Hierarchization of patient and healthcare professional preferences
among the 24 items of the WOMAC following total hip and total knee arthroplasty: a *best-worst* scaling study

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BACKGROUND

o In an increasingly patient-centered vision of healthcare, it is necessary to take patient preferences into consideration.

o Many patient-reported outcome questionnaires have been developed and validated to date.

o However, most of them do not consider patients' preferences, although they are the first to perceive the consequences of their pathology and the potential benefits of intervention.

OBJECTIVES

o The primary objective of this study was to determine a hierarchy of preferences among the 24 improvements that can be described by the 24 items of the *Western Ontario and McMaster Universities Osteoarthritis Index* (WOMAC) in patients undergoing revalidation for total hip arthroplasty (THA) or total knee arthroplasty (TKA).

o The secondary objective was to compare this patient hierarchy with that of healthcare professionals (HCPs) caring for these patients.

METHODS

Study design

o Cross-sectional, monocentric study, using a Best-Worst Scaling (BWS) "object case" approach to determine a ranking of preferences of patients and HCPs with respect to the 24-item WOMAC.

o The study protocol was approved by the Hospital-Faculty Ethics Committee of Liege University. All participants were informed about the study and procedures, and they provided their consent to participate.

o Patients were invited to participate as they arrived at the *Centre de Revalidation Neurologique et de Réadaptation Fonctionnelle de Fracture-en-Condroz* (CNRF). HCPs were interviewed according to their availability. Participation in the survey was voluntary in both groups.

Study populations

o The first study population comprised patients undergoing rehabilitation after THA or TKA surgery at the CNRF. The exclusion criterion was the inability to answer the questionnaire for cognitive or linguistic reasons.

o The second study population comprised HCPs (doctors, nurses, nursing assistants, physiotherapists, occupational therapists, or others) working at the CNRF in the rehabilitation sector and in charge of THA and TKA patients.

WOMAC questionnaire

o The WOMAC is a 24-item questionnaire assessing three quality of life dimensions, which are deemed relevant and indicative of lower limb osteoarthritis: pain (five items), stiffness (two items), and physical function (17 items). The 24 items are rated using a five-level Likert scale, ranging from 0=no pain/limitation to 4=extreme pain/limitation [1]. Therefore, the WOMAC questionnaire provides self-reported data from patients affected by lower limb osteoarthritis.

Best-worst scaling approach

o BWS enables the ranking of preferences based on choices, and to compare preferences among the set of items considered [2].

o Respondents not only express their preferences among the various items proposed, but they also provide the researcher with information as to which option is the most preferable (best) and the least preferable (worst) for them (FIGURE 1).

o The respondent is asked to choose the ones that seem the most (best) and least (worst) important to him/her. A series of several questions is then generated with a combination of different items, each occurring the same number of times [3].

FIGURE 1 EXAMPLE OF A BWS QUESTION - OBJECT CASE #1

For which of the following 4 symptoms (or difficulties) would you prefer to see an improvement thanks to your hip or knee replacement?

The LEAST important improvement	*By improvement, we mean a reduction in the pain, joint stiffness or difficulty you may be experiencing.*	The MOST important improvement
O	A reduction in the difficulty of walking on a flat surface	O
O	A reduces the pain you feel when going up or down stairs	O
O	A reduction in the stiffness of your joints when you wake up in the morning	O
O	A reduction in difficulty getting out of bed	O

Data analysis

o Bayesian hierarchical regression analyses were carried out to obtain relative importance score (RIS) for each item. RISs were summarized with their mean surrounded by their 95% confidence interval [4].

o The total RIS sum for all items equals 100, with higher scores indicating stronger preferences and a score of 4.17 (100/24) suggestive of equal importance [5].

RESULTS

o RIS comparison between patient and HCP groups revealed significant differences for 10 out of the 24 items of the WOMAC (FIGURE 2).

o In the patient group, the most important items were #22 "PHYSICAL FUNCTION - Getting on/off toilet" ($RIS_{Patients}=7.76\pm2.49$), #5 "PAIN - Standing upright" ($RIS_{Patients}=6.95\pm2.55$), and #14 "PHYSICAL FUNCTION - Getting in/out of car" ($RIS_{Patients}=6.56\pm3.43$).

o For HCPs, the most important improvement was item #13 "PHYSICAL FUNCTION - Walking on flat surfaces" ($RIS_{HCPs}=8.68\pm2.29$), #3 "PAIN - At night while in bed, pain disturbs sleep" and ($RIS_{HCPs}=8.63\pm3.13$) and #1 "PAIN - Walking on a flat surface" ($RIS_{HCPs}=8.26\pm3.30$).

o FIGURE 3 shows the differences measured between the average RIS of patients and those of HCPs. For seven items, RISs were significantly higher for HCPs than for patients (red bars). The largest significant difference between the two groups concerned item #13 "PHYSICAL FUNCTION - Walking on flat surfaces", whose importance attributed by patients was largely overestimated by HCPs (+124.5%).

o However, three items appeared significantly less important to HCPs than to patients (blue bars). The importance attributed by patients to item #14 "PHYSICAL FUNCTION - Getting in/out of car/bus" was the most significantly underestimated (-63.5%) by HCPs.

