Validation of the Spanish Version of the *Self-Administered Patient Satisfaction Scale* (SAPS) for Total Hip and Knee Arthroplasty

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ABSTRACT

Introduction: Patient satisfaction is an important parameter when evaluating clinical outcomes after total hip (THA) or knee (TKA) arthroplasty. The objective of this work was to validate the Spanish version of the Self-Administered Patient Satisfaction scale (SAPS) for THA or TKA, as well as to study its psychometric properties. **Materials and Methods:** A cross-sectional validation study was carried out to evaluate the content, internal consistency, and criterion validity of the SAPS scale. A total of 105 subjects who were treated with THA or TKA were included. Criterion validity was assessed with the WOMAC scale (Western Ontario and McMaster Universities Osteoarthritis Index) and SF-36 (Short Form 36 Health Survey). **Results:** Fifty patients undergoing THA and 55 undergoing TKA were analyzed at a median follow-up of 14 months (Interquartile range, 11-19) after surgery, with a mean age of 71.3 ± 11.6 years; 73.3% (77) were women. Cronbach's alpha was 0.797, indicating an acceptable internal consistency. A moderate correlation was found between the SAPS scale and the WOMAC scale (Spearman's coefficient: 0.488, p <0.05), as well as with the physical component of the SF-36 (Spearman's coefficient: 0.525, p <0.05).

Conclusion: The Spanish version of the SAPS scale is a valid and reliable tool to measure patient satisfaction after THA or TKA, with psychometric properties similar to those of the original scale.

Keywords: Satisfaction; functionality; total hip arthroplasty; total knee arthroplasty; clinical outcomes.

Level of Evidence: II

Validación al español del instrumento Self-Administered Patient Satisfaction Scale (SAPS) para reemplazo total de cadera o de rodilla

RESUMEN

Introducción: La satisfacción del paciente es un indicador importante al evaluar los resultados clínicos de un reemplazo total de cadera o rodilla. El objetivo de este estudio fue validar al idioma español el instrumento *Self-Administered Patient Satisfaction Scale* (SAPS) para reemplazo total de cadera o rodilla, y estudiar sus propiedades psicométricas. **Materiales y Métodos:** Se realizó un estudio de validación de corte transversal para evaluar el contenido, la consistencia interna y la validez de criterio de la SAPS. Se incluyó a 105 pacientes con reemplazo total de cadera o rodilla. La validez de criterio fue valorada con las escalas WOMAC (*Western Ontario and McMaster Universities Osteoarthritis Index*) y SF-36 (Short form 36 health survey). **Resultados:** Se analizó a 50 pacientes con reemplazo total de cadera y 55 con reemplazo total de rodilla y una mediana de seguimiento de 14 meses (rango intercuartílico, 11-19), con una edad de 71.3 ± 11.6 años; 73,3% (77) eran mujeres. El coeficiente alfa de Cronbach fue de 0,797 indicando una consistencia interna aceptable. La correlación entre las escalas SAPS y WOMAC fue moderada (coeficiente de Spearman 0,488; p <0,05), al igual que con el componente físico de la SF-36 (coeficiente de Spearman 0,525; p <0,05).

Conclusión: La versión en español de la SAPS es una herramienta válida y confiable para medir el grado de satisfacción de los pacientes sometidos a reemplazo total de cadera o rodilla, con propiedades psicométricas similares a las de la escala original.

Palabras clave: Satisfacción; funcionalidad; reemplazo total de cadera; reemplazo total de rodilla; resultados clínicos.

Nivel de Evidencia: II

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How to cite this article: Mantilla M, Stangl-Correa P, Stangl-Herrera W, Cantor E, Echeverry-Vélez A, Palacio JC. Validation of the Spanish Version of the Self-Administered Patient Satisfaction Scale (SAPS) for Total Hip and Knee Arthroplasty. *Rev Asoc Argent Ortop Traumatol* 2022;87(6):765-771. https://doi.org/10.15417/issn.1852-7434.2022.87.6.1535

