An exploration of the psychometric properties of the PASS-20 in older adults with chronic pain

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An exploration of the psychometric properties of the PASS-20 in older adults with chronic pain: preliminary development and validity

RUNNING TITLE: Preliminary validation of the PASS-20

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Abstract

Objectives

The Pain Anxiety Symptoms Scale (PASS-20; McCracken & Dhingra, 2002) is well validated in adults and younger populations, but not in older adults. This study aimed to analyse the psychometric properties of the PASS-20 in Spanish older adults who experience chronic pain.

Methods

Participants were 111 older adults with chronic pain living in nursing homes (mean age= 83.36; SD= 6.53; 78.6% female). Face-to-face interviews were conducted which included assessment of pain anxiety (PASS-20), chronic pain acceptance (CPAQ), depression symptoms (GDS), catastrophizing beliefs (PCS), pain severity, and sociodemographic information. An Exploratory Structural Equation Modelling (ESEM) approach was used to refine the scale.

Results

The final scale was composed of seven items, measuring two factors that could be labelled 'Internal experiences' and 'Escape / Avoidance behaviours'. The two factors explained 60.98% of the total variance. PASS-7 version fit properly: χ^2/df= 14.57/13, CMIN/df = 1.121, CFI= 0.99, RMSEA= 0.033, TLI= 0.98, GFI= 0.96, AGFI= 0.92. Good validity indices were found and acceptable reliability results in the scale and its subscales (Chronbach´s α; Internal Experiences= 0.70; Escape/Avoidance Behaviours= 0.73; Total Scale= 0.77).

Conclusions

The short version of the PASS-7 has good psychometric properties.

Clinical Implications

The brevity of the PASS-7 increases the feasibility of this instrument which could potenitially be utilized in a variety of clinical settings and research studies with older people with chronic pain samples, specially institutionalized older adults.

Keywords: older adult, assessment, pain anxiety, PASS

Introduction

A wide variety of scientific studies pointed at the high rates of chronic pain prevalence in the general population and in older adults (Riskowski, 2014) and the great economic cost of pain (Gaskin & Richard, 2012). Pain is particularly common in older people, though age itself is not a strong predictor of pain, disability, or affect (Larsson et al., 2016). Persistent pain is particularly common in people over 80 years old and those who live in nursing homes (Patel et al., 2013), but older community-dwelling adults also report high rates of persistent pain (Voscopoulos & Lema, 2010).

Older people report pain of longer duration and more comorbidities than the younger adult pain population (Rustøen, Wahl, Hanestad, Lerdal, Paul, et al., 2005). In addition, significant differences have been found in the experience of pain in older people as a consequence of changes in nociceptive transduction and cerebral processing of noxious stimuli (González-Roldan et al. 2020). Age-related changes in the organization of the brain have been proposed to be responsible of the observed alterations in pain perception in the older population, as well as to their greater vulnerability to suffering from chronic pain disorders (Farrell, 2012). A recent meta-analysis has shown that pain thresholds increase with age, supporting the assumption that advanced age is linked to a dulled sensitivity for low pain intensities (Lautenbacher et al., 2017). In parallel, diverse cultural and environmental factors can affect pain perception of older adults. This way, many older people conceive pain as an inevitable consequence of the normal ageing process (Cowan et al., 2003), resulting in an acceptance that persistent pain is incurable (Sofaer-Bennet et al., 2007). These circumstances may suppose a distinctive nature of anxiety to pain in older people where future-oriented cognitive elements denoting helplessness and fear, loose significance in favor of more present-oriented responses focused in the pain experience

and aimed to avoid pain exacerbation. In turn, these changes may become more remarkable for older adults in nursing homes, as these contexts may reinforce their view that pain progression is beyond their control (Gibson & Helme, 2000; Langer and Rodin, 1976; Rodin and Langer, 1977).

Additionally, chronic pain is associated in older adults with poorer physical functioning and increased dependency (Voscopoulos & Lema, 2010), increased depression and anxiety (Herbert et al., 2017; Hoover et al., 2010; Miloyan et al., 2015), reduced life satisfaction and less perception of quality of life (Baker et al., 2011; Gagliese, 2009). Further, many psychological factors associated with chronic pain, function, and well-being have been specifically studied in this population (Hawker et al., 2011; López-López et al., 2008; Macea et al., 2010). Pain beliefs such as locus of control (people's belief about whether or not they have control over the events that happen to them), self-efficacy (a person`s belief in their ability to succeed in a particular situation or task), and catastrophizing beliefs (a cognitive style in which pain and its consequences is magnified and the self is appraised as helpless) can influence the experience of pain in both younger and older adults Turk & Okifuji, 2002). Catastrophizing is strongly associated with functional capacity (the capability of performing activities or tasks) (Sullivan et al., 2002), pain severity (pain level or intensity rating) (Gustavson et al., 2010), and psychological distress (Grant et al., 2002; López et al., 2008). In contrast, chronic pain acceptance is a widely studied psychological process associated with better physical functioning and emotional well-being, and these findings have also been replicated in older people living in nursing homes (Bickerstaff, et al., 2003; Kratz et al., 2007).

