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## ORIGINAL

### VALIDATION OF THE QUESTIONNAIRE OF THE TRANSTHEORETICAL MODEL OF CHANGE OF PHYSICAL EXERCISE

### VALIDACIÓN DEL CUESTIONARIO DEL MODELO TRANSTEÓRICO DEL CAMBIO DE EJERCICIO FÍSICO

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## ABSTRACT

The aim of this study was to translate and validate in Spanish the Questionnaire of the Transtheoretical Model of Change of Physical Exercise, of Prochaska and DiClemente (1983), and also to make adaptations and modifications as needed. The sample was composed of 812 people, aged between 14 and 88 years ( $29.5 \pm 21.7$ ) was used. Confirmative factorial analysis, analysis of internal consistency and of predictive validity were carried out. After the confirmative factorial analysis, the Questionnaire of the Theoretical Model of Change of Physical Exercise showed acceptable results ( $\chi^2/g.l.=4,3$ , CFI=0,92, IFI= 0.92, TLI = 0.90, RMSEA = 0.06, SRMR = 0,05). Similarly, internal consistency obtained from the respective dimensions showed values above .70. A positive and significant prediction of the most active stages of the Transtheoretical Model (action and maintenance) was found on the 'intention to be physically active'. This study has enabled the provision of a valid and reliable.

**KEYWORDS:** Transtheoretical model, physical exercise, intention to be physically active, measuring instrument.

## RESUMEN

El objetivo de este estudio fue traducir y validar al español el Cuestionario del Modelo Transteórico del Cambio de Ejercicio Físico de Prochaska y DiClemente (1983). Se utilizó una muestra de 812 personas, entre los 14 y los 88 años ( $29,5 \pm 21,7$ ). Se realizó un análisis factorial confirmatorio, análisis de consistencia interna y validez predictiva. Los resultados del Cuestionario del Modelo Transteórico del Cambio de Ejercicio Físico presentaron valores adecuados ( $\chi^2/g.l.= 4,3$ , CFI = 0,92, IFI = 0,92, TLI = 0,90, RMSEA = 0,06, SRMR = 0,05). La consistencia interna mostró valores encima de .70. Se halló una predicción positiva y significativa de los estadios más activos del Modelo Transteórico sobre la intención de ser físicamente activo. Este estudio ha permitido proporcionar un cuestionario válido y fiable para evaluar el estadio en el que se encuentran las personas con respecto a la práctica de ejercicio físico, en el ámbito español.

**PALABRAS CLAVES:** Modelo transteórico, ejercicio físico, intención de ser físicamente activo, instrumento de medida.

## INTRODUCTION

Nowadays, the interest that arises in the practice of physical exercise is remarkable. According to Moreno, Pardo, Jorge, and Huéscar (2016), during the last three decades, sport practice of the Spanish population between 15 and 65 years has increased considerably, going from 25% in 1980 to 45% during the year 2010, thus increasing the number of older people (55 years or more) who practice some kind of physical-sport activity, being especially important last decade's rise, and the young population that also reflects a gradual increase in sports practice.

Therefore, it is fundamental to analyse the different aspects that may influence the start or maintenance of physical exercise practice on a regular basis, due to the important benefits that said activity has been demonstrating (Moreno, Silva, Pardo, Rodríguez, and Hernández, 2016).

The Transtheoretical Model (TM) was initially the comparative analysis central product of twenty-nine of the relevant and available theories at the end of the 1970s to explain change in the behaviour of drug dependents and cigarette users. The model derived its name from the theoretical principles and components integration of the different analysed intervention systems (Prochaska, 1979).

Other subsequent analyses of human behaviour theories and models, as well as observations of the spontaneous and induced change in the behaviour of tobacco users, and empirical validations of intervention proposals to facilitate the abandonment of the use of substances that generate dependence, were analyzed as evidence about the nature of the stages and the processes that underlie the behavioral change (Prochaska and DiClemente, 1982). These preliminary analyses of the TM application in practice (especially in relation to tobacco consumption and on how people changed their smoking behaviour of their own will or as a consequence of external interventions planned therapeutically) were the first efforts to isolate and describe with greater precision the basic components and stages of the still partially unknown process of changing this risk behaviour for health (Prochaska and DiClemente, 1984).

