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Creating Compact Comparative Health Care Information: What Are the Key Quality Attributes to Present for Cataract and Total Hip or Knee Replacement Surgery?

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Background. The recent emphasis on providing comparative health care data to the public has resulted in a large amount of online information. To focus on the most essential attributes, insight is needed into which attributes are actually considered by consumers. Objective. To assess which attributes of Dutch hospital performance information contribute most to consumers' hospital choice for cataract and total hip or knee replacement surgery.

Design.Two discrete-choice experiments were performed: one for cataract surgery and one for total hip or knee replacement surgery. Participants viewed hypothetical hospitals based on representative values for 10 attributes (e.g., distance to the hospital, waiting time for the surgery, conduct of professionals, information provision, complication rate) and were asked to select the hospital they would choose if they needed treatment. We used multilevel logistic regression analysis to test the effects of the attributes and the interactions between attributes and respondent characteristics on consumers' hospital choice. Results. All except one attribute (length of the first appointment with the ophthalmologist) contributed significantly to consumers' choices.

Although some differences were found between cataract and hip/knee replacement surgery, the most influential attributes for both types of surgeries were distance, waiting time, and the attributes of patient safety (complication rate of capsular rupture and the use of procedures to prevent adverse effects of thrombosis). Interaction effects were found between hospital attributes, on one hand, and age, education, and consumer choice orientation, on the other hand. Conclusions. As for cataract and total hip/ knee replacement surgery, the attributes that seem most important to consumers when choosing a hospital are access (waiting time and distance) and patient safety attributes.

Informed decision making by patients is a central element of current health care reforms toward more (regulated) competition in many countries.

Patients, increasingly called ''consumers,'' are expected to take more responsibility for their own health and to inform themselves about existing treatments and facility options to make an informed decision. [1,2] Patient participation in decision making has also been encouraged from an empowerment perspective. [1,3] In several Western countries, different types of information are available for health care consumers to help them with their choices. One important information type that has been published in large amounts are public performance reports about the differences between health care providers (also called comparative health care information).

This information mainly consists of facts about provider characteristics and services as well as performance data on a variety of quality indicators.[4,5] Although governments and patient associations are usually inclined to disclose lots of information, there is little evidence that consumers are taking up the role of active information processors.[6–9] This, despite the fact that when asked about public reporting initiatives, consumers have generally responded positively to the existence of the information.[10–13] It has been suggested that comparative health care information is not perceived as valuable or salient by consumers.[7] When the perceived value of the attributes outweighs the costs of obtaining the information, consumers may more actively incorporate comparative health care information in their decisions.[14] Other explanations for the limited use of information by consumers are based on psychological studies on human information processing and decision making. Barriers such as information complexity and overload and consumers' failures to process numbers and abstract ideas have been cited.[15–18] Previous studies have shown that consumers can only process a limited amount of information.[18,19] Therefore, reductions in the amount of presented information seem required. Both from an economic and a psychological point of view, compact Web pages consisting of only the most important attributes seem to be a precondition for a successful public reporting system.

WHAT IS IMPORTANT FOR HEALTH CARE CONSUMERS?

When health care consumers are asked to rate or rank different attributes important for them or to choose between providers, both technical aspects (e.g., competence and accuracy) and interpersonal aspects (e.g., physicians' conduct and communication) of health care are highly valued.[6,20–26] Furthermore, consumers have reported appreciating attributes such as good information provision, accessibility of health care, and good care coordination and continuity.[22,23,27,28] In addition to these quality attributes, distance to the health care facility,[26,29,30] short waiting times,[25,28] and affordability and costs[7,22] have been demonstrated to be important for consumers.

It is recognized that attributes of importance may vary across different subgroups of health care consumers.[26,28,31,32] Variables such as age, educational level, medical condition, and type of disease have been shown to be influential.[6,28,33,34] Several studies also investigated the role of consumers' level of activation in health care and their choice attitudes, that is, the degree to which consumers (want to) take on an active role in the health care system. Harris[6] found that consumer activation was positively associated with the use of comparative information and actual switching between physicians. Groenewoud[26] distinguished 2 groups of people based on their choice attitude: consumers with an outcome-driven choice attitude (focusing on the expected treatment outcome and the expertise of the provider) and consumers with a trust-driven choice attitude (focusing on trust in and cooperation with the provider). In addition, he measured the (stated) choice behavior of people (i.e., the extent to which a person uses health care information and actively chooses between providers). It appeared that both consumers' choice attitudes and their (stated) choice behavior were related to the relevance of attributes for provider choice. For example, patients with an outcome-driven choice attitude attached more importance to the expertise/competence of the provider than patients with a trustfocused attitude.

