

Validation of the Knee Osteoarthritis Patient Education Questionnaire (KOPEQ) in a sample of participants with knee osteoarthritis undergoing routine knee replacement by comparison of two measures

Erika Omega Huber (✉ omega-e.huber@zhaw.ch)

Zurich University of Applied Sciences <https://orcid.org/0000-0003-4670-6319>

Axel Boger

Kantonsspital Winterthur

André Meichtry

Zurcher Hochschule fur Angewandte Wissenschaften Hochschulbibliothek Winterthur

Caroline H. Bastiaenen

Universiteit Maastricht

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Abstract

Background: Objective: The aim of this study was to investigate aspects of construct validity, as part of the ongoing developmental process of the Knee Osteoarthritis Patient Education Questionnaire (KOPEQ 2). The subjects were patients with severe knee osteoarthritis who participated routinely in a preoperative educational intervention prior to undergoing a knee replacement operation. Construct validity was compared to an alternative measure with a comparable construct. The design used was a mixed method approach.

Methods: The first step was to reduce the number of items on the first version of the KOPEQ. This was followed by a cross-sectional validation study to compare the revised KOPEQ 2 to a patient-testing protocol GOLD (interview-based), which was tailored to the same patient educational material. The KOPEQ was also correlated with the Short Test of Functional Health Literacy and the Mini-Mental State Examination score, based on a priori hypotheses.

Results: Following item reduction, a relatively high internal consistency for the revised 7-item KOPEQ 2 was found, with a Cronbach's alpha of 0.84 (SE: 0.036). Explanatory factor analysis showed no evidence against a one-factor model (with the first and second eigenvalue being 3.8 and 0.31, respectively). Bayesian Estimation of the correlation between KOPEQ 2 and GOLD was 0.78 (mode) (95% HPD 0.58 – 0.89).

Conclusions: The KOPEQ 2 shows good psychometric properties and can provide support to health professionals by giving valid feedback on how patients experienced the applied patient education intervention while waiting for a knee replacement operation. Further studies are needed to assess the applicability of the KOPEQ 2 outside the fields of knee osteoarthritis and knee replacement.

Background

Before people with osteoarthritis (OA) are scheduled for an invasive intervention, such as knee replacement, they are likely to have accumulated many years of experience with their disease and its management. However, an invasive intervention, such as a knee replacement (KR) operation, is a new event for them and it is important for health professionals to understand patients' perceptions and concerns that they may have (1, 2). Research has been carried-out on preoperative patient education interventions for this patient group, addressing their needs and concerns with respect to their accumulated expertise (3–6) and the potential benefits of KR (7, 8). However, the understandability of the content and the incentivization for patients to “take action” and manage their own health in relation to the offered patient education is a largely unexplored field.

A patient-reported outcome instrument, called the Knee Osteoarthritis Patient Education Questionnaire (KOPEQ), was recently developed to investigate the content of such a preoperative educational intervention from the patients' perspective (3). The theoretical background of the measure itself, ‘validity’ (“the degree to which an instrument truly measures the construct it purposes to measure” (9)), falls within

the field of health literacy. Health literacy is the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions (10, 11). Feasibility, internal consistency and factor structure were investigated in an initial small cross-sectional study.

The following prerequisites for improving the construct validity of the KOPEQ were identified, based on the insights from the factor analysis of the KOPEQ and interviews with patients in the first study: a reduction in the number of items; further investigation into the construct validity of the measure; and a need for a study using a larger sample size.

Based on the developed construct, an educational intervention targeted at a health problem provides patients with the opportunity to take a greater role in decisions about their health issues and to “take action” towards improving their quality of life. To function effectively, people require a basic set of skills to seek, understand and use the offered health information, summarized as “health literacy”.

The aim of this second study was to investigate aspects of construct validity, as part of the ongoing developmental process of the Knee Osteoarthritis Patient Education Questionnaire (KOPEQ 2). The subjects were patients with severe knee osteoarthritis who routinely participated in a preoperative educational intervention prior to a knee replacement operation. Construct validity was compared to an alternative measure based on a comparable construct. The design used was a mixed method approach.