In the mid-eighties, new advances in theory and practice generated by various research groups with interests in behaviour explanatory models application of tobacco consumption and health-related behaviours, led to the incorporation in the TM of the constructs of self-efficacy, temptation and decision-making balance. This occurred to reinforce the capacity of the stages of change and processes to evaluate and predict the spontaneous and induced change in the behaviour of cigarette consumption (Prochaska and Velicer, 1997).

In the first years of the nineties, in the United States of America and some countries in Europe, the TM was progressively incorporated into the investigations and interventions of a large number of already recognized risk behaviours for health (Prochaska et al., 1994). Several publications recognized the model ability to describe and explain the different stages that are common to most behavioural changes processes (Prochaska and Velicer, 1997). Regarding to this, it stands out the review carried out by Guiraos, Cabrero, Moreno and Muñoz (2009) which validates the measurement instrument reliability and validity of Marcus, Selby, Niaura, and Rossi (1992), as well as the studies of Fahrenwald and Walker (2003), Cheung, et al. (2006), among others, that showed their application usefulness in physical exercise practice intervention programs.

Currently the Transtheoretical Model of Physical Exercise Changes (TMPEC) is used in the interventions design that enables healthy behaviours such as physical exercise practice adoption (Esparza, et al., 2016). The TMPEC has been used in several behavioural changes investigations, among which we can highlight those of González et al., (2015a), Guzmán, Ricardo, Retamozo and Soto (2015), Práxedes, Sevil, Moreno, del Villar and García (2016), and Puigarnau, Foguet, Balcells, Ambrós and Anguera (2016), for physical exercise.

The TM supposes, currently, one of the most promising models in terms of behaviour change comprehension and promotion related to the acquisition of healthy lifestyle habits (DiClemente and Prochaska, 1982, Prochaska and DiClemente, 1983, Prochaska, Norcross, Fowler, Follnick and Abrams, 1992). The TM'Ss main idea is found in the status change construct, which defines a six stages time dimension (Gustavo and Cabrera, 2000, Prochaska and DiClemente, 1983): precontemplation (stage in which people have no intention to change), contemplation (stage in which the person has an intention to change and, potentially, will make a formal attempt to modify their behaviour in the coming months), preparation (stage in which people already make a decision to change and have a commitment to do it, they make small changes and try to change in the immediate future, normally the next 30 days), action (stage in which people make objective changes, measurable and externalized of their behaviour, normally in a time period that ranges between one to six months) and maintenance (it is characterized by the stabilization attempts of the behavioural change already manifested).

The stage concept has been re-evaluated due to the stages temporality criterion and the labels of each of them, however, the levels or change disposition degrees concept that vary according to the motivation degree to abandon or change a behaviour has received ample empirical evidence (Davidson, 2001, DiClemente, 2005). The studies have tried to establish with some precision which are the TM'S proposed processes that should be privileged to favour change, according to the stage where the subjects are, especially in the smoking behaviour (DiClemente, et al. , 1991, Herzog, Abrams, Emmons, Linnan and Shadel, 1999, Perz, DiClemente and Carbonari, 1996, Segan, Borland and Greenwood, 2004), and for other behaviours (Armitage, Sheeran, Conner and Arden, 2004). Rosen (2000) reviewed 47 researches in which it is explain the differential use of change processes according to the motivational stage, for smoking behaviour and other behaviours; as a conclusion it proposes that although the differentiation between the processes through the different stages is valid, the sequencing between the processes is not the same through different behaviours: in the case of smoking modification and other substances consumption it has been determined that first the cognitive-affective processes (experiential processes) are modified to culminate in the behavioural processes, which are more observed in the action and maintenance stages. On the other hand, for other behaviours such as physical exercise and diet, the use of cognitive and behavioural processes has been simultaneous throughout all stages (Flórez-Alarcón, 2005). Partially, this difference in the use of processes between these behaviors has been attributed to the fact that in some, such as smoking, the

change refers to "stop doing" old habits, while in others, such as exercise and ,in part, diets , the change refers to «making» new habits; in the first case it is logical that the fact of stop thinking about old habits is a way of helping oneself to change, while in the second case the fact of thinking about new habits is a way of helping oneself in the stages of action and maintenance.(Flórez-Alarcón, 2005).

In accordance with the above, in some researches where it was used the TM, they have shown difficulties such as having to group stages (Sánchez, García, and Landabaso, 1998), or lack of internal consistency (Fahrenwald and Walker, 2003; Simkin, 1993) supporting these facts the opinion of different researchers (Davidson, 2001, Hodgins, 2001, West, 2005, Wilson and Schlam, 2004) who have criticized the TM concept, questionnaire application problems, as well as the way that the different stages are evaluated.

