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ATTITUDES OF THE ELDERLY TOWARD PHYSICAL ACTIVITY AND EXERCISE. ADAPTATION OF THE OLDER PERSON'S ATTITUDES TOWARD PHYSICAL ACTIVITY AND EXERCISE QUESTIONNAIRE IN SPAIN

Key words: older adults, attitudes, health promotion.

ABSTRACT

In Spain today, few studies have been carried out to provide sufficient information regarding the attitudes of older persons toward physical activity and exercise. The present study was designed to remedy this deficiency by adapting and validating the Older Person's Attitudes Toward Physical Activity and Exercise Questionnaire. Firstly, a panel of experts offered first hand evidence in support of the content validity of the Spanish adaptation of the questionnaire. Evidence regarding the viability of the instrument was obtained through a test-retest pilot study and with the use of internal consistency method. In line with theoretical expectations, respondents who reported more positive attitudes toward physical activity showed better adherence rates. Finally, recommendations for future replications are discussed, considering the fact that the data on predictive validity of the instrument was obtained only at correlational level.

INTRODUCTION

During the last decades Spain's birth rate has become one of the lowest in Europe. Demographic data illustrate a continually growing proportion of elderly people in the Spanish population. In 2003, the number of people aged 65 and older was 17%, and the predictions for the next years are not quite optimistic; this, already high, percentage is expected to increase to an estimated 25% in 2030 [4]. One of the major concerns for the future derives from the fact that older adults constitute a risk population for adopting a sedentary lifestyle that leads to impairments and functional limitations [12, 21]. In this context, sport and exercise science can play a key role in preventing some of the declines associated with ageing and can help reduce disability in old age. Recent studies conclude that

involvement in long-term physical activity can be an effective way to postpone disability and maintain independence [18, 22]. Although the positive benefits of aerobic exercise are nowadays widely accepted, most of the elderly do not exercise at recommended levels [16]. Thus, identification of factors that determinate participation in exercise is vitally important in order to help sedentary older adults to become physically active.

Among the different factors that might influence the successful compliance with long-term exercise is that of attitudes [9, 17, 23]. Nevertheless, there have been very few studies specially designed to investigate attitudes in the elderly population. The study of Terry, Biddle, Chatzisarantis and Bell [19] came to fill this gap by developing the OPAPAEQ, an age-specific instrument for measurement of exercise attitudes. The

OPAPAEQ is a scale specifically designed for adults over 50 years of age. This instrument had been proved to be valid and reliable for measurement of attitudes towards physical activities and exercise. With the completion of the present study we aim to obtain further evidence regarding validation of the OPAPAEQ.

At first, the OPAPAEQ was translated and administrated into the Spanish-speaking population in order to examine its transcultural validity. The complexity of the phenomenon of exercise adherence points to development of specific questionnaires validated in different cultural backgrounds. Nevertheless, to date, no studies have been produced that used an age-specific instrument such as OPAPAEQ in Spain or in any other Spanish-speaking country. Moreover, Doganis and Theodorakis [7] reported that most studies that focused on factors related to an active lifestyle were conducted outside Europe. Kim, Williams and Gill [10] also observed that the majority of research conducted so far on participation motivation took place in English-speaking countries. Yet, what should be carefully considered is the fact that participation in physical activities is a social phenomenon manifested in different ways depending on the diverse conditions prevailing in each country.

The second objective of the present study consisted of gathering preliminary evidence regarding the predictive validity of the instrument. This type of validity was not examined during the original study of Terry et al. [19]. As such, the present study also examined whether there was a correlation between the scores of the OPAPAEQ respondents and the eventuality of continuing or discontinuing the exercise program.

Instrumentation

During the development phase, the creators of the scale [19] concentrated on elaboration of an instrument to identify beliefs and opinions regarding physical activity and exercise. The OPAPAEQ scale was designed to focus on the cognitive component of attitudes. During the developmental phase an exhaustive three-stage procedure took place, including initial item pool construction, consultation with a panel of experts, and exploratory factor and reliability analysis. By the end of the elaboration phase of the instrument, 14 items were retained constituting a final version which comprised four, well-defined subscales (Tension Release, Health Promotion, Vigorous Exercise and Social Benefits). Exploratory and confirmatory factor analyses as well as internal reliability analy-

ses demonstrated satisfactory results regarding the psychometric properties of the instrument.