COMPARATIVE INFORMATION ABOUT ROUTINE ELECTIVE SURGERY.

Comparative health care information has been disclosed for various types of diseases, treatments, and health care sectors. In the Netherlands, several public reporting efforts have explicitly concentrated on routine elective surgery involving relatively short hospital stays, such as cataract and total hip or knee replacement surgery. The reason to put effort in public reports about these treatments is that patients usually have sufficient time to consider different alternatives because acute health problems are not involved. Prices for reimbursement of these treatments are subject to negotiation between Dutch health insurance companies and hospitals. Individual consumers are encouraged to actively choose between hospitals for this type of surgery, all of which argues for transparent comparative information.

The comparative information available for cataract surgery and total hip/knee replacement surgery in the Netherlands can be divided into 3 categories: 1) information about hospital characteristics and services, 2) performance information derived from the hospitals themselves, and 3) information about patient experiences measured with the Dutch Consumer Quality Index.[35,36] Although some of this information has been disclosed on Web sites,[28] the 3 types of information have not typically been presented simultaneously.

However, all 3 information types are collected for public reporting purposes and may be of importance to consumers. Following the arguments of Fung and others[24] about the value of different types and sources of information, an important aim of the Dutch system is to bring together these different information types in a comprehensible way.

An urgent question is which aspects of the different information types should be disclosed as public information. An obvious criterion would be selecting those aspects most important to consumers choosing a hospital. However, a frequently found finding in the literature is that consumers value an infinite number of attributes[37] and that preferences shift very quickly.[10,38] Moreover, the attributes that consumers mark as important are not always actually weighted in their decisions.[16,39] We are thus confronted with an important challenge: how to select the attributes to be disclosed in public comparative health care information? The present study applies discrete-choice analysis to determine which hospital attributes are most influential in consumers' hypothetical choices in the case of cataract surgery and total hip or knee replacement surgery. This approach, which is a specific type of conjoint analysis, has an important advantage compared to ratings or rankings methodologies: It considers the decision-making process and not mere evaluations or appraisals. It specifically includes the tradeoffs being made between different attribute levels in the decision process, and the method thus more closely resembles the actual health care market.[40] Another advantage of the method is that the differential importance of attributes for the decisions of different consumer subgroups can be effectively analyzed. Discrete-choice experiments have been applied in previous research but mainly to investigate patient preferences for specific treatment options and health care services.[40] A few studies used discrete-choice experiments for health care provider choice (e.g., hospitals) and found that quality-of-care attributes, provider facilities, and surgery-specific information are important factors.[41,42] The findings of these studies, however, may be less relevant in practice because little attention has been devoted to existing attributes of performance information such as patient experience attributes. Experimental attributes have been created at a general level, and aspects such as ''reputation'' and ''other patients' opinion'' were included, whereas in reality, comparative health care information consists of other, more specific indicators to be weighted. In addition, the way the stimuli have been presented in previous studies does not always correspond to the actual presentation of the attributes on the Internet.

The aim of the current study was to determine the attributes most eligible to be disclosed in comparative health care information about cataract and total hip/knee replacement surgery. This study extends the use of discrete-choice methods by using existing attributes and attribute levels found in the Dutch performance data for these two surgeries and by closely resembling the presentation formats to existing formats on the Internet. The research questions were as follows: 1. What is the relative importance of different hospital attributes for consumers' choice in the case of cataract surgery and total hip or knee replacement surgery? 2. Does the relative importance of different hospital attributes for consumers' choice vary with consumers' demographic background? 3. Does the relative importance of different hospital attributes for consumers' choice vary with consumers' choice orientation?

METHODS.

Design.

An experimental design based on discrete-choice analysis was used to construct hypothetical but realistic comparative information about hospitals. We tested the effects of 10 attributes for cataract surgery and 10 for total hip or knee replacement surgery in 2 separate experiments. In a pilot study (Box 1), 8 of these 10 attributes had been rank-ordered by patients as the most important aspects for hospital choice.

[BOX 1].

