
</table>

¹ User satisfaction is evaluated by means of the device subscale of the Quebec User Evaluation of Satisfaction with assistive devices (QUEST 2.0) instrument supplemented with a “Does not know” response option.
Table 3. Significant results of the regression analyses. Percent of explained variance.

<table>
<thead>
<tr>
<th>Items</th>
<th>OR (95% CI)</th>
<th>p-value</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First level model</strong></td>
<td></td>
<td></td>
<td>0.359</td>
</tr>
<tr>
<td><strong>Block 1: Body functions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced balance and/or vertigo</td>
<td>5.63 (1.12-28.34)</td>
<td>0.036</td>
<td></td>
</tr>
<tr>
<td>Reduced endurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced function in arms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced function in back and/or legs</td>
<td>0.07 (0.08-0.68)</td>
<td>0.021</td>
<td></td>
</tr>
<tr>
<td>Tiredness</td>
<td>0.09 (0.02-0.59)</td>
<td>0.011</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Block 2: Environmental factors** | | | 0.113 |
| Place of living, city or not | | | |
| Living alone | | | |
| Stairs in and out of the dwelling | | | |
| Gender | | | |
| Age | | | |

| **Block 3: Satisfaction with scooter characteristics** | | | 0.482 |
| Satisfaction with adjustments | | | |
| Satisfaction with safety | 86.55 (2.05-3650.29) | 0.019 | |
| Satisfaction with ease of use | | | |
| Satisfaction with comfort | | | |
| Satisfaction with effectiveness | | | |
| Gender | | | |
| Age | | | |

| **Second level model** | | | 0.528 |
| Reduced balance and/or vertigo | 5.63 (0.90-35.39) | 0.065 | |
| Reduced function in back and/or legs | 0.04 (0.00-0.75) | 0.032 | |
| Tiredness | 0.06 (0.01-0.51) | 0.011 | |
| Satisfaction with safety | 11.76 (1.70-81.28) | 0.012 | |
| Gender | | | |
| Age | 0.93 (0.87-1.00) | 0.047 | |

¹The reduced balance and/or vertigo, reduced endurance, reduced function in arms, reduced function in back and/or legs, and tiredness were dichotomized into 0=no/sometimes and 1=yes. For the analysis frequency of use is dichotomized into 1=daily and 0=more infrequently. In addition, place of living is dichotomized into 1=city, 0=suburb, rural areas; stairs in and out of the dwelling into 1=yes, 0=no; Living alone 1=yes, 0=no; satisfaction 1=high satisfaction (very satisfied, score 5) 0=lower satisfaction (the scores of all the other response alternatives); gender 1=male, 0=female.

²Age is a continuous variable.
Figure 1. Variables for regression analysis classified according to the International Classification of Functioning, Disability and Health (ICF) supplemented with a subjective satisfaction component.
Invited users of powered mobility devices (n=225)
Denmark: 82, Norway: 143

Persons who did not accept to participate (n=44)
Denmark: 20; Norway: 24. The main reason: "did not want to"

Allocated to the study (n=181)
Denmark: 62; Norway: 119

Persons who did not participate in the follow-up interviews or had not been provided a scooter (n=44)
Denmark: 13; Norway: 31. The main reasons for not participating were "did not want to", "too ill", "hospitalized", "deceased", "other reasons", or no reason given

Persons who participated in the follow-up interviews (n=137)
Denmark: 49; Norway: 88

Persons who did not answer the frequency of use question (n=78)
Denmark: 25; Norway: 53

Analysed (n=59)
Denmark: 24; Norway: 35

Figure 2. Participants from Denmark and Norway in the study.
Figure 3. The frequency of use of powered scooters in the Danish and Norwegian samples (n=59).
References


25. Layton N. Barriers and Facilitators to Community Mobility for assistive technology users. Rehabilitation Research and Practice 2012;Article ID 454195:9 pages.


38. SPSS Inc. Introduction to statistical analysis using SPSS Statistics. Chicago; 2009.


