

# Wheelchair use, pain, and satisfaction with life in a national sample of older adults

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*V. Leung, A. Colantonio, P. L. Santaguida. Wheelchair use, pain and satisfaction with life in a national sample of older adults. Gerontechnology 2005; 3(3):159-164.* Older adults with significant disability rely on wheelchairs to minimize the impact of their disability. It is therefore critical to identify aspects of living (e.g. pain, life satisfaction) that are affected by wheelchair use. Wheelchair users may develop overuse syndromes and pain. There is, however, limited data on pain associated with wheelchair use among older adults. This study explored the relationship between wheelchair use and pain and life satisfaction of community living older adults. Results show that older wheelchair users experience more pain than non-users. As well, pain interfered strongly with activities and life satisfaction.

**Keywords: wheelchair, pain, life satisfaction, community living**

As the number of older adults in our population increases, the use of assistive technology becomes more vital as it has been shown to improve social autonomy, reduce and resolve functional limitations when compared with personal assistance, and reduce some Medicare expenditures<sup>1-3</sup>. For those elderly with significant disability, there is great reliance on wheelchairs to minimize the impact of their disability. It is important to identify specific aspects of a user's daily experience that are most affected by using a wheelchair. Long-term wheelchair use can result in chronic shoulder pain in persons with spinal cord

injuries using wheelchairs<sup>4,5</sup>. Although the prevalence of musculo-skeletal pain in the upper quadrant is high in the general population, recent work by Boninger<sup>6</sup> would suggest that the prevalence of neck and shoulder pain amongst wheelchair users approximates 60%. Wheelchair users may also develop overuse syndromes due to repetitive stress, primarily in the shoulder and in the hand and wrist<sup>6-8</sup>. Studies evaluating pain associated with wheelchair use have focused primarily on spinal cord injury subjects and there is limited data on the elderly. There have been estimates of the preva-

lence of wheelchair use in national populations of older subjects, and some descriptions of user characteristics such as reported health status and functional limitations<sup>9</sup>. However, there is limited information regarding other factors, such as the role of pain in the lives of wheelchair consumers in large population-based samples.

Since wheelchairs have the potential to ameliorate function and social autonomy within the elderly, understanding the types and degree of activities limited amongst older wheelchair users with respect to pain, function, and satisfaction is critical. The Canadian Study for Health and Aging<sup>10</sup> (CSHA) was a longitudinal study that followed a cohort of older adult participants and evaluated the use of wheelchairs among older adults in addition to their function and life satisfaction. The purpose of this study was to explore the relationship between wheelchair use and pain and satisfaction of 'older' users from the CSHA database. It was of interest to compare the satisfaction of elderly wheelchair users with the satisfaction of non-users in various life domains.

## METHODS

The primary goals of the CSHA were to provide estimates of the prevalence, incidence, and risk factors of dementia, and its secondary objectives were to address other health concerns of older adults. The first phase of the study (CSHA-1) took place in 1991. A representative sample ( $n = 10\,263$ ) of people aged 65 and over was drawn from 36 communities across Canada, including rural and urban areas of all provinces. The sample included older adults both from the community ( $n = 9008$ ) and from institutions ( $n=1255$ ). In 1996, the surviving participants not diagnosed with dementia in CSHA-1 were asked to take part in the second phase (CSHA-2). Of the original 9008 older adults, 5395 (59.9%) still living in the

community participated in this phase. Details of the study methods have been previously published<sup>10</sup>.

## Measures

In CSHA-2, community residents were asked the question: "Do you ever use a wheelchair to get around?" The answers were coded dichotomously as 'yes/no'. The question referred to the present, but was not limited to the day of the interview. If the respondent was currently using a wheelchair for a short-term ailment (e.g. broken hip), or used a wheelchair only during the winter, for shopping, or for long distances, the response was coded as 'yes'. However, if the respondent had used a wheelchair in the past, but was not using one currently, or if a wheelchair was only used in the hospital or airport, a 'no' was recorded.

The CSHA-2 questionnaire also asked the question: "How much bodily pain have you had during the past 4 weeks?" The five possible responses ranged from 'none' to 'very severe' and referred to average pain over the past four weeks. If the respondent experienced any pain, they were asked to assess if the amount of pain interfered with their mood, their ability to move about, their sleep, their normal tasks, their recreational activities, and their enjoyment of life. There were five possible responses ranging from 'not at all' to 'extremely' to evaluate pain.

Additionally, the senior's participation in leisure activities was evaluated. Participants were asked how often, over the past summer, they had visited friends, gone shopping, worked in the garden, golfed or played other sports, gone for a walk, gone to church or other clubs, or played cards. The responses were recorded as 'less than once a week', 'once a week' or 'two or more times a week'.

