
Internal consistency of the CHAMPS physical activity questionnaire for Spanish speaking older adults

MARTÍN G. ROSARIO, PT, DSc*; JENNIFFER M. VÁZQUEZ, PT†; WANDA I. CRUZ, PT‡; ALEXIS ORTIZ, PT, Ph D, SCS, CSCS§

Introduction: The Community Healthy Activities Model Program for Seniors (CHAMPS) is a physical activity monitoring questionnaire for people between 65 to 90 years old. This questionnaire has been previously translated to Spanish to be used in the Latin American population.

Purpose: To adapt the Spanish version of the CHAMPS questionnaire to Puerto Rico and assess its internal consistency.

Methods: An external review committee adapted the existent Spanish version of the CHAMPS to be used in the Puerto Rican population. Three older adults participated in a second phase with the purpose of training the research team. After the second phase, 35 older adults participated in a third content adaptation phase. During the third phase, the preliminary Spanish version for Puerto Rico of the CHAMPS was given to the 35 participants to

assess for clarity, vocabulary and understandability. Interviews to each participant in the third phase were carried out to obtain feedback and create a final Spanish version of the CHAMPS for Puerto Rico. After analyses of this phase, the external review committee prepared a final Spanish version of the CHAMPS for Puerto Rico. The final version was administered to 15 older adults (76 ± 6.5 years) to assess the internal consistency by using Cronbach's Alpha analysis.

Results: The questionnaire showed a strong internal consistency of 0.76. The total time to answer the questionnaire was 17.4 minutes.

Conclusion: The Spanish version of the CHAMPS questionnaire for Puerto Rico suggested being an easy to administer and consistent measurement tool to assess physical activity in older adults.

Key words: Reliability, Geriatric patients, Seniors.

In recent years, physical activity has gained an important role in the prevention and treatment of several chronic diseases in addition of being part of a healthy lifestyle (1). In people older than 60 years of age, (2) physical activity is considered a challenge (3) given the difficulties in compliance due to lifestyles, family structure, and illnesses associated with aging (4). Physical activity in older adults helps reduce mortality, (5) decreases the risk of arthritis, (5) reduces the symptoms of depression, (5) maintains several aspects of cognitive function, (5) reduces the risk for diabetes mellitus type II (6), and reduces the risk for falls and subsequent fractures (7). Furthermore, adults older than 50 years of age which

engage in physical activity have more active social lives and create new interpersonal relationships (8).

In Puerto Rico, life expectancy is greater than 70 years of age and is expected that by 2010 more than 19.7% of the population of the island will be older than 65 years of age (9). This increase in life expectancy could significantly affect the health industry, especially, health insurance companies and medical services in general. In the United States alone, Medicare costs for hip fractures during the 1990's averaged \$2.9 billion dollars annually (10). After the year 2000, the direct medical expenses from falls and fractures have reached an approximate annual cost of \$179 million dollars for fatal cases and \$19.3 billions for non fatal injuries in the US (10). For that reason, implementation of physical activity programs for older adults might help reduce health care costs and improve quality of life in this population.

The measurement process of physical activity requires the use of reliable and valid assessment tools (11). One of the most common assessment tools are questionnaires, with the advantage of low cost and easy administration (12). The Community Healthy Activities Model Program for Seniors (CHAMPS), is a questionnaire to assess the

*Department of Sports Medicine & Physical Therapy, San Juan Bautista Medical Center, Caguas, PR; †Professional Therapy, Bayamón, PR; ‡Home Health & Hospice San Lucas, Mayagüez, PR; §Physical Therapy Program, School of Health Professions, University of Puerto Rico, Medical Sciences Campus, San Juan, PR and Department of Physical Education & Recreation, University of Puerto Rico Rio Piedras Campus, San Juan, PR.

Address correspondence to: Alexis Ortiz, PT, Ph.D, SCS, CSCS, Physical Therapy Program, School of Health Professions, University of Puerto Rico, Medical Sciences Campus, San Juan, PR, PO Box 365067, San Juan, PR 00936-5067. Tel: 787-765-2144 • Fax: 787-765-2165 • E-mail: alexisortiz@cprsr.rcm.upr.edu

level of physical activity in older adults (>60 y/o) taking into consideration caloric expenditure and frequency of the activities performed (13). The CHAMPS questionnaire consists of 41 questions in which the responder answers “yes” or “no”. After responding “yes”, the responder specifies the frequency of days and hours per week that the activity was performed within the last four weeks. The types of activities assessed by the CHAMPS questionnaire are activities of daily living at home, exercise and recreational activities. The CHAMPS questionnaire has been translated and adapted to general Latin American Spanish, (13) and its construct validity has been established, but its internal consistency has not been tested.