We added the attributes ''distance to the hospital'' and ''waiting time for surgery'' to these 8 attributes because previous research had demonstrated their relevance.[25,29,30] Existing performance data about the attributes were available, so that we were able to create realistic experimental attribute levels. The levels were set to equal or to slightly exceed the factual range in the available comparative information.[43,44] For example, although the range of complications varied from 0% to 2.13% in the actual data, we set the attribute levels to 1.0% and 4.0% in the experiment. For distance, the attribute levels were set to 3 and 23 kilometers based on an estimation of the average distance to hospitals nearby for Dutch inhabitants. Table 1 describes the 10 attributes and their levels for each experiment.

In each experiment, the combination of all attributes and levels resulted in a total of $2^7 3\ 3^3 = 3456$ stimuli. To reduce the number of stimuli, we constructed fractional factorial designs (i.e., subsets of conditions that allow determining all main effects and interaction effects of interest; Orthoplan in SPSS 14.0 [SPSS, Inc., an IBM Company, Chicago, Illinois]), which resulted in 27 stimuli. We checked whether any of the hospitals described in these 27 stimuli had maximum scores on all attributes or minimum scores on all attributes. This was not the case.

In some pairs, one hospital may have been equal or better than the other on all attributes. Because each individual stimulus was a realistic combination of hospital attributes and these pairings might actually occur, we allowed them. We analyzed the main effects of the attributes and assessed interactions between attributes and respondents' demographic characteristics and choice orientation.

Procedure.

Members of a Dutch online access panel were invited to participate in 1 of the 2 experiments through e-mail by the panel managers. They were instructed to choose between hospitals in the hypothetical situation that they needed to undergo a cataract surgery or hip or knee replacement surgery, respectively. Each participant performed 10 choice trials; in each trial, the participant chose between 2 hospitals. The 20 stimuli were randomly selected without replacement from the 27 cases (see the appendix for an example of a choice task). Participants were provided with an explanation of the different attributes before they started with their first choice task. In addition, they could review this explanation list throughout the experiment.

Participants.

Individuals between 50 and 85 years of age were included in the study. We chose the minimum age of 50 years because of the high prevalence of cataract and hip/knee replacement surgery in older people.

Panel members were approached until each pair of hospitals was rated by approximately 100 respondents.

We chose for 100 responses because with this sample size, the minimal relevant effect is that the preferred level of an attribute is chosen in 67% of the cases in which it is provided (compared to the null hypothesis of no effect [50%]). Quota sampling was used to ensure even distributions of age, sex, and educational level across the different conditions. A total of 1751 panel members were approached per experiment.

Measures.

The dependent variable was the forced choice between the 2 hospitals. Predictor variables were the attributes, demographic variables (age, sex, general health status, educational level), whether or not the respondent had undergone cataract or hip/knee replacement surgery, and choice orientation. Concerning the predictor variable choice orientation, 2 measures were distinguished—namely, choice attitude and choice behavior. Both measures were based on the measures developed by Groenewoud.[26] Two basic choice attitudes were described, and people had to indicate which of the two fitted them best: a focus on trust or a focus on outcomes (see Table 2). The choice behavior measure was composed of the mean value of answers to 6 Likert scale statements (on a scale from 1 = completely disagree to 4 = completely agree). Two examples of the choice behavior statements are as follows: ''If I need care, I usually investigate thoroughly how, where, and from whom I will receive the best treatment'' and ''It doesn't matter too much to me where and by whom I am treated.'' The negatively phrased items were reverse-coded; a higher value represented a relatively high degree of active choice behavior in health care.

[TABLE 1].

Statistical Analysis.

Each respondent had to make 10 choices between 2 hospitals, and not every respondent was provided with the same pairs of hospitals. Every choice resulted in 2 data records, one for every hospital in the pair with a 0/1 dependent variable (0 = not chosen and 1 = chosen). The decisions made by the respondents were dependent on the random display of stimuli pairs to respondents, and we needed to take into account this data hierarchy.

Normally, this would imply dealing with 2 forms of clustering—namely, clustering within respondents and within hospital pairs. But because respondents were forced to make a choice, the response rates were the same for every respondent (50%, meaning that every respondent was forced to select 10 hospitals out of 20 and, as a consequence, to reject 10 hospitals).

Each respondent saw only a small number of all possible stimuli, and after controlling for the attributes, the between-respondent variance would be (equal to) zero. The clustering within respondents can thus be ignored, which leaves only the clustering within hospital pairs (i.e., respondents' choices were dependent not only on the attributes of the chosen hospital but also on the attributes of the other hospital shown).