One of the theoretical models that best represents psychological variables in pain processes is the fear-avoidance model (Vlaeyen, Kole- Snijders, Boeren, et al., 1995;

Vlaeyen, Kole- Snijders, Rotteveel, et al., 1995, Vlaeyen & Linton, 2000). These models argue that the fear of pain (or fear that physical activity can cause re-injury) is an important factor that maintains disability in people with persistent pain (Vlaeyen, Kole- Snijders, Boeren, et al., 1995). In this sense, the fear of pain could bring the person to perform avoidance behaviors and these avoidance behaviors will contribute to the maintenance or increasing the fear of pain, while confrontation behaviors will improve the health condition (Vlaeyen, Kole- Snijders, Boeren et al., 1995). For example, the fear of pain could activate escape behaviours and, with this the avoidance of movements and activities. This long-term avoidance of movements in the context of chronic pain may impair functioning (e.g., reduced social activities), increase the level of functional disability (physical deconditioning) and increase the negative mood (e.g., depression symptoms). Previous research has found that pain-related fear is associated with escape/avoidance behaviors and with a greater level of functional impairment (Asmundson et al., 1999; Crombez et al., 1999; McCracken et al., 1992; Vlaeyen, Kole- Snijders, Rotteveel, et al., 1995). In this line, self-reported disability levels and poor behavioral responses are more associated with fear of pain than with pain severity or biomedical aspects (Asmundson et al., 1999; Linton, 2000; Vlaeyen, Kole- Snijders, Rotteveel, et al., 1995). All that literature supported the key role of pain-related fear in the development and maintenance of chronic pain, highlighting the importance of early detection of fear of pain in order to prevent the establishment of disability (De Jong et al., 2005).

Research on anxiety or fear of pain in older adults is sparse. Anxiety in general (and pain-related anxiety) is often undiagnosed and untreated in older people with chronic pain (Karp et al., 2016). Some reasons are the differential expression of anxiety in late-life (more somatic complaints or more physical health and disability concerns)

(Gonçalves & Byrne, 2013; Myloyan et al., 2014; Wetherell et al., 2013). The lack of well-established guidelines for the assessment of anxiety in older adults with chronic pain may also be a factor (Karp et al., 2016). In the absence of specific guidance, clinical assessment tends to rely on measures validated with younger adults (Rundsell et al., 2015). While common, this practice can be problematic due to social, biological, and psychological differences between younger and older adults (Paeck et al., 2014). The differential expression of anxiety in older people could cause that these symptoms are not identified as characteristic symptoms of anxiety disorders in late-life. The tendency for older people to report somatic symptoms (e.g. gastrointestinal symptoms) as phenomenological of anxiety can lead them to receive unnecessary investigations and reduce the likelihood of them being considered for evidence based psychological intervention.

The Pain Anxiety Symptoms Scale (PASS-20) is a frequently used clinical assessment tool for anxiety toward pain (McCracken & Dhingra, 2002). This tool is well validated in young adult populations and conceptualizes pain-related anxiety as multi-dimensional. It has items that assess four pain anxiety dimensions: cognitive anxiety (impaired concentration or racing thoughts due to pain), escape or avoidance (behavioural responses with the main objective of reducing or eliminating the pain), fear (fearful thoughts about the consequences of pain), and physiological anxiety (physiological arousal in response of pain). This instrument has been validated using various pain populations, including treatment-seeking samples (Coons et al., 2004) and community samples (Abrams et al., 2007). It has been validated with adults and adolescents (Page et al., 2011; Page et al., 2010; Sanchez- Rodríguez et al., 2016). Surprisingly, these validation studies showed different solutions of the Four-Factor Structure of the original PASS-20 (McCracken & Dhingra, 2002). For example: four-

factor structures solutions with item changed between subscales, items removed and/or correlations between different factor errors (Page et al., 2011; Page et al., 2010; Roelofs et al., 2004; Sanchez- Rodríguez et al., 2016), five-factor structures (Larsen et al., 1997; Roelofs et al., 2004), and a proposal of four-factor structure although their PA and MAP test suggested two-factor structure (Coons et al., 2004). This last study's methodology is controversial as some providers consider that PA and MAP test is the more accurate method for factor retention in instrument validations (Hayton et al., 2004). Regardless, the PASS scale seems to have different structure solutions according to samples.

It is unknown the number of studies exploring the psychometric properties of PASS-20 (McCracken & Dhingra, 2002) in samples of older adults, even though, as it has been commented, the experience of pain is frequent in older adults. In this sense, this instrument could be useful to assess anxiety toward pain in older adults, and it could be interesting to test the best factor structure of the scale in older adults. Furthermore, there is a need for having available assessment instruments specifically validated with older adults (Márquez- González et al., 2012). In this sense, there is a Spanish version of the Geriatric Anxiety Inventory (Márquez- González et al., 2012) with good psychometric properties (Márquez- González et al., 2012). There remains a need for an instrument to assess pain-related anxiety in older people. Indeed, considering the need by researchers and clinicians of assessing a wide number of pain-related characteristics and, at the same time, to reduce fatigue and accommodate slowed cognitive performance in some older adults (Hadjistavropoulos et al., 2007), the creation of valid but brief forms of assessment has been suggested (Coons et al., 2004).

Taking into consideration the issues mentioned above, the purpose of this paper is to evaluate the psychometric properties of the original PASS-20 (McCracken & Dhingra,

2002) in a sample of older Spanish people with chronic pain. A second aim of the research was to determine if shorter forms of the PASS-20 could retain good psychometric properties.

Methods

Participants

A total of 141 older people with chronic pain were contacted though five nursing homes in Madrid, Spain and invited to participate in this study. Of these, 30 declined to participate and declined to provide a reason for their decision. All 111 assessed older people lived in nursing homes located in Madrid, Spain. The inclusion criteria were: 1) age 65 years or older, 2) diagnosis of chronic musculoskeletal pain of at least six months, 3) no severe cognitive impairment or dementia, and 4) ability to read and write in Spanish. The nursing home staff assessed that all participants contacted met the inclusion criteria. All the potential participants had objective measures of chronic musculoskeletal pain and no cognitive impairment (assessed by the doctor). The sample was predominantly female (81.1%) and Spanish (91.1%), with a mean age of 83.36 (S.D. 6.53; range 65 to 97 years old). The mean duration of pain was 21.54 years (S.D. 19.96; range 1 to 69 years). The majority of participants were widowed (55.9%) and had primary school education (52.3%). Demographic and clinical characteristics are presented in Table 1.

Table 1 near here

Procedure

The study was approved by the Research Ethics Committee of the Rey Juan Carlos University. Participants provided informed consent prior to being assessed. The assessments in sociodemographic, clinical variables and in questionnaires were completed by a psychologist trained in pain assessment with older adults. Before the assessment, researchers ensured that the participants met the inclusion criteria.