A scale adapted by Alex Michalos, originally developed by Andrews and Withey,

was used to measure satisfaction in nine domains<sup>11</sup>: health, family relations, friendships, housing, finances, neighbourhood, activities, religion, and transportation. The answers lie on a seven-point scale that ranges from 'terrible' to 'delighted'. The same scale was used for some additional questions, that included: "How do you feel about your life as a whole right now?", representing a global rating of overall satisfaction with life.

It was of interest in this analysis to evaluate the association between wheelchair use and the degree of pain, the functional activities affected by pain, and satisfaction with activities and life in general.

## Statistical Analysis

Chi square tests were used to test for differences between wheelchair users with pain and those without. Spearman correlations were used to evaluate the associations between pain, interference of the pain with various daily activities, and interference of the pain with enjoyment of life. Wilcoxon tests were used to assess differences between continuous variables. All statistical analyses were performed using the Statistical Analysis System (SAS Version 8.1 for Windows). Statistical significance was assessed using a two-tailed alpha of 0.05.

## RESULTS

Of the 5395 community-dwelling older adults in CSHA-2, 298 (5.5%) reported using a wheelchair, 4989 (92.5%) stated that they did not use a wheelchair, and 108 (2.0%) did not respond to the question.

A significant association between wheelchair use and the degree of bodily pain was found. Older adults in wheelchairs were more likely to report higher levels of pain ( $\chi^2_{4df} = 128.6$ ;  $p < 0.0001$ ). Figure 1 shows this degree of bodily pain experienced by wheelchair users, in comparison

with non-wheelchair users. Wheelchair users reported that pain had a significant effect on mood and sleep ( $\chi^2_{4df} = 49.2, 34.3$ ;  $p < 0.0001$ ) and also on moving about, normal tasks, recreation, and enjoyment of life ( $\chi^2_{4df} = 117.6, 88.0, 65.6, 74.9$ ;  $p < 0.0001$ ). A larger percentage of wheelchair users relative to non-users reported that pain interfered 'quite a bit' or more with aspects of daily

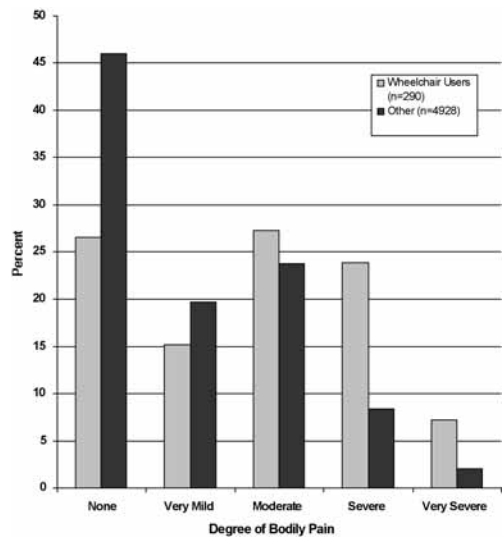


Figure 1: Degree of bodily pain experienced by wheelchair users, in comparison with non-wheelchair users

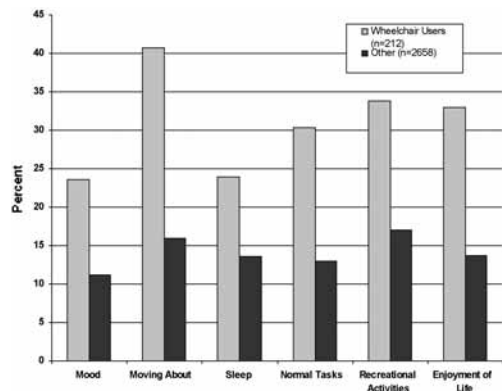


Figure 2: Percentage of wheelchair users for which pain interfered 'quite a bit' or more with aspects of life, in comparison with non-wheelchair users

life. Similarly, 33% of wheelchair users stated that pain interfered 'quite a bit' or more with enjoyment of life. Figure 2 demonstrates the percentages of wheelchair users for whom pain interferes considerably with various aspects of daily life, with the percentages of non-wheelchair users.

Among wheelchair users only, the effect of pain on enjoyment of life was significantly associated with all areas assessed. The effect of pain was most strongly correlated with its interference with recreation and

*Table 1: Spearman Correlations Between the Enjoyment of Life, Rating of bodily pain and Interference of that pain on usual activities for wheelchair users*

Interference of Pain	Correlation	P-value	n
General Rating of Pain over past 4 weeks	0.245	0.0003	212
With mood	0.536	< 0.0001	211
With moving about	0.415	< 0.0001	210
With sleep	0.278	< 0.0001	212
With normal tasks	0.491	< 0.0001	204
With recreational activities	0.559	< 0.0001	189

mood, and the least with sleep (Table 1). Wheelchair use was also found to have an influence on leisure activities. While 37.2% of non-wheelchair users visited friends at least twice a week, only 24% of wheelchair users visited friends as often, and 53.7% visited less than once a week. Other activities affected by rating of pain, including shopping, gardening, and going for walks, were significantly reduced for wheelchair users ( $p < 0.0001$ ).

