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ORIGINAL ARTICLE

Reasons for Treatment Choices in Knee and Hip Osteoarthritis: A Qualitative Study

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Objective. **Conservative treatment modalities in osteoarthritis (OA) of the hip or knee are underused, whereas the demand for surgery is rising substantially. To improve the use of conservative treatment modalities, a more in-depth understanding of the reasons for patients' treatment choices is required. This study identifies the reasons for choice of treatment in patients with hip or knee OA.**

Methods. **Semistructured in-depth interviews with 24 OA patients were held. Stratified purposive sampling was used to enrich data variation. Interviews were transcribed verbatim and subsequently coded using a thematic approach. Two independent researchers reflected on, compared, discussed, and adjusted the coding.**

Results. **Various treatment modalities were discussed by respondents: medication, exercise, physical therapy, injections, surgery, complementary, and alternative treatment. Four key themes underlying the choice for or against a treatment modality for OA were identified: 1) treatment characteristics: expectations about its effectiveness and risks, the degree to which it can be personalized to a patient's needs and wishes, and the accessibility of a treatment; 2) personal investment in terms of money and time; 3) personal circumstances: age, body weight, comorbidities, and previous experience with a treatment; and 4) support and advice from the patient's social environment and health care providers.**

Conclusion. **The 4 identified key themes enhance the insight of health care providers into the widespread reasons influencing patients' treatment choices for knee or hip OA. This knowledge can be used in clinical practice to aid shared decision making, which may lead to optimized treatment choices for both conservative and surgical treatment.**

INTRODUCTION

Management of hip and knee osteoarthritis (OA) is to a large extent similar, comprising a comparable range of surgical and conservative treatment modalities (1). As no cure is available, treatment focuses on the reduction of symptoms and risk factors for progression. Following the Osteoarthritis Research Society International guidelines (2), patients are eligible for surgical treatment when they do not feel adequate pain relief and functional improvement after receiving conservative treatment. However, patients do not always receive treatment in line with guidelines and recommendations, or their own preferences (3), which may lead to dissatisfaction and lower treatment adherence. Previous research showed that conservative treatment modalities in both knee and hip OA are underused (4–6). In contrast, surgical treatment modalities are being used increasingly (7), despite some observations that surgery does not always lead to positive outcomes and pain reduction (8). These inadequacies in treatment indication and timing may obstruct optimal care and increase health care costs.

Suboptimal use of conservative treatment modalities might be associated with health care provider–related factors, such as lack of knowledge about conservative treatment options, or with patient-related factors, such as patient preferences (9). Shared decision-making models (10,11) emphasize the importance of taking patients' values and preferences into account. A recent meta-synthesis indicated that patients with OA have mainly negative beliefs about the efficacy of conservative treatment options and prefer surgical treatment options (12). More in-depth knowledge of patients' reasons for choosing a specific OA treatment modality will aid shared decision making and might increase patients' usage of conservative treatment modalities.

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Significance & Innovations

- Treatment characteristics, personal investment, personal circumstances, support and advice are key themes guiding treatment choices for knee and hip osteoarthritis (OA).
- Our results are applicable to various treatment modalities of knee and hip OA, instead of focusing on one specific treatment modality.
- Health care providers and patients should discuss these key themes during consultations to support informed shared decision making.
- Discussing these key themes may optimize the use of conservative OA treatment modalities.

Qualitative research is a suitable approach for obtaining in-depth knowledge about patients' reasons for treatment choices in hip or knee OA (13). Previous qualitative research in knee and hip OA has focused on patients' beliefs about single treatment modalities, or has studied subgroups of patients. These studies examined patients' beliefs about exercise (14–16), joint replacement surgery (17–20), and pharmaceutic and surgical control of pain (21). The studies included patients with either hip or knee OA (14,16,18,19,21), examined patients who were already eligible for surgery (17), or who had already chosen a treatment (14,18). To our knowledge, only 1 study described the beliefs of patients with knee OA regarding a wide range of treatment modalities (22), but no qualitative study has focused on identifying reasons for treatment choice among a wide range of treatment modalities for both hip and knee OA. Therefore, this study sets out to identify the reasons for treatment choices of patients with knee or hip OA in primary and secondary care.