The purpose of this investigation was to adapt the Spanish version of the CHAMPS questionnaire to Puerto Rico in a population of older adults from 65 to 90 years of age, and assess its internal consistency by using the Cronbach’s alpha coefficient. It was hypothesized that the CHAMPS questionnaire would present an internal consistency greater than .75 based on Portney & Watkins criteria (14).

Methods

Participants

A total sample of convenience of 53 non-institutionalized participants from both sexes (65-90 years old) was recruited from community centers from the San Juan area. This sample size has been recommended by Guillemin, et al. (15) for the processes of adaptation and validation of questionnaires. This sample was divided in three, 35 and 15 participants for three different phases of the study. The inclusion criteria for the participants on this investigation were: 1) ability to read, write and communicate in Spanish and 2) being Puerto Rican. People with chronic illnesses such as hypertension, arthritis, pulmonary problems, and diabetes were included because these conditions are inherent to this age group. The exclusion criteria were: 1) diagnosis of any psychiatric problem that could interfere with cognitive ability, 2) inability to read, write and communicate in Spanish, and 3) dependent persons that require assistance in activities of daily living such as bathing, dressing, eating, among others. Individuals that required assistance in activities of daily living where excluded because these activities were rated by the questionnaire and could not be evaluated individually if someone else was involved in the effort.

Instrumentation

The instrument used in this investigation was the adapted Spanish version of the CHAMPS questionnaire

(questionnaire can be solicited from corresponding author). In addition, a separate socio-demographic questionnaire was used to describe the population.

Procedures

The development and adaptation of the Puerto Rican version of the CHAMPS questionnaire was divided in four phases. The first phase consisted of adapting the current Spanish version of the CHAMPS. For this adaptation, the guidelines recommended by Guillemin, et al. (15) were used. This adaptation included revision, analysis and language modifications performed by a panel of experts. The panel of experts included two translators, one linguist, a researcher, and a gerontologist. The changes made to the original Spanish version of the CHAMPS were written in a form recommended by Beaton, et al. (16) to organize, analyze and implement adaptation to questionnaires. As a result from this first phase, a preliminary version of the CHAMPS was obtained to be used in the Puerto Rican population.

The second phase consisted in training the research team in the questionnaire administration process. This second phase was performed with three volunteers of 65 years of age after reading and signing the consent form approved by the Institutional Review Board. The three participants were not part of the follow-up phases of the study.

The third phase consisted of administering the questionnaire to 35 participants (65-90 years old). During this phase, the researchers were available to answer questions related to the questionnaire. After completion of the questionnaire, the researchers individually interviewed each participant for feedback related to clarity, comprehension, vocabulary, and content of the CHAMPS. The feedback from each participant was analyzed and considered as a whole for a final modified version. The modification of the CHAMPS consisted of changing the original Spanish words to others more commonly used in Puerto Rico and phrase the wording to make it more culturally acceptable. Once modifications to the CHAMPS were performed, the questionnaire was given back to the panel of experts to produce a final version of the CHAMPS for Puerto Rico.

Once a final version of the CHAMPS was obtained (questionnaire can be solicited from corresponding author), the final and fourth stage of the investigation consisted of assessing the internal consistency of the questionnaire. In this stage of the study, the CHAMPS was answered by 15 participants (Table 1) to assess the internal consistency of the items that compose the questionnaire.

Data Analysis

To obtain the internal consistency of all items that compose the CHAMPS, the Cronbach’s alpha coefficient

was determined. The Statistical Package for Social Sciences v. 9.0 (SPSS, Inc., Chicago, IL) was used for the analysis. According to Portney and Watkin's (14) criteria, a Cronbach's alpha of .70 to .90 was considered a strong internal consistency.

Table 1. Socio-demographic characteristics of participants during the internal consistency phase.

Socio-demographic Characteristics	
N	15
Sex	9 Female 6 Male
Age (mean ± SD)	76 ± 6.5 years
Weight (mean ± SD)	79.1 ± 10.1 kg
Height (mean ± SD)	168.3 ± 6.9 cm
Co-morbidities	Arthritis = 6 Diabetes = 4 High blood pressure = 7 Other Cardiac Illnesses = 3 Respiratory illnesses = 3 Other systemic diseases = 3
Educational Level	Elementary school: 6 Junior high school = 5 High school = 3 College = 1

Results

During the initial stages of the investigation, only two items: nine and ten, which asked about playing golf, were modified by similar activities such as playing with a child and gardening. These modifications were performed given the practice of golf is uncommon in the general geriatric population of Puerto Rico.

