The physical activity scale for individuals with physical disabilities: limited validity in people with spinal cord injury

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Abstract The purpose of this study was to determine the construct and divergent validity of the Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) in people with spinal cord injury (SCI). The **c**onstruct validity was examined by relationships between PASIPD and measures of fitness (peak oxygen uptake, peak power output, muscular strength) and activities (wheelchair skills, Utrecht Activity List, mobility range and social behaviour subscales of the SIP68) in 139 persons with SCI 1 year after discharge from inpatient rehabilitation. Divergent validity was determined by comparing PASIPD scores of people with different personal (age, gender, body mass index) and lesion characteristics (paraplegia/tetraplegia, completeness, time since injury). PASIPD scores showed low correlations with fitness parameters (0.25-0.36, $p<0.05$) and low to moderate correlations with activities (0.36-0.51, $p<0.01$). Persons with a tetraplegia or longer time since injury had significantly lower PASIPD scores compared to those with a paraplegia ($p<0.02$; effect size: 0.17) or those with a short time since injury ($p<0.03$; effect size: 0.30). It can be concluded that the PASIPD showed weak to moderate relationships with fitness and activity parameters. This construct validity is comparable to self-report questionnaires from the general population. The divergent validity of the PASIPD was low. Therefore, the PASIPD should be used with caution in persons with SCI.

Keywords Spinal cord injuries, exercise, leisure activities, validation study

Introduction

Being physically active and fit appears to be associated with several health benefits in persons with spinal cord injury (SCI). Therefore, it is important to promote a physical active lifestyle in people with SCI to prevent secondary complications such as cardiovascular disease (Warburton, Eng et al. 2007), pain, fatigue and depression (Tawashy, Eng et al. 2008). To determine the level of active lifestyle, a reliable and valid measure of physical activity for people with SCI is necessary.

The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) was developed to assess the physical activity level of individuals with a disability (Washburn, Zhu et al. 2002). The purpose of the present study is to determine the construct and divergent validity of the PASIPD in people with SCI.

Methods

Participants

The study was part of the Dutch Research Project 'Physical Strain, Work Capacity, and Mechanisms of Restoration of Mobility in the Rehabilitation of Persons with a Spinal Cord Injury' (www.scionn.nl). 139 Persons with SCI 1 year after discharge from inpatient rehabilitation participated.

Variables

The following variables were measured:

- Main outcome variable: The PASIPD was filled out to obtain a total physical activity score, according to Washburn et al.
- Construct validity variables: Physical capacity was determined by the peak oxygen consumption, peak power output, and muscle strength. Activity measures were determined by the wheelchair skills performance time and ability score, the Utrecht Activity List and the subscales Mobility Range and Social Behavior of the SIP68.
- Divergent validity variables: Personal (age, gender, body mass index (BMI)) and lesion (level, completeness, time since injury (TSI)) characteristics.

Statistics

Construct validity was determined with a Spearman correlation coefficient between the PASIPD and physical capacity and activity measures. To determine the divergent validity, PASIPD scores of people with different personal and lesion characteristics were compared with a Mann-Whitney test ($p<0.05$).

Results

Construct validity

PASIPD scores showed low correlations with physical capacity (0.25-0.36, $P<0.05$) and low to moderate correlations with activities (0.36-0.51, $p<0.01$).

Divergent validity

Persons with a tetraplegia or long time since injury had a significantly lower PASIPD score compared to those with paraplegia ($p=0.02$) or a shorter time since injury ($p=0.03$) (Table 1).

Table 1. Mean (M) and standard deviations (S) of the PASIPD scores of people with different personal and lesion characteristics. * = significant difference at $p<0.05$.

	Age (years)		**Gender**		**BMI (kg/m^2)**		**Lesion level***		**Completeness**		**TSI (days)***	
	≤40.8	*>40.8*	*Men*	*Women*	*≤24.7*	*>24.7*	*Tetra*	*Para*	*Compl*	*Incompl*	*≤672*	*>672*
M	21.1	15.0	17.7	18.1	18.6	17.2	15.7	18.9	18.0	18.7	20.7	15.1
S	20.9	15.8	18.9	18.0	19.2	18.5	21.0	17.6	18.2	20.9	19.3	17.5

Conclusion

The PASIPD showed a weak relationship with fitness measures and a moderate relationship with activity parameters in people with SCI. This construct validity is comparable to well established self-report questionnaires of physical activity for the general

population. The divergent validity of the PASIPD was low. Therefore, the PASIPD should be used with caution in persons with SCI. Other measures for physical activity in SCI should be considered.

References

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