Translation and linguistic validation of the PASS-20

The Brislin (1986) procedure was followed for translation of the PASS-20 (McCracken & Dhingra, 2002). The original version of PASS-20 was translated into Spanish by two psychologists with previous experience in the study of pain. Then, the items were translated back into English by a bilingual psychologist, who also had expertise in the field of pain. Finally, an expert committee reviewed the original version of PASS-20, and the version translated back into English and reached a consensus on the final Spanish version of PASS-20. The expert committee considered the translation version understandable.

Measures

Sociodemographic and clinical variables

The participants for age, gender, race, marital status, and education level were collected. Additionally, time since pain diagnosis was obtained.

Pain Anxiety Symptoms Scale

The Pain Anxiety Symptoms Scale (PASS-20) (McCracken & Dhingra, 2002) is the short version of the original version of the PASS (McCracken et al., 1992). The PASS-

20 assesses anxiety toward pain in a chronic pain patient sample through four pain constructs: cognitive anxiety (e.g., ""When I hurt I think about pain constantly""), fear of pain (e.g., ""When I feel pain I am afraid that something terrible will happen""), Escape-avoidance behaviors (e.g., ""As soon as pain comes on I take medication to reduce it"") and physiological arousal (e.g., ""I begin trembling when engaged in an activity that increases pain""). Each component contains five items and they are measured on a 6-point Likert Scale. The internal consistency of the PASS-20 was excellent for the original scale (Chronbach' 's α= 0.91) (McCracken & Dhingra, 2002). Also construct validity and predictive reliability was good (McCracken & Dhingra, 2002).

Chronic Pain Acceptance Questionnaire

Pain acceptance was measured by the Chronic Pain Acceptance Questionnaire (CPAQ) (McCracken et al., 2004). This scale measures two dimensions of pain acceptance in people with different chronic pain conditions: pain willingness (a mental attitude of allowing pain without needless struggle) and activity engagement and is scored on a 7-point Likert Scale. The 20 item instrument has an acceptable internal consistency in previous studies (Chronbach' 's α= 0.78) (McCracken et al., 2004). This instrument was translated into Spanish in previous studies and showed good psychometric properties; good test-retest reliability, internal consistency reliability and an adequate convergent and discriminant validities (Gonzalez, Fernández, & Torres, 2010; Rodero, García-Campayo, Casanueva, López, Serrano-Blanco, & Luciano, 2011). Unfortunately, the authors were not aware of this translation until after beginning the study. In the current study, the authors used the same translation procedure as described above for the PASS-20. The analysis of results showed that

this Spanish CPAQ has acceptable internal consistency reliability (Cronbach's α= .77) and acceptable internal consistency reliability for the pain willingness subscale (Cronbach's α= .75) and activities engagement subscale (Cronbach's α= .75).

Geriatric Depression Scale

Depression symptoms were measured with the Spanish version (Izal & Montorio, 1993) of the Geriatric Depression Scale (GDS) (Brink et al., 1982). This Spanish version adapted in an older people sample living in nursing homes has 30 items and has good internal consistency (Chronbach' 's α= 0.89), high temporal stability (r_{xy}= 0.89; p< 0.001) and good validity convergent (Izal & Montorio, 1993).

Catastrophizing

The Spanish version (García-Campayo et al., 2008) of the Pain Catastrophizing Scale (PCS; Sullivan et al., 1995) is a 13-item measure that is scored on a 5-point Likert Scale adapted in a chronic pain sample. This scale assesses catastrophizing beliefs and has shown good internal consistency (Chronbach' 's α= 0.79), test-retest reliability (intraclass correlation coefficient= 0.84) and sensitivity to change (García-Campayo et al., 2008).

Pain severity

Pain severity was measured by the Spanish version (Badia et al., 2003) of the Brief Pain Inventory (BPI) (Cleeland, 1991). This 11-item scale assesses four aspects of pain severity (worst pain in the last 24 hours, least pain in the last 24 hours, average pain in the last 24 hours and pain intensity now) items and seven interferences in activities of daily living (ADL) items (general activity, walking, work, mood, enjoyment of life, relations with others, and sleep). Participants rated using a Visual Analog Scale (VAS)

on 0-10 scales. In pain severity dimension, we selected only the item that assessed the average pain over the last week and BPI pain interference is scored as the mean of the seven interference items. This scale has good psychometric properties (Chronbach' 's α= 0.89) (Badia et al., 2003). Indeed, data from studies of people with chronic pain in many languages have demonstrated high internal consistency and good psychometric properties in the two dimensions of the PBI. A consensus panel recommended that this instrument be included as outcomes in chronic-pain clinical trials (IMMPACT; Turk, Dworkin, Allen, et al., 2003).

Statistical Analysis

Statistical analyses were performed using IBM AMOS Version 23 and IBM SPSS Statistics version 22. First, missing data analysis showed low levels of missing data (no case had more than 10% missing and no item more than 10%), and the pattern of missing data suggested a random distribution. A total of two participants had three or more items missing of the PASS-20 and were excluded from further analysis (less than 3% of the total sample). No more participants had missing data in this PASS-20 instrument. For the other measures, the missing items were prorated based upon their scores for the rest of each instrument items. For that, five participants had up to 1 item prorated (5% of the participants).

Secondly, Velicer' 's MAP test (Velicer et al., 2000) and Parallel Analysis (PA) (O'Connor, 2000) were performed on the polychoric matrix of the PASS-20 items to analyze the number of factors to retain. Syntax for PA was extracted from O'Connor (2000).

