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Preliminary examination of the relationship between participation and confidence in older manual wheelchair users

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Abstract

Objective—To examine the relationship between frequency of participation and confidence with using a manual wheelchair among community-living, older wheelchair users, and the moderating effect of sex.

Design—Cross-sectional

Setting—Community

Participants—54 participants who were community-living manual wheelchair users (65% male), were ≥50 years of age (mean = 59 years), used their wheelchair daily, and had ≥6 months experience with using a wheelchair.

Intervention—None

Main Outcome Measures—The 16-item Late Life Disability Instrument, and the 65-item Wheelchair Use Confidence Scale measured participation and confidence respectively. Age, sex, and wheelchair skill measured using the performance-based Wheelchair Skills Test, were included as covariates in the multiple regression models.

Results—Significant and positive relationships exist between participation and: 1) confidence (standardized coefficient (β)=0.83, p=0.002), and; 2) the interaction term (β=0.33, p=0.05). The

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R^2 change associated with confidence was 10% (p = 0.02), and 6% (p = 0.05) for the interaction term. Subsequent regression analyses revealed the magnitude of the relationship between higher confidence and greater participation is stronger for men (β = 1.05, p = 0.002) than for women (β = 0.44, p = 0.05).

Conclusions—Confidence with using a manual wheelchair is a positive and significant determinant of frequency of participation of older wheelchair users, after controlling for important covariates. Because the relationship is moderated by sex, treatments addressing low confidence may lead to increased frequency of participation especially for male wheelchair users.

Keywords

wheelchairs; mobility; social participation; self efficacy; aging

Participation is an individual's involvement in life situations.[1] It is characterized by a complex relationship between an individual's health condition, and the context in which the person conducts his/her life.[1] Because a high level of participation is important for better quality of life,[2] enabling participation in desired roles is an important rehabilitation focus.

Individuals with mobility disabilities are often faced with less than optimal participation, and consequently have an increased risk of health issues, including depression.[3] Fortunately, manual wheelchairs are often prescribed to facilitate mobility and promote independent participation in various roles. However, older wheelchair users are more likely to report a lack of independence with using their wheelchair[4] and they experience less than desirable participation levels due to increased participation restrictions associated with aging.[3] Thus, an issue in the study of this population is that despite knowledge of an increase in the prevalence of older wheelchair users related to aging, an insufficient amount of research has focused only on a limited number of determinants of participation, accounting for modest amounts of variance.[5,6]

Confidence with using a manual wheelchair is an emerging construct in the study of community-living, older wheelchair users.[7] According to Social Cognitive Theory,[8] confidence is the belief individuals have in their ability to perform certain behaviours to achieve desired outcomes (for purposes of this paper we use confidence and self-efficacy interchangeably). When considering the positive influence of various forms of confidence on important health-related behaviors among different patient populations,[8] it is plausible that confidence may have similar implications on the participation of older wheelchair users. Furthermore, on the basis of theory and research, confidence generally has had greater behavioural implications for men[8] and thus the relation between confidence and participation may be stronger for men than for women. In this paper we examine the relationship between frequency of participation and confidence with using a manual wheelchair among older wheelchair users, and the moderating effect of sex. We hypothesized that confidence with using a manual wheelchair is positively and significantly related to frequency of participation in social and personal roles among community-living, older wheelchair users, and that the relationship is moderated by sex, after controlling for age and wheelchair skill.

Methods

Study design

A cross-sectional study design was used to test the hypotheses.

Participants

A volunteer sample was recruited from the local rehabilitation research lab's contact database, and various health authorities, and community groups. Participants had to: be 50 years or older; live in the community; have at least 6 months experience using a manual wheelchair; use their wheelchair on a daily basis; be able to communicate in English; and have no cognitive impairment as indicated by a score of 23 or less on the Mini Mental State Examination.

Study protocol

Participants met once with one of two researchers who gathered demographic information, and number of health conditions, and administered the participation, confidence, and wheelchair skill measures. Ethical approval was obtained from the university and health authorities.

