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Influence of upper limb disability, manual dexterity and fine motor skill on general self-efficacy in institutionalized elderly with osteoarthritis

Jose Manuel Pérez-Mármol OT [a], María Azucena Ortega-Valdivieso OT, PhD [a], Enrique Elías Cano-Deltell OT [a], María Isabel Peralta-Ramírez PhD [b], Mª Carmen García-Ríos PT, PhD [c], María Encarnación Aguilar-Ferrándiz PT, PhD [d,*]

[a] Department of Physical Therapy, Faculty of Health Science, University of Granada (UGR), Spain
[b] Department of Personality, Evaluation and Psychological Treatment, University of Granada, Spain
[c] Department of Physical Therapy, University of Granada (UGR), Spain
[d] Instituto de Investigación Biosanitaria Granada (IBIS Granada), Department of Physical Therapy, University of Granada (UGR), Spain

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ABSTRACT

Study design: Descriptive, cross-sectional.
Introduction: The impact of upper limb (UL) disability, dexterity and fine motor skill on self-efficacy in older adults with osteoarthritis (OA) is not well known yet.
Purposes of the study: To evaluate the self-efficacy and its relationship with UL function/disability in institutionalized OA.
Methods: Institutionalized adults ($n = 45$) over the age of 65 years with OA were evaluated in a single session, to determine pinch strength, active range of motion of the hand and UL disability and functionality. They were classified as self-efficacious or not based on their general self-efficacy level. The influence on self-efficacy on upper limb function was statistically analyzed using bivariate and multivariate regression analyses.
Results: Self-effective older adults showed significantly lower scores in disability and higher scores in pinch strength, dexterity and motion of thumb than those who were classified as non-self-effective. Self-efficacy was associated with pinch strength ($p \leq 0.038$), disability ($p < 0.001$) and dexterity ($p \leq 0.048$). Multiple regression analyses showed that disability explained almost 40% of the variability of self-efficacy.
Conclusions: Older adults classified as non-self-effective have higher UL disability and less pinch strength, manual dexterity and thumb motion than those who are self-effective, suggesting a relationship between impairment and perceived ability.
Level of evidence: 3a.

Introduction

Osteoarthritis (OA) is the most prevalent type of arthritis and the most common chronic joint disorder in people older than 65 years.[1] The majority of people over the age of 55 years have radiographic OA in at least one hand joint[2] and from 60 to 70% of population aged 65 years and older request medical assistance for hand OA symptoms.[3,4] This disorder is identified by degeneration of cartilage provoking joint pain and stiffness that worsen over time.[5] Furthermore, OA often is associated with significant fatigue with a high impact on physical function, mobility and quality of life.[1]

Behavioral self-management treatments are one of the most effective interventions existing for OA; however, several factors affect the success of these techniques such as self-efficacy, physical dysfunction or psychological distress.[5] Self-efficacy is a construct described as the belief that one can successfully execute a behavior required to produce an outcome.[6] According to Bandura, perceived self-efficacy is the degree of confidence that individuals have in

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* Corresponding author. Department of Fisioterapia, Universidad de Granada, Spain. Tel.: +34 953699166, +34 669546384 (mobile); fax: +34 950214384.
E-mail address: encaguilar@hotmail.com (M.E. Aguilar-Ferrándiz).

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their ability to perform specific activities successfully.[7,8] The expectations of personal efficacy determine whether coping behavior will be initiated, how much effort will be expended, and how long it will be maintained in the face of obstacles and aversive experiences.[7] A strong self-efficacy implies an increase in attention and effort to the demands of the situations and a regulation of how long will persist in participation in an activity when faced with problems.[8,9] This conceptual framework suggests that the stronger self-efficacy is, the more active and persistent the person's efforts are.[9] Perceived self-efficacy has been previously evaluated as a specific domain, linked to concrete behaviors (i.e. falls, exercise) however, there are few studies that examining general self-efficacy perception towards general daily life situations. Some authors, such as Baessler and Schwarzer[10,11] consider self-efficacy as a broad construct referred to general and stable belief that people have about ability to properly manage different daily life stressors.

Upper limb function can be measured using different approaches. Measures can be self-reported disability at the level of the person or hand/arm; or can be in performance-based impairment tests. Common impairments evaluated in hand therapy include, pinch strength and range of motion of hand fingers. Activity can be measured with timed dexterity tests or self-reported ability to perform specific tasks.