Methods

Design

The aim of the KOPEQ developmental process is to evaluate whether the KOPEQ can meet pre-defined criteria for our construct. The criteria focus on relevance, comprehensiveness and comprehensibility. In order to transparently and systematically answer the questions posed in this second study, further steps are necessary. These steps are described below in successive phases, using qualitative as well as quantitative methods within an integrated approach.

This study used a cross-sectional design and was embedded in the clinical practice of an orthopedic department of the cantonal hospital in Winterthur, Switzerland. Patients with severe OA who are scheduled for a KR operation are offered an educational intervention as part of the hospital’s routine care. This routine intervention was developed in a previous study (3). Several authors recommend the use of easily understandable, special educational material, such as worksheets, handouts, presentations, photos and videos, to improve patients’ self-management. The information should be prioritized according to importance, illustrated and conveyed in plain language, using short sentences without medical terms (12–16). The educational intervention applied in this study consisted of two sessions (with one week in between) and contained all of these recommendations.

Population

Participants were required to be proficient in spoken and written German, scheduled for KR surgery based on OA, treated at the cantonal hospital in Winterthur (inclusion criteria) and have a Mini-Mental State Examination score of greater than 24/30 (17) (exclusion criterion). Eligible participants were given information about the research project at the first educational session, during which written information was also distributed. One week later, following the second educational session, patients were asked whether they would agree to participate in the research study. Fifty percent of the eligible participants gave their written, informed consent.

The study was conducted according to the Declaration of Helsinki (64th WMA General Assembly, Brazil 2013). According to cantonal and federal law, this project did not fall within the scope of responsibilities of the Ethics Committee of the canton of Zurich, Switzerland (Req-2016-00669).

Participants attended a patient education intervention (two sessions) and were asked to complete the KOPEQ 2 some six to ten weeks after their KR surgery. During the same research sessions, participants were asked to participate in the patient-testing (interview) protocol and to undergo the Short Test of Functional Health Literacy (S-TOFHLA) (18).

Index measure

The intention of the KOPEQ (3) is to measure the understandability of a pre-operative educational intervention and to assess its actionability from the patient perspective. Patients had to be scheduled for knee replacement (KR) surgery due to knee osteoarthritis (OA). Within the theoretical field of health literacy, patient education materials are described as understandable, “when consumers of diverse backgrounds (patients) and varying levels of health literacy can process and explain key messages” (19). Patient education materials are described as actionable, “when consumers of diverse backgrounds and varying levels of health literacy can identify what they can do based on the information presented”. The original items of the KOPEQ were developed by four persons from diverse backgrounds (the expert team).

The conceptual framework of Wilson and Cleary (20, 21) served as the methodological guide for both our studies. Based on the concept of the Knee Osteoarthritis Patient Education Intervention, 13 items to assess content were formulated within a formative model approach, and 3 items to assess clinical impact within a reflective model approach. Likert items with a five-point scale were chosen for the scoring option. The items of the KOPEQ were linked to the International Classification of Functioning, Disability and Health (ICF).

Exploratory factor analysis of the scale, in a small homogeneous group of TKR patients who underwent the pre-operational educational intervention, resulted in a 4-factor structure; subscales of didactics, addressability, empowerment and theory. Sixty-one percent of the variance was explained and loading of

the separate items was between 0.47 and 0.96. Internal consistency of the total scale was 0.83 (95% CI 0.71–0.94).

The development of the second version of the KOPEQ (KOPEQ 2) was executed in two phases: 1) a reduction in the number of items in the first version of KOPEQ; and 2) psychometric testing of internal consistency, factor analysis and construct validity. The reduction was considered necessary because some items in the first KOPEQ focused on the practical aspects of the first study (such as the number of intervention sessions). However, these items could form an impediment to implementation of the KOPEQ in other contexts.