Measurement

The demographic information questionnaire gathered data on sex, age, marital status, time spent in a wheelchair daily, and years experience with using a wheelchair.

The Late Life Disability Instrument is a 16-item questionnaire that is reliable and valid for use with older adults.[9] It was used to evaluate the frequency of participation in social and personal roles using a response scale ranging from 1 (never) to 5 (very often).[9] Raw scores are transformed to scaled scores ranging from 0 to 100.[9]

The Wheelchair Use Confidence Scale (WheelCon) is comprised of 65 situations that challenge confidence with using a manual wheelchair.[5] It has recently been validated for use with wheelchair users.[7] Each item is scored using a response scale ranging from 0 (not confident) to 100 (completely confident). Total scores range from 0 to 100%.

The Wheelchair Skills Test 4.1 is a reliable and valid measure for use with wheelchair users.[10] It is comprised of 32 skills of varying degrees of difficulty. A trained rater observes the completion of a wheelchair skill and either passes or fails the attempt. Total scores range from 0 to 100% with higher percentages indicating better skill with using a wheelchair.

Data analyses

Descriptive statistics were used to characterize the sample. Hierarchical multiple regression analyses were used to test the study hypotheses. After centering the continuous variables, coding the sex variable, and creating a confidence-by-sex interaction term, the dependent variable, participation, was first regressed on age and wheelchair skills, then on sex and confidence, and finally on the interaction term. Weighted effects coding was used in the primary analyses to account for the fact that more males participated in the study than

females. Dummy coding was then used to determine if the male and female simple slopes significantly differed from 0.

With a sample size of at least 50, up to 5 variables could be entered into the participation models.[11] All analyses were completed using SPSS Version 19.0.[a]

Results

The sample (n=54) was mostly male (65%), had a mean age of 59.2 years, mean experience with using a wheelchair of 23.9 years, and a mean WST score of 73.0. The mean number of health conditions was 2.4. Sample characteristics are presented in table 1.

Model A (table 2) shows that confidence is a positive and significant determinant of participation ($\beta = 0.83$, $p = 0.002$), and that the relationship is moderated by sex ($\beta = 0.33$, $p = 0.05$). The R^2 change in participation associated with confidence was 10% ($p = 0.02$), and 6% ($p = 0.05$) for the interaction term.

Models B and C (table 2) show the magnitude of the relationship between confidence and participation significantly differed from 0 for both sexes, and is stronger for men ($\beta = 1.05$, $p = 0.002$) than for women ($\beta = 0.44$, $p = 0.05$).

Discussion

The results suggest confidence with using a manual wheelchair is an important determinant of participation among community-living older wheelchair users. The results are also consistent with Social Cognitive Theory[8] that postulates confidence to be an influential determinant of health outcomes, moderated by sex. In a recent study, Phang et al.[12] examined the confidence construct as a mediator in the relationship between wheelchair skills and participation in physical activity. Contrary to our findings, they found an absence of an association between confidence and leisure-time physical activity participation after controlling for skills, and therefore demonstrated no mediating effect.[12] The lack of association, however, was likely due to the use of only a few items on the WheelCon pertaining to confidence maneuvering around in the wheelchair and not the entire measure, and/or the type of leisure activity performed not requiring high levels of confidence with using their wheelchair, which was consistently reported by the sample of younger individuals (i.e. ≤50 years) with spinal cord injury.[12]

In our study, the fact that the confidence term alone accounted for 10% of the participation variance has both research and clinical implications. Because existing participation models have explained only modest amounts of variance,[5,6] inclusion of the confidence variable into future studies of older manual wheelchair users will likely contribute to a greater overall understanding describing the complexities of participation. Furthermore, because confidence is modifiable,[8] the evaluation of treatment strategies is warranted, especially when considering that low confidence may be a barrier to participation. The use of confidence-

[a]**Suppliers**
SPSS version 19.0, IBM Corporation 1 New Orchard Road Armonk, New York 10504-1722.

building strategies by means of performance accomplishment, vicarious learning, verbal persuasion, and/or managing physiological and affective states[6] clinically may potentially improve an individual's participation, even among experienced wheelchair users.