Usually the stages movement is assumed in order, but in reality, it is about stages cycles, being possible to be carried out in phases prior to the action or stay for a long time in the same stage, emphasizing that the permanence time is only determined by the subject behavioural change. Therefore, motivation will be a determining factor within this model for change to occur (Aspano, Lobato, Leyton, Batista, and Jiménez, 2016, Ingo, Brännström, Andersson, Lunner, and Laplante-Lévesque, 2016; Jiménez, Moreno, Leyton, and Claver, 2015). Deci and Ryan (2012) and Vallerand (2015), define self-determination theory as an empirical theory of human motivation and personality in social contexts, which distinguishes between non-self-determined or self-determined motivation. There are numerous studies that show that a greater self-determined motivation is positively related to a greater commitment and adherence to sports practice, and therefore to the most active exercise change stages: action and maintenance (Aspano, et al., 2016 Buckworth, Lee, Regan, Schneider, and DiClemente, 2007; Landry and Solmon, 2004).

This way, the most self-determined motivation forms have been shown as an important factor for the intention to remain physically active, and, that intention will predict the most active change stages (Almagro, Sáenz-López, González-Cutre, and Moreno-Murcia, 2011, Cecchini, Fernández-Losa, González, and Cecchini, 2013). According to Franco, Coterón, and Pérez-Tejero (2016), the future practice intention is influenced by the individual motivational, attitudinal and behavioural factors.

Therefore, this study main goal was to translate and validate the TMPECQ (Transtheoretical Model of Physical Exercise Changes Questionnaire) into Spanish, in addition to making adaptations and modifications to it, so that it can be applied to the entire population, in relation to the physical exercise practice. To look for external validity evidences, as a secondary objective it were analysed the change stages factors that predict the intention to be physically active. In this sense, it was suggested that the most active TM stages (action and maintenance) would predict in a positive and significant way the Intention to be Physically Active (IPA).

## **MATERIAL AND METHODS**

### **Participants**

This study included 812 people aged between 14 and 60 ( $29.5 \pm 21.7$ ) from a Spanish province, of whom 311 were men and 501 were women. The sample was taken from different maintenance gymnastics groups, as well as high school students and students of the Sports Science Course. The components of this sample group were selected by applying an intentional non-probabilistic sampling by conglomerate (Azorín and Sánchez-Crespo, 1986).

### **Instrument's translation and adaptation**

Following Hambleton (1996) it was carried out a reverse translation of the URICA-E2 questionnaire items. First, they were translated into Spanish, and later a translator from outside the research group translated them back into English, observing a great similarity with the original questionnaire in English. Next, the items were evaluated by four experts in the field (Lynn, 1986), psychologists, who considered that they were adequate to evaluate the construct for which it was created. Once translated, the questionnaire was given to a small group of people with ages similar to the ones in the final study sample to verify its correct understanding. No problems of reading comprehension were reported.

### **Variables and Measurement Instruments**

The original TMPEC questionnaire was initially presented in a study with smokers by Prochaska and DiClemente (1983), and subsequently adapted for use related to physical activity and exercise by Marcus et al. (1992). However, due to applying problems of the original questionnaire discussed in the introduction, and in order to solve this problem, the TMPECQ was divided into two parts. In the first part, in addition, the precontemplation stage was divided into two factors for better understanding by the subject. These were: precontemplation no (he does not intend to practice physical exercise) and precontemplation yes (he does not intend to practice physical exercise but considers it important). The first part refers to the less active stage of change (pre-contemplation no, pre-contemplation yes, contemplation and preparation) oriented only to people who do not practice physical exercise; and the second part refers to the most active stage of change (action and maintenance) directed exclusively to people who already perform physical exercise.