Phase 1: Reduction of items from the first version of the KOPEQ

For the process of reducing the KOPEQ items, we used the consensus-based standards for the selection of health measurement instruments (COSMIN) methodology for assessing the content validity of patient-reported outcome measures (PROMs) as a methodological guide (22). According to this guide, ten criteria concerning the three aspects of content validity (relevance, comprehensiveness and comprehensibility) are developed and formulated as questions. The questions should be answered based on information about how the measure was developed, evidence from content validity studies and content.

Through discussions within the expert team, we firstly checked the existing KOPEQ items against the aspect of relevance and removed three items (“benefit of the imparted knowledge during hospitalization”, “benefit of the imparted knowledge after hospitalization” and “less fear of the time after surgery by the imparted knowledge”). The construct of these items did not directly conform to the defined content of the KOPEQ. A fourth item was removed because the preoperative patient education was offered in two sessions in the second study and not in three sessions, as was the case in the initial KOPEQ study.

Secondly, we reviewed the aspect of comprehensibility and changed the wording to be more understandable (items “how was the comprehensibility of the text in the handouts” and “how were my questions answered”).

The impact of the reduction of items was subsequently tested in an exploratory factor analysis (EFA), resulting in a 4-factor-model (3). Internal consistency analysis showed no notable change (16 items versus 12 items) with Cronbach’s Alpha: 0.83 (SE: 0.058) for the 16-item versus 0.88 (SE: 0.026) for the 12-item version, respectively.

The items remaining in the KOPEQ 2 will address more relevant issues, increase understandability and improve actionability for patients undergoing the educational intervention.

Phase 2: Psychometric testing of the KOPEQ 2

In the second phase, the focus of the study was on examining construct validity by comparing the construct of the KOPEQ 2 with alternative measures from conceptually-related constructs. The comparisons were based on a priori hypotheses regarding the strength and direction of the correlation of the constructs of the index and comparator measures. The primary correlation studied was between the sum score of the KOPEQ 2 to the sum score of an interview protocol GOLD (IP), with the latter tailored to the patient educational material.

The secondary correlations of interest were between the KOPEQ 2 and the Short Test of Functional Health Literacy (German version), the Mini-Mental State Examination score and age.

Comparator measures:

- Interview protocol (IP) GOLD A patient-testing IP tailored to the patient educational material (19) based on a mixed methods approach. For us, this is the most accurate measure and is therefore treated as a GOLD standard.
- Before the interview, patients are asked to randomly read or view selected material from the patient educational material
- The interviewer then asks a set of questions to investigate the patient's understanding of the content of the material (understandability) and the extent to which they know what action to take (actionability). Patients could refer to the material as much as needed in order to answer the questions.
- There are 4 types of questions in the protocol:
 - Comprehension questions
 - Numeric-scoring questions (scale 1–10, how easy was the material to understand and/or to action)
 - Open-ended opinion questions
 - Questions that asked patients to describe what information was given in each session, or what a visual-aid was showing
- Short Test of Functional Health Literacy (S-TOFHLA)The S-TOFHLA (18) measures a patient's ability to read and understand health-related materials. The S-TOFHLA has been developed from the TOFHLA (a 50-item reading comprehension test and 17-item numeracy test). The original TOFHLA is extensive, taking 22 minutes to complete. This led to the development of a shorter version taking only 10 minutes to complete. The items selection was based on previous data from a large-scale study that used the TOFHLA. Numeracy items were selected on their perceived importance and frequency of task in the health-care setting, proportion of items answered incorrectly in prior studies and ease of administration. The S-TOFHLA consists of 36 reading comprehension items and 4 numeracy items. Three aspects are measured:

- Reading comprehension is assessed by a test using two reading health-related passages. Each passage has every 5th to 7th word deleted; for each blank word, the participant must select the ones that best complete the sentence from a list of four words. The numeracy test assesses the ability to read and understand numerical information in the form of prescription medication, appointment slips or other health-related material. The items are selected based upon perceived importance and frequency of the task in the health-care setting.
- The total time needed to complete the S-TOFHLA
- The number of points after 7 minutes.