All 15 participants from the fourth phase answered the whole questionnaire in an average time of 17.4 minutes. Thirteen out of the 15 (87%) participants answered the questionnaire independently while two (13%) of the participants needed clarification in some items. The Cronbach's alpha coefficient for the CHAMPS was .76 demonstrating strong internal consistency between items. Strong internal consistency demonstrates homogeneity of the items which compose the questionnaire indicating the measurement of the domain intended to be measured (14, 17). One item (#16) received 100% negative response (no) indicating that it was not performed by any of the participants. Item number 16, which asks about ice skating and is considered a high energy expenditure activity, needs to be reconsidered because it is not an activity available throughout the entire Island with the exception of the west

coast. Although this question was part of the questionnaire from the beginning, neither the panel of experts or individuals who participated during the initial stages could identify similar activities to substitute this item.

Discussion

The purpose of this investigation was to adapt and establish the internal consistency of the Community Healthy Activities Model Program for Seniors (CHAMPS) questionnaire in Puerto Ricans of 65 to 90 years of age. This is the first investigation in Puerto Rico that assesses the internal consistency of a questionnaire designed to measure physical activity in the geriatric population. It is expected that it will be used to assess physical activity in this population and evaluate the necessity for the implementation of physical and recreational activities in the geriatric population. The results of this investigation supported the hypothesis of obtaining a questionnaire with good internal consistency to measure physical activity in people from 65 to 90 years of age. The internal consistency results obtained in combination with the validity results reported in the original version by Stewart, et al. (13) demonstrate that the CHAMPS questionnaire is an accepted measurement tool to assess physical activity in adults of 65 to 90 years of age.

The Physical Activity Scale for the Elderly (PASE), which is a widely used questionnaire to assess physical activity level in people older than 65 years of age, has shown an internal consistency of .69 (18). While comparing the results of our investigation to the PASE, it can be concluded that the Spanish version for Puerto Rico of the CHAMPS can be accurately used to assess physical activity in the geriatric population surpassing other physical activity assessment questionnaires used in this population. Several factors that helped obtain this internal consistency result was the use of the guide of the American Association of Orthopedic Surgeons for adapting and validating questionnaires (15). Another important aspect that helped obtain a strong internal consistency was the three phase adaptation process in which a panel of experts, in combination with participants from the same age group as subjects, gave feedback and assisted in the modifications of the original Spanish version. However, there were several limitations that needed consideration as limiting factors. First, the participants who encountered problems while filling out the questionnaire reported that their problems were mainly related to the way the items were written. Second, some participants started answering the questionnaire without reading the instructions and they needed a pause for getting correct instructions from the investigators. Another difficulty was that the participants

needed to count to obtain the frequency and total amount of hours per week they participated in a specific activity. Another limiting factor was that the test-retest reliability was not assessed. Hence, at this point in time it is unknown if there is stability over time of the CHAMPS questionnaire. In addition, the sample in this investigation was a sample of convenience from a specific area in the vicinity of San Juan. This fact makes impossible an overall generalization to the population of Puerto Rico. Finally, it was identified that the amount of items in the questionnaire could be too extensive for this population.

Based on the results of this investigation and its limiting factors, few recommendations for future investigations can be made. To minimize the possibility of misinterpretation of the items and instructions, it is recommended that a person be available at all times while the participants fill out the questionnaire to clarify doubts that may arise. Another recommendation to address this matter could be the administration of the CHAMPS in an interview format, with the interviewer filling out the questionnaire based on the responses by the participant. For future investigations, the use of a larger population is warranted if the results are to be generalized to the total population of the island. Furthermore, with the purpose of measuring a larger population and enhancing the time for data collection, the possibility of adapting the CHAMPS questionnaire to a shorter version will reduce data collection time (19). Another important recommendation for future investigations is to establish a day-to-day reliability of the questionnaire to determine its stability over time (14).

Conclusion

Although, the Spanish version for Puerto Rico of the CHAMPS questionnaire appears to exhibit a good internal consistency in assessing physical activity in older adults of 65-90 years of age, future investigations are warranted to assess its validity and test re-test reliability before the impact of physical activity and physically active lifestyles in the geriatric population of Puerto Rico are assessed.

Resumen

El Community Healthy Activities Model Program for Seniors (CHAMPS) es un cuestionario que mide la actividad física en personas de edad avanzada y ha sido traducido al español. El propósito de este estudio fue adaptar la versión en español del cuestionario CHAMPS para personas de 65 a 90 años en Puerto Rico y establecer su consistencia interna. Como parte de la primera fase del estudio piloto, se formó un comité de revisión externo para

un proceso de adaptación cultural y obtener la versión preliminar del cuestionario CHAMPS para Puerto Rico. Una segunda fase fue llevada a cabo con tres participantes con el propósito de entrenar a los investigadores. La versión preliminar y un cuestionario sociodemográfico fueron entregados a 35 participantes que luego fueron entrevistados sobre la comprensibilidad y la claridad de éste durante la tercera fase. Luego de las tres fases iniciales, se obtuvo la versión final del cuestionario que fue entregado a 15 participantes para medir su consistencia interna por medio del alfa de Cronbach. El cuestionario demostró tener una consistencia interna de 0.76 según el coeficiente alfa de Cronbach. El tiempo promedio para completar el cuestionario fue de 17.4 minutos. El cuestionario CHAMPS, versión en español para Puerto Rico, demostró una consistencia interna aceptable y rapidez al administrar. Estos datos sugieren que este cuestionario puede ser recomendado como instrumento para medir actividad física en adultos de edad avanzada.