Thirdly, data were examined for skewness and kurtosis at the item level. According to Muthén and Kaplan (1985), scores below or around ±1 suggested that the distribution was normal. Conceptually, the approach taken was an Exploratory Structural Equation Modelling (ESEM) approach (Marsh et al., 2014), in which an initial Exploratory Factor Analysis (EFA) was used to assess initial communalities, item loadings and cross-loadings, removing items with poor loadings and significant cross-loadings (following recommendations form Costello and Osborne, 2005). Following this initial stage, a measurement model was constructed on the remaining items using AMOS, and goodness of fit indices assessed. To determine the goodness of fit we used indices proposed by Browne and Cudeck (1992): Root Mean Square Error of Approximation (RMSEA; < 0.06 for a close fit), Chi-Square/df ratio (χ^2 /df; values < 2.0). For Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Tucker-Lewis Index (TLI) values above to 0.95 suggesting good fit (closer to 1 are better), except for AGFI which values above 0.90 suggesting good fit (Byrne, 2001; Kline, 2005). In accordance with Hu and Bentler (1999) both absolute and iterative fit indices were required to meet criteria to establish good fit.

Reliability analysis (Chronbach' 's α) was calculated to determine the internal consistency of the total PASS scored version and subscales. Criterion related validity was assessed by examining the Pearson' 's correlations between PASS versions scales and its subscales (PASS-20 and PASS-7) and chronic pain acceptance, pain severity, depression symptoms, and catastrophizing beliefs.

Results

Descriptive data of the questionnaires

Descriptive information about the measures (means and standard deviations) is shown in Table 2. Indeed, descriptive data of previous PASS instrument validation studies are included in Table 2. According to this, the descriptive results of this study were quite close to descriptive data with an adult clinical sample of previous studies (Abrams et al., 2007; Zhou et al., 2017). Nevertheless, descriptive results with low back pain or fibromyalgia sample (Roelofs et al., 2004) were higher than descriptive results of this study sample. These data could suggest that the PASS-20 is sensitive in the measurement of pain anxiety in populations with specific pain (for example, fibromyalgia and low back pain; Roelofs et al., 2004), because the descriptive data (mean and standard deviation) in this specific samples (Roelofs et al., 2004) are higher in all dimensions of pain anxiety.

Table 2 near here

Factor Structure Analysis

The PA and MAP test results indicated that two factors should be extracted from the data (Eigenvalue Factor 1= 6.64; Eigenvalue Factor 2= 1.81). Then, to test the structure of the PASS-20 in our sample, an Exploratory Factor Analysis (EFA) was performed to generate an adequate factor solution to conform to two factors. Each item was analyzed according to its loading in both factors: primary loadings >0.40 and secondary loadings <0.30 and then subsequently primary loadings >.5 and secondary loading <.25 (Costello & Osborne, 2005). Five iterations of EFA were run, with problematic items removed at each step according to the criteria described above. In the first iteration item 6 and item 8 were removed for low loadings (<0.30). Items 12, 13, 14 & 18 were removed in the second iteration due to low loadings in both factors

(<0.40). Then item 15 was eliminate for low loading (<0.40). In the fourth iteration items 3, 4 and 5 were pull out from the model because low loadings in both factors (<0.40). Finally, items 11, 17 and 20 were removed for low loadings in the two factors (<0.40). The final results of the EFA process showed one Internal Experiences Factor with items 1, 2, 16, and 19 (cognitive anxiety, fear and physiological anxiety dimensions of the original PASS-20; McCracken & Dhingra, 2002) and other Avoidance / Escape Behaviour Factor with items 7, 9 and 10. The total of variance explained in this PASS-7 version was 60.98%, KMO= 0.76 and Bartllet´s Sphericity Test (186.91, df= 21, $p < 0.001$) (Table 3). The two factors were easily interpreted as reflecting the internal experiences of anxiety and behavioral responses to escape or avoid pain. These were labeled Internal Experiences of anxiety (because it includes different dimensions of anxiety, as raised arousal, attentional dominance) and Escape / Avoidance Behaviours.

The PASS-7 model was tested as a measurement model using SEM and showed satisfactory results χ^2/df= 14.57/13, CMIN/df = 1.121 (< 3), CFI= 0.99 (> 0.95), RMSEA= 0.033 (< 0.05), TLI= 0.98 (> 0.95), GFI= 0.96 (> 0.95), AGFI= 0.92 (> 0.90). Table 4 shows a summary of maximum likelihood confirmatory factor analysis results of all analysed version of the PASS and in Figure 1 the structure and loadings of the final version of the PASS-7.

Table 3 near here

Table 4 near here

Figure 1 near here

Reliability

Internal consistency reliability for the Total Scale of PASS-20 (McCracken & Dhingra, 2002) was good in the current sample (Chronbach´s α= 0.88). Nevertheless, psychometric properties for the four scales were from acceptable or borderline to good (Chronbach´s α; Physiological Anxiety= 0.81; Escape-Avoidance= 0.61; Fear= 0.76, and Cognitive Anxiety= 0.70). The internal consistency of the PASS-7 was acceptable (Chronbach´s α; Internal Exteriences= 0.70; Escape/Avoidance= 0.73; Total Scale= 0.77) (Table 3).

Validity

Correlational analysis showed that both versions of the PASS (PASS-20 and PASS-7) and their subscales correlated significantly, positively and moderately with depression and strongly with catastrophizing. Further, the PASS-20, the PASS-7 total scales, and all the subscales correlated significantly and negatively with acceptance to chronic pain (all correlations from moderately to strongly). According to correlations between pain severity, the PASS-20, the PASS-7 total scores, and the different subscales correlates between them moderately or low, only the escape-avoidance subscale did not correlate with the pain severity variable in both versions of the instrument (see Table 5).

Table 5 near here

Discussion

This study aimed to examine the original PASS-20 structure (Cognitive Anxiety, Escape/ Avoidance, Fear of Pain and Physiological Anxiety) (McCracken & Dhingra,

2002), reliability, and validity in a sample of older adults with chronic pain, living in nursing homes. Results of initial CFAs fit indices did not support the original Four-Factor Structure of the scale. The MAP and PA test results suggested a two-factor structure, which was extracted in iterative steps. The resulting factors could be clearly interpreted as internal experiences aspects of anxiety and Escape /Avoidance behaviors. A seven-item version of the PASS provided the best fit of the instrument in this sample.