PATIENTS AND METHODS

Semistructured in-depth interviews were held (23), questions were asked both retrospectively (about treatment choices in the past) and prospectively (about hypothetical treatment choices in the future). A grounded theory approach (13) with thematic analysis (24) was used to identify main themes and subthemes. The Consolidated Criteria for Reporting Qualitative Research checklist was used to ensure complete and transparent reporting (25). The Institutional Review Board of the Radboud University Medical Center, Nijmegen approved the study (protocol number: 2013/482).

Eligible patients met the clinical classification criteria of hip or knee OA, were age ≥18 years, lived within 50 kilometers of the Sint Maartenskliniek hospital, spoke fluent Dutch, were free of any hearing or speech impairment, and provided informed consent. Inclusion criteria were checked by the attending rheumatologist and the researcher, using patient records. Stratified purposive sampling was used to enrich data variation: the sample selection was stratified by sex and affected joint, based on the Dutch epidemiologic distribution of OA (26). In addition, we aimed for a broad age range. Patients were recruited simultaneously in 3 different ways. Fifty-two patients were invited who participated in a group consultation (shared medical appointment) at the rheumatology department of Sint Maartenskliniek, Nijmegen in 2013. This was a convenience sample of patients who were assessed to be not eligible for surgery but who might have more severe OA than patients attending primary care. Of these, 26 patients responded positively, indicating a response rate of 50%. Reasons given for not taking part in the study were "not interested" and a lack of time. In addition, to obtain a more heterogeneous sample, 3 patients were recruited in a primary care physical therapy practice, and 4 patients responded to an advertisement in the newsletter of the local patient association for rheumatic diseases (their eligibility was assessed by telephone). In total, 33 eligible patients were willing to take part in the study. Data collection ended after 24 interviews, as saturation had been reached (no new information emerged from the last 2 interviews).

Interviews were held in the patients' homes, were audio-recorded, and additional field notes were made during and after the interviews. Written informed consent to record the interview was obtained prior to the start of the interview. The use of an interview guide ensured that the main issues were discussed (Table 1); elements of the Health Belief Model by Rosenstock (perceived barriers and benefits) (27) were used as sensitizing concepts for the interview guide. The questions had an open-ended format. The interview guide was pilot tested, leading to minor changes in the interview guide, and data obtained in the pilot test were also used in the data analysis. All interviews were conducted by 1 female PhD student (EMS), who received interview training. No contact existed with the patients prior to the interviews. A summary of each interview (member check) was sent to each patient, in which patients were asked for comments and corrections, to ensure their views and beliefs had been interpreted correctly by the researcher.

Interviews were transcribed verbatim. Meaningful fragments in the text were coded and analyzed using the qualitative data analysis software MAXQDA 11 (28). Coding was done in 3 steps: open, axial, and selective coding (13). First, relevant fragments were selected in the interviews and each fragment was given a label (open coding). Second, these open codes were categorized (axial coding). Third, from these axial codes the core themes and interrelatedness between themes were identified (selective coding). This grounded theory approach, with thematic analysis, resulted in an overview of reasons for the choice of a treatment modality for OA, divided into main themes and subthemes. To support the coding process, field notes were made during the interviews. In addition, the researchers made reflective notes about their thoughts and views regarding the identification of themes. Data collection and data analysis was continuously alternated in a cyclic process. Throughout this process, 2 researchers (JEV and EMS) continuously and repetitively reflected on, compared, discussed, and adjusted the codings in order to carefully determine the number and wording of

Table 1. Interview guide to explore beliefs about treatment and treatment choices

Leading questions
Which treatments have you had? (retrospective)
Which treatments have you considered? (prospective)
Which treatments do you know? (prospective)
Do you know other ways to ease osteoarthritis complaints? (prospective)
Retrospective probing questions
How was the choice for this treatment modality made?
What do you think were the advantages and disadvantages of the treatment?
What were your reasons for choosing/not choosing a particular treatment?
Prospective probing questions
What elements would play a role if you were to consider choosing this treatment modality?
What do you think are advantages and disadvantages of the treatment?
What would be your reasons for choosing or not choosing this treatment?

themes in an iterative design (13). The identified themes were thoroughly discussed in a project group (comprising a rheumatologist, an orthopedic surgeon, a general practitioner, a physical therapist, and researchers).