To assess the main effects of the attributes, we performed multivariate multilevel logistic regression analyses that accounted for the clustering of hospitals within pairs. To examine the differences in the relative importance of attributes between different consumer subgroups, we also tested multilevel regression models containing both main effects of the attributes and interactions between attributes and several respondent characteristics and the consumer orientation measures. The following respondent characteristics were used in the analysis: age, educational level, sex, general health status, and having had a cataract or total hip/knee replacement surgery.

[TABLE 2].

RESULTS.

In total, 714 individuals (41%) completed the cataract survey, and 589 individuals (34%) completed the hip/knee survey. Because each respondent made 10 choices, the final samples consisted of 7140 cases for the cataract survey and 5890 cases for the hip/knee survey to be analyzed.

Table 3 describes several demographics of the respondents of both surveys. The mean (SD) age of the respondents was 59.9 (6.3) years for the cataract survey and 60.0 (7.8) years for the hip/knee survey.

In both samples, 23% were highly educated. Both surveys showed that respondents were more focused on trust in health care (60.4% cataract survey; 76.1% hip/knee survey) instead of outcomes of health care (Table 2). The scores on the choice behavior meaure were normally distributed, and the mean scores were 2.6 for the cataract survey and 2.7 for the hip/knee survey.

Influence of Hospital Attributes.

Cataract survey. For cataract surgery, 9 out of 10 attributes significantly ($P < 0.001$) influenced respondents' choice (see Table 4). The only attribute without a significant influence was the length of the first appointment with the ophthalmologist ($P = 0.07$). Table 4 also shows the relative importance of the attributes for respondents' choices. The 3 most influencing factors were 1) rate of complications (capsular rupture; lower complication rate preferred), 2) waiting time for the surgery (shorter time preferred), and 3) distance to the hospital (closer preferred).

[TABLE 3].

Hip/knee survey. All 10 attributes contributed significantly ($P < 0.001$; see Table 4) to respondents' hospital choice for total hip/knee replacement surgery.

The relative importance of the attributes is displayed in Table 4. The 3 most influencing factors were 1) presence of procedures to prevent adverse effects of thrombosis (procedures preferred), 2) waiting time for the surgery (shorter time preferred), and 3) pain control (positive patient experience with pain control preferred).

Differences between Consumer Subgroups

Table 5 shows the statistically significant interactions at $P < 0.001$ and $P < 0.01$. We found 4 significant interactions for the cataract survey and 7 for the hip/knee survey. Educational level appeared to be the dominant factor influencing the effects of the hospital attributes for cataract surgery.

Higher educated respondents less often selected hospitals with relatively high complication rates and relatively low performance on conduct of ophthalmologists and more often selected hospitals where the diagnostic examinations and surgery were conducted by the same ophthalmologist. Furthermore, a significant interaction between choice behavior and distance to the hospital was demonstrated. Respondents reporting more active choice behavior more frequently selected hospitals at a relatively far distance, compared to respondents with more passive choice behavior.

[TABLE 4].

Four person characteristics interacted with the effects of hospital attributes in the case of total hip/ knee replacement surgery, with the most consistent effect caused by respondents' age. Compared to younger respondents, older respondents less frequently selected hospitals scoring above average on conduct of physicians and more frequently selected hospitals scoring below average on pain control and hospitals having performed more hip/knee replacements. The other demographic variable that made a difference was educational level: Higher educated respondents more often selected hospitals at a relatively far distance than lower educated respondents. For choice behavior, one interaction appeared: People with active choice behavior more often opted for hospitals with relatively long waiting times, compared to people with more passive choice behavior. Two significant interaction effects related to choice attitude were found. Respondents focusing on trust in health care less often selected hospitals at a relatively far distance and more frequently selected hospitals scoring relatively high on conduct of physicians, compared to respondents who focused on health care outcomes.

In both groups (hip/knee replacement and cataract surgery), we found no interaction effects for sex, health status, and having had a cataract or total hip/knee replacement surgery.

[TABLE 5].

DISCUSSION.

The success of public health care reporting systems depends on whether comprehensible and salient information is created for consumers. However, it is unknown which attributes should be incorporated in compact overviews of comparative information. With this study, we used discrete-choice analysis to assess which attributes found in the existing types of Dutch comparative health care information are most influential in determining consumers' hospital choice in the case of cataract surgery and total hip or knee replacement surgery. It was shown that all except one attribute for cataract surgery contributed significantly to consumers' choices. Overall, distance to the hospital, waiting time for the surgery, and the more technical attributes derived from hospitals' own registrations were most influential for both surgeries. The effects of the attributes were related to 3 consumer characteristics— namely, age, educational level, and consumer choice orientation.