INTRODUCTION

Osteoarthritis is a common disease in adults >60 years and is considered one of the main causes of pain and disability.[1] Joint replacements in patients with severe osteoarthritis of the hip or knee have been shown to be successful surgical procedures, relieving pain and restoring function for the patient.[2,3] Traditionally, the clinical outcomes of these procedures have been evaluated by measuring objective variables, such as implant survival, range of motion, joint stability, and radiographic results.[4] However, in recent years, the need to involve the opinion of patients has been recognized, and this has led to the implementation of measurement instruments based on the outcomes reported by the patient, known as *Patient-Reported Outcome Measures*, which are focused in determining the degree of relief experienced by the patient in areas such as pain, function and sensation of stiffness.[5,6] The most widely used instruments to assess clinical outcomes after total hip replacement (THR) or total knee replacement (TKR) are: *Western Ontario and McMaster Universities Arthritis Index* (WOMAC),[7] *Harris Hip Score* (HHS),[8] *Knee Society Score* (KSS)[9] and *36-Item Short Form Health Survey* (SF-36).[10] However, none of these scales measure patient satisfaction in isolation and provide a global score aimed at evaluating function or quality of life, and they are also extensive instruments.[11] In 2011, Mahomed et al.[12] proposed the *Self-Administered Patient Satisfaction scale* (SAPS). The SAPS is a short four-item instrument that integrates patient satisfaction and assessment of functional outcomes after a THR or TKR. This scale assesses four areas: overall patient satisfaction with the joint replacement, pain relief, ability to perform house or yard work, and ability to perform recreational activities. It has been shown that the SAPS scale is an instrument with adequate psychometric properties that allows determining patient satisfaction with the results obtained after joint replacement based on their own perception of their state of health.[13,14] This scale is in English and, therefore, the objective of this study was to validate the SAPS scale for TKR or THR in Spanish, as well as to study its psychometric properties.

MATERIALS AND METHODS

An observational, cross-sectional study was carried out to validate the Spanish version of the SAPS scale, analyzing its psychometric properties in terms of content validity, internal consistency, and criterion validity in patients undergoing THR or TKR.

This study was approved by an Institutional Ethics Committee and was carried out according to the principles of the Declaration of Helsinki. All participants gave their informed consent for the study.

Men and women >18 years of age who had undergone a primary TKR or THR between January 2013 and December 2014 were included. Illiterate patients or patients with cognitive alterations that prevented them from answering the questionnaire correctly were excluded. The sample size was determined following the recommendation to include at least 10 participants per item and a minimum of 100 participants.[15] Finally, the analysis included 105 patients who answered all the study questionnaires.

SAPS scale

The SAPS scale was developed in the United States, in English, to assess the degree of patient satisfaction after a THR or TKR.[12] For its preparation, a panel of experts (rheumatologist, orthopedic surgeon and behavioral specialist) defined four research areas (questions/items) and determined scenarios or activities in which patients undergoing a THR or TKR could have a greater degree of disability due to the surgical procedure. Each question is scored on a Likert-type scale (25 points: very dissatisfied, 50 points: somewhat dissatisfied, 75 points: somewhat satisfied, and 100 points: very satisfied) and the overall score is obtained by performing an unweighted average of the four items, with a minimum and maximum score of 25 and 100, respectively. Values close to 100 indicate a higher degree of satisfaction. Each patient responded to the SAPS scale independently and without the presence of their attending physician.

Translation and adaptation of the SAPS scale

The SAPS scale was translated and adapted using the translation - back translation methodology. First, it was translated from English to Spanish by two bilingual translators (translators A and B) independently. Within a week, translator A's version was delivered to translator B and translator B's version was delivered to translator

A for a reverse translation from Spanish to English. In both the translation and back-translation stages, a review committee made up of a rheumatologist and three orthopedic subspecialists in joint replacements analyzed the meaning of the translated questions until a single translation was reached by consensus. The preliminary version of the SAPS scale was applied to a pilot sample of 10 patients in order to assess the appropriate meaning, clarity, and comprehension of the questions. A focus group was created with the objective of obtaining feedback from the patients and thus arriving at the final version in Spanish of the scale. During this stage, the content validity of the scale was assessed.

Other instruments

In addition to the SAPS scale, all the participants were asked to answer the WOMAC and SF-36 instruments to perform the criteria validation. The WOMAC scale was originally created to assess the general state of health in patients with osteoarthritis. It consists of three components: pain, stiffness and function in a total of 24 items, with a total score that varies between 0 and 100 (from best to worst result).[7] For the analysis, the WOMAC scale scores were inverted and therefore scores close to 100 indicated better clinical outcomes. Likewise, the quality of life related to health status was analyzed using the SF-36 questionnaire, which is made up of 36 questions grouped into two dimensions: physical health and mental health. The values of this questionnaire range from 0 to 100, where 100 reflects an optimal state of health.[16]

Statistical Analysis

Continuous variables are represented as mean ± standard deviation or median (interquartile range [IQR]). The adjustment to the normal distribution was analyzed with the Shapiro-Wilk test. Qualitative variables are summarized as absolute frequencies and percentages. Initially, a comparison of the characteristics of the patients who underwent THR or TKR was performed to ensure the homogeneity of the entire cohort. Continuous variables were compared using Student's t test for independent data or the nonparametric Mann-Whitney U test. In the case of qualitative variables, the X2 test or Fisher's exact test was used.

Internal consistency was assessed with Cronbach's alpha coefficient, where values greater than 0.70 represent acceptable reliabilities and those greater than 0.90, the presence of redundant items.[17] The correlation between the SAPS scale and the scores of the WOMAC and SF-36 instruments was evaluated with Spearman's rank correlation coefficient. A p-value <0.05 was considered statistically significant. All analyses were performed using Stata version 13.0 (StataCorp, College, Station, TX, USA).

RESULTS

105 participants were included, 50 had undergone a THR and 55, a TKR. The average age was 71.3 ± 11.6 years and 77.3% were women. All three scales were answered by study participants at a median follow-up of 14 months (IQR 11-19). The reported scores of the SAPS, WOMAC, SF-36 physical component and SF-36 mental component scales were 100 (IQR 93.7-100), 95.0 (90.5-97.0); 50.2 (43.7-55.3) and 60.0 (52.3-63.1), respectively. No statistically significant differences were found regarding age, sex, laterality, and follow-up time between patients with a THR or TKR (p>0.05). The degree of satisfaction reported with the SAPS scale, as well as the scores of the WOMAC scale and the SF-36 questionnaire were similar between the groups (p>0.05) (Table 1).

The majority stated that they were somewhat or very satisfied with the results of the joint replacement in the four items of the SAPS scale. The degree of satisfaction was lower in the items related to the ability to perform domestic, work or recreational activities. The internal consistency analysis showed that the SAPS scale has an acceptable grade, with a Cronbach's alpha coefficient of 0.797. The internal consistency of the SAPS scale did not change when removing any of the items and remained in a range of 0.711 to 0.782 (Table 2).

The WOMAC scale and the SF-36 physical component questionnaire were considered as criteria measures to determine the degree of 'satisfaction' of the patients undergoing a THR or TKR. A statistically significant moderate correlation was obtained between the SAPS scale and the rest of the assessed scales (p <0.05). The correlation between the SAPS and WOMAC scales did not vary according to the type of joint replacement performed. A slight change in the correlation coefficient between the SAPS scale and the SF-36 physical component questionnaire was observed among the group of patients with THR or TKR, the correlation was stronger among the patients who underwent TKR (p <0.05) (Figure).

Table 1. Description of the participants

Characteristics	THR (n = 50)	TKR (n = 55)	p
Age, years, mean ± SD	69.3 ± 13.8	73.1 ± 8.9	0.106
Sex, n (%) Female Male	 34 (68.0) 16 (32.0)	 43 (70.2) 12 (21.8)	0.239
Laterality, n (%) Right Left	 27 (54.0) 23 (46.0)	 34 (61.8) 21 (38.2)	0.417
Follow-up time median (IQR)	14 (11-19)	14 (10-19)	0.799
SAPS, median (IQR)	100 (93.7-100)	100 (87.5-100)	0.311
WOMAC, median (IQR)	95.0 (90.7-98.0)	94.0 (89.0-97.0)	0.322
SF-36 Physical, median (IQR)	51.0 (43.7-57.2)	49.8 (43.6-54.3)	0.333
SF-36 Mental, median (IQR)	60.7 (56.4-63.0)	58.3 (48.8-63.5)	0.277

THR = total hip replacement, TKR = total knee replacement, SD = standard deviation, IQR = interquartile range, SAPS = *Self-Administered Patient Satisfaction scale*, WOMAC = *Western Ontario and McMaster Universities Arthritis Index* , SF-36 = *36-Item Short Form Health Survey*.

Table 2. Distribution of SAPS scale responses and Cronbach's alpha coefficient

SAPS scale	THR (n = 50)	TKR (n = 55)	Total (n = 105)	Cronbach's alphato
How satisfied are you with the results of your surgery? Very satisfied Somewhat satisfied Somewhat dissatisfied Very unsatisfied	 44 (88.0) 5 (10.0) 1 (2.0) 0 (0.0)	 48 (87.3) 6 (10.9) 1 (1.8) 0 (0.0)	 92 (10.5) 11 (10.5) 2 (1.9) 0 (0.0)	0.782
How satisfied are you with the results of your surgery for improving your pain? Very satisfied Somewhat satisfied Somewhat dissatisfied Very unsatisfied	 43 (86.0) 6 (12.0) 0 (0.0) 1 (2.0)	 48 (87.3) 6 (10.9) 0 (0.0) 1 (1.8)	 91 (86.7) 12 (11.4) 0 (0.0) 2 (1.9)	0.711
How satisfied are you with the results of surgery for improving your ability to do home or yard work? Very satisfied Somewhat satisfied Somewhat dissatisfied Very unsatisfied	 43 (86.0) 5 (10.0) 2 (4.0) 0 (0.0)	 41 (74.5) 11 (20.0) 2 (3.6) 1 (1.8)	 84 (80.0) 16 (15.2) 4 (3.8) 1 (0.9)	0.722
How satisfied are you with the results of surgery for improving your ability to do recreational activities? Very satisfied Somewhat satisfied Somewhat dissatisfied Very unsatisfied	 41 (82.0) 5 (10.0) 3 (6.0) 1 (2.0)	 37 (67.3) 12 (21.8) 1 (1.8) 5 (9.1)	 78 (74.3) 17 (16.2) 4 (3.8) 6 (5.7)	0.767

[a]Cronbach's alpha coefficient when removing the question from the SAPS scale.
SAPS = *Self-Administered Patient Satisfaction scale*, THR = total hip replacement, TKR = total knee replacement.

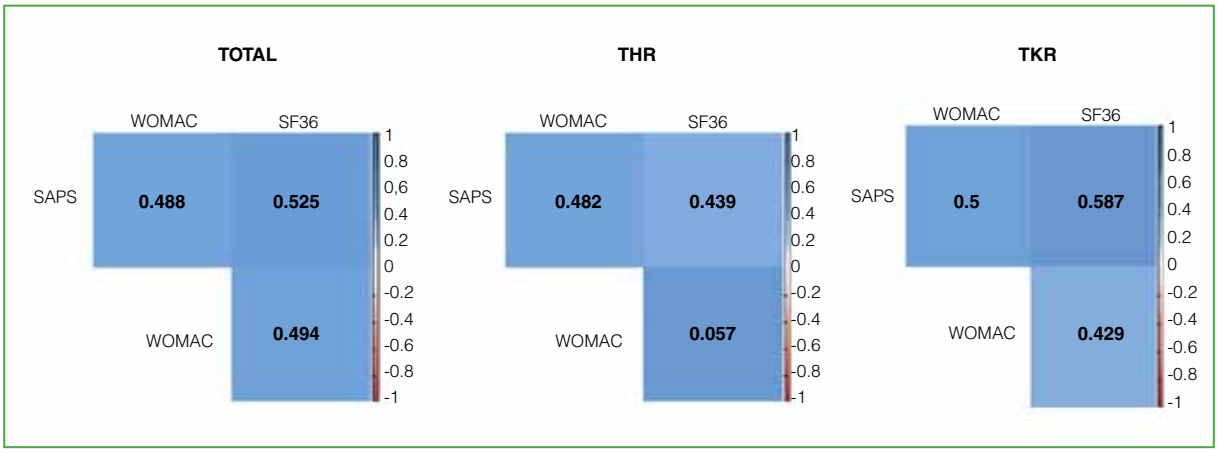

Figure. Spearman's correlation coefficients between the SAPS scale, WOMAC and SF-36 physical component for the total sample and according to the type of joint replacement. THR = total hip replacement, TKR = total knee replacement. SAPS = *Self-Administered Patient Satisfaction scale*, WOMAC = *Western Ontario and McMaster Universities Arthritis Index*, SF-36 = *36-Item Short Form Health Survey*.

DISCUSSION

Pain relief and improvement in function have been the mainstays in determining the efficacy of THR or TKR in patients with severe osteoarthritis. The subjective measurement of these components based on the patient's expectations constitutes a challenge for specialists, since they must be assessed directly by them and not by their treating physician.[4] This has motivated the development of multiple scales that attempt to quantify patient satisfaction after a THR or TKR. However, most of them continue to involve objective measures, such as the range of motion, and are only available in English, in addition to the fact that they cannot be extrapolated to Spanish-speaking populations. The objective of this study was to validate the SAPS scale in Spanish, a brief, easy-to-use instrument designed to directly quantify patient satisfaction with the treatment received, involving personal preferences and expectations.[4,12]

The SAPS scale can be considered a relatively new instrument; therefore, until now, no validation of this instrument in Spanish had been carried out and this study is the first to analyze the psychometric properties of this scale for Spanish-speaking populations. Our results showed that the Spanish version of the SAPS scale has the same psychometric properties as the original version, with acceptable internal consistency and adequate construct validity.[12]

In general, it is possible to divide the concept of satisfaction into two dimensions: determinants and components.[4] Among the determinants are all the factors specific to the patient that are not modifiable by the surgeon (age, sex, comorbidities, degree of osteoarthritis) and that will directly influence their expectations regarding the intervention. On the other hand, the components of satisfaction include the factors associated with hospital care (waiting times, surgical technique, type of anesthesia, dose of analgesia, among others), which are modifiable. For example, a higher degree of satisfaction has been reported after a THR or TKR as the age of the patient increases, especially after 80 years, because this age range has less functional demand.[18,19] Other authors, such as Bourne et al.,[20] have reported that the degree of patient satisfaction is related to postoperative complications, those who suffered at least one complication are 86% more likely to be dissatisfied than those who did not have complications after TKR.

Measurement of satisfaction has been interpreted in different ways, ranging from the use of isolated questions focused on pain reduction (How much pain do you have after surgery?), functional scales (WOMAC, HHS, KSS) to implementation. of validated satisfaction scales (SAPS).[4,21,22] For example, in a systematic review that included 208 articles aimed at measuring patient satisfaction with TKR, Kahlenberg et al. found that only 13% (27 studies) used validated scales that measured function or satisfaction. In six of 27 (22.2%), the SAPS scale had been used and 21% did not explain how they did the measurement.[22] These findings show that there is a

need to introduce standardized instruments that make it possible to objectively measure patient satisfaction after joint replacement.

As with other instruments, the SAPS scale can be used as part of clinical follow-up in order to assess how patient satisfaction evolves. With the SAPS scale, it has been shown that patient satisfaction increases as follow-up time elapses and is correlated with functional improvement and pain relief, as well as being sensitive to the presence of complications.[13,14] Because the SAPS scale is an instrument answered by the patients themselves, it can also represent a valid tool from a legal point of view when there are differences in the perception of the postoperative result between the patient, the treating physician, and the insurers.

This study has limitations. First, due to the research design, it was not possible to measure the sensitivity to change of the SAPS scale in its Spanish version. However, due to the similarity of our results with the original validation, it is expected that this version will also be sensitive to change in the same way as the English version.[12] Second, the sample size did not allow quantifying the internal consistency of the SAPS scale, in a stratified manner, according to the type of joint replacement. However, given the similarity of the observed responses, we do not believe that there are differences depending on the affected joint.

CONCLUSION

The Spanish version of the SAPS scale is a valid and reliable tool to measure the degree of satisfaction of patients undergoing a THR or TKR, with psychometric properties similar to those of the original scale.

Conflict of interest: The authors declare no conflicts of interest.

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