Evidence shows how self-efficacy is related to several health variables. An association between self-efficacy and disability in activities of daily living has been reported in elderly patients with stroke and other diseases.[12] Another study has also showed a relationship between self-efficacy, functional ability and depression in older adults. These authors stated that self-efficacy present two relevant roles by helping to preserve healthy physical and emotional functioning after major voluntary surgery (total hip replacement surgery).[7] Moreover, high levels of self-efficacy are associated with greater quality of life, reduced pain, and increased activity.[5,13–15] In general, patients with higher self-efficacy have less physical disability than patients with low self-efficacy.[16–18] The reasons for these associations is not always clear. It may be that better self-efficacy promotes better ability through the pathways discussed above. Conversely, people with better physical ability may have a stronger belief they can mange things and hence the ability may be the causal agent, not the result. Since associations do not prove causation we cannot determine what the causal pathway is from the reported associations. That is, people may calibrate their expectations based on their actual physical abilities and/or enhance their physical abilities based on better self-efficacy. Dewan et al[19] suggested that needed component abilities to reach a determined performance such as people's skills and resources may influence the expectations of self-efficacy.[6,19] If self-efficacy is related to actual physical capability it would be important to improve physical capabilities to enhance self-efficacy instead of relying primarily on psychological interventions that are intended to improve dimensions of self-efficacy.

In people with arthritis, self-efficacy is a predictor of psychologic well-being, adherence to prescribed treatments, and pain coping mechanisms.[20] Furthermore, self-efficacy seems to affect the recovery of patients that suffer different disorders.[21–23]

Although previous studies have explored the relationship between self-efficacy and several health variables, it has not been still studied in people with OA with a focus on upper limb function. From a hand therapy perspective it is important to understand to what extent poor self-efficacy reflects attitudes and beliefs that might require education or psychological interventions versus a patient's calibration of their true physical capability that might indicate he need for attention to physical impairments.[19] The objectives of the present study were: to describe the general self-efficacy and the upper limb functions/disability in a sample of institutionalized older adults with OA; to compare patients who were/were not self-effective and to investigate the upper limb variables associated with general self-efficacy in this sample.

Methods

Participants

Participants were institutionalized older adults with OA, aged 65–95 years, who attended to six health community centers in Granada province, between May 2014 and January 2015. Oder adults have been defined as people with more than 60 years old in United States. Otherwise, most developed world countries have determined 65 years as cutoff to define this population.[24] In addition, some authors also identify subgroups of older adults as "younger old" (ages 65–75), "older old" (ages 75–85) and "oldest old" (ages 85+).

Inclusion criteria were: 1) being ≥65 years; 2) being institutionalized either on a full or part-time basis. Exclusion criteria were: 1) having cognitive impairment defined as a score <23 in educated people (with at least school studies) and <20 points with not educated or illiteracy (without school studies), in the Spanish Mini-Mental State Examination-MMSE test[25]; 2) problems in postural control system; 3) balance disorders while the subject is seated.

Among the 257 subjects recruited from the available population, 45 met the selection criteria. The most common exclusions were due to cognitive impairment and medically instability. The flow of subjects through the study is depicted in Fig. 1.

All participants were informed about the characteristics of the study, its objectives and the procedures. A written informed consent form was obtained from all participants. We received ethical approval to perform this study from the Investigation Ethic Committee of Granada province-CEI (Andalusian Health Service, Granada, Spain) May the 26th, 2014. The study was conducted in accordance with the modification of the Helsinki Declaration, 2013.[26]

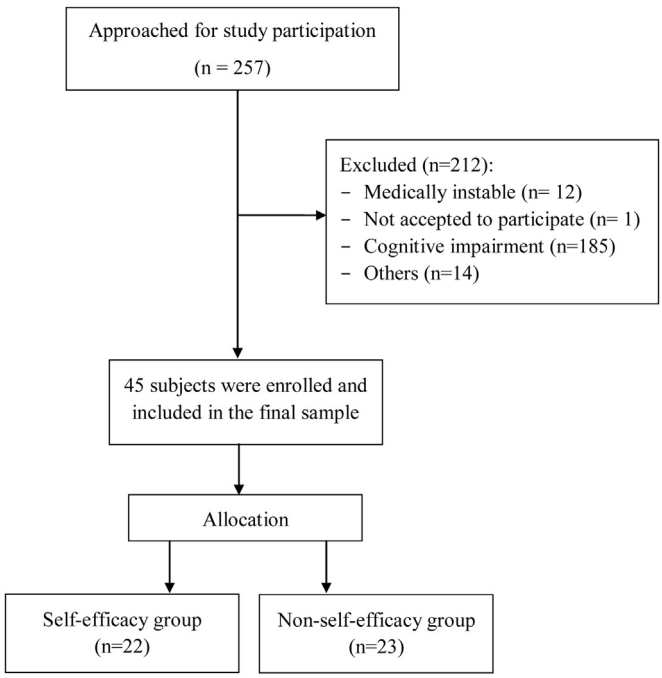

Fig. 1. Flow diagram of subjects who participated in the study following STROBE guidelines.