Our study shows the importance of presenting information about the more technical aspects of care. For both surgeries, a technical attribute related to patient safety was the number one factor determining consumers' choices. This is in line with the findings of Marang–van de Mheen and others[41] and Dixon and others[42] that surgery-specific attributes and hospital infection rates had a great impact on patients' choices for a hospital. The importance of these attributes is interesting because Hibbard and others[45] recently demonstrated that patient safety indicators were not well understood compared with indicators of patient centeredness. Previous research has also shown that consumers disregard information they do not understand.[46] Perhaps the attributes in our study were relatively well interpreted because we provided respondents with plain descriptions of each attribute. However, it should be noted that mainly higher educated people avoided hospitals with higher complication rates. It remains to be seen how people with lower education or low health literacy actually understand these attributes.

This study further indicates that waiting times and distance to the hospital are important attributes, especially for people with more passive choice behavior and trust-oriented attitudes. Although this may not be surprising,[27,42,47,48] access attributes are not routinely part of comparative information, perhaps owing to a primary focus on the measurement of health care quality and safety. Another reason might be that distance to the hospital is inherently related to consumers' area of residence, making it necessary that online reporting systems entail a calculator that tailors the distance to the consumer. It would be interesting to know why distance to the hospital is such a critical aspect. Is it because of efforts of time and transportation when hospitals are not nearby? Or could it be that distance is used as a marker for familiarity of the hospital? The importance of patient experience information in choosing a hospital differed for the 2 types of surgery.

For total hip or knee replacement, patients' experiences with pain control were the third most important attribute. The other patient experience attributes (conduct of physicians and nurses) were far less influential. For cataract surgery, the conduct of ophthalmologists was the only patient experience attribute appearing in the top 5 of the most influential attributes. Interestingly, a worse performance on patient experience

attributes overall had more effect on consumers' choices than a better performance. In other words, when consumers have to weigh different attributes, they are more focused on avoiding hospitals performing badly on patient experience attributes. We know from decision research that an often used decision strategy is to eliminate alternatives that do not meet certain requirements.[19,49] However, the difference between the influence of negative and positive information is not extremely large, suggesting a compensatory decision-making strategy with loss aversion.[50] Contrary to the findings of Fung and others,[24] we found that the importance of several attributes varied across consumer subgroups; the importance was influenced by age, education, and consumer choice orientation.

Notably, the interaction effects were mainly found for attributes that were relatively important for hospital choice, such as distance to the hospital, waiting time for the surgery, complication rates, and pain control. For example, hospitals at a relatively far distance were selected less frequently by people with passive choice behavior, lower educational attainment, and a trust-oriented choice attitude. This suggests the existence of certain consumer subgroups that differentially weigh the attributes in comparative health care information, such as a group of young, highly educated consumers with active choice behavior and a group of older, lower educated consumers with more passive choice behavior. Dijs-Elsinga and colleagues[28] showed that younger persons more likely intended to use various quality-of-care aspects and procedure-specific information, whereas older persons were more likely to use information about easy access and hospital facilities. These results are in line with such differentiation of consumer subgroups.

Limitations.

A limitation of the current study is that the respondents were people from the general public, instead of patients facing a hospital choice. It is therefore unclear to what extent our results can be generalized to health care consumers or real patients. The generalizability can also be limited by the fact that our response rates were not very high (41% and 34%). We did not measure health literacy or numeracy, so we do not know whether the importance of the attributes differs between people with different levels of health literacy and numeracy.

A further limitation might be the fact that we forced respondents to choose between pairs of hospitals. In real life, consumers often show status quo biases preferring the hospital they are familiar with, and they consequently fail to choose between different alternatives.[51] We nevertheless preferred to measure forced choices in our experiment because we wanted to include explicit tradeoffs between attributes. In addition, the alternative of providing respondents with a ''no choice'' option could have resulted in an insufficient number of observations to analyze. We did not pilot-test the levels of the attributes, so we do not have any evidence that consumers are also actually willing to make tradeoffs with the attributes at the levels chosen.

Although we checked the 27 stimuli on the values of the attributes and found no obvious better and worse hospitals, it could be that some choice tasks had slightly comparable stimuli and that this has somewhat influenced the results. If 2 hospitals are alike, respondents' choices will likely be more random, which would make it more difficult to identify effects of the attributes. Finally, the selection of the attribute levels and the assigned labels could have influenced the attributes' impact. It remains to be seen what the relative importance of the attributes is when using other levels or labels.