The original Four-Factor Structure of PASS-20 (McCracken & Dhingra, 2002) was supported by previous research (Abrams et al., 2007). Nevertheless, other research studies report different solutions of the PASS-20 factor structure. In this line, while Coons and Colleagues (2004) proposed a four-factor structure of the PASS-20, their PA and MAP test suggested two factor structure in a sample with chronic pain. In another adaptation of the PASS-20 into the Chinese language (Zhou et al., 2017), the four factor structure solution included some correlations between errors of the different factors in the model fit. Furthermore, Larsen and colleagues (1997) found a five factor structure in the first version of the PASS (PASS-40; McCracken et al., 1992). A similar five factor structure proposal was suggested previously in a validity study of the PASS-20 (Roelofs et al., 2004). Tests of the factor structure of PASS have yielded inconsistent results (Roelofs et al., 2004). The structure of the PASS scale shows different solutions according to the samples, and more research is needed on this issue.

The seven-item PASS version proposed in this study suggested two factors: an Internal Experiences Factor (4 items: 1, 2, 16, & 19 from the PASS-20) and an Avoidance / Escape Factor (3 items: 7, 9, & 10 from the PASS-20). The Avoidance / Escape Factor corresponds to one of the factors included in the four factor solution found by (Abrams et al., 2007; Coons et al., 2004; Larsen et al., 1997; Page et al., 2011; Page et al., 2010;

Roelofs et al., 2004; Sánchez- Rodríguez et al., 2016; Zhou et al., 2017). However, only three of the five items fit properly in the 7-PASS. In the present study, the Avoidance / Escape subscale reported the highest internal consistency ('Cronbach's α= 0.73) and factor loadings (range from 0.60 to 0.75). McCracken & Dhingra (2002), comparing a sample with chronic pain with another without this health condition, found significantly higher scores and more variance in this subscale in their chronic pain group. These authors suggest that escape or avoidance behaviors could be the most differentiating factor between people with and without chronic pain, highlighting this theoretical construct's relevance.

Furthermore, avoidance behaviors have an important role in the pain of older people with chronic pain. A meta-analysis by Stubbs and Colleagues (2014) reported that older people with chronic pain were significantly less active than those without, and other researchers have also suggested that avoidance is related to lower levels of physical activity (Larsson et al., 2016; Nelson & Churilla, 2015). Avoidance in older people may be due to feelings of frailty, fear of falling, fear of pain, or a possible injury (Larsson et al., 2016; Stubbs et al., 2014). In this line, some research suggested that the fear of pain would lead to future pain-related avoidance (Hadjistavropoulos et al., 2007). According to the fear of falling or the fear of a reinjury it is hypothesized that older people could become mired in a vicious fear–avoidance cycle at the time of injury or disease onset and therefore develop poorer adaptations to illness and rehabilitation outcomes (Hadjistavropoulos et al., 2007). To summarize, the fear of pain or fear of falls could evoke avoidance strategies in older people and this avoidance could have especially negative consequences in this population, as deconditioning, a decrease of a recovery from injuries or physical activity, or even being paradoxically more prone to falls and pain (Cumming, Salkeld, Thomas, & Szonvi, 2000;

Hadjistavropoulos et al., 2007). The present study's findings provide support to the importance of these variables in older people with chronic pain.

Regarding the Factor of Internal Experiences of the Anxiety, four items fit properly in the 7-PASS. Two of these items belonged to the Cognitive Anxiety Factor of the original scale, and the other two items were from the Physiological Anxiety Factor of the original PASS-20 (McCracken & Dhingra, 2002). No item of the Fear Factor of the McCracken' 's scale (McCracken & Dhingra, 2002) remained in the PASS-7 proposed in this study. The theoretical explications of these results are controversial. It is possible that this could be explained by the differences in the anxiety experience in elderly. Anxiety disorders do seem to have different presentations in older adults compared with other age populations (Myloyan et al., 2014). For example, somatic symptoms as fatigue, unrest, concentration difficulties, dizziness or stomach upset are the most typical symptoms in the anxiety in late life (DiefenBach & Goethe, 2006). Indeed, older adult samples present less worries than adults with anxiety (Myloyan et al., 2014). Furthermore, older people are often a population with high rates of health conditions, specifically chronic pain (Larsson et al., 2017) and anxiety disorders (Baxter et al., 2013), which usually occur comorbidly in late-life. This co-occurrence of different illness is especially common in older adults living in nursing homes (Takai, Yamamoto-Mitani, Okamoto, Koyama, &, Honda, 2010). In this sense, this comorbidity in older population could result in a specific way of experiencing pain anxiety. Regarding the Fear Factor, no item of this dimension remained in the PASS-7. In an early study of PASS replication proposed initially by McCracken (McCracken, Gross, Hexum, & Semenchuck, 1993), the results showed a version of the PASS with Five- Factor Structure; Catastrophic Thoughts, Physiological Anxiety, Escape /Avoidance, Cognitive Interference and Coping Strategies (Larsen et al., 1997). This

version of the PASS (Larsen et al., 1997) did not have the fear factor and the fear factor items from the original version of the PASS (McCracken et al., 1993) were allocated in Physiological Anxiety, Cognitive Interference and Escape / Avoidance dimensions (Larsen et al., 1997). In this line, previous studies argue that fear are comprised of at least three components, e.g., subjective experience (i.e., cognitions), physiological arousal, and behaviors (Lang, 1968; Rachman and Hodgson, 1974; Hugdahl, 1981). Furthermore, if we attend at the wording of the items in the fear dimension of the PASS-20 (McCracken & Dhingra, 2002), there are items with content very close to the Physiological and Cognitive Anxiety dimensions. Future research should provide more information of the Fear Factor of the PASS instrument. In summary, future studies in this line could focus on increasing the understanding of the phenomenology of older people's anxiety with chronic pain, and design adequate assessment instruments.

