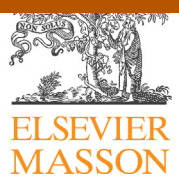
Orthopaedics & Traumatology: Surgery & Research (2013) 99, 313—319



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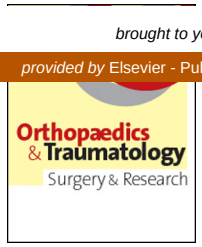

ORIGINAL ARTICLE

Validation of an educational booklet targeted to patients candidate for total knee arthroplasty

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Accepted: 25 January 2013

KEYWORDS
Knee osteoarthritis;
Total knee arthroplasty;
Information;
Patient education;
Informed patient consent;
Consent process

Summary
Background: Knee osteoarthritis is a highly prevalent condition and the leading reason for total knee arthroplasty (TKA). No consensus exists about the optimal content of preoperative patient information and, to the best of our knowledge, no validated information document is available. Our objective here was to obtain validation by healthcare professionals and patients of an educational booklet for patients awaiting TKA.
Materials and methods: The booklet was developed and validated in six phases: systematic literature review, drafting of the first version, critical revision by a panel of experts, modification of the booklet, validation by a multidisciplinary panel of experts, and validation by two groups of patients, one composed of patients awaiting TKA and the other of patients in the immediate post-TKA period. We assessed the impact of the booklet based on knowledge and belief scores before and 2 days after receiving the booklet.
Results: Critical revision of the first draft led to changes to meet the concerns voiced by the experts. Knowledge improved only in the patient group given the booklet preoperatively (from 6/10 to 9/10, $P = 0.005$). The booklet did not modify beliefs in either patient group.

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1877-0568/$ - see front matter
http://dx.doi.org/10.1016/j.otsr.2013.01.007

Discussion: We used a rigorous methodology to develop and validate the contents of an educational booklet. Receiving this document before TKA resulted in improved patient knowledge but had no impact on beliefs.
Level of evidence: Level IV.

Introduction

Knee osteoarthritis is the main reason for total knee arthroplasty (TKA). The number of TKAs performed for knee osteoarthritis is projected to increase by about 670% by 2030 in the US [1]. Preoperative rehabilitation therapy prepares patients for the procedure, improving functional outcomes and recovery of self-sufficiency and thereby decreasing hospital stay length and facilitating the return home [2,3].

The French Society for Physical and Rehabilitation Medicine (*Société française de médecine physique et de réadaptation* [SOFMER]), together with the French Society for Orthopaedic and Trauma Surgery (*Société française de chirurgie orthopédique et traumatologique* [SOFCOT]) [2] and the French National Authority for Health (*Haute Autorité de santé* [HAS]) [4] recommend preoperative information and rehabilitation therapy in patients awaiting TKA. Although this guideline is based on studies of educational interventions, the content of the information delivered to patients was neither standardised nor described in detail in the study reports.

Printed materials are optimal for disseminating consensual information as a means of improving patient information [5]. Many patient information documents are available. However, most of them were developed by the industry, with no prior multidisciplinary discussions and no reference to established evidence or recommendations by learned societies. To the best of our knowledge, there is no widely available information document in French designed for patients awaiting TKA and having a validated content.

We therefore developed an educational booklet according to the method described by McClune et al. [6] and in compliance with guidelines issued by the French National Authority for Health [7] about drafting patient information documents. Development of the booklet took place in five phases (Table 1):

- systematic review of the recent literature on the perioperative management of patients awaiting surgery for knee osteoarthritis. We searched the PubMed and Cochrane databases for articles published between 1990 and 2011 that reported clinical practice guidelines, systematic literature reviews, meta-analyses, and randomised controlled trials [8–15]. The search terms were ''knee, osteoarthritis'', ''total knee replacement/arthroplasty'', ''patient education'', and ''self-care'';
- drafting of the first version of the educational booklet;
- critical revision by a multidisciplinary panel composed of two rehabilitation physicians, one orthopaedic surgeon, one rheumatologist, one occupational therapist, and one physical therapist;
- modification of the document according to the comments made by the panel;
- and repeated revisions until all experts agreed on the contents of the document.