The Swiss, German-language validated version will be used.

- Mini-Mental State Examination (MMSE) The MMSE (17) is a widely-used test for screening cognitive functions. It includes tests of orientation, attention, memory, language and visual-spatial skills.

Potential confounder:

Age measured in years. It is suggested that reading ability may deteriorate with age and thus influence health literacy (23–27).

Sample Size

For an appropriate sample size for research questions regarding validity, we followed the recommendation of a minimum number of 50 persons (28).

Statistical analysis (phase 2)

Hypotheses:

- Comparison between the constructs of the KOPEQ 2 with GOLD (IP). We hypothesize that the two measures are indicators of closely-related constructs and that a strong positive correlation (29) (above 0.7) is expected. This is our primary hypothesis.
- Comparison between the constructs of the KOPEQ 2 and the S-TOPHLA and the MMSE. We hypothesize that the comparators for both constructs with the KOPEQ 2 are only minimally-related and that weak positive correlations (below 0.3) are expected. For the S-TOPHLA, the comparison between the KOPEQ 2 and the aspects of, a) reading comprehension, b) total time needed, and c) number of points after 7 minutes, will be tested separately.

Descriptive statistics were used to describe the population for all collected variables.

The internal consistency of the KOPEQ 2 was investigated using Cronbach's alpha (30). A score above 0.70 was set as an indicator of sufficient reliability (29).

Exploratory factor analysis (EFA) was performed to assess the dimensionality of the KOPEQ 2.

To quantify the construct validity by testing the preset hypotheses, all pairwise correlations were estimated in an exploratory manner. The KOPEQ 2 sum score was correlated with the GOLD sum score. In a second step, the KOPEQ 2 was correlated with the other comparators (S-TOFHLA 1–3 and MMSE). We computed Pearson's correlation coefficient with bootstrapped 95% CI using Fisher transformation. In addition to the Pearson's correlation, a Bayesian estimation of the main quantity of interest (the correlation between KOPEQ 2 and GOLD) was performed by using uninformative priors. We used Gibbs to sample from the posterior distribution. A 95% Highest Posterior Density (HPD) interval for this correlation was constructed.

All analyses were performed using the R statistical software R version 3.5.2 (2018–12–20) (31). For Bayesian analysis, we used JAGS (Just Another Gibbs Sampler).

Data storage and protection

Data was handled confidential and all obtained data were stored confidentially on the ZHAW server and coded according to the rules of the Institute to protect the privacy of the participants. The principal investigator (PI) kept the key of the code safeguarded. Only the PI (EOH) had access to the code. The PI and two members of the project team (epidemiologist and statistician) had access to the data.

Results

Characteristics (patients and variables)

From the total of 50 patients, 35 were females and 15 males. Their education levels were distributed as follows: 1 person on level 1 (primary school); 3 persons on level 2 (secondary school); 36 persons on level 3 (apprenticeship); 1 person on level 4 (high/grammar school); 4 persons on level 5 (higher technical/business school); 2 persons on level 6 (university of applied sciences); and 3 persons on level 7 (university or technical university).

The MMSE scores were above 24 points for all patients, so that nobody had to be excluded.

There were 50 complete observations on the 7-items of the KOPEQ 2 (sum score, mean (SD) = 91.9 (6.99)) and 31 complete observations of the IP items (GOLD) (sum score, mean (SD) = 88.9 (8.12)). The reading comprehension (S-TOPHLA) in points (mean (SD)) was 33.6 (1.89), the time needed in minutes was 10.6 (3.87) and the number of points after 7 minutes was 23.8 (7.61).

The characteristics of all variables are presented in Table 1.