Wheelchair users were significantly less satisfied with most aspects of their lives compared to non-users. Table 2 presents the chi square values for the association between wheelchair use and satisfaction with various aspects of life. In general, the rating of life as a whole was lower than the non-wheelchair users and they were significantly less satisfied with their health. More specifically, physical categories, such as activities and transportation were limited in wheelchair users. Of the

categories relating to environment, housing, finances, and religion were affected significantly by wheelchair use while neighbourhood was not. With regards to their satisfaction with the support offered by people around them, it is positive to note that satisfaction with family relations and with their living partner was not significantly different than of non-wheelchair users. However, satisfaction with friends was lower in wheelchair users. Table 3 presents the Spearman correlations between satisfaction with life in general and satisfaction with more specific aspects of life. Among wheelchair users, the rating of life as a whole correlated most strongly with satisfaction with health, activities, and transportation.

*Table 2: Chi square values for the association between wheelchair use and satisfaction with various aspects of life*

Satisfaction with:	chi <sup>2</sup>	p-value
Health	198.8	<0.0001
Family Relations	4.1	0.40
Friends	12.0	0.017
Housing	16.9	0.002
Finances	31.7	<0.0001
Neighbourhood	8.9	0.065
Activities	142.3	<0.0001
Religion	11.1	0.025
Transportation	79.2	<0.0001
Spouse	0.276	0.96
Life in General	68.5	<0.0001

*Table 3: Spearman correlations between satisfaction with life in general and satisfaction with more specific aspects of life for wheelchair users only*

Specific Aspects	Correlation	P-value	n
Degree of bodily pain	-0.087	0.1940	223
Satisfaction with health	0.508	< 0.0001	223
Satisfaction with family relations	0.366	< 0.0001	222
Satisfaction with friendships	0.277	< 0.0001	219
Satisfaction with housing	0.346	< 0.0001	224
Satisfaction with finances	0.232	0.0005	221
Satisfaction with neighbourhood	0.386	< 0.0001	222
Satisfaction with activities	0.441	< 0.0001	215
Satisfaction with religion	0.248	< 0.0001	205
Satisfaction with transportation	0.442	< 0.0001	212
Satisfaction with spouse	0.196	0.1036	70

## DISCUSSION

Wheelchairs, like other assistive devices, have the potential to ameliorate function and social autonomy within the elderly.

The CSHA presented a unique opportunity to explore the influence of pain associated with wheelchair use on function and satisfaction in older subjects, for which little has been reported in the literature. Our analysis was aimed at determining the strength of the relationship between wheelchair use and pain and satisfaction specific to 'older' users.

The results of this analysis have shown that older adults using wheelchairs experience higher ratings of pain and less satisfaction with life than those who do not use wheelchairs. Pain interfered strongly with functional activities and also impacted transportation and activities domains. In particular, the influence of pain on recreation was strongly related to pain's effect on the enjoyment of life. Although wheelchairs help bridge the gap between older adults requiring assistance and those who do not, the reduction in activities is significantly related to less satisfaction with life.

While wheelchair users are generally satisfied with the support from family members, they report much lower satisfaction with their friends. This may in part be due to their inability to visit them frequently. This data would support the hypothesis that wheelchair users are not as content with their friendships or leisure activities. The extent to which pain is associated with wheelchair use is an important factor in decreasing satisfaction with leisure and friendships requires further research.

### Limitations and Future Research

The CSHA-2 was not specifically designed to address all aspects of wheelchair use. The analysis undertaken in this study therefore focused on the associations between variables and not causal factors leading to the observed pain and dissatisfaction. The study was restricted by the questions on the survey, which did not include information on specific sites of

pain. Nevertheless, the large sample size allowed the study to provide a national perspective on differences between wheelchair users and some aspects of their pain and satisfaction in the elderly.

Our study analyzed data of wheelchair users in the community only, and not in institutional settings where the support systems may be greater and the planned activities may be more suited for wheelchair users. The CSHA-2 data showed that a larger percentage of institutionalized older adults use wheelchairs (54.3%) relative to the community dwelling older adults (4.6%) ( $\chi^2 1 df = 738.0; p < 0.0001$ ). However, the institutional sample was much smaller relative to the community sample and hence omitted from our analysis. Future research should attempt to evaluate factors associated with pain and satisfaction in institution-dwelling wheelchair users, as they represent proportionally greater users of wheelchairs.

In general, the nature, location, and degree of pain and its influence on function and satisfaction should be evaluated in greater detail in future in attempts to improve these outcomes for the elderly. Wheelchair design should consider minimizing pain in order to maximize mobility, participation in leisure and improve satisfaction with life.

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