Future Research.

We do not know how individual consumers made their choices and how they made tradeoffs between attributes. Were all attributes actually weighted by individuals, or did some participants take heuristic shortcuts, for example, by focusing on one single attribute? Previous research has shown that different people have different interpretations of information[45] and use various decision strategies.[16,52,53] The complexity of the information influences these processes.[15,54] More insight is needed into the amounts of attributes that consumers can effectively manage and how attributes of different complexity are used. On the basis of previous research, we assume that only a few (4 or 5) attributes can be effectively weighted into decisions.

[55] Qualitative research and other methods of decision analysis are therefore warranted.

In addition, we would advocate further research using discrete-choice analysis methods for other types of diseases, treatments, and health care sectors.

Our results showed that the importance of several attributes differed for cataract and total hip/knee replacement surgery. Presumably, the value of certain attributes will be even more different for other health care sectors, such as nursing homes and home care. In chronic and/or longterm care, patients usually have

more permanent relationships with health care professionals, and attributes related to interpersonal quality might be far more influential than for routine elective surgery.

Implications.

For Web-based reporting systems, our findings imply that a range of different attributes should be available for consumers, and depending on the subgroup to which they belong, consumers should be able to select aspects of interest. However, considering our arguments about not overwhelming and confusing consumers, we think that clear, succinct overviews of information should be the primary focus. The attributes most eligible for disclosure in such overviews seem to be the following: (for cataract surgery) complication rate, waiting time for surgery, distance to the hospital, and having the same ophthalmologist for examinations and surgery; (for hip/knee replacement surgery): procedures to prevent adverse effects of thrombosis, waiting time for surgery, pain control, and distance to the hospital.

People interested in attributes other than the ones displayed in the overview could search further through deep linking approaches. However, we recognize that there may be reasons for managers of reporting systems to select other attributes. For example, it may be justifiable to display those aspects on which hospitals highly differ or aspects on which hospitals perform badly.

[APPENDIX].

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TABLES

Box 1

A pilot study was conducted in 2009 to explore which quality of care aspects might be more or less important for Dutch patients when choosing a hospital for cataract or total hip/knee total replacement surgery. Patients (n = 110 for hip or knee replacement surgery and n = 44 for cataract surgery) filled out a pen and paper questionnaire in which they had to rank existing Dutch quality indicators in 3 different areas: 1) 7 indicators about hospital characteristics and services: 2) 6 indicators about clinical performance; and 3) 4 indicators about patient experiences. Of the cataract patients, 33 had already undergone surgery. Of the hip/knee patients, 84 had already undergone surgery. Multilevel regression analysis was used to estimate and test the mean importance of the indicators (t tests) and the variance between individuals (Wald statistics). For cataract surgery, it was found that the most important indicators were the same ophthalmologist for examinations and surgery (hospital services), complications concerning capsular rupture (clinical performance), and conduct of ophthalmologists (patient experience). For total hip/knee replacement surgery, the most important indicators appeared to be specialist areas of physicians (hospital services), procedures to prevent adverse effects of thrombosis (clinical performance), and conduct of physicians (patient experience).