Acknowledgments

We acknowledge the assistance of Nilda Frontera M.A., Julia Gil, Ph D, Dawn Gillis, MS, Margarita González, M.A., Lourdes Reus, Ph D, Abraham Rosa, Ph D, Mariano Santini, Ph D, Anita Stewart Ph D, and Albert Villanueva, Ph D. Also, we thank Sister Teresita Rivera and Mrs. Iris M. Pérez de Santa.

This investigation was completed as partial fulfillment for graduation for the degree of Master of Science in Physical Therapy by Martín Rosario, Jennifer Vázquez and Wanda Cruz. The authors have no conflict of interest to disclose. This investigation was presented in its abstract form at the 2007 Annual Meeting of The American College of Sports Medicine in New Orleans, LA. This investigation was not funded by any agency.

References

1. United, States, Department, of, Health, and, Human, Services. Healthy People 2010: Understanding and Improving Health. 2 ed. Washington, DC: U.S. Government Printing Office; 2000.
2. Carta de Derechos de la Persona de Edad Avanzada; 1986.
3. Mazzeo RS, Tanaka H. Exercise prescription for the elderly: current recommendations. *Sports Med* 2001;31:809-818.
4. Krems C, Lührmann PM, Neuhäuser-Berthold M. Physical activity in young and elderly subjects. *J Sports Med Phys Fitness* 2004;44:71-76.
5. Sihvonen S, Rantanen T, Heikkinen E. Physical activity and survival in elderly people: a five-year follow-up study. *J Aging Phys Activity* 1998;6:133-140.
6. Laaksonen DE, Lindstrom J, Lakka TA, Eriksson JG, Niskanen L, Wikstrom K, Aunola S, Keinänen-Kiukaanniemi S, Laakso M, Valle TT, Ilanne-Parikka P, Louheranta A, Hamalainen H, Rastas

- M, Salminen V, Cepaitis Z, Hakumaki M, Kaikkonen H, Harkonen P, Sundvall J, Tuomilehto J, Uusitupa M. Physical activity in the prevention of type 2 diabetes: the Finnish diabetes prevention study. *Diabetes* 2005;54:158-165.
7. Gregg EW, Pereira MA, Caspersen CJ. Physical activity, falls, and fractures among older adults: a review of the epidemiologic evidence. *J Am Geriatr Soc* Aug 2000;48:883-893.
 8. Strawbridge WJ, Deleger S, Roberts RE, Kaplan GA. Physical activity reduces the risk of subsequent depression for older adults. *Am J Epidemiol* 2002;156:328-334.
 9. United, States, Census, Bureau. Census 2000 Data for Puerto Rico. Vol 2005: United States Census Bureau; 2000.
 10. National, Center, for, Injury, Prevention, and, Control. Falls and hip fractures among older adults. Centers for Disease Control and Prevention. Available at: URL: <http://www.cdc.gov/ncipc/factsheets/adulthipfx.htm>.
 11. Martinson BC, O'Connor PJ, Pronk NP. Physical inactivity and short-term all-cause mortality in adults with chronic disease. *Arch Intern Med* 2001;161:1173-1180.
 12. VanSwearingen JM, Brach JS. Making geriatric assessment work: selecting useful measures. *Phys Ther* 2001;81:1233-1252.
 13. Stewart AL, Mills KM, King AC, Haskell WL, Gillis D, Ritter PL. CHAMPS physical activity questionnaire for older adults: outcomes for interventions. *Med Sci Sports Exerc* 2001;33:1126-1141.
 14. Portney LG, Watkins MP. Foundations of clinical research: applications to practice. 2nd ed. Upper Saddle River, NJ: Prentice Hall; 2000.
 15. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *J Clin Epidemiol* 1993;46:1417-1432.
 16. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine* 2000;25:3186-3191.
 17. Crocker LM, Algina J. Introduction to classical and modern test theory. New York: Holt, Rinehart, and Winston; 1986.
 18. Washburn RA, Smith KW, Jette AM, Janney CA. The Physical Activity Scale for the Elderly (PASE): development and evaluation. *J Clin Epidemiol* 1993;46:153-162.
 19. Coste J, Guillemin F, Pouchot J, Fermanian J. Methodological approaches to shortening composite measurement scales. *J Clin Epidemiol* 1997;50:247-252.
-