Limitations

A limited number of variables were included in the model due to the small sample size and foundational nature of the study. Furthermore, the generalizability of the findings is limited to community-living, older wheelchair users residing in similar geographic and cultural environments to that of the sample in this study.

Conclusion

Confidence with using a manual wheelchair is a positive and significant determinant of frequency of participation of older wheelchair users, after controlling for important covariates. Because the relationship is moderated by sex, treatments addressing low confidence may lead to increased frequency of participation, especially for males. Experimental research evaluating the relationship is needed to corroborate this study's findings.

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List of Abbreviations

LLDI	Late Life Disability Instrument
WheelCon	Wheelchair Use Confidence Scale
WST	Wheelchair Skills Test

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Table 1

Sample characteristics (n=54)

Characteristic	Men (n=35)	Women (n=19)	All participants (n=54)
Married or common law	17 (49%)	6 (32%)	23 (43%)
Age (years)	59.9 ± 7.4	57.7 ± 5.6	59.2 ± 6.8
Experience with using a wheelchair (years)	24.9 ± 16.0	22.2 ± 14.3	23.9 ± 15.4
Time in a wheelchair per day (hours)	12.8 ± 4.6	11.9 ± 5.3	12.5 ± 4.8
FCI (0 – 10)	2.0 ± 1.5	3.2 ± 3.2	2.4 ± 2.3
LLDI (0 – 100)	54.2 ± 7.8	51.8 ± 8.6	53.4 ± 8.1
WheelCon (0 – 100) *	86.8 ± 10.7	72.1 ± 23.2	81.6 ± 17.5
WST (0 – 100) *	77.7 ± 11.5	64.4 ± 16.0	73.0 ± 14.6

Values are mean ± standard deviation or frequency in number and (%).

FCI = Functional Comorbidity Index; LLDI = Late Life Disability Instrument; WheelCon = Wheelchair Use Confidence Scale; WST = Wheelchair Skills Test

* $p<0.05$

Table 2

Testing moderator effects using hierarchical multiple regression (n=54)

Step and variable	B	SE B	95% CI	β	R^2
Model A: Weighted effects coding (men coded 1.00, women coded −1.84)					
Step 1					
Age	−0.29	0.15	−0.59, 0.01	−0.25	
Wheelchair skills	−0.12	0.12	−0.37, 0.13	−0.22	0.16
Step 2					
Sex	0.10	0.81	−1.52, 1.72	0.02	0.16
Step 3					
Confidence with using a wheelchair	0.38	0.12	0.15, 0.62	0.83**	0.26
Step 4					
Confidence x Sex interaction	0.10	0.05	0.00, 0.20	0.33*	0.32
Model B: Dummy coding (men coded 0.00, women coded 1.00)					
Step 1					
Age	−0.29	0.15	−0.59, 0.00	−0.25	
Wheelchair skills	−0.12	0.12	−0.37, 0.13	−0.22	0.16
Step 2					
Sex	−0.28	2.29	−4.89, 4.33	−0.02	0.16
Step 3					
Confidence with using a wheelchair	0.48	0.15	0.18, 0.78	1.05**	0.26
Step 4					
Confidence x Sex interaction	−0.28	0.14	−0.55, 0.00	−0.49*	0.32
Model C: Dummy coding (men coded 1.00, women coded 0.00)					
Step 1					
Age	−0.29	0.15	−0.59, 0.01	−0.25	
Wheelchair skills	−0.12	0.12	−0.37, 0.13	−0.22	0.16
Step 2					
Sex	0.28	2.29	−4.33, 4.89	0.02	0.16

Step and variable	B	SE B	95% CI	β	R^2
Step 3					
Confidence with using a wheelchair	0.20	0.10	0.00, 0.40	0.44*	0.26
Step 4					
Confidence x Sex interaction	0.28	0.14	0.00, 0.55	0.31*	0.32

*p<0.05

**p<0.01

B = unstandardized regression coefficient; SE = standard error; CI = confidence interval; β = standardized regression coefficient; R^2 = coefficient of determination.