The two subscales and the total scale of the PASS-7 showed adequate levels of internal consistency. These results are similar to previous validity studies of the PASS (Roelofs et al., 2004; Sánchez- Rodríguez et al., 2016). With regard to the construct validity of the PASS instrument, in the present study, significant correlations were found between the PASS total score and their subscales and depression and catastrophizing variables. In this sense, greater levels of pain anxiety was associated with higher depression symptoms and catastrophizing beliefs. Previous validity studies of the PASS scale reported similar correlational results (Coons et al., 2004; Page et al., 2010; Zhou et al., 2017), also the same results have been found in older adults with chronic pain living in nursing homes (Lapane et al., 2012; Vargas et al., 2014). Indeed, significant and negative correlations between acceptance of chronic pain and the PASS with their

subscales were found. These results were coherent with previous research (McCracken & Samuel, 2007; Wicksell et al., 2009).

Regarding the PASS variables and pain intensity relation, the Avoidance / Escape subscale was the only dimension that did not correlate with pain severity. Although most PASS validation studies do not include pain intensity measures, this result is contrary to two other PASS validity studies (Coons et al., 2004; Zhou et al., 2017). In a validation of the PASS in children with acute pain, significant correlations between pain anxiety and pain intensity were found a few hours after surgery, while no associations were found with pain severity after two weeks (Page et al., 2010). These authors argue that the PASS scale is a valid measure for concurrent pain intensity and its predictive validity is more related to the affective pain dimension than with the sensory dimension. Furthermore, a longitudinal study of older adults with chronic pain reported that pain-related avoidance was not predictive of pain (Hadjistavropoulos et al., 2007) and supported the necessity of more studies that analyze the role of avoidance behaviors in the pain experience in older people. These results could indicate that the relationship between behavioral avoidance and pain intensity in older people with chronic pain may differ compared to younger people with chronic or acute pain.

As expected, the structure of PASS found in this study differed than for the working-age adult pain population. The two factors, internal experiences and escape/avoidance include present-oriented items focused on the pain experience and on the necessity of avoiding pain exacerbation. This structure my represent a possible different nature of pain anxiety for older people, and specifically living in nursing homes, that may have significant implications for treating chronic pain in this population. Concretely, therapeutic strategies aimed to increase functional autonomy and to increase the

quantity of activities that older people with chronic pain may accomplish (Alonso-Fernández et al., 2013), in combination with prevention of fear-avoidance responses, should take preeminence over strategies for treating helplessness-related cognitions.

This study has several limitations. Firstly, the sample size of this study is low, although relevant considering the difficulty to access participants living in nursing homes that suffer chronic pain. In any case, a larger sample size would have allowed EFA and CFA to be performed on separate samples, which would comply with the scale development recommendations (Netemeyer et al., 2003). Despite this, some authors argued that in a simple factor structure with strong loadings a sample size of 111 is adequate for both power and model convergence (MacCallum, Widaman, Zhang, & Hong, 1999) and other authors suggested that the adequacy of a given sample size depends on the ratio of variables to factors, the sample homogeneity and the communality level (Ferrando y Anguiano-Carrasco, 2010; Beavers, Lounsbury, Richards, Huck, Skolits, et al., 2013). The current study presents a measurement model, but should not be considered a confirmatory test of the factor structure. The current analyses are exploratory and need to be replicated and confirmed in a separate sample. In this sense, future studies are necessary to obtain reliable estimates. In addition, even though MAP and PA have been considered the most accurate procedures to determine the number of components to retain (Zwick and Velicer, 1986), and MAP has been found to perform better and being more accurate for sample sizes of at least 100 participants and for not oblique structures (Caron, 2019), both methods may have a poor performance for oblique structures (Caron, 2019). Moreover, when the approaches to factor identification errors, MAP tends to be underextract and PA tends to overextract (O`Connor, 2000). So, the findings regarding the obtained factor structure should be considered with caution and future studies are needed in

order to confirm the results. In a similar way, considering that average reliability indexes have been found future studies done with older adults with chronic pain are also needed in order to provide support to the internal consistency of the scale. Second, the PASS-20 is an instrument typically validated in adult samples (Coons et al., 2004; Roelofs et al., 2004; Zhou et al., 2017). The finding of a different factor structure in older adult sample could suggest dimensions and item functions with different importance between age ranges, as previous studies suggested (Page et al., 2010). Therefore, additional studies should further assess differences in the experience of anxiety toward pain according to age. Indeed, following different authors' proposals (Sánchez- Rodríguez et al., 2016), the analysis of the PASS-20 in other samples with pain could help clarify the instrument's psychometric properties. Third, this study does not provide longitudinal data of test-retest reliability for the scale. Such research would provide necessary data of the consistency of PASS versions scales analyzed in this study. Fourth, according to our data, the fact that the sample had mostly primary education could influence their response to the questionnaire. Furthermore, participants were not asked to give feedback on the items. In this sense, it could have been necessary to ask the participants about their degree of understanding of the PASS-20. Further research should consider these limitations in order to improve our understanding of the measure.

Conclusions

This study is an initial assessment of the Pain Anxiety Symptoms Scale's psychometric properties in older people in Spain. The results suggest that a short scale with two subscales has the strongest psychometric support: Internal Experiences of Anxiety and

Avoidance Behaviors. Despite the necessity for further validity investigations of the PASS-20 and the PASS-7 structure proposed in this study in older people with chronic pain, the differences found in the structure of the PASS with respect to the original version could reflect that the experience of anxiety toward pain in older people is different to patients studied in previous studies (who were predominantly younger). The specific characteristics of older adults living in nursing homes, such as a greater pain severity or more frequency of illnesses comorbidity (Takai et al., 2010), less access to physical activity, more likely to be sedentary or more probability to be reinforced for passivity as care provided compared to community dwelling older people could explain that the experience of pain anxiety was even more different from adult patients with chronic pain.