Phase 1

Internal consistency

Based on the ten criteria recommended by COSMIN (29) and a statistical item analysis considering, 1) item whole correlation (for the item against the scale without the item); and 2) analysis of change in internal consistency, we removed another five items: three items because they were not content-relevant, but rather asking about organizational aspects (“division into three sessions”, “how was the session anatomy and function” and “how was the session recommended activities”); and two items because the content was already covered by other items (“how comprehensible was the imparted knowledge” and “how was the arrangement of the handouts”). The following seven items were retained: Item 1, Item 3, Item 4, Item 5, Item 8, Item 11, and Item 12.

A good internal consistency was found for the 7-item KOPEQ 2, with a Cronbach’s alpha of 0.84 (SE: 0.0357).

A synopsis of the reduction of the items of the KOPEQ is presented in Table 2.

Exploratory factor analysis

EFA analysis showed no evidence against a one-factor model with a ratio of 12.3 of the first (3.83) to the second eigenvalue (0.31).

Phase 2

Hypotheses testing

The Pearson’s correlation coefficient between the 7-item KOPEQ 2 and the GOLD was 0.77 (bootstrapped 95% CI: 0.60–0.89), between KOPEQ 2 and S-TOPHLA was 0.15 (–0.18–0.44), –0.02 (–0.33–0.30) and 0.14 (–0.24–0.46) respectively, and between KOPEQ 2 and MMSE was 0.14 (–0.12–0.14). These correlations were not confounded by age (–0.10 (–0.37–0.15)).

All pairwise correlations between the variables are presented in Table 3.

The Bayesian posterior distribution of the correlation between the 7-item KOPEQ 2 and GOLD is shown in Figure 1 (mean: 0.74, mode: 0.78, 95% HPD: 0.58–0.89).

All five of the five hypotheses were confirmed (Table 3).

Discussion

This article describes the second study in the developmental of the KOPEQ that has resulted in the KOPEQ version 2 with only 7 items (based on a reduction in phase 1). Phase 2 reports on the

psychometric testing of the 7-item Knee Osteoarthritis Patient Education Questionnaire (KOPEQ 2). The construct validity is tested by comparing the KOPEQ 2 with related measures based on a priori hypotheses. All five hypotheses were confirmed.

Removing five items and internal consistency

A questionnaire should be as short as scientifically possible, because it increases its feasibility and practicability, which is important for use in clinical practice. The content and statistically-driven reduction from 12 to 7 items is justifiable: removal of items 2, 6 and 7 are based on the argument that these items address organizational issues and not content. How to organize a patient education intervention is controversial. The educational format can range significantly, from the simple delivery of an information booklet or video, to face-to-face verbal communication, to multiple group sessions (32–36). It is therefore justifiable to remove all items concerning the aspect of organization in order to improve the feasibility and practicability of the KOPEQ 2. Removal of item 9 is the outcome of an investigation into internal consistency and is based on its high correlation with items 11 and 12, thus providing no additional information. Item 10 was removed because it was already covered by items 3 and 4. Generally, we assume that these removals are in line with the COSMIN recommendations (29). The 7-item KOPEQ 2 shows strong internal consistency

Construct validity by hypotheses testing

The primary a priori hypothesis on the association between the construct of the KOPEQ 2 and the GOLD (positive correlation above 0.7) was confirmed with a Pearson's correlation coefficient of 0.77 (95% CI 0.60–0.89).

Our four secondaries a priori hypotheses were also confirmed with Pearson's correlation coefficients below 0.30.

The mean time participants took to complete the S-TOFHLA in our study was 10.58 (3.87) minutes, which accords with the completion time of 12 minutes or less of the original S-TOFHLA (37). In the German version of the S-TOFHLA the test must be stopped after 7 minutes, and the cut-off graded. "Adequate health literacy" at this cut-off is deemed to be 23 points (18). Our patients achieved a mean value of 33.6 (1.89) points without time limit and a mean value of 23.8 (7.61) points at the 7-minute cut-off. This is at the lower limit, meaning that some of the patients did not achieve the grade of adequate health literacy. However, without the time limit, our population showed a good health literacy. In addition, the MMSE scores for all patients were above 24 points. Hence, we assume that the study population was competent to complete the questionnaire and respond to the questions of the GOLD measure. Age did not influence the KOPEQ and older people were capable of completing the questionnaire. This is in line with the results for the S-TOFHLA (18), although several studies have reported that levels of health literacy decrease with increasing age (23–27). Our result may be explained by the fact that older people with health conditions

are likely to have accumulated a significant amount of knowledge about their condition over a lengthy period, which has been shown to increase health literacy levels (38).

