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The PaArticular Scales – A new outcome measure to quantify the impact of joint contractures on activities and participation in individuals in geriatric care: Development and Rasch analysis

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ABSTRACT

Background: Joint contractures are frequent conditions in individuals in geriatric care settings and are associated withactivity limitations and participation restrictions. As such, relevant intervention programs should address these aspects, and the effectiveness of such programs should be determined by assessing improvement in activities and participation. However, no patient-centred and psychometrically sound outcome measures for this purpose are available so far.
Objectives: The objectives of this study were to develop and to validate a new outcome measure, the PaArticular Scales, to quantify activities and participation in older individuals with joint contractures. Specific aims were (A) to operationalize the content of an International Classification of Functioning, Disability and Health-based standard set towards meaningful questions and to combine them to a questionnaire and (B) to assess the psychometric properties of the developed questionnaire, in detail to evaluate test–retest reliability, objectivity, internal consistency reliability and criterion validity.
Design: Operationalization was reached by an expert consensus conference and a subsequent expert Delphi survey. Psychometric properties were assessed in a cross-sectional study.
Settings: Nursing homes, geriatric rehabilitation facilities.
Participants: 23 experts (nurses, physicians, physical and occupational therapists) participated in the consensus conference and the Delphi survey. A total of 191 individuals with joint contractures (as confirmed by physician, nurse or physical therapist) between 65 and 102 years, living in nursing homes or as patients in geriatric rehabilitation were enrolled in the cross-sectional study.

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Methods: Rasch Partial Credit Modelling.
Results: The consensus conference and Delphi survey resulted in a questionnaire with 86 items of the International Classification of Functioning, Disability and Health. Test–retest-reliability among those was acceptable (Cohen's weighted kappa: 0.779). The Rasch analysis revealed two independent interval-scaled scales with 24 items for the Activities scale and 11 items for the Participation scale with high internal consistency reliability. Cronbach's alpha was 0.96 for the Activities scale and 0.92 for the Participation scale. Criterion validity was −0.40 and −0.30 for the Activities scale and for the Participation scale, respectively.
Conclusions: The PaArticular Scales, a new patient-centred and psychometric sound outcome measures to comprehensively assess the impact of joint contractures in geriatric care, are available now. These developed scales will serve as primary outcomes in a scheduled evaluation of a complex intervention to improve participation and quality of life in nursing home residents with joint contractures.

What is already known about the topic?

- Structural impairments, such as range of motion, are most frequently assessed in studies in older patient with joint contractures.
- Activity limitations and participation restrictions are most relevant to these patients.
- Patient-centred and psychometrically sound measures to comprehensively assess interventions tailored for patients with joint contractures are missing.

What this paper adds

- Two independent objective interval-scaled outcome measures, the PaArticular Scales, could be derived from an International Classification of Functioning, Disability and Health-based standard set for individuals with joint contractures.
- The PaArticular Scales make the situation of individuals with joint contractures in geriatric care settings accessible for evaluation.
- Statistically sound comparisons between individuals and within individuals over time are now possible.

1. Introduction

Joint contractures are functional restrictions andlimitations of joint movement due to a wide array of ethiologies, such as immobility, pain, or neurological conditions (Clavet et al., 2008; Gerrits et al., 2015; Hoang et al., 2014; Souren et al., 1995; Wong et al., 2015). They are a common problem for older, frail people in nursing home and homecare settings and have great impact on the capacity to perform daily activities, such as toileting, moving around, or social activities, but also on the need for nursing care (Fergusson et al., 2007; Harrington, 2009; Rabiner et al., 1996; Resnick, 2000). Even though it is known that the extent of structural impairment, such as the range of motion of the affected joint, is not sufficient to explain the impact on daily life, range of motion is still the most frequently reported outcome measure in studies on joint contractures (Gnass et al., 2010; Offenbacher et al., 2013). In contrast, recent research showed that both from the perspective of the affected individuals living in nursing homes or in the community, and the perspective of experts in management and care of individuals with joint contractures, activity limitations and participation restrictions, such as mobility or practicing leisure activities, are the most relevant aspects (Bartoszek et al., 2015a,; Fischer et al., 2014a,b; Fischer et al., 2015).

Therefore, interventions exclusively targeted at range of motion of the affected joint have been hardly effective (Fox et al., 2000). However, interventions targeted at the broader goal of improving activity and participation are facing several challenges: firstly, the population is heterogeneous and includes both frail but ambulatory individuals and individuals who are already heavily restricted in their mobility. Secondly, affected individuals have differing preferences regarding participation. Thirdly, individuals may already have one or several fully developed joint contractures or are at risk for developing a joint contracture. Fourthly, individuals' living situations are diverse, including varying resources of nursing care and assistance. Thus, a successful intervention has to be complex by its very nature, and the measure used to assess this success has to acknowledge the complex personal experience of the affected individuals. Up to now, there was no generally accepted measure to do this.

Our project on developing a standard set based on the International Classification of Functioning, Disability and Health (ICF) to describe the impact of joint contractures on functioning and social participation in older individuals addresses this gap (Bartoszek et al., 2015b; Müller et al., 2013). Up to now, we have developed this standard set as a blueprint of what should constantly be measured. The next steps are to operationalize these items and to combine the resulting questions into a psychometric sound questionnaire that can be used to quantify the impact of joint contractures on social participation and make these entities accessible for further research.

2. Objective

The objective of this study was to develop and to validate a new outcome questionnaire, the PaArticular