Clinical Implications

The brief nature of the scale increases the feasibility of this instrument which could potenitially be utilized in a variety of clinical settings and research studies in future. The brevity of PASS-7 could be useful to assess older people with chronic pain, especially institutionalized older adults, because the instrument could help to reduce their fatigue and accommodate slowed cognitive performance in some older people.

The short version of the PASS-7 would allow early detection of anxiety toward pain and it could contribute to the prevention of the maintenance of pain over time, an increase of the level of functional impairment, or the prevention of the patient`s tendency to respond with escape or maladaptive behaviours, such as increased on

analgesic medication. More attention should be pay to improving pain management in older people, particularly in nursing homes.

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Conflicts of interest

The authors do not have any conflicts of interest to declare.

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Table 1. Demographic characteristics of the sample (N=111).

Duration of pain (years)	
Mean (S.D.)	21.54 (19.96)
Range	1-69
Marital Status n, (%)	
Widowed	62 (55.9%)
Married	19 (17.1%)
Single	23 (20.7%)
Divorced	7 (6.3%)
Education level n, (%)	
Less than primary education	44 (39.6%)
Primary education	58 (52.3%)
Secondary education	7 (6.3%)
Higher education	2 (1.8%)

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Table 2. Means and standard deviations of assessed variables (N= 109).

			Abrams et al., 2007	Roelofs et al., 2003		Zou et al., 2017
			PASS-20	PASS-20		PASS-20
				A	B	
PASS-20		38.01 (22.22	38.62 (20.38)	68.4 (32.9)	84.7 (37.7)	37.02 (18.56)
	Cognitive anxiety	12.51 (7.70)	12.27 (6.73)	21.3 (10.2)	23.7 (11.3)	9.74 (6.75)
	Escape-avoidance	9.29 (6.27)	12.84 (6.11)	12.5 (9.6)	18.8 (10.9)	10.71 (5.85)
	Fear	10.09 (7.27)	7.37 (6.38)	18.1 (8.4)	25.2 (9.8)	9.18 (5.58)
	Physiological anxiety	6.26 (6.13)	6.15 (5.69)	16.6 (10.8)	17.0 (11.8)	7.39 (4.85)
CPAQ		66.22 (19.26)				
GDS		11.23 (6.42)				
Catastrophizing		21.47 (14.13)				
Pain severity		5.03 (2.11)				

Note: PASS-20: Pain Anxiety Symptom Scale; CPAQ: Chronic Pain Acceptance Questionnaire; GDS: Geriatric Depression Scale; Abrams et al., 2007 (PASS-20) means and standard deviations of their clinical sample; Roelofs et al., 2003 (PASS) descriptive data of their Fibromyalgia sample (A) and of their Chronic Low Back Pain sample (B); Zou et al., 2017 (PASS-20) descriptive results of their Chinese sample.

Table 3. Descriptive data, Communalities (h^2), Factor loading, Skewness, Kurtosis, Fiability and Variance Explained of PASS versions (N=109).

Item	**X (S.D.)**	**h^2**	**Item loading**		**Skew**	**Kurtosis**	**PASS-7**				
			F1	**F2**			**λ**	**α if item deleted**	**h^2**	**F1**	**F2**
1. I can´t think straight when in pain	2.15 (2.11)	.264	.464	.082	0.26	- 1.71	0.83	0.74	.462	.598	
2. During painful episodes it is difficult for me to think of anything besides the pain	2.31 (2.01)	.467	.610	.120	0.16	- 1.62	0.89	0.73	.678	.872	
3. When I hurt I think about pain constantly	2.66 (2.00)	.549	.826	-.183	- 0.04	- 1.62					
4. I find it hard to concentrate when I hurt	2.39 (1.98)	.528	.761	-.065	0.11	- 1.58					
5. I worry when I am in pain	3.01 (2.02)	.366	.626	-.040	- 0.44	- 1.47					
6. I go immediately to bed when I feel severe pain	0.94 (1.58)	.100	.298	.030	1.61	1.28					
7. I will stop any activity as soon as I sense pain coming on	1.92 (2.07)	.300	.486	.100	0.50	- 1.45	0.82	0.73	.626		.806
8. As soon as pain comes on I take medication to reduce it	1.60 (1.99)	.032	.207	-.064	0.81	- 1.04					
9. I avoid important activities when I hurt	2.00 (2.09)	.345	.550	.063	0.39	- 1.60	0.73	0.73	.482		.635
10. I try to avoid activities that cause pain	2.84 (2.08)	.285	.577	-.088	- 0.31	- 1.61	0.83	0.75	.583		.635
11. I think that if my pain gets too severe, it will never decrease	1.88 (1.94)	.212	.145	.364	0.53	- 1.28					

Table 3. Continue

	X (S.D.)	h^2	Item loading		Skew	Kurtosis	PASS-7				
			F1	F2			λ	α if item deleted	h^2	F1	F2
12. When I feel pain I am afraid that something terrible will happen	1.68 (2.04)	.529	.332	.489	0.67	- 1.30					
13. When I feel pain I think that I might be seriously ill	1.32 (1.92)	.541	.409	.426	1.06	- 0.59					
14. Pain sensations are terrifying	3.12 (2.11)	.377	.420	.273	- 0.52	- 1.49					
15. When pain comes on strong I think that I might become paralysed or more disabled	2.07 (2.01)	.243	.391	.154	0.39	- 1.45					
16. I begin trembling when engaged in an activity that increases pain	1.35 (1.91)	.431	.498	.233	1.01	- 0.70	0.51	0.74	.444		.482
17. Pain seems to cause my heart to pound or race	1.67 (1.91)	.214	.295	.229	0.65	- 1.13					
18. When I sense pain I feel dizzy or faint	1.01 (1.67)	.694	-.351	.974	1.41	- 0.49					
19. Pain Makes me nauseous	0.95 (1.66)	.572	-.074	.795	1.61	- 1.13	0.57	0.75	.458		.528
20. I find it difficult to calm my body down after periods of pain	1.25 (1.76)	.353	.081	.546	1.14	- 0.13					

Table 3. Continue

PASS-7	**Total of variance explained**	60.98		
	α Cronbach	**I.E.** 0.70	**E.** 0.73	**T.** 0.77

λ= factor loadings, P.A. = Internal Experiences Factor, E= Escape/Avoidance Factor, T= Total Factor

Table 4. Pain Anxiety Symptoms Scale (PASS-20): summary of maximum likelihood confirmatory analysis results (N=109).

Model	**χ2/df**	**CMIN/df**	**RMSEA**	**p**	**GFI**	**AGFI**	**TLI**	**CFI**
PASS-20	278.1/164	1.696	0.08	0.00	0.80	0.74	0.82	0.84
PASS-7	14.57/413	1.121	0.03	0.33	0.96	0.92	0.98	0.99

Note: χ^2 /df= relative chi-square, **Δ-** Difference (Δχ2/Δdf), CMIN/ df= Minimun Discrepancy Function/ Degrees of Freedom, RMSEA= root mean square error of approximation, GFI= goodness of fit index, AGFI= adjusted goodness of fit index; TLI= Tucker-Lewis Index; CFI= comparative fit index.

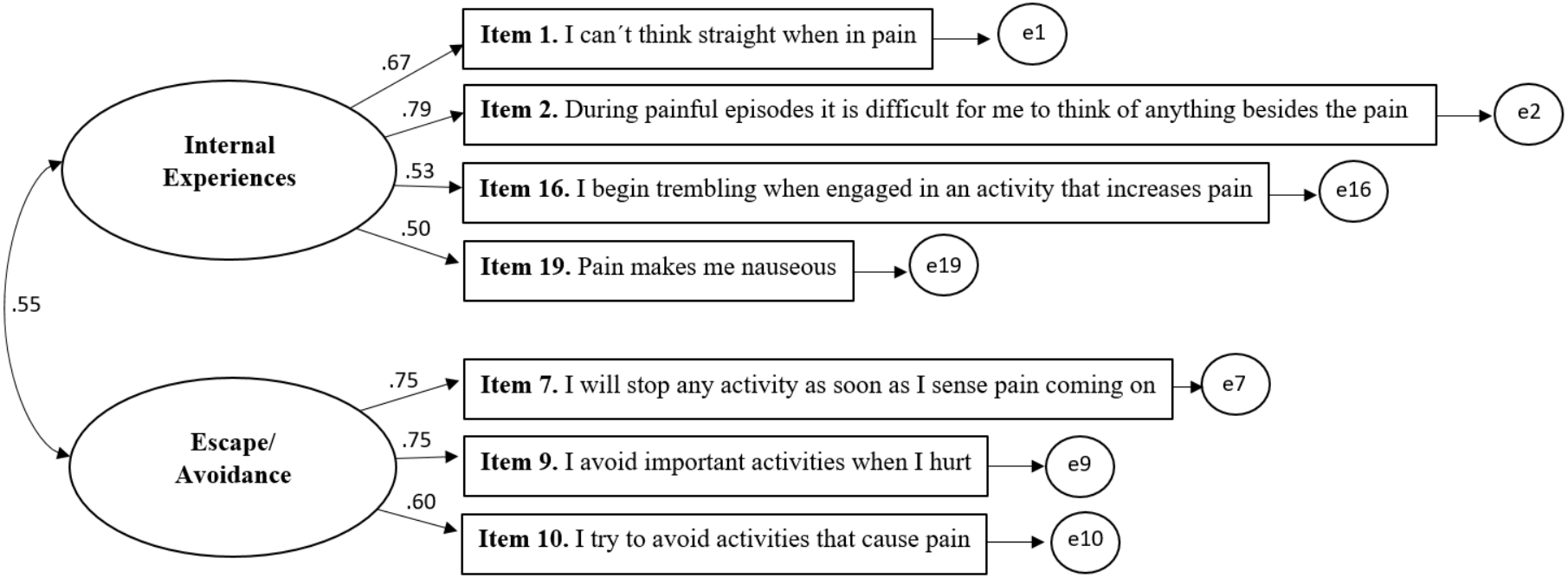
Table 5. Correlations of the assessed variables (N= 109).

	1	2	3	4	5	6	7	8	9	10	11	12
PASS-20												
1.Total Score												
2. Cognitive Anxiety	.826**											
3. Fear of Pain	.740**	.584**										
4. Escape/ Avoidance	.860**	.538**	.466**									
5. Physiological anxiety	.801**	.502**	.714**	.411**								
PASS-7												
6.Total Score	.915**	.796**	.694**	.694**	.689**							
7. Internal Experiences	.843**	.825**	.692**	.692**	.737**	.866**						
8. Escape/ Avoidance	.703**	.899**	.474**	.474**	.415**	.830**	.439**					
9.CPAQ	-	-.603**	-.505**	-.456**	-.497**	-.633**	-	-				
10.GDS	.495**	.397**	.387**	.291**	.547**	.465**	.464**	.317**	-.420**			
11.Catastrophizing	.768**	.701**	.755**	.446**	.545**	.654**	.652**	.446**	-.593**	.343**		
12. Pain severity	.397**	.261**	.466**	.114	.399**	.315**	.382**	.138	-.354**	.292**	.380**	

Note: PASS-20: 20 Items Pain Anxiety Symptom Scale; PASS-7: 7 Items Pain Anxiety Symptom Scale; CPAQ; Chronic Pain Acceptance Questionnaire; GDS: Geriatric Depression Scale.

** $p < 0.01$

Figure 1. Structural factor model of the PASS-7.



Structure and loadings of the final version of the PASS-7.

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