Limitations

Our study has some limitations. We only used a sample of KR patients recruited from the cantonal hospital in Winterthur and only 50% of the eligible people participated. This could limit the generalizability of the results. Lastly, we did not perform an exploratory factor analysis on a new sample.

Conclusion

The KOPEQ 2 shows good psychometric properties and can help to provide health professionals with valid feedback on how patients with OA on a waiting list for KR judge the applied patient education intervention.

Further investigation is needed to assess the applicability of the KOPEQ 2 outside the fields of knee osteoarthritis and knee replacement.

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Declarations

Ethics approval and consent to participate

According to cantonal and federal law, this project did not fall within the scope of responsibilities of the Ethics Committee of the canton of Zurich, Switzerland (Req–2016–00669). Eligible participants were given information about the research project at the first educational session, during which written information was also distributed. One week later, following the second educational session, patients were asked whether they would agree to participate in the research study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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This research was not funded.

Author's contributions

EOH and CHB designed the study and were the major contributors on writing the manuscript. AM analyzed and interpreted the patient data. AB recruited the participants and performed the educational intervention. AM and AB contributed also to the manuscript. All authors read and approved the final manuscript.

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List Of Abbreviations

KOPEQ: Knee Osteoarthritis Patient Education Questionnaire

OA: Osteoarthritis

KR: Knee replacement

ICF: International Classification of Functioning, Disability and Health

COSMIN: (COnsensus-based Standards for the selection of health Measurement INstruments)

PROMs: Patient-reported outcome measures

IP: interview protocol

S-TOFHLA: Short Test of Functional Health Literacy

MMSE: Mini-Mental State Examination

PI: Principal investigator

Tables

Table 1: Characteristics of all variables

Items	Mean (SD)	Median	Min	Max
Age	72.4 (8.19)	73	53	89
MMSE	28.4 (1.48)	28.5	25	30
S-TOFHLA 1*	33.6 (1.89)	34.0	29	36
S-TOFHLA 2*	10.6 (3.87)	10.0	4.83	23.67
S-TOFHLA 3*	23.8 (7.61)	23.0	10	36
KOPEQ 1	90.5 (14.58)	95.0	15	100
KOPEQ 2	85.7 (18.77)	92.5	0	100
KOPEQ 3	91.8 (10.75)	95.0	52	100
KOPEQ 4	90.6 (11.18)	94.5	44	100
KOPEQ 5	91.8 (7.06)	92.5	72	100
KOPEQ 6	90.4 (11.6)	93.0	38	100
KOPEQ 7	89.5 (17.00)	94.5	0	100
KOPEQ 8	93.4 (6.74)	94.5	73	100
KOPEQ 9	92.7 (7.35)	95.0	71	100
KOPEQ 10	92.3 (7.97)	95.0	71	100
KOPEQ 11	92.7 (7.82)	95.0	73	100
KOPEQ 12	92.7 (7.95)	94.0	69	100
GOLD A1	91.4 (9.78)	94.5	55	100
GOLD A2	91.3 (8.60)	93.0	68	100
GOLD A3	92.1 (8.97)	94.0	62	100
GOLD A4	8.7 (15.41)	91.5	20	100
GOLD A5	91.8 (9.55)	95.0	64	100
GOLD A6	92.5 (7.50)	94.0	69	100
GOLD A7	92.4 (7.63)	93.5	66	100
GOLD A8	90.9 (14.82)	95.0	6	100
GOLD A9	92.0 (11.98)	96.0	48	100
GOLD A10	85.7 (15.26)	90.5	49	100
GOLD A11	94.5 (6.49)	98.0	73	100
GOLD A12	93.1 (10.10)	97.5	51	100
GOLD A13	76.9 (25.36)	81.0	0	100
GOLD A14	87.3 (15.99)	92.0	39	100
GOLD A15	93.7 (7.22)	96.0	73	100
GOLD A16	92.7 (8.41)	96.0	65	100
GOLD B1	92.9 (8.54)	96.0	60	100
GOLD B2	91.4 (12.61)	97.0	49	100
GOLD B3	71.5 (28.01)	81.5	0	100
GOLD B4	93.8 (7.22)	96.5	73	100
GOLD B5	94.0 (7.16)	96.0	74	100