Development of the European-Spanish version

In order to obtain the most precise translation of the items a double procedure took place. First, a bi-directional translation was carried out by a professional language translator and two bilingual scholars. All 14 items from the original version of the instrument were translated from English into Spanish and then back into English.

Secondly, the first draft of the Spanish version was subjected to a content validation procedure by three prominent experts, all of whom had doctoral degrees: two in physical education and one in psychology. The panel members were invited to reword items from the initial Spanish translation in case their opinion did not appropriately reflect one of the four attitudinal dimensions (Tension Release, Health Promotion, Vigorous Exercise and Social Benefits) proposed in the original English version. The back-translation method indicated several changes regarding the format and the wording of the questionnaire to achieve conceptual equivalence of the measures. Following the steps outlined above the Spanish version was gradually refined. The resulting Spanish version is presented in Table 1.

Pilot study

The objective of this pilot study was to obtain primary evidence regarding the reliability of the draft Spanish version. This phase involved taking a convenience sample of thirty-seven respondents and administering the instrument twice, within the period of two weeks in the same conditions. For the evaluation of the pilot study the intraclass correlation rate was employed. The statistical analysis, evaluating the repeatability of the instrument within the same data, showed an excellent rate on the intraclass correlation coefficient (attitudes: $r = 0.92$) Further evidence of the reliability of the instrument, using the internal consistency method was collected during the main administration of the scale presented below.

Table 1. The Spanish version of the OPAPAEQ as derived from the semantic analysis

Original items	Items adapted
1) Physical activity releases the tension of the individual participant.	1) La actividad física libera la tensión del individuo.
2) Exercise helps to work off emotional tensions and anxieties.	2) El ejercicio físico ayuda a liberar tensiones y ansiedades emocionales.
3) Physical activity in some form is an excellent remedy for the tense, irritable, and anxious person.	3) La actividad física puede ser un remedio excelente para las personas irritables y con ansiedad.
4) Developing one's physical skills leads to mental relaxation and relief from tension.	4) Desarrollar las habilidades físicas ayuda a la relación mental y proporciona alivio contra la tensión.
5) Physical exercise is important in helping a person gain and maintain all around health.	5) El ejercicio físico es importante para conseguir y mantener un buen estado de salud general.
6) Physical exercise is beneficial to the human body.	6) El ejercicio físico es beneficioso para el cuerpo humano.
7) Physical exercise, undertaken with common sense and good judgment, is essential to good health.	7) El ejercicio físico, practicado con sentido común y buen criterio, es esencial para una buena salud.
8) Regular physical activity makes one feel better.	8) La actividad física habitual nos hace sentir mejor.
9) Regular vigorous exercise is necessary for good health.	9) El ejercicio físico intenso y regular es necesario para una buena salud.
10) Vigorous exercise is necessary to maintain one's general health.	10) El ejercicio físico intenso es necesario para mantener su salud general.
11) Vigorous exercise is not necessary to maintain one's general health.	11) El ejercicio físico intenso <u>no</u> es necesario para mantener su salud general.
12) Exercising with other people in the same age range is socially beneficial.	12) Hacer ejercicio con otra gente de la misma edad es beneficioso socialmente.
13) Associating with others in some physical activity is fun.	13) Relacionarse con otras personas al practicar alguna actividad física es divertido.
14) Participation in physical recreation is a satisfying and enriching use of leisure time.	14) Participar en alguna actividad física es un uso satisfactorio y enriquecedor del tiempo libre.

METHODS

Participants

One hundred and eighty-two participants, who were engaged in sport activities for seniors offered by the Municipality of Granada in Spain, constituted the sample of the present study. Their average age was 62.94 years, 60% of the participants were female and 40% were male. The activities in which the subjects participated were aerobics, fitness, tai chi and hall dances. All of the activities were specially designed for older adults.