Table 1 Hospital Attributes and Levels

Attribute	Information Type[a]	Levels	Explanation for Respondents
Cataract survey			
1. Distance to the hospital	1	0 = 3 kilometers 1 = 23 kilometers	Indicates how many kilometers from the patient's postal code the hospital is located
2. Waiting time for surgery	1	0 = 4 weeks 1 = 11 weeks	Indicates how many weeks patients on average have to wait until the surgery
3. Conduct of ophthalmologists[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how the ophthalmologists communicate with patients, for example, their politeness, careful listening, and clear explanations
4. Conduct of nurses[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how the nurses communicate with patients, for example, their politeness, careful listening, and clear explanations
5. Information about medication[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how information about medication is dealt with. For example, whether professionals ask for allergy to iodine and certain medications and whether potential side effects are clearly explained
6. Complications (capsular rupture)	3	0 = 1% 1 = 4%	Indicates how often the complication of capsular rupture occurs. This is one of the most common complications in cataract surgery and means that the posterior lens capsule is blurred. This can be the result of errors but is also a "normal" risk of care. One consequence of the complication is worse vision than in people who do not have this complication.
7. Registration system for treatment outcomes	3	0 = no 1 = yes	Indicates whether a hospital records the outcome of cataract surgeries, for example, data about complications
8. All diagnostic examinations and diagnosis on 1 day	3	0 = no 1 = yes	Indicates whether all diagnostic examinations and the actual diagnosis are on the same day
9. The same ophthalmologist for examinations and surgery	3	0 = no 1 = yes	Indicates whether the patient sees the same ophthalmologist during the diagnostic examinations and the surgery
10. Length of first appointment with the ophthalmologist	3	0 = 10 minutes 1 = 15 minutes	Indicates how many minutes there are scheduled for the first appointment with the ophthalmologist
Hip/knee survey			
1. Distance to the hospital	1	0 = 3 kilometers 1 = 23 kilometers	Indicates how many kilometers from the patient's postal code the hospital is located
2. Waiting time for surgery	1	0 = 4 weeks 1 = 11 weeks	Indicates how many weeks patients on average have to wait until the surgery
3. Conduct of physicians[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how the physicians and the nurse practitioners communicate with patients, for example, their politeness, careful listening, and clear explanations
4. Conduct of nurses[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how the nurses communicate with patients, for example, their politeness, careful listening, and clear explanations
5. Pain control[b]	2	0 = 1 star (*) 1 = 2 stars (**) 2 = 3 stars (***)	Indicates how well pain is controlled, for example, whether all possible actions are performed to help the patient with his or her pain

(continued)

Table 1 (continued)

Attribute	Information Type[a]	Levels	Explanation for Respondents
6. Information provision before surgery	3	0 = no 1 = yes	Indicates whether information materials are given to patients before surgery, for example, written or audiovisual information
7. Procedures to prevent adverse effects of thrombosis	3	0 = no 1 = yes	Indicates whether the hospital uses guidelines and blood thinners to prevent adverse effects of thrombosis. Thrombosis is common after total hip or knee surgery.
8. Specialist areas	3	0 = no 1 = yes	Indicates whether there are orthopedists with 1 or more specialist areas working in the hospital, such as hip dysplasia teenagers, children's orthopedics, revision surgery, complex spine surgery, or tumor surgery
9. Number of performed total knee or hip replacements per year in adults	3	0 = 98 1 = 314	Indicates how many adults (age >18 years) had an operation in the hospital for a total hip replacement or total knee replacement in the past year
10. Information provision approach	3	0 = only written information 1 = written information and information sessions	Indicates how the hospital provides information about the surgery: only written information or information sessions in addition to written information

[a]The type of information is categorized as follows: 1 = information about hospital characteristics and services; 2 = information about patient experiences measured with the Dutch Consumer Quality Index; 3 = information based on performance indicators of the Dutch Health Care Transparency Programme.
[b]The information about patient experiences was displayed using a 3-star system. This is the standard presentation approach in the Netherlands. Each hospital's rating is compared to the overall rating across all hospitals. Depending on whether the comparison interval of a hospital's rating overlaps with the overall rating, a hospital receives 1 star (worse than average performance), 2 stars (average performance), or 3 stars (better than average performance). Respondents were provided with a legend explaining the star rating system.

Table 2 Choice Orientation Results

Variable	Cataract Survey No. (%) Agree/Totally Agree	Hip/Knee Survey No. (%) Agree/Totally Agree
Choice Behavior		
It doesn't matter too much to me where and by whom I am treated	213 (30)	176 (30)
I don't want to invest too much time and energy in the choice process	335 (47)	259 (44)
If I need care, I usually go to the therapist/care facility to which my GP or specialist has referred me	606 (85)	488 (83)
If I need care, I usually investigate thoroughly how, where, and from whom I will receive the best treatment	534 (75)	473 (80)
I have experience with the health care system and therefore know which therapist or care facility is best for me	381 (53)	329 (56)
I think it's important to weigh possible treatments, therapists and care facilities against each other properly	599 (84)	514 (87)
Choice Attitude	**No. (%) Applicable**	**No. (%) Applicable**
Focus on trust: Trust in the staff on a personal level and the expertise of the professionals are the most important things for me. If there is trust and expertise, we can deliberate and decide about the best treatment, so that I can resume my daily life without being troubled by bad vision (cataract)/ without pain (hip/knee).	431 (60)	448 (76)
Focus on outcomes: The expertise and experience of the professionals are the main priorities for me. An expert team is the best guarantee of a good outcome. Enabling me to function without bad vision (cataract)/suffering pain (hip/knee) is what the treatment is ultimately about.	283 (40)	141 (24)

[a]Factor and reliability analyses revealed moderate stable constructs with corresponding Cronbach's α of .68 (cataract survey) and .66 (hip/knee survey).