*S-TOFHLA 1 (reading comprehension / 0-36 points), S-TOFHLA 2 (needed total time in minutes), S-TOFHLA 3 (number of points after 7 minutes)

Table 2: Synopsis of the reduction of the items of the KOPEQ

Nr	KOPEQ (Original, first study)	Nr	KOPEQ 2 (at the beginning of the second study)	Nr	KOPEQ 2 (final version, after analysis)
1	Overall impression of the knee school	1	Overall impression of the knee school	1	Overall impression of the course?
2	Division into 3 sessions	2	Division into 2 sessions		
3	Comprehensibility of the text in the hand outs	3	Comprehensibility of the text in the hand outs	2	Comprehensibility of the text in the hand outs
4	Completeness of the hand outs	4	Completeness of the hand outs	3	Completeness of the hand outs
5	Relation between theory and active participation	5	Relation between theory and active participation	4	Relation between theory and active participation
6	Session "anatomy and function"	6	Session 1		
7	Session "recommended activities"	7	Session 2		
8	Session "Rehabilitation phases after surgery"				
9	Answers to patient questions	8	Answers to patient questions	5	Answers to patient questions
10	Comprehensibility of the imparted knowledge	9	Comprehensibility of the imparted knowledge		
11	Arrangement of the hand outs	10	Arrangement of the hand outs		
12	PowerPoint presentations	11	PowerPoint presentations	6	PowerPoint presentations
13	Material to look at	12	Material to look at	7	Material to look at
14	Benefit during hospitalisation				
15	Benefit after hospitalisation				
16	Fear of the time after surgery				

Table 3: Pearson's correlation matrix of the KOPEQ with the other variables

Measure	1	2	3	4	5	6
1. KOPEQ	-----					
2. GOLD	.77 (0.60 to 0.89)	-----				
3. S-TOFHLA 1*	.15 (-0.18 to 0.44)	-.23 (-0.57 to 0.18)	-----			
4. S-TOFHLA 2*	-.02 (-0.33 to 0.30)	.32 (0.07 to 0.55)	-.43 (-0.63 to -0.16)	-----		
4. S-TOFHLA 3*	.14 (-0.24 to 0.46)	-.23 (-0.57 to 0.11)	.59 (0.40 to 0.72)	-.87 (-0.94 to -0.78)	-----	
5. MMSE	.14 (-0.12 to 0.14)	.05 (-0.28 to 0.34)	.13 (-0.13 to 0.39)	-.11 (-0.37 to 0.11)	.20 (-0.07 to 0.49)	-----

Values are presented as Pearson's correlation coefficient with 95% Confidence Interval.

KOPEQ (Knee Osteoarthritis Patient Education Questionnaire), GOLD (patient-testing protocol), S-TOFHLA (Short Test of Functional Health Literacy; 1: reading comprehension; 2: total time needed; 3: number of points after 7 minutes), MMSE (Mini-Mental State Examination).