RESULTS

Twenty-four patients were interviewed. The heterogeneity and representativeness of the sample were ensured for sex (8 men), affected joint (13 knee OA, 10 hip OA, 1 hip and knee OA), and age (mean 59 years, range 35–78 years) (see also Supplementary Appendix A, available on the *Arthritis Care & Research* web site at http://onlinelibrary.wiley.com/doi/10.1002/acr.22841/abstract). The duration of the interviews varied from 25 to 75 minutes (mean ± SD 49.8 ± 12.9 minutes). Various treatment modalities were discussed by patients: medication, exercise, physical therapy, injection, surgery, and complementary and alternative treatment. Table 2 provides an overview of general subthemes (identified in various treatment modalities), and Table 3 provides an overview of particular subthemes (identified in particular treatment modalities) illustrated with exemplary citations from the interviews. Four key themes underlying patients' treatment choices were identified: 1) treatment characteristics, 2) personal investment, 3) personal circumstances, and 4) support and advice. The identified themes were found across the study population and did not differ for specific subgroups (e.g., affected joint, sex).

Table 2. General identified subthemes with exemplary citations*

Effectiveness
"I think a benefit of surgery is that you can go on without pain." (patient 12)
Fear of treatment risks
"And at a certain moment in time you become immune to some medicines. Then I think: OK, soon I'll be given increasingly stronger (medicines). I really don't want that." (patient 23)
"But it (an injection) isn't good for your joints. That affects the cartilage, it affects your muscles. Because it's a cocktail, containing antibiotics, narcotics. Who knows what's in it." (patient 3)
"The body relaxes with medicines... naturally, pain is also a signal that something isn't right. And if you continuously suppress this, and carry on regardless, you're not listening to that signal." (patient 12)
"In two hospitals they said 'we can't guarantee you'll be able to walk after surgery.' So, what do you do? What would you do?" (patient 3)
"I can see the positives of surgery. But I think, once it's behind me, and it's gone well, OK. But I'm still afraid. Imagine my body doesn't actually accept the new hip." (patient 23)
Advice of social environment
"You hear from those around you, and there's this person they know who had two new hips, who says, 'I should have done it much sooner.'" (patient 22)
"You don't decide on your own. It's good if you have a partner who also sees the usefulness of it (the treatment). Who doesn't say, 'Are you going again?' or 'Is that really necessary?' That wouldn't be helpful." (patient 2)
Advice of health care providers
"Well, if you (the doctor) say this is the best, then that's OK... I trust (the doctor) and I'm not going to sow any seeds of doubt, like 'Is that allowed?' or 'Is that good for me?' or whatever." (patient 9)
"Look, it's my body... I no longer take everything and anything they prescribe." (patient 5)

* General identified subthemes identified in medication, exercise, physical therapy, injection, surgery, complementary, and alternative treatment.

Table 3. Identified subthemes in a particular treatment modality, with exemplary citations