Table 1 Development of an educational booklet using the methodology described by McClune et al. [6].

Literature review
First draft of the booklet
Critical revision by a panel of 6 experts
Modifications to the document
Evaluation by the panel of 6 experts

Care was taken to use clear language that would be easily comprehensible by all readers. The document presented a globally optimistic scenario built around eight messages considered of particular importance (Table 2).

The objective of this study was to obtain validation by samples of healthcare professionals and patients, of an educational booklet designed for patients awaiting TKA.

Material and methods

Experts

We invited French-speaking healthcare professionals involved in the everyday management of patients with knee osteoarthritis, including physical medicine and rehabilitation physicians, rheumatologists, orthopaedic surgeons,

Table 2 Messages delivered in the educational booklet.

The patient should be involved in his or her own management
Regular physical activity improves overall health without worsening the osteoarthritis
Appropriate pain management enables the patient to engage in regular physical activities
The objective of preoperative rehabilitation is to ensure that surgery is performed under optimal conditions
Making arrangements before surgery to prepare the return home is crucial
A stay in a physical medicine and rehabilitation department is not necessary to obtain good results
About 6 months are needed for nearly complete recovery of knee function
Expectations about the benefits from knee replacement surgery should be realistic

primary-care physicians, anaesthesiologists, physiotherapists, occupational therapists, nurses, psychologists, dieticians, and social workers. Eligible healthcare professionals were those involved in the overall management of patients awaiting TKA in public or private hospitals or in private practices.

A black and white copy of the booklet and a questionnaire were posted to each healthcare professional. For each of the ten chapters of the booklet, the healthcare professional was to rate the content, didactic style, and illustrations on scales from 0 to 10. Space was available on the questionnaire for open comments about each chapter.

Evaluation criteria

The primary evaluation criterion was the sum of the scores assigned to each chapter of the booklet. Total scores between 7 and 10 were considered satisfactory, indicating that no modifications were required, except in the event of pertinent comments.

Patients

The booklet was evaluated by one group of patients awaiting TKA and by another group immediately after TKA. Patients awaiting TKA were recruited at the orthopaedic surgery department immediately after the preoperative visit with the anaesthesiologist. Patients who had had TKA were recruited either at the physical medicine and rehabilitation therapy department or at the orthopaedic surgery department. In each group, we included patients with and without a history of TKA on the other side, to compensate for the absence of involvement of TKA patients in the initial booklet development phases.

Inclusion and exclusion criteria

Patients were eligible if they were awaiting TKA or were in the immediate postoperative period after TKA. We excluded patients with any of the following: cognitive or behavioural disorders precluding evaluation, difficulty understanding and/or speaking French, or complex knee disorder as the reason for TKA.

Conduct of the study

For each patient, we collected the following data: age, sex, body mass index (BMI), occupation, social situation, and living arrangements; a knowledge score (Supplementary data, Appendix 1); and a beliefs score (Supplementary data, Appendix 2). The booklet was then handed to the patient. Two days later, the patient participated in a face-to-face interview designed to evaluate the impact of the booklet via a second determination of the knowledge and beliefs scores and the collection of qualitative data on the content and format of the booklet. Study data collection and patient visits were performed by the study investigator.

Evaluation criteria

The main evaluation criteria were the knowledge and beliefs scores. Both scoring systems were designed specifically for the study as, to our knowledge, no such tools were published previously. The questionnaire items were related to the messages delivered in the booklet.

Statistical analysis

Descriptive statistics consisted in number (%) for categorical variables and median for quantitative variables. Given the small sample size, the non-parametric Kruskal-Wallis test was used to compare quantitative data. We used Fisher's exact test for comparisons of qualitative data between independent groups and the Stuart-Maxwell test for paired data. Despite the small sample size, we performed a multivariate analysis adjusted on BMI, which differed significantly between the preoperative and postoperative patient groups. Values of p smaller than 0.05 were considered significant. All analyses were done using STATA V10 (Stata Corp, College Station, TX, USA).

Ethical considerations

According to French law on biomedical research, ethics committee approval was not required for this study, as there was no risk of jeopardising the physical or psychological integrity of the patients. Given that preoperative information is an integral component of the management of lower-limb osteoarthritis, oral informed consent was collected before study inclusion. The study was conducted in compliance with good clinical practice guidelines and with the Declaration of Helsinki.

Results

Validation by the healthcare professionals

Of the 33 healthcare professionals invited to revise the draft of the booklet, 27 accepted, including 16 working in public hospitals and 11 in private practices (Table 3). Overall, the healthcare professionals assigned high scores to all the chapters (Table 3).

The illustrations for the second chapter entitled ''Your knee'' were found unsatisfactory, with scores lower than 5/10 assigned by six of the 10 categories of professionals represented in the panel (Table 3). The main criticism was the absence of a legend for the knee anatomy diagram; this diagram was enlarged and a legend was added. In the same chapter, eight of the ten categories of professionals assigned scores lower than 8/10 because they felt that the description of knee biomechanics was excessively detailed.

For the third chapter entitled ''Treatment options for knee osteoarthritis'', the rheumatologists and primary-care physicians felt this topic might not be suitable in a document intended for patients in whom the decision to perform TKA had already been taken. The social worker felt this chapter was excessively detailed (7/10). This chapter was left in the booklet on the grounds that improvements in the non-surgical aspects of management remain possible even in patients treated with TKA (Table 2). Thus, introducing appropriate physical activities, wearing an orthotic device, learning to use crutches, and optimally adjusting the analgesic regimen are useful measures at any time. In addition, many patients undergoing unilateral TKA have knee osteoarthritis on the other side also.

Table 3 Validation by the experts. The data are the median scores for each chapter assigned by each of the ten categories of professionals. The X/Y/Z values are the scores assigned for content, didactic style, and illustrations, respectively.

	Rehab. *n* = 5	Orthop. surgeon *n* = 6	Rheumatologist *n* = 2	PCP *n* = 4	Anaest. *n* = 1	Phys. Ther. *n* = 3	Occ. Ther. *n* = 3	Nurse *n* = 1	Psy. *n* = 1	SW *n* = 1
What is OA?	10/7/7	10/9/7	10/7.5/6	9.5/6.5/7.5	10/10/7	10/10/8	10/10/8	10/10/10	10/10/5	10/9/10
Your knee	10/6/7	9.5/7.5/2	10/6/4	6.5/6.5/3	10/9/6	10/8/4	10/6/9	10/10/1	10/7/7	1/1/1
Treatment options for knee osteoarthritis	10/8/9	10/8.5/8.5	10/5.5/4	8.5/9/8	10/10/NR	10/10/0	10/10/9	10/10/NR	10/10/NR	7/9/9
What can you do before your surgery?	10/8/9	9/9/8	7.5/6/7.5	9/10/9	10/10/8	10/9/9	10/10/10	10/10/10	10/10/10	7/9/7
Your surgery	10/10/9	10/8/6	10/3.5/7.5	9/10/7.5	10/10/10	10/10/4	10/10/9	10/10/10	10/7/8	10/10/8
Your rehabilitation programme after surgery	10/9/7.5	9.5/9/8.5	9.5/8.5/10	9.5/9.5/10	10/8/8	10/10/8	10/10/8	10/10/10	10/7/5	10/10/9
Your return home	10/10/10	10/9/8	8.5/8.5/8.5	8.5/9.5/10	10/10/10	10/9/9	10/10/10	10/10/10	10/8/10	10/10/10
Returning to your everyday activities	10/9/9	8/8/8	10/8.5/10	9.5/9.5/8	10/10/NR	10/10/9	10/10/10	10/10/NR	10/10/NR	10/10/10
Returning to work	10/10/10	9.5/9.5/8	10/10/10	8.5/9.5/8.5	10/10/8	10/10/10	10/10/10	10/10/NR	10/10/NR	9/9/9
Returning to your sports activities	10/10/8	9/9/8.5	10/8/NR	8/10/7	10/10/8	10/10/9	10/10/10	10/10/5	10/10/5	10/7/8

Rehab.: rehabilitation physician; Orthop.: orthopaedic; PCP: primary-care physician; Anaest.: anaesthesiologist; Phys. Ther.: physical therapist; Occ. Ther.: occupational therapist; Psy.: psychologist; SW: social worker; OA: osteoarthritis.

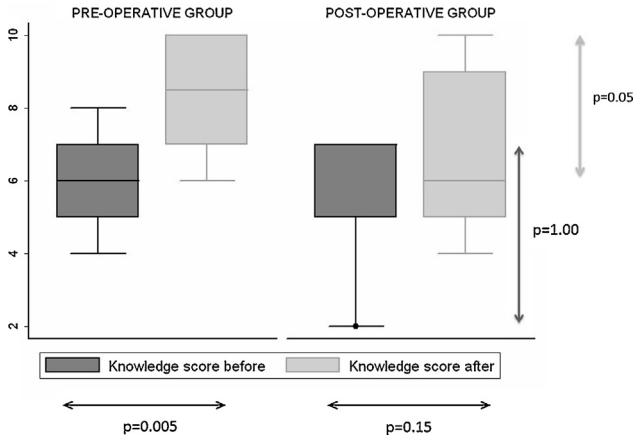

Figure 1 Knowledge scores before and after receiving the educational booklet.

The fourth chapter, ''What can you do before your surgical procedure?'', included a discussion of thromboembolism prophylaxis. The orthopaedic surgeons, rheumatologists, and social worker felt this topic should be moved to the next chapter, which dealt with the surgical procedure. Again, the paragraph on compression stockings was kept in this chapter, as patients were asked to purchase compression stockings (and crutches) before the surgical procedure.

The healthcare professionals in all categories assigned high scores ($\geq$ 7/10) to both the content and the format of all the chapters on postoperative rehabilitation therapy. However, for the 10th chapter, entitled ''Returning to your sports activities'', the primary-care physicians (8/10) and occupational therapists (10/10) commented that additional details should be provided about contra-indications. No absolute contra-indications to any sports activity were stated, as practices vary across surgeons and according to the patient's sports history.

Validation by the patients

The booklet was assessed preoperatively by 10 patients and postoperatively by nine other patients. The number of patients with a history of previous hip or knee arthroplasty was 4/10 in the preoperative group and 5/9 in the postoperative group.

The two groups were comparable for the demographic and clinical data, living arrangements, and ability to be discharged home after surgery (score on the validated French version of the Risk Assessment and Prediction Tool) [16] (Table 4). Median BMI differed significantly between the two groups (28 [range, 25—33] in the preoperative group and 31 [range, 29—38] in the postoperative group, $P = 0.004$).

In the preoperative group, the median knowledge score improved significantly ($P = 0.005$) after reading the booklet (from 6/10 to 9/10) (Fig. 1). In the postoperative group, reading the booklet had no significant influence ($P = 0.15$) on the median knowledge score (7/10 and 6/10) (Fig. 1).

When beliefs were analysed item by item, no significant influence of the booklet was found in either group.

Discussion

Creating a written and validated information document is a crucial step that should be taken before considering therapeutic education methods of greater complexity. The availability of printed material enhances the impact and ensures uniformity of the information delivered by all the professionals involved. Critical revision of the initial draft allowed us to make modifications based on the comments of experts, until all the panel members agreed on the final version.

The booklet improved knowledge in the preoperative patients but not the postoperative patients. Beliefs were not affected by the booklet in either group.

Our study has several methodological limitations. As no validated knowledge and beliefs questionnaires were available in the literature, we designed tools specifically for our study. Furthermore, both the high scores assigned by the multidisciplinary panel and the qualitative data collected during face-to-face interviews of patients by the study investigator indicated that a Delphi type procedure was unnecessary [17], although the Delphi method is widely recommended for achieving a consensus.

The influence of simply handing a booklet to the patients seems modest. However, this was an open-label study whose main objective was to obtain validation of the document by experts and patients. The limited effect of our intervention consisting only in information is consistent with earlier data. A 2011 meta-analysis [18] of 12 trials comparing preoperative interventions to standard information in patients with knee osteoarthritis showed that preoperative information before TKA had a limited impact. However, neither the content nor the modalities of the information are described in detail. Oral information delivered by various healthcare professionals may be contradictory, and there is no consensus about some of the components of patient information. Similarly, in a randomised controlled trial from Taiwan reported in 2012 [19], a 40-minute home education programme followed by delivery of a booklet was associated with significant decreases in surgery-ward stay length and healthcare costs, although no changes occurred for function (walking and joint range of motion), pain, or complication rates. This study did not evaluate knowledge, beliefs, or satisfaction.

It would be of interest to conduct a study in a larger patient sample in order to evaluate the impact of our booklet on knowledge, beliefs, and satisfaction with the information received. We plan to conduct a randomised controlled trial comparing standard information delivered by the surgeon to the same information combined with a validated written printed document. Satisfaction is also a relevant outcome, as postoperative satisfaction correlates with preoperative expectations [20]: higher preoperative expectations predict a lower degree of postoperative satisfaction. Thus, providing high-quality information before surgery may help patients to adjust their expectations to what is reasonably achievable. The delivery of standardised and validated information could be part of a multidisciplinary education program involving the various healthcare professionals who contribute to manage patients awaiting TKA.

Table 4 Baseline patient characteristics.

	Preoperative $n = 10$	Postoperative $n = 9$
Age in years, median	68	71
Sex, n Females/males	7/3	4/5
BMI in kg/cm^2, median	28	29
VAS for pain at 48 h, median	8	5
Function (WOMAC), median	24.5	25
Level of formal education, n Primary/secondary	7/3	8/1
Work status, n Working/retired	0/10	1/8
Physically active before surgery, n Yes/No	6/4	4/5
Frequency, n < or > 30 min × 3/week	3/3	2/2
Type of activities, n Walking/cycling/swimming/other	1/0/1/4	2/1/0/1
Preoperative physical therapy, n Yes/no	4/6	2/7
Previous THA or TKA, n Yes/no	4/6	5/4
Date of previous arthroplasty < 3 years/> 3 years	1/3	0/5
Rehabilitation modality Outpatient Day hospital Hospital	1 0 3	2 1 2
Patient wishes about rehabilitation modality Home Day hospital Hospital	5 0 5	1 1 7
Ability to return home (RAPT), median	7	7

BMI: body mass index; VAS: visual analogue scale; WOMAC: Western Ontario and McMaster Universities Arthritis Index; THA: total hip arthroplasty; TKA: total knee arthroplasty; RAPT: Risk Assessment and Prediction Tool.

Conclusion

In this study, we validated a patient education tool consisting in a booklet for patients with knee osteoarthritis awaiting TKA. The validation procedure involved both healthcare professionals considered to be experts in the management of such patients and by patients awaiting TKA (to be performed within the next month) or immediately after TKA. Simply handing the educational booklet to the patients was effective in improving knowledge but had no influence on beliefs.

Disclosure of interest

EC is an expert for Sanofi, Expanscience. The other authors declare no conflicts of interest in relation to this article.

Acknowledgements

We are grateful to all the patients and physicians who contributed to this study.

We thank Sanofi for their support in printing the educational booklets.

Appendix A. Supplementary data

Supplementary data (Appendix 1 and 2) associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.otsr.2013.01.007.

References

[1] Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. J Bone Joint Surg Am 2007;89:780—5.
[2] Coudeyre E, Jardin C, Givron P, Ribinik P, Revel M, Rannou F. Could preoperative rehabilitation modify postoperative outcomes after total hip and knee arthroplasty? Elaboration of French clinical practice guidelines. Ann Readapt Med Phys 2007;50:189—97.
[3] Huang SW, Chen PH, Chou YH. Effects of a preoperative simplified home rehabilitation education program on acute inpatient total knee arthroplasty patients. Orthop Traumatol Surg Res 2012;98:259—64.
[4] HAS. Critères de suivi en rééducation et d'orientation après arthroplastie totale du genou. Service des recommandations professionnelles. Paris, France: HAS; 2008 [In French].
[5] Coudeyre E. Enhancing patient education in physical medicine and rehabilitation practice. Ann Phys Rehabil Med 2009;52:523—4 [In French].
[6] McClune T, Burton AK, Waddell G. Evaluation of an evidence based patient educational booklet for management of whiplash associated disorders. Emerg Med J 2003;20:514—7.
[7] ANAES. Information des patients. Recommandations aux médecins. Service des recommandations et références professionnelles. Paris, France: ANAES; 2000 [In French].
[8] Pendleton A, Arden N, Dougados M, Doherty M, Bannwarth B, Bijlsma JW, et al. EULAR recommendations for the management of knee osteoarthritis: report of a task force of the Standing Committee for International Clinical Studies Including Therapeutic Trials (ESCISIT). Ann Rheum Dis 2000;59:936—44.
[9] Rannou F, Coudeyre E, Ribinik P, Macé Y, Poiraudeau S, Revel M. Establishing recommendations for physical medicine and rehabilitation: the SOFMER methodology. Ann Readapt Med Phys 2007;50:100—10.
[10] McDonald S, Green SE, Hetrick S. Preoperative education for hip or knee replacement. Cochrane Database Syst Rev 2004 [Issue 1. Art. No.: CD003526].
[11] Weidenheim L, Mattsson E, Brostrom LA, Wersallbrobertsson E. Effect of preoperative physiotherapy in unicompartmental prosthetic knee replacement. Scand J Rehabil Med 1993;25:33—9.
[12] Fisher DA, Trimble S, Clapp B, Dorsett K. Effect of a patient management system on outcomes of total hip and knee arthroplasty. Clin Orthop Relat Res 1997;345:155—60.
[13] Fortin PR, Clarke AE, Joseph L, Liang MH, Tanzer M, Ferland D, et al. Outcomes of total hip and knee replacement: preoperative functional status predicts outcomes at six months after surgery. Arthritis Rheum 1999;42:1722—8.
[14] Fransen M, McConnell S, Bell M. Exercise for osteoarthritis of the hip or knee. Cochrane Database Syst Rev 2003;3 [CD004286].
[15] Coudeyre E, Sanchez K, Rannou F, Poiraudeau S, Lefevre-Colau MM. Impact of self-care programs for lower limb osteoarthritis and influence of patients' beliefs. Ann Phys Rehabil Med 2010;53:434—50.
[16] Coudeyre E, Descamps S, McIntyre J, Boisgard S, Poiraudeau S, Lefevre-Colau MM. Translation and French cultural adaptation of a decision making tool for patients orientation after total hip or knee arthroplasty. Ann Phys Rehabil Med 2009;52:694—703.
[17] Brown B, Delphi Process:. A methodology used for the elicitation of opinions of experts. California: Rand Paper Corporation; 1968. p. 3925.
[18] Wallis JA, Taylor NF. Preoperative interventions (non-surgical and non-pharmacological) for patients with hip or knee osteoarthritis awaiting joint replacement surgery- a systematic review and meta-analysis. Osteoarthritis Cartilage 2011;19:1381e—95e.
[19] Huang SW, Chen PH, Chou YH. Effects of a preoperative simplified home rehabilitation education program on length of stay of total knee arthroplasty patients. Orthop Traumatol Surg Res 2012;98:259—64.
[20] Mancuso CA, Graziano S, Briskie LM, Peterson MG, Pellicci PM, Salvati EA, et al. Randomized trials to modify patients' preoperative expectations of hip and knee arthroplasties. Clin Orthop Relat Res 2008;466:424—31.