Instrumentation

The translated 14 items of the OPAPAEQ were employed in order to evaluate its construct validity. According to the original version of the instrument, 5 items were hypothesized to reflect *tension release*, 4 *health promotion*, 7 were supposed to represent the factor of *vigorous exercise* and 5 *social benefits*. Responses were rated on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5, (“strongly agree”). All but one item were positively phrased; in the case of the one item that was negatively phrased, the SPSS software used in the statistical analyses converted the negatively worded questions to positive scores.

Procedure

The Sports Service of the Municipality was contacted so as to explain the characteristics of the study and request collaboration. The participants were fully informed of the fact that the inventory they were supposed to respond to was a preliminary version of a psychological instrument designed to assess attitudes towards Physical Activity and Exercise.

Participation was voluntary and written consent was obtained from each participant. Then, the participants were supplied with general instructions on the way the questionnaire should be filled in. Prior to completing the questionnaires, the researchers reminded the participants that there were no correct or incorrect answers and therefore they were kindly requested to answer as honestly as possible. Finally, the fact that all individual responses would be kept confidential was stressed.

Data analysis

Once the participants' responses were collected, the data was analyzed with the use of the SPSS 10.0.06. As Anastasi and Urbina indicate [1], the primordial characteristics that should be taken into account when evaluating a psychological instrument are validity and reliability. In order to examine the reliability of the instrument the internal consistency method was used. This type of homogeneity analysis is recommended for the measure of reliability with Likert attitude scales [8]. Lastly, it was decided to implement exploratory factor analysis in order to evaluate the construct validity of the instrument.

RESULTS

Psychometric Properties

Descriptive statistics of the 14-item translated Spanish version of the OPAPAEQ are displayed in Table 2. As it can be observed the mean scores of the attitudes subscale were relatively high (i.e. mostly above 3 on a five-point scale) indicating that participants had a positive attitude toward participating in physical activity. A further examination of the data, shows that the majority of the responses fell between the "agree" and the "strongly agree" category, resulting in a relatively "peaked" distribution. The item analysis on the whole, allowed refinements in the scale by detecting doubtful items like item 11: "vigorous exercise is not necessary to maintain one's overall

health." The phrasing of this item, however, probably caused confusion to participants; eighteen of them abstained from answering this item. Furthermore, the examination of the discriminative ratings indicated a low correlation rate between item 11 and the rest of the items ($r = 0.093$). Moreover, as can be seen from the last column of Table 2 in the event of eliminating item 11 a considerable increase of the overall alpha rate is to be expected.

Table 2. Item analysis of the subscale of attitudes

Item	M	SD	Item-total	Alpha if item deleted
1	4.50	1.39	0.552	0.674
2	3.85	1.99	0.125	0.619
3	3.50	1.74	0.371	0.681
4	4.30	1.74	0.430	0.671
5	3.14	1.66	0.537	0.658
6	4.27	1.59	0.630	0.643
7	4.12	1.28	0.372	0.668
8	4.37	1.69	0.437	0.670
9	4.00	1.24	0.536	0.690
10	4.30	1.13	0.399	0.687
11	2.62	1.22	0.093	0.740
12	4.27	0.91	0.635	0.695
13	3.92	1.24	0.536	0.670
14	4.18	0.97	0.304	0.689

Alpha = 0.699

The concept of the construct validity relates to whether a research instrument is measuring what it is supposed to [14]. Exploratory factor analyses were conducted with principal components analysis and oblique rotation. The objective of this analysis is to explore the interrelations between the items of a questionnaire, so that it is possible to identify the items that can be brought together to form a more ample construct known as *factor*. In the present study three criteria were established for factor extraction; a) each factor should have an eigenvalue greater than 1.0 indicating that it can explain more variance than any single item individually; b) each factor should have a Cronbach [5] alpha coefficient greater than 0.60 indicating an acceptable internal consistency; c) factor loadings of 0.40 and above for selecting items; and d) items that would constitute each factor should have a similar content, with a clear orientation, constituting a clear factor that is easy to interpret and identify. In conclusion, following the inventory adaptation and item-trimming procedure, by means of Oblimin rotation, the 14 items of the questionnaire were loaded across four factors, each of which had a clear

orientation and interpretation. In Table 3 the items are distributed into four factors in accordance with their highest loadings.