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ISPOR Europe 2024 | 17-20 November 2024 | Barcelona, Spain

CONCLUSION

o The BWS method allows the **description and prioritization of preferences** among the 24 improvements that can be described by the 24 WOMAC attributes.

o Analysis of the improvement priorities reveals **discrepancies between patients and HCPs**.

o Recognizing these discrepancies could **improve the efficiency of care** by customizing the support offered to patients during rehabilitation based on their unique preference profiles.

RESULTS

TABLE 1 PATIENT CHARACTERISTICS

20 Patients		N (%)	Mean (±SD)
Age (years)			71.0 (±9.1)
Female		13 (65.0%)	
BMI (kg/m²)			29.1 (±5.4)
Type of prosthesis	THA	12 (60.0%)	
	TKA	8 (40.0%)	
Indication	Osteoarthritis	15 (75.0%)	
	Fracture/other	5 (25.0%)	

TABLE 2 HEALTHCARE PROFESSIONAL CHARACTERISTICS

56 HCPs	Participants N (%)	Years of experience Median (IQR)
Total	56 (100%)	5.0 (2.0-13.5)
Nurses	24 (42.9%)	7.0 (3.0-15.2)
Physiotherapists	13 (23.2%)	5.0 (2.0-9.0)
Nursing assistants	7 (12.5%)	5.0 (1.5-15.5)
Occupational therapists	6 (10.7%)	2.0 (1.3-4.3)
Doctors	5 (8.9%)	4.0 (3.0-20.0)
Other (chiropodist)	1 (1.8%)	3.0 (3.0-3.0)

FIGURE 2 MEAN RELATIVE IMPORTANCE SCORES (RISs) FOR PATIENTS AND HCPs REGARDING THE 24 ITEMS OF THE WOMAC
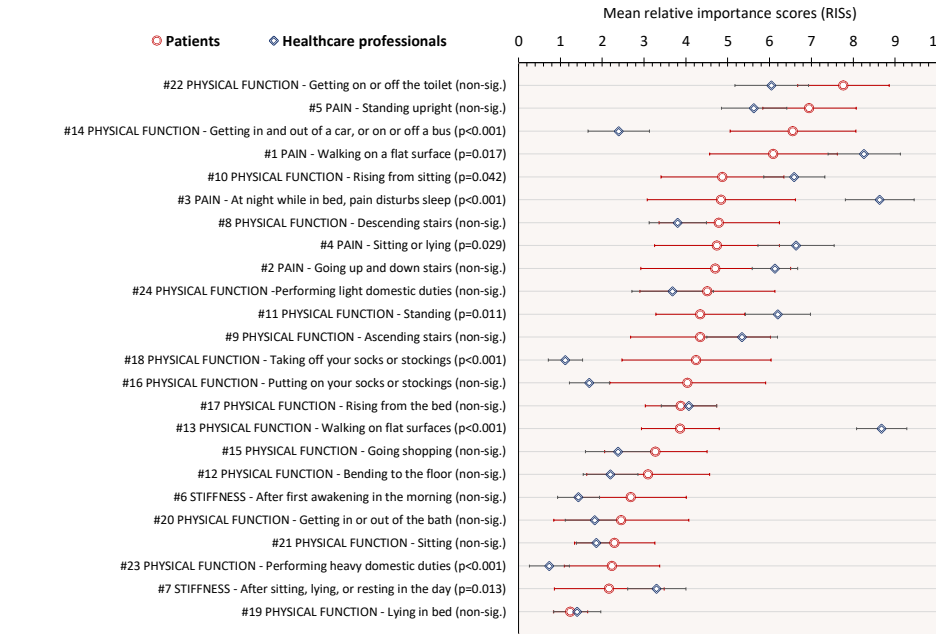

FIGURE 3 DIFFERENCES IN RIS BETWEEN PATIENTS AND HCPs REGARDING THE 24 ITEMS OF THE WOMAC