Understanding the Effect of Physical Activity on the Incidence of Secondary Conditions in Spinal Cord Injury (SCI): Results from a Nation-wide Survey

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Objective:

To examine the role of regular participation in physical activity as it relates to the incidence of secondary conditions

Background:

People with a spinal cord injury (SCI) have been frequently characterized as being less physically active than their non-disabled counterparts. This population is additionally at great risk for secondary conditions such as cardiovascular and respiratory disease as well as medical complications such as pressure ulcers and urinary tract infections. It is suggested that those with an increasingly active lifestyle may suffer from a lower incidence of such conditions.

Methods:

Design

Prospective national mail-in survey based on convenience sampling

Instrument

A self-report survey is completed by participants two times over two years. Survey items include:

- Chronic and secondary conditions;
- Health risk behaviors;
- Skin breakdowns;
- Chronic pain;
- Frequency of health care provider visitation;
- Functional capacity;
- Exercise activities (aerobic, strengthening and flexibility) including their intensity, frequency and duration;
- Logistics of exercise regimen (facility versus home exercise);
- Therapy (physical, occupational, speech, therapeutic);
- Wheelchair use;
- Community integration;
- Work status and
- Perceived exercise self-efficacy

Analysis

SPSS v. 15; descriptive (frequencies; median; mean, standard deviations, range), bivariate analysis (X2, Mann-Whitney U test; T-test); logistic regression analysis

Results:

Sample Characteristics: All participants (1) had a spinal cord injury (SCI), (2) were at least one year post-injury, (3) were at least 18 years of age and, (4) living in the United States.

Table A. Demographic and clinical sample characteristics

Variable	Exercisers (n=413)	Non-exercisers (n=179)	p
Sex			
Female	156 (70.6%)	65 (29.4%)	.793
Male	256 (69.6%)	112 (30.4%)	
Age	M=48.2 ; SD=13.8	M= 48.3; SD=12.4	.920
Race			
White	363 (68.9%)	164 (31.1%)	.131
Non-White	47 (78.3%)	13 (21.7%)	
Education			
Up to 12 years	102 (69.4%)	45 (30.6%)	.905
13 and more years	309 (69.9%)	133 (30.1%)	
Current work status			
Employed (full/part-time)	239 (68.7%)	109 (31.3%)	.492
Unemployed	174 (71.3%)	70 (28.7%)	
Household income			
Under $20k	100 (63.3%)	58 (36.7%)	.025*
$20k <	301 (72.9%)	112 (27.1%)	
Duration	M=14.5; SD=12.6	M= 18.4; SD=12.1	.001***
Completeness of injury			
Complete	132 (59.7%)	89 (40.3%)	.001***
Incomplete	240 (77.2%)	71 (22.8%)	
Wheelchair use			
Yes	349 (68.3%)	162 (31.7%)	.051
No	64 (79.0%)	17 (21.0%)	

***p<.001; **p<.01; *p<.05

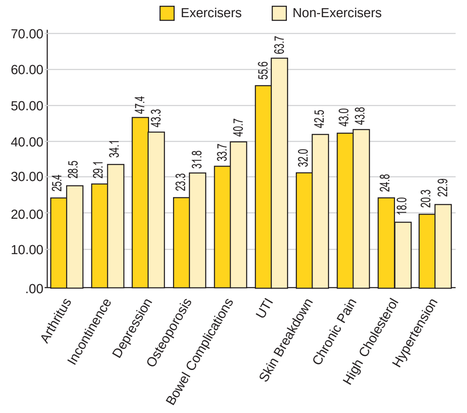
*Participants who reported exercising at "home" or in a "facility" were identified as "exercisers"; those reporting no activity in either venue were identified as "non-exercisers"

Most frequently cited reasons for not exercising at home or outside the home

- 69.8% (n=413) individuals reported that they exercised regularly either at home or outside the home (e.g. gym).
- 59.5% (n=352) said they exercised at home only;
- 29.9% (n=177) reported exercising outside the home only(e.g. gym)

Do not Excersize at Home	Do not Exersize Outside the Home Because...
Exercise in the gym	Exercise at home
Lack of motivation	Cost
Lack of affordable, accessible equipment	Convenience and access (transportation)
Health-related reasons (e.g. pain)	Lack of accessibility or available facilities
Busy work schedule	Lack of motivation
Impairment-related reasons (e.g. level of injury)	Health-related reasons

Table B. 10 most frequently reported health conditions (in %)



Statistical differences between exercisers and non-exercisers in terms of co-morbid conditions

Statistically significant differences (p<.05) between exercisers and non-exercisers were found for the following conditions

- 'Hearing impairment/deafness'
- 'Osteoporosis'
- 'Bladder/kidney stones'
- 'Respiratory infections'
- 'Skin breakdown'

Health Service use

Among those who reported 'unexpected visits', we found statistically significant group differences between exercisers and non-exercisers in terms of 'ER use (.03) and 'hospital use' (.017) with exercisers reporting more frequent use of these services but not for doctor visits.

Perceived exercise self-efficacy

We compared exercisers and non-exercisers in terms of perceived exercise self-efficacy using the ESES, a validated scale that was developed by the team (see Kroll, Kehn, Ho & Groah, 2007) and found statistically significant differences between the groups (p<.001, n=570). Exercisers report on average higher exercise self-efficacy scores (M (exercisers)=33.7, SD=5.3 vs. M (non-exercisers)=28.3, SD=8.3).

Logistic regression analysis

Multivariate logistic regression analyses were computed for skin breakdown, and respiratory infections, controlling for gender, race, education, household income, age at injury, completeness of injury, and level of injury. Non-exercisers were 1.6 times more likely than exercisers to develop skin breakdown and were 1.8 times more likely to report a respiratory infection.

Conclusion:

In contrast to public opinion, the majority of our respondents identified themselves as exercise active. Perceived exercise self-efficacy is significantly higher among exercise active people with SCI and may be an important motivator of an active lifestyle. Incidence of some secondary conditions is significantly lower among exercise active adults with SCI than their non-active counterparts. Exercise is associated with decreased risks of certain secondary conditions regardless of gender, age at injury, injury level/ severity and completeness of injury.

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