TMPECQ, uses 22 items (Attachment I), for people who are not physically active, which are preceded by the headline "I do not perform regular physical exercise..."; from which 4 factors are extracted: precontemplation no stage (they do not care about Physical Exercise, composed of 6 items) (e.g. "Because I think I do not need it"), precontemplation yes stage (they recognize that it is good, composed of 5 items) (e.g. "But I think it's worth doing"), contemplation stage (composed of 5 items) (e.g. "But I would like to try some physical activity"), and preparation stage (composed of 6 items) (e.g. "I already know



where I am going to practice physical exercise."); as well as 9 more items (Attachment I) for physically active people, which are preceded by the headline "I perform regular physical exercise ...", from which 2 factors are extracted: action stage (composed of 4 items) (e.g. "I have recently started to do regular exercise"), and maintenance stage (composed of 5 items) (e.g. "I have been doing regular physical exercise for a long time and I intend to continue like this"). The answers were collected on a Likert scale, whose score ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

The Intentionality Measure to Be Physically Active (IMPA) was also applied, adapted and translated version into Spanish by Moreno et al. (2007), by Hein, Müür, and Koka (2004), called Intention to be Physically Active Scale (Attachment II), since according to the bibliography, a positive association is expected with TM'S most advanced stages, such as the Action and Maintenance Stages. It consists of a single factor composed of 5 items (e.g. "I like to practice sports"). All the items are answered through a Likert-type scale whose range goes from 0 (totally disagree) to 5 (totally agree).

## **Procedure**

For the information collection, we contacted the management team of the different centres to ask for their collaboration in this study. Participants were asked for a written authorization, and some of their parents due to their underage status. The final scales administration was carried out in the presence of the principal investigator, to briefly explain the objectives and structure, as well as the way to fill them out. During the completion process, the principal investigator solved all the problems that could arise. The time spent in completing the questionnaire by each participant was approximately ten minutes.

## **Data Analysis**

It was carried out an initial analysis of the scales psychometric properties, thus verifying their reliability and validity. First, an internal consistency analysis was performed through Cronbach's alpha. To verify if the structure of the respective factors, with their corresponding items, was correctly adjusted to the Spanish context, it was performed a confirmatory factor analysis (CFA). The used program for the CFA was the EQS 6.1 for Window- Multivariate Software, Inc.

It was considered a goodness-of-fit indexes series. Thus, based on the different authors' contributions (McDonald and Marsh, 1990, Mulaik, et al., 1989, Tucker and Lewis, 1973), the indexes that were considered to evaluate the measurement model goodness were:  $\chi^2$ ,  $\chi^2 / gl$ , RMSEA (Root Mean Square Error of Approximation), RMSR (Root Mean Square Residual) and the incremental indexes (IFI, CFI and TLI).

Finally, to determine the predictive validity, a linear regression analysis was performed using the successive steps technique, using the CTMPEC and the IMPA factors.

The program used for the obtained data analysis was the statistical program IBM SPSS Statistics for Windows, Version 19.0 (Armonk, NY. USA).

## RESULTS

### Confirmatory factor analysis

It was performed a confirmatory factor analysis to evaluate the six factor model of the original TMPECQ version. In the analysis, an indexes combination was taken into account, as advised by Bentler (1995).

For this reason, to determine the scale's adjustment, it were followed the indicators recommended by Byrne (2008):  $\chi^2$ ,  $\chi^2 / gl$ , CFI (Comparative Fit Index), IFI (Incremental Fit Index), TLI (Tucker Lewis Index), RMSEA (Root Mean Square of Approximation) and SRMR (Standardized Root Mean Square Residual). The  $\chi^2$  indicates the observed covariance's similarity with those who predicted in the hypothetical model, but it is very sensitive to the sample size, so authors such as Jöreskog and Sörbom (1993) recommend that in addition it be completed with the  $\chi^2 / gl$ , whose values below 2 indicate a very good model fit, while values below 5 are considered acceptable (Schumacker and Lomax, 2004). The incremental indexes (CFI, IFI, TLI) compare the hypothetical model and the null model, not affected by the sample size. Values higher than 0.90 are considered acceptable (Schumacker and Lomax, 2004). The RMSEA and SRMR error indexes should be less than 0.08 (Browne and Cudeck, 1993, Hu and Bentler, 1999).

The items that had the fewer steps to achieve a satisfactory adjustment were eliminated. The standardized items factorial loads with the highest weight were statistically significant ( $p < 0.01$ ), so it can be concluded that the model presents satisfactory results (see Table 1).