Medication
Comorbidities
"...paracetamol for the pain. I say: 'I already take loads of medicines and then those paracetamol on top... You'll then have a body with all kinds of rubbish, I think.'" (patient 9)
Physical therapy and exercise
Personalized treatment
"And it's also really simple... the device knows exactly, everything is set up for me, I don't have to do anything. I just start with my exercises.... It was all set up with me in advance by someone, and it's occasionally checked. If I think 'I want it a bit heavier,' then we adjust the settings together. After 20 times, the settings automatically get heavier. If I say 'I've got such a pain in my neck,' they adjust that. Or 'I've got such a pain in my back or hip,' they adjust that." (patient 13)
"There are sports you can better not do. I also think that's important, you can go to the gym but you need to know what you can and can't do." (patient 4)
Accessibility
"You don't have to buy anything, you don't have to do much for it. You can simply do it at home in front of the TV, or it doesn't matter where you do it." (patient 20)
"Of course they're all exercises I can do at home and that I need to keep up but, I know how it works, you do it for a while and then there comes a point when you think, 'Oh, I haven't done any exercises for three days,' and then there comes a point when you forget it. If you have an appointment (with the physical therapist), she can see how you're still doing it right. And that's a trigger for me to think: 'I have to keep it up.'" (patient 12)
Time
"To keep (my muscles strong and joints supple), I should go to the gym 3 times a week, but I can't manage the time for that." (patient 24)
Costs
"It's annoying that the health insurers think physical therapy isn't necessary. I need it, so I chose a health care policy that covers unlimited physical therapy. That's what you're paying for. And then you get a letter this year saying, 'It's no longer unlimited'... Apparently, they no longer see the value of physical therapy for some conditions." (patient 2)
Body weight
"I also had physio for a while, but he can't do much with me, so to say... Because he finds it really difficult, also due to my being overweight and putting pressure on that." (patient 24)
"Losing weight is a constantly recurring issue for me. It's something I am trying to work on, but it's not always that easy." (patient 24).
Surgery
Time
"You're out of the running for quite a while... I wouldn't choose an operation lightly, because I have to care for (my) very small children." (patient 17)
Age
"When I'm 80, I don't want to be having surgery anymore. I'll see. Who knows if I'll still be alive by then? I want to enjoy life now, and I want to be able to walk now, and to go on holiday. That's why I do want that new knee." (patient 1)
Body weight
"My weight also plays a role, that doesn't have positive effect on the lifetime of an artificial knee." (patient 24)
Comorbidities
"If I go for surgery, with all its hassle. With my diabetes on top, the cure can be worse than the problem (OA). Because if I get an infection as a result of the operation, because this can't heal due to the diabetes, then I'm even worse off." (patient 6)
Previous experience
"I am scared: imagine my body doesn't accept the new hip. It took a good 2 and a half to 3 years before the bone grew back together. Nobody can give any reasons why." (patient 23)
"I've had enough of all those operations, and I don't want any more for now. If you know what kind of operations I've had, then I'm not looking to have another one." (patient 14)

Theme 1: treatment characteristics. The first key theme encompassed patients' beliefs about treatment effectiveness, fear of treatment risks, whether the treatment could be personalized to individual needs, and the accessibility of the treatment.

Effectiveness. Effectiveness of a treatment was considered the most important reason for choosing a treatment. Patients wanted a treatment that was effective for a longer period of time, and that took only a brief amount of time to start becoming effective. These considerations involved all treatment modalities. Although some patients stated that "nothing can be done" about OA, most wanted a treatment to be effective in relieving or alleviating OA symptoms (most importantly, pain) and in improving mobility, the activities of daily life, and quality of life. Some patients preferred surgical treatment above conservative treatments, because they felt that surgery is the only effective treatment option for OA.

Fear of treatment risks. Patients worried about risks, consequences, and side effects of treatments. They tended to be cautious about taking medication or having injections to reduce their symptoms because of potential adverse effects such as infection, gastrointestinal problems, hypertension, headaches, feeling sick, and damage to bodily structures (bones, tendons, and muscles). Moreover, patients feared developing a tolerance to medication, that the medication would no longer be effective after longer term use, or that they would have to take stronger medication over time (e.g., increased doses or other types of medication) to alleviate symptoms. They feared becoming dependent on, addicted to, or "immune" to medication. Patients were afraid that medication and injections suppressed the body's signals that the joint was being overexerted, causing increased OA symptoms, or even accelerating the progression of OA. The negative consequences of surgery, both short term and long term, were also an important theme. Most patients feared complications during surgery, nausea caused by the anesthetic, and postoperative pain. In addition, patients were afraid that symptoms return after surgery and that their functioning would become restricted after surgery. One patient expressed her doubts about choosing surgery because she feared being unable to walk afterwards, and some patients worried that their body would reject the prosthesis.

Personalized treatment. Several patients mentioned their positive attitude toward treatments that were personalized to their own requirements and wishes. This was mainly discussed with respect to exercise and physical therapy. One patient described the personalized approach when exercising in a gym. She appreciated that the settings of equipment in the gym could be continuously adjusted to her own level and symptoms. Patients were positive about the way exercising could help them with exploring and securing their physical limits, i.e., the degree of physical activity (e.g., work, household tasks, or sport) that could be performed before the symptoms increased. Some patients had difficulty with not exceeding their physical limits; therefore they preferred a treatment modality that helped with exploring and securing these limits. Some patients preferred treatment that helped shift their physical limits, so that they could increase their physical activity without increasing their symptoms.

Accessibility. Several patients considered the accessibility of the treatment when making a treatment choice; for instance, whether or not treatments could be carried out by patients themselves, were easy to do, and were easy to fit into their daily schedule. This was primarily the case with home-based exercises given by the physical therapist. However, carrying out these exercises at home diligently was found to be difficult; patients indicated that they became less motivated over time.

Theme 2: personal investment. The degree to which patients were willing to invest time and money in a treatment was the second key theme identified.

Time. Patients expressed a lack of time for travelling to the treatment or following the exercise program provided by the physical therapist. The time surgery and rehabilitation took was considered a reason for not choosing surgical treatment modalities. Patients dreaded being dependent on others during a long rehabilitation period. One patient avoided surgery because she had to care for her young children and could not be missed.

Cost. In general, patients indicated that the benefits of the treatment should outweigh the costs. Potentially high financial costs of a treatment modality were considered a barrier when the patient had to pay the costs but not when the health insurer reimbursed the costs.

Theme 3: personal circumstances. The third theme encompassed personal circumstances influencing a patient's choice of treatment: age, body weight, comorbidities, and previous experiences with OA treatment.

Age. Relatively young patients expressed their doubts about choosing total joint replacement because of the limited durability of a prosthesis, and because a prosthesis might cause restrictions in physical movement. By contrast, other patients did prefer surgical treatment modalities at a younger age because of the better outcome. Some said that with surgery at a younger age the positive outcome could be enjoyed for longer. Older patients expected to experience more physical and psychological difficulties with surgery. Finally, some patients stated that age was not an important reason; pain and function were more pivotal reasons for choosing for surgery than age.

Body weight. Being overweight was considered a barrier for choosing physical therapy and surgery. Patients mentioned that health care providers advised them to lose weight because it would decrease both the burden on the joint and the OA symptoms. Also, being overweight was considered disadvantageous for the durability of the prosthesis. However, losing weight seemed to be difficult.

Comorbidities. Patients indicated that comorbidities (diabetes mellitus, in particular) could affect the outcome of surgery. One patient described aversion to taking additional medication due to her diabetes mellitus medication.

Previous experience. Previous experience influenced whether or not a treatment would be chosen again. Patients with positive experiences of surgery in the past described their faith in surgical treatment modalities. One patient described her fear that her body would reject the prosthesis because this happened after previous surgery. Another

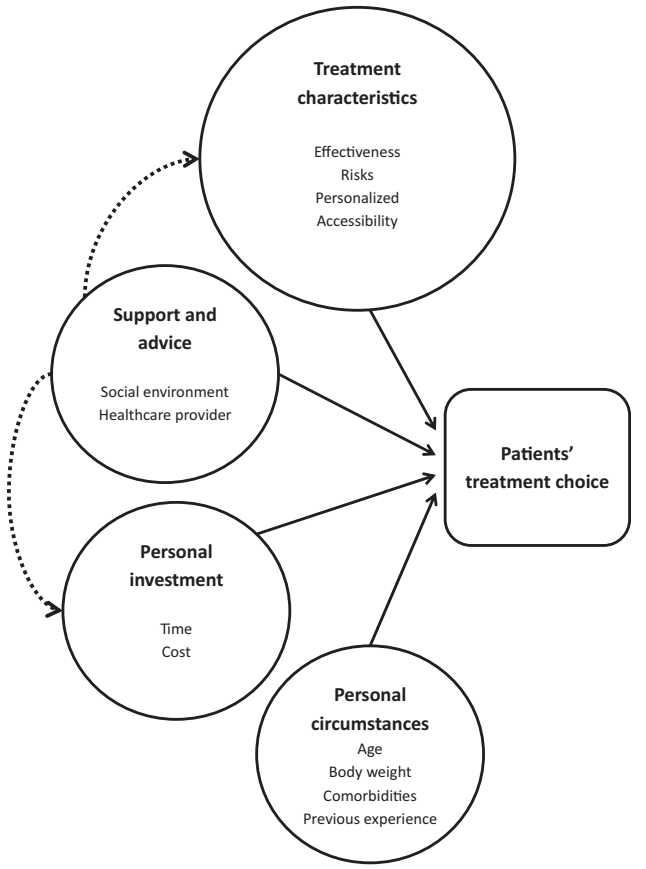

Figure 1. Conceptual model of patients' considerations affecting treatment choices in knee or hip osteoarthritis. Solid lines represent the influence of themes on patients' treatment choice; broken lines indicate the interrelatedness of themes.

patient who had undergone several operations in the past did refuse another operation.

Theme 4: support and advice. Support and advice from patients' social environment was the final theme identified regarding patients' choice of treatment. Experiences of family, friends, and acquaintances, their advice and support, as well as advice from the health care provider, all influenced treatment preferences.

Advice from social environment. Positive experiences of family and friends were mentioned as a reason for a treatment choice. In addition, peer support also helped patients in their decision-making process.

Advice of health care providers. The advice given by health care providers highly influenced the choice patients made. Many patients trusted the doctor and did not question his/her decision; other patients ignored their doctor's advice.

Integrative model. Figure 1 presents a conceptual model synthesizing patients' reasons affecting their treatment choice in hip or knee OA. The size of the circles reflects that treatment characteristics were considered a central theme in decision making. However, patients' choices for treatment were influenced by all 4 themes to a varying degree depending on the treatment at hand and individual preferences and circumstances. For instance, the subtheme "cost" was especially important for treatments that were not reimbursed by health insurance companies (Table 3). The dotted lines from the theme "support and advice" indicate the influence of the patient's network on patients' perceptions of benefits, harms, and barriers of the treatment.

DISCUSSION

This in-depth qualitative study provides a wide range of reasons for choosing or not choosing a treatment modality for knee or hip OA from a patient perspective. Four overarching themes were identified: treatment characteristics, personal investment, personal circumstances, and support and advice. This study is one of the first addressing both conservative and surgical treatment modalities in OA. Most of the themes and subthemes were found across the various treatment modalities.

A conceptual model (Figure 1) integrated the considerations of patients when weighing the pros and cons of various treatment modalities. Themes from previous qualitative studies exploring patients' beliefs about one specific treatment also fit into this conceptual model. The most important theme was treatment characteristics, including the expected effectiveness of the treatment to reduce symptoms and increase function, and the fear of potential risks and side effects, in line with other studies focusing on medication (21,29), surgery (20,21,30,31), injections (22), exercising (14,16), and complementary medicine (29). Our study was motivated by the observation that conservative treatment modalities in OA are underused. Fear of addiction to and risks of medication may lead to dose lowering or discontinuation of medication intake (21,22,29), and fear of physical exercise may obstruct the choice for physical therapy. This suggests that addressing these barriers is crucial to facilitate the consideration for conservative treatment. It is important to customize physical exercise to patients' individual preferences, and to promote the accessibility of facilities and exercise classes in the neighborhood (15).

Treatment decisions are furthermore influenced by personal circumstances such as age, body weight, comorbidities, and previous positive and negative experiences (17,20,31). Both younger and older patients indicated that age is a reason for either choosing surgery (because they can enjoy the outcome for a longer time) or refraining from it (because of the limited durability of a prosthesis or fear of physical and psychological difficulties). Other personal considerations influencing the choice for surgery were personal investments, as the time surgery and revalidation takes (18,22) and "caring commitments" (20,30). Patients expressed that there was a tension between spending time to perform exercises and competing demands in daily life. This emphasizes that treatment adherence and a better treatment outcome may be enhanced when the choice for an optimal therapy fits into patients' daily lives. Therefore, the treatment regimen should be a collaborative venture of the health care provider and the patient. Our study was the first to observe patients' fear of the long rehabilitation period of surgery, because this prevents them from

performing their social roles (e.g., family caregiver, household, work).

Besides other constraints, patients identified financial costs as a barrier. Some insurance companies do not reimburse conservative treatment modalities for knee and hip OA, while more expensive surgical treatment is reimbursed. As a consequence, some patients may prefer surgical treatment even though (conservative) treatment is considered a more optimal treatment by the health care provider and patient. Therefore, actually not only the patient and health care provider are involved in shared decision making but the insurance company may play a role as well. Future research should point out to what extent financial constraints are considered a barrier for (conservative) treatment choices in knee and hip OA.

For some patients the advice of their partner or peers is important in deciding on a treatment, as was also shown in other studies (14,18,20,22). Reports of poor outcomes of surgery by others may create fear and uncertainty in patients about their own choice for surgical treatment (17,20,21). However, individual reasons to choose a specific treatment modality likely depend on patients' individual circumstances in terms of OA severity, pain, functioning, working status, etc. For instance, fear of complications during surgery will not likely be mentioned by a patient in whom surgical treatment is not (yet) an option. To allow for an informed decision regarding treatment, health care providers should assess whether their patients feel restricted in their treatment choice due to outcome expectations, fears, personal investments and circumstances (e.g., cost, time, dependency on others, caring commitments, comorbidities, and previous experience), and support and advice of peers. Where possible, health care providers should aim to help patients overcome these barriers.

A strength of this study is the extensive, in-depth overview of reasons for choosing a specific treatment modality for knee or hip OA. The study adds to existing literature by focusing on the decision-making process regarding all conservative and surgical treatment modalities for OA from the perspective of the patient. A heterogeneous sample of patients was acquired in order to be able to identify many, divergent reasons. Our approach appears successful, since the identified reasons and themes in our study are largely similar to the aggregated findings of multiple previous qualitative studies in distinctive subgroups of OA patients (14,16,20–22,29,30). Although care was taken in selecting a heterogeneous sample of patients, a limitation of our study is that we cannot demonstrate the heterogeneity, because we did not assess clinical and functional characteristics of patients. Another limitation of any qualitative study is interpretation bias. To deal with this and to prevent our missing any themes, themes were identified independently by 2 researchers. A limitation of the study is that patients were not involved in the coding process and identification of themes, which might have led to different interpretations.

The identified themes in this study can be used for both scientific and clinical purposes. The current qualitative study was meant to identify an encompassing set of reasons, rather than to statistically analyze these reasons, or examine applicability in other populations. Future quantitative research is needed to examine the frequency of occurrence and importance of the themes, the relationship between patients' reasons for treatment choices and their demographic characteristics and clinical status, and the hypothesized interrelatedness between the themes. To achieve this, a validated measurement instrument could be developed, based on the themes identified.

Our findings can also be used in clinical practice to better meet patients' needs (32). If health care providers identify reasons for not choosing specific treatment modalities, they can discuss them with their patients. This may lead to a better allocation of both conservative and surgical treatment modalities, and may improve successful referrals to conservative treatment modalities. Future research should point out whether addressing these reasons during consultations leads to an increase in utilization of conservative treatments and delay of surgery.

The current study identified multiple reasons integrated in a 4-facet model guiding the patient's choice for or against a treatment modality for OA: treatment characteristics, personal investment, personal circumstances, and support and advice. The findings of the current study will improve shared decision making by helping health care providers to address the core reasons that guide a patient's choice.

AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be submitted for publication. Ms Selten had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study conception and design. Selten, Vriezekolk, Geenen, Schers, van den Ende.

Acquisition of data. Selten.

Analysis and interpretation of data. Selten, Vriezekolk, Geenen, van der Laan, van der Meulen-Dilling, Nijhof, Schers, van den Ende.

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