Factor I. There were four items that recorded the highest loading on factor I (items 1, 2, 4, and 8); these items presented loadings ranging from 0.71 to 0.90 and were directly orientated with a vision of sport as an activity that contains positive psychological effects and releases tension and anxieties. Therefore, this factor corresponds to the factor “Tension Release” in the original version. As far as the composition of this factor in its original version is concerned, in the present study we can observe inclusion of item 8 in the first factor and absence of item 3.

Factor II. Fourth items (3, 5, 6 and 7) were grouped together to form Factor II, ranging from 0.73 to 0.90. The items that make up factor II relate to sport as an activity that enhances health. In relation with the original version, the inclusion of item 3 is accompanied by removal of item 8. The content of these items still seems to refer to exercise and health benefits, therefore the original labeling of this dimension as “health promotion” is considered appropriate for the Spanish version.

Factor III. In this factor the same three items (9, 10, and 11) from the original version were grouped together in the Spanish version as well. The loadings of the items on factor III were between -0.72 and 0.74 . This factor comprises items in which the dominant notion is related to the *inten-*

Table 3. Factor loadings of Sp-AMSQEP

Items	F 1	F 2	F 3	F 4
1) Physical activity releases the tension of the individual participant.	0.90			
2) Exercise helps to work off emotional tensions and anxieties.	0.84			
3) Physical activity in some form is an excellent remedy for the tense, irritable, and anxious person.		0.75		
4) Developing one's physical skills leads to mental relaxation and relief from tension.	0.72			
5) Physical exercise is important in helping a person gain and maintain all around health.		0.89		
6) Physical exercise is beneficial to the human body.		0.90		
7) Physical exercise, undertaken with common sense and good judgment, is essential to good health.		0.73		
8) Regular physical activity makes one feel better.	0.71			
9) Regular vigorous exercise is necessary for good health.			0.74	
10) Vigorous exercise is necessary to maintain one's general health.			0.69	
11) Vigorous exercise is not necessary to maintain one's general health.			-0.72	
12) Exercising with other people in the same age range is socially beneficial.				0.77
13) Associating with others in some physical activity is fun.				0.61
14) Participation in physical recreation is a satisfying and enriching use of leisure time.				0.52

sity of exercise. Thus, this factor was labeled “vigorous exercise”.

Factor IV. Three items (12, 13 and 14) were grouped together, ranging from 0.52 to 0.77, representing factor IV. The naming of factor IV “Social Benefits”, in the original version, seems to be adequate also for the Spanish application since the content of these three items comprised notions of group participation and a vision of sport as an activity that promotes socialization of the participants.

Hence, evidence for the validity of the construct was obtained; additionally, it is relevant to note that all but two items that make up the factors of the Spanish version concur with their original extraction. Finally, this four-factor solution was found to account for 48.0% of the variance.

Drop-Out Analysis

Second part of the analysis represents a series of analyses referring to a possible relationship between the attitudes of our participants and their perseverance in the physical exercise program. The statistical phase that deals with the conditions that validate the hypothesis of such a relationship is named *inductive statistics* or statistical inference. Since such an inference is not precise, our conclusions will be presented in terms of probabilities [20].

In order to examine the predictive validity of the instrument, the data of the dependent variable labelled “adherence” had to be collected; following this aim, during six months the health clubs were visited again in order to examine the participants’ perseverance. The main purpose of the second part of the study was to detect and study correlations and differences, related to attitudes between the two subgroups.

Two subgroups of participants were identified from one hundred and eighty-two, based on a *post hoc* analysis of adherence to the exercise program they were following; the two groups were named as a) Adherents and b) *Drop-outs*.

In order to detect whether the attitudinal variable has a significant influence on exercise adherence univariate analyses were first applied. Firstly, a non *parametrical test* (U Mann-Whitney test) was applied in order to detect differences between the measured variables among *Actives* and *Drop-outs* and, secondly, Spearman’s coefficient

was used to examine the magnitude of correlation between the independent variables and the exercise adherence variable. All statistical analyses were performed using SPSS for Windows, Release 10.

The descriptive data indicate that within a period of six months a large number of the participants (79) dropped out from the physical activity programme that they were following.

Preliminary univariate analyses (U Mann-Whitney test, t-test) indicated that differences existed between *Adherents* and *Drop-outs* depending on the nature of their attitudes towards participation in physical exercise. Additionally, Spearman’s coefficient offered correlational data showing that the independent variable of attitudes (positive correlation) was highly correlated with the adherence to the health club’s programme (Table 4).

It is worth mentioning that we considered it more pertinent to use non-parametrical statistical methods because of the nature of our sample (our study was based on an *intentional* non-probabilistic sample, consequently we can not assume the *normality* of the distribution of our sample).

In order to carry out the U Mann-Whitney non-parametrical test for two independent samples the data were previously set in ranges. The results of this test, as presented in Table 4 offer evidence that the active group was significantly different from the drop-out group as far the scores in the independent variable of attitudes were concerned*.

In accordance with what was mentioned above we used the non-parametrical Spearman’s test in order to carry out the correlation analysis; moreover, we considered this statistical instrument to be the most adequate because of the binomial character of the *adherence* dependent variable. As observed in Table 4 Spearman’s coefficient (0.324) offers evidence of a correlation between the variables of attitudes and adherence.

* Additionally, we carried out a parametrical test (Student’s t-test) and we obtained similar results that confirmed the findings of the non-parametrical test.

Table 4. Attitudes data and its correlation with the adherence variable

	Adherence	N	M	SD	U	R
Attitudes	Drop-out	80	39.74	4.89	3750	0.324
	Actives	50	42.74	2.70		
Sig. Bilateral					0.00	0.00

DISCUSSION

As it was mentioned earlier, the aim of this study was twofold. The primary objective was to adapt and validate the Older Person's Attitudes Toward Physical Activity and Exercise Questionnaire (OPAPAEQ) in a Spanish sample. The secondary purpose was to extend the validity of the instrument obtaining preliminary evidence regarding its ability to differentiate between older adults with a high likelihood of remaining active and of dropping out. In summary, the results of our research provide support for the appropriateness of the Spanish adaptation of the OPAPAEQ and offer preliminary evidence regarding the predictive validity of the instrument.

When examining the psychometric data of the scale, it can be concluded that the Spanish version of the scale reached the required levels. The reliability of the scale was double-examined by the test-retest method and the internal consistency analysis. The test-retest method showed an excellent estimate regarding repeatability of the instrument. However, the obtained internal consistency score ($\alpha = 0.69$) was not as high as in the original version of Terry et al. [19] who reported an alpha rate of 0.78. According to our numerical analysis, this was probably due to inappropriate function of certain items, e.g. item 11; the low correlation rate of this particular item suggests that it should be modified in future administrations of this version of the instrument. As noted above the problem apparently emerged because item 11 was negatively phrased, i.e. in which a negative response is keyed positively [1]. Such items are included in psychosocial scales in order to avoid an affirmative answer to all items. Taken onto account the fact that eighteen of our respondents did not answer this item, two possible solutions are to be considered to avoid similar problems in the future; item 11 could be modified in future studies, possibly by inversing its negative wording and/or emphasis should be placed, during administration of the ques-

tionnaire, on the fact that certain items may be negatively worded.

Another aspect that could possibly explain the difference between the internal consistency scores between the present and the original study is possibly due to the different size of the samples. Terry et al. [19] administrated the OPAPAEQ in a particularly larger sample ($N=471$). Therefore readministration of the Spanish version of the OPAPAEQ using a larger sample is strongly recommended in order to verify whether this has a positive impact on the internal consistency score.

As far as the overall descriptive data analysis is concerned, it appears that the older adults from our sample had very positive attitudes towards toward physical activity and exercise. Their answers, in the great majority of cases, were grouped between the option "*I agree*" and "*I strongly agree*." It is noteworthy that the items that obtained the most positive evaluation (as reflected by the mean scores) were items 1, 4 and 8; all of them corresponding to factor I named "Tension Release". If we tried to synthesize the meaning of this descriptive finding in one single phrase this would be as follows: "Physical activity releases the tension of the individual, [and]... develops one's physical skills that lead to mental relaxation, [and]...makes one feel better (items 1, 4 and 8, respectively).

Nevertheless, it is relevant to point out that these results do not pretend to be representative of the elderly since our sample was not randomly selected. The fact that our respondents were already active people surely influenced their response. According to the Transtheoretical Model (TTM) of behavioral change [13], people have different perceptions and beliefs as they move through a series of changes in their attempt to adopt certain patterns of health behavior. Taking this into account the responses of the participants in the present study correspond to the fourth stage of behavior called "action" (engaging in health-oriented behavior for less than six months). Thus, it could be interesting

for future replications of this study to administer the scale to people as they move through the TTM stages of behavior.

We also found good support for the construct validity of the instrument. The factor analysis produced four factors, identical to the four dimensions determined a priori according to the factor model proposed by Terry et al. [19]. If we compare the factorial distribution of the items in the present study with that of the original version, we can observe a mutual replacement of two items. Item 8, initially belonging to factor II, in our study was positioned in factor I; item 3 which was initially placed in factor I, was positioned in factor II. A further examination of these items shows that these slight modifications are not just consistent with the meanings of the items but they even contribute to a better interpretation of the dimensions. That is to say, item 8 "*Physical activity in some form is an excellent remedy for the tense, irritable, and anxious person*" seems to fit factor I labeled "Tension Release". The same observation is valid for item 3 *Regular physical activity makes one feel better*, which was now grouped together with items 5, 6, 7, forming factor II labeled "Health Promotion."

The results of the drop-out analysis illustrate the problematic phenomenon that induced our research: more than 1/3 of our sample dropped out in the course of six months (n=79). This result is consistent with those from other studies demonstrating that six months is a critical period for dropping out from a physical activity program [2, 3, 6, 11, 13, 15].

Further, the data gathered in the drop-out analysis permitted to obtain positive preliminary evidence regarding the second main objective of the study: the predictive validity of the instrument. The correlational evidence supports the hypothesis of a relationship between the attitudes that the older persons hold toward physical activity and the likelihood of their continuing or discontinuing the physical activity program. It appears that a person with positive attitudes is more likely to stay active than a person who is not strongly convinced. Our results are consistent with those of Wankel et al. [23] who observed that the variable of attitudes was a potential determinant between a group of runners that maintained and another group of runners that dropped out.

The results of the present study allow for some important indications. It appears that a short and simple attitudinal questionnaire such as the OPAPAEQ can be potentially used to identify participants with a high risk of dropping out. Once

these subjects are identified then socio-cognitive interventions can be applied in order to achieve better exercise adherence of older adults. This research follows the same line as those studies that have recently begun to develop specific measures of potential determinants and to evaluate their reliability and validity. Understanding how attitudes, and other possible determinants like motivation and self-efficacy, are associated with maintaining regular exercise is critical for designing effective interventions.

However, it is noteworthy that this evidence was only obtained at a correlational level, therefore, further analyses, such as multiple regression methods, should be included in replications in order to examine which of the four dimensions of the instrument are most significantly related to the exercise adherence. Taking into account the fact that the findings of several studies raise doubts about the potential of attitudes to predict the exercise behaviour, it is obvious that there is still a lot of work to be done in order to obtain sufficient evidence regarding the impact of attitudes as an exercise adherence determinant.

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