**Table 1.** Standardized Factorial Loads of the Physical Exercise Change Transtheoretical Model Questionnaire (TMPECQ).

<i>Factor</i>	<i>Items</i>	<i>SF</i>
Precontemplation No	1	0,53*
	3	0,56*
	7	0,49*
Precontemplation Yes	2	0,66*
	8	0,03*
	10	0,44*
Contemplation	5	0,93*
	11	0,88*
	13	0,36*
Preparation	4	0,61*
	6	0,78*
	9	0,69*
Action	2	0,76*
	5	0,83*
	6	0,82*
Maintenance	1	0,87*
	3	0,61*
	4	0,87*

Note. SF: Standardized Factor Load; \* $p < 0,01$

The overall model results indicated an optimal fit:  $\chi^2 / g.l = 4.3$ , CFI = 0.92, IFI = 0.92, TLI = 0.90, RMSEA = 0.06, SRMR = 0.05. With these results, it can be concluded that the structural model has a satisfactory global adjustment.

### Descriptive analysis

The mean and standard deviation statistics for each of the TMPECQ and IMPA valid items are shown in table 2. In the TMPECQ, the highest mean correspond to the maintenance factor (M = 3.63, dt = 1.41) and the lowest mean correspond to the precontemplation no factor (M = 1.75, dt = 0.62). The IMPA showed a mean of 3.85 (d.t. = 0.88).

**Table 2.** Descriptive Statistics and Reliability Factors of the Physical Exercise Change Transtheoretical Model Questionnaire (TMPECCQ) and of the Measure of the Intentionality to Be Physically Active (IMPA).

	<i>M</i>	<i>DT</i>	<i>Cronbach Alfa</i>
Precontemplation No	1,75	0,62	0,70
Precontemplation yes	2,21	0,45	0,71
Contemplation	3,76	0,78	0,71
Preparation	3,38	0,93	0,75
Action	3,23	1,27	0,71
Maintenance	3,63	1,41	0,72
IMPA	3,85	0,88	0,82

### Internal consistency analysis

After the analysis, the items were grouped as follows: precontemplation no (1, 3, 7), precontemplation yes (2, 8, 10), contemplation (5, 11, 13), preparation (4, 6, 9), action (2, 5, 6) and maintenance (1, 3, 4). The internal consistency of each of the factors resulting from the factor analysis (Cronbach's alpha), presented the following results: (0.70) precontemplation no, (0.71) precontemplation yes, (0.71) contemplation, (0.75) preparation, (0.71) action, and (0.72) maintenance. Both in the TMPECCQ as in IMPA exceed the criterion value of 0.70 established by Nunnally (1978) to establish an acceptable internal consistency (see Table 1).

### Predictive validity

Table 3 describes the carried out linear regression analyses (using the successive steps technique), being the predictor variables the TM'S dimensions and IPA' criterion variable. This procedure has been used to identify those TM factors that allow predicting the IPA variable value, indicating the variable with the highest predictive capacity and the most adequate model. The excluded variables are not present due to lack of significance ( $p > 0.05$ ). The results meet the model acceptance assumptions, such as the linearity in the relationship between predictor variables and criteria, as well as the homoscedasticity and the residuals normal distribution, whose mean value is 0 and the standard deviation is practically 1 (0.99). In addition, the Durbin-Watson values are adequate (1.73). Pardo and Ruiz (2005) consider that when the statistic is between 1.5 and 2.5 it can be assumed that the residuals are independent, fulfilling the independence assumption of the independent variables regarding to the dependent one. On the other hand, collinearity statistics indicate adequate Tolerance index values (between 0.61 and 1.00) and variance inflation (between 1.00 and 1.65) (Hair, Anderson, Tatham and Black, 1999).

**Table 3.** Linear Regression Analysis (successive steps)

Criterion Validity (IPA)	M	R	R <sup>2</sup>	D-W	Variables Predictors (TM)	B	Sig.	T	VIF
Intention to be Physically Active	1	0,46	0,20	1,73			37,25* **		
					Action	0,46	14,65* **	1,00	1,00
	2	0,64	0,41				32,17* **		
					Action	0,10	2,94**	0,61	1,65
				Maintenance	0,57	16,76* **	0,61	1,65	

Note. IPA = Intention to be Physically Active; TM = Transtheoretical Model. M = Model; D-W = Durbin-Watson; B = Beta; T = Tolerance Index; VIF = Variation Inflation Factor. \* p <0.05; \*\* p <0.01; \*\*\* p <0.001.

As can be seen in Table 3, the analyses indicate that the best model to explain the intention to be physically active has included the predictors Action and Maintenance. Therefore, the variables that predict significantly and positively the intention to be physically active are the stages of action and maintenance, with an explained variance percentage of 41%.