Table 3 Demographic Characteristics of Respondents

Variable	Cataract Survey No. (%)	Hip/Knee Survey No. (%)
Age		
50–59	349 (49)	85 (48)
60–69	321 (45)	239 (41)
70–79	32 (5)	59 (10)
80 and older	12 (2)	9 (1)
Sex		
Male	372 (52)	288 (49)
Female	342 (48)	301 (51)
General health status		
Excellent	35 (5)	33 (6)
Very good	109 (15)	104 (18)
Good	379 (53)	302 (51)
Fair	174 (24)	132 (22)
Poor	17 (2)	18 (3)
Education[a]		
Low	292 (41)	246 (42)
Medium	261 (37)	210 (36)
High	161 (23)	133 (23)
Having had cataract/total hip or knee surgery	53 (7)	54 (9)
Relatives/friends having had cataract/total hip or knee surgery		
Yes	470 (66)	364 (62)
No	186 (26)	200 (34)
Unknown	58 (8)	25 (4)

[a]Low: primary school, lower level of secondary school, or lower vocational training. Medium: higher level of secondary school or intermediate vocational training. High: higher vocational training or university.

Table 4 Main Effects of Hospital Attributes on Respondents' Hospital Choice

Attribute[a]	Estimate of Regression Coefficient (*B*)	Standard Error	Significance (*P* Value)	Odds Ratio	Relative Importance[b]
Cataract survey (n = 7140)					
Distance to the hospital (23 kilometers)	−1.46	0.06	0.000	0.23	3
Waiting time for surgery (11 weeks)	−1.51	0.06	0.000	0.22	2
Conduct of ophthalmologists (1 star)	−1.06	0.07	0.000	0.35	5
Conduct of ophthalmologists (3 stars)	0.87	0.07	0.000	2.38	7
Conduct of nurses (1 star)	−0.64	0.07	0.000	0.53	10
Conduct of nurses (3 stars)	0.57	0.07	0.000	1.76	11
Information about medication (1 star)	−0.81	0.07	0.000	0.45	8
Information about medication (3 stars)	0.56	0.07	0.000	1.75	12
Complications (capsular rupture) (4%)	−2.76	0.07	0.000	0.06	1
Registration system for treatment outcomes (yes)	0.68	0.06	0.000	1.98	9
All diagnostic examinations and diagnosis on 1 day (yes)	0.94	0.06	0.000	2.54	6
The same ophthalmologist for examinations and surgery (yes)	1.07	0.06	0.000	2.90	4
Length of first appointment with the ophthalmologist (15 minutes)	0.11	0.06	0.066	1.11	13
Hip/knee survey (n = 5890)					
Distance to the hospital (23 kilometers)	−1.26	0.06	0.000	0.28	4
Waiting time for surgery (11 weeks)	−1.45	0.07	0.000	0.24	2
Conduct of physicians (1 star)	−0.85	0.07	0.000	0.43	9
Conduct of physicians (3 stars)	0.92	0.07	0.000	2.51	7
Conduct of nurses (1 star)	−0.68	0.07	0.000	0.51	11
Conduct of nurses (3 stars)	0.68	0.07	0.000	1.97	12
Pain control (1 star)	−1.40	0.08	0.000	0.25	3
Pain control (3 stars)	0.88	0.07	0.000	2.41	8
Information provision before surgery (yes)	1.19	0.06	0.000	3.30	5
Procedures to prevent adverse effects of thrombosis (yes)	2.42	0.07	0.000	11.20	1
Specialist areas (yes)	0.81	0.07	0.000	2.24	10
Number of performed total knee or hip replacements per year in adults (314)	1.01	0.06	0.000	2.74	6
Information provision approach (written information and information sessions)	0.21	0.06	0.001	1.23	13

[a]The reference categories of the independent variables (the attributes) in the regression analyses were distance to the hospital: 3 kilometers; waiting time for surgery: 4 weeks; conduct of ophthalmologists, physicians, and nurses: 2 stars; information about medication: 2 stars; complications: 1%; registration system for treatment outcomes: no; all diagnostic examinations and diagnosis on 1 day: no; the same ophthalmologist for examinations and surgery: no; length of first appointment with the ophthalmologist: 10 minutes; pain control: 2 stars; information provision before surgery: no; procedures to prevent adverse effects of thrombosis: no; specