

What is HOOS-12?

HOOS-12 is a 12-item measure derived from the original Hip disability and Osteoarthritis Outcome Score (HOOS) [1,2]. HOOS-12 contains 4 HOOS Pain items, 4 HOOS Function (Activities of Daily Living and Sport/Recreation) items, and 4 HOOS Quality of Life (QOL) items [3]. HOOS-12 reduces respondent burden by 70% from the original HOOS while providing scale scores for hip-specific Pain, Function and QOL, along with a summary measure of overall hip impact. As with the full-length HOOS survey, HOOS-12 is intended to elicit people's opinions about the difficulties they experience due to problems with their hip and covers aspects of pain, functional limitations and hip-related quality of life.

How was HOOS-12 developed?

HOOS-12 items were selected based on their content, along with information from patients, clinicians, and international researchers about item importance and translatability [4]. Item response theory (IRT) models and real-data computerized adaptive test (CAT) simulations also were used to identify items that were best for patients at higher and lower levels of pain and function [4]. Data used for item selection came from a U.S. cohort of nearly 1300 hip osteoarthritis (OA) patients before and after total hip replacement (THR). Reliability, validity and responsiveness of HOOS-12 scales were evaluated in a separate cohort of nearly 1300 U.S. THR patients who had hip osteoarthritis [3].

How are HOOS-12 scales scored?

Each item is scored from 0 to 4, left to right, with 0 representing no hip problems and 4 representing extreme hip problems. HOOS-12 Pain, Function and QOL scale scores are calculated using the method of summated ratings, in which item responses in a scale are simply summed. At least half of the items (i.e. a minimum of 2 items) in a scale must be answered to calculate a scale score, and a person-specific estimate is imputed for any missing item data. HOOS-12 scale scores are transformed so 0 is the worst possible and 100 is the best possible score. This is similar to the method used to score the original HOOS scales, which also are scored using the method of summated ratings and transformed to range from 0 to 100 [5].

The HOOS-12 Summary hip impact score is calculated as the average of the HOOS-12 Pain, HOOS-12 Function, and HOOS-12 QOL scale scores. A Summary impact score is not calculated if any of the three scale scores are missing. The HOOS-12 Summary impact score also ranges from 0 to 100, where 0 is the worst possible and 100 is the best possible score.

An excel-file for calculation of HOOS-12 scores is available at www.koos.nu. This scoring file takes missing items into account, and will not calculate a score if more than 2 items are missing for a scale.

What are the measurement properties of HOOS-12?

Internal consistency reliability (Cronbach's alpha) of HOOS-12 scales ranged from 0.77-0.78 (HOOS-12 Pain), 0.81-0.84 (HOOS-12 Function) and 0.79-0.82 (HOOS-12 QOL) before to 6-12 months after THR in the U.S. hip OA cohort [3]. Internal consistency reliability of the HOOS-12 Summary impact score ranged from 0.91-0.92 before to 6-12 months after THR. Convergent and discriminant validity and responsiveness of the HOOS-12 Pain, Function and QOL scales was satisfactory and reached similar conclusions as comparable HOOS scales. The HOOS-12 Summary score had high effect sizes and standardized response means post-THR [3].

In what patient populations has the HOOS-12 measurement properties been studied?

As of March 2019, HOOS-12 measurement properties have been studied in U.S. hip OA patients with end-stage disease who had total hip replacement. It had not yet been studied in patients with early-stage OA or patients with other hip dysfunctions.

Are there any considerations when HOOS-12 is used with younger, more active patients? HOOS-12 does not include three of the four Sport and Recreation items, including the most difficult one, running. This activity is not performed by some hip OA patients, particularly older patients, and for that reason this item was not included in the 4-item HOOS-12 Function scale. However, activities such as running can be important for younger, more active patients. Thus, it is recommended that the full HOOS Sport/Recreation scale be administered in addition to the HOOS-12 for patients who aspire to high-level function. Administering a total of 15 items (HOOS-12 plus 3 additional HOOS Sport/Recreation items) to younger and more active patients allows for calculation of HOOS-12 scale scores and the HOOS-12 Summary impact score along with the HOOS Sport/Recreation scale score. Calculating both the HOOS-12 Function and HOOS Sport/Recreation scores in these patients allows for long-term follow-up of patients who may decline in hip function over time. In these situations, the three items "squatting", "running" and "twisting/pivoting on loaded leg", should be added to the HOOS-12 after the Function items and before the QOL items. The "walking on an uneven surface" item is already included in HOOS-12.

Are HOOS-12 translations available?

HOOS-12 translations can be developed in any language for which a HOOS translation is available. Directions for doing so are forthcoming. If you want to translate the HOOS-12 into a new language for which a HOOS translation is not available, please contact us to be sure no other translation work in your intended language is currently underway. As with the original HOOS, we recommend that you follow the guidelines for cross-cultural validation proposed by Beaton et al. [6].

Do I need permission to use HOOS-12? Are there any costs associated with using it?

HOOS-12 is available free of charge from www.KOOS.nu. No licensing or permission to use HOOS-12 is required. Please do not change the wording of any part of HOOS-12, or delete any questions or responses. This is for purposes of standardization of content, scoring, and labeling, so users can be assured that the designation HOOS-12 refers to the identical instrument and scoring rules in all cases. This will allow for comparison of scores across multiple studies and other applications.

References

1. Nilsson AK, Lohmander LS, Klässbo M, Roos EM. Hip disability and osteoarthritis outcome score (HOOS)--validity and responsiveness in total hip replacement. *BMC Musculoskelet Disord*. 2003;4:10.
- 2 Klässbo M, Larsson E, Mannevik E. Hip disability and osteoarthritis outcome score. An extension of the Western Ontario and McMaster Universities Osteoarthritis Index. *Scand J Rheumatol*. 2003;32:46-51..
3. Gandek B, Roos EM, Franklin PD, Ware JE, Jr. A 12-item short form of the Hip disability and Osteoarthritis Outcome Score (HOOS-12): tests of reliability, validity and responsiveness. *Osteoarthritis Cartilage*. 2019;27:754-761.
4. Gandek B, Roos EM, Franklin PD, Ware JE, Jr. Item selection for 12-item short forms of the Knee injury and Osteoarthritis Outcome Score (KOOS-12) and Hip disability and Osteoarthritis Outcome Score (HOOS-12). *Osteoarthritis Cartilage* 2019;27:746-753.
5. HOOS Scoring 2013. June 2013.
6. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000; 15:3186-91.