Figures

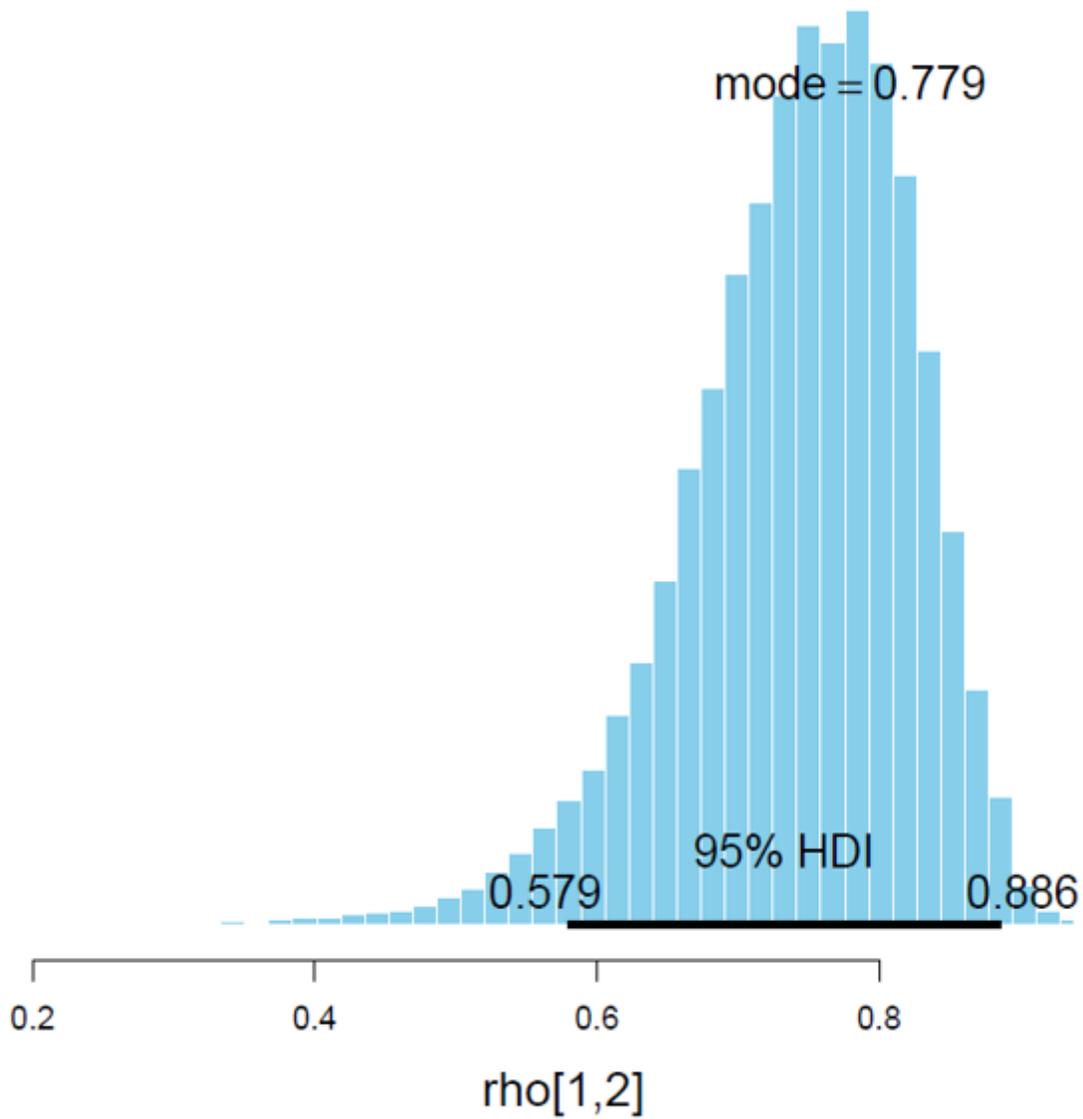


Figure 1

Posterior Distribution of the correlation of the KOPEQ versus GOLD. HDI (High Density Interval).

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementarymaterialKOPEQ2191116.docx](#)