## DISCUSSION

In the last years, there has been a verified growth in the publication of adaptation works and validation of questionnaires in the field of sports psychology in Spain (Cantón, Espejo and Checa, (2015), Gálvez and Morales, (2015), González, et al., (2015b), Trigueros, et al., (2016). This is attributed to the fact that both validated instruments adapted to the language and culture of the users are indispensable for both research and fieldwork.

In this study, the Spanish version of the TMPECQ was validated following a protocolized process of translation and adaptation and later analysing its psychometric properties in a study with people practicing physical exercise.

The scale's cultural and linguistic equivalence has been guaranteed with its original version; in addition, the presented results confirm the psychometric properties and reliability of the TMPECQ Spanish version and confirm that it is a useful instrument to determine the stage of change towards physical exercise practice in different population groups, from 14 to 60 years old.

TMPECQ has application to the entire population. It contrasts with other previously designed instruments for the evaluation of the stages of change towards physical exercise practice, such as the questionnaire of Kearney, Graaf, Damkjaer, and Engstrom (1999), a scale that was translated into Spanish in the Montil' thesis (2004), and that was made to apply exclusively to children between 10 and 13 years.

An obvious fact is the lack of validation to Spanish of questionnaires related to the stages of change. González et al., (2015) used the "Stages of Change Survey" in the planning of physical education teachers, based on the TM (Buckworth, Dishman, O'Connor, and Tomporowski, 2013; Buckworth, et al., 2007; DiClemente, Schlundt, and Gemmell, 2015). However, there is no evidence of being validated.

In the same line, Morínigo and Samudio (2015), used a "Prochaska's Stages" survey that collected the 5 stages of change in relation to lifestyles, including physical activity and diet. They conducted the survey based on the model proposed by James Prochaska in 1979.

Many of the validated questionnaires have referred to addictive behaviours such as alcohol consumption, and one example is the Alcohol Abstinence Self-Efficacy, built by Flórez-Alarcón (2001) based on the Spanish adaptation of the Self-Efficacy General Scale designed by Babler and Schwarzer (1996). This scale is composed of 20 items that evaluate the subject's attitudes towards himself in relation to his capacity to face the temptations that invite him to consume. This adaptation was made under the Prochaska's TM concepts and the Stages of change for smokers by Velicer et al. (1995). This scale belongs to the TM'S questionnaire, it consists of three questions with multiple response choices, which allows locating the person in any of the stages of change.

As a secondary objective, we aimed to provide TMPECQ predictive validity through a regression analysis by successive steps. The obtained data allowed us to corroborate the proposed hypothesis since the most active stages (action and maintenance) predicted positively and significantly the IPA. The rest of the stages (pre-contemplation no, pre-contemplation yes, contemplation and preparation) did not predict the IPA.

There are few studies that relate TM'S most active stages with IPA. However, according to Gurrola, et al. (2013), people who are in the action stage have already changed their behaviour, and begin to do the amount of recommended exercise by investing time and energy in this change. That is, they have made changes in favour of an environment that motivates them to be physically active. Those who are in the maintenance stage work not to relapse and to consolidate the benefits obtained. Once they have been exercising for six months in the action stage, they move on to maintenance.

In this sense, in the action stage the individual has made manifest and perceptible changes in his way of life for at least six months (Prochaska, Redding, and Evers, 1997). That is, they practice physical exercise, and there has been a change in behaviour that has lasted less than six months. In the maintenance stage regarding to physical exercise practice, individuals work to hold on to their commitment, prevent relapse and consolidate the insured benefits. Those who are in this stage are distinguished from those who refer higher levels of self-efficacy and, above all, are considered less likely to relapse (Prochaska and DiClemente, 1984).

TM allows classifying the population according to their adherence degree to physical exercise practice, taking into account not only the intention to practice (Práxedes, et al., 2016), thus, makes sense the positive and significant regression between the most active TM and IPA stages, since the fact of having reached these behaviour stages regarding to the practice of physical exercise manifests the IPA.

There are several limitations to this study that should be taken into consideration for future research; in first place, the fact that it was intended to represent the maximum population diversity, which means that, in some way, the degree of physical exercise practice and type is also variable among participants, since the sample includes population from 14 to 60 years. Another limitation is the lack of evidence for the convergent and divergent scale validity.

On the other hand, the vocabulary used in the statements of the TMPECQ is correct, understandable and its extension appropriate. However, it is recommended to ensure its understanding with the participants before starting the administration of the specific items.

In future investigations it would be interesting to complete the analyses in relation to other properties of the questionnaire such as the test-retest reliability, or the intervention programs sensitivity to increase the physical exercise practice. In order to maximize the future people adherence to physical exercise practice, it is essential to know the stage in which they are as well as the variables that could be intervening at the time that people decide to adopt such behaviour, with the clear purpose of establishing possible intervention guidelines that help professionals in the sector.

## **CONCLUSIONS**

In short, this study has made it possible to provide a valid and reliable questionnaire to evaluate the stage where people are regarding to the practice of physical exercise. However, the instrument psychometric properties should be tested in other sports contexts; perhaps more specific such as school sports, non-federated sports practice or physical exercise in sports centres, since the validation process of an instrument should be continued.

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## ATTACHEMENT I

### ***TRANSTHEORETICAL MODEL OF PHYSICAL EXERCISE CHANGE QUESTIONNAIRE (TMPECQ)***

DID NOT PRACTICE REGULAR PHYSICAL EXERCISE

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1	Because I think I do not need it.	1	2	3	4	5
2	Because I do not have access to a suitable place.	1	2	3	4	5
3	And I'm satisfied to be a sedentary person.	1	2	3	4	5
4	But I'm thinking that I should try to start a regular physical exercise program in the next 6 months.	1	2	3	4	5
5	But I would like to try some physical activity.	1	2	3	4	5
6	But I have already established a day and an hour to start regular physical exercise in the coming weeks.	1	2	3	4	5
7	And I do not plan to do it.	1	2	3	4	5
8	But I think it's worth doing.	1	2	3	4	5
9	But I already know where I'm going to practice physical exercise (gym, park, sports court ...).	1	2	3	4	5
10	Because I cannot count on my surroundings (family, friends ...).	1	2	3	4	5
11	But I wanted to start having a more active life.	1	2	3	4	5
12	Because I do not have energy (I do not feel like it).	1	2	3	4	5
13	But I have considered if I would be able to do it	1	2	3	4	5
14	But I've been thinking that maybe I want to start.	1	2	3	4	5
15	But I consider it important.	1	2	3	4	5
16	But I've been thinking about the possibility of starting to do it.	1	2	3	4	5
17	And I do not worry.	1	2	3	4	5
18	But I am already preparing to start exercising in a group in the following weeks.	1	2	3	4	5
19	But I've already been with a friend to start exercising within the next few weeks.	1	2	3	4	5
20	But I've already been calling friends to find someone to start exercising with me in the next few weeks.	1	2	3	4	5
21	Because I do not consider it important.	1	2	3	4	5
22	Because I do not have time	1	2	3	4	5



PERFORMING REGULAR PHYSICAL EXERCISE ...

1	I have been successful in exercising regularly and I plan to continue.	1	2	3	4	5
2	I have recently started doing regular exercise.	1	2	3	4	5
3	I have been doing regular physical exercise for a long time and I intend to continue like this.	1	2	3	4	5
4	I have managed to keep doing physical exercise in the last six months.	1	2	3	4	5
5	I have started to do regular exercise and I plan to continue.	1	2	3	4	5
6	I have started to exercise regularly in the last six months.	1	2	3	4	5
7	Finally I exercise regularly.	1	2	3	4	5
8	I have been exercising for some time and I plan to continue.	1	2	3	4	5
9	I have completed more than six months doing regular physical exercise.	1	2	3	4	5

**Precontemplation stage (does not mind physical exercise): 1-3-7-12-17-21**

**Precontemplation stage (recognizes that physical exercise is good): 2-8-10-15-22**

**Contemplation Stage: 5-11-13-14-16**

**Preparation stage: 4-6-9-18-19-20**

**Action Stage: 2-5-6-7**

**Maintenance stage: 1-3-4-8-9**

**ATTACHEMENT II**

**INTENTIONALITY TO BE PHYSICALLY ACTIVE MEASURE**

**(IMPA)**

1	I am interested in the development of my physical form.	1	2	3	4	5
2	I like to practice sport.	1	2	3	4	5
3	I would like to be part of a group to do sports.	1	2	3	4	5
4	I would like to stay physically active.	1	2	3	4	5
5	I usually practice physical activity in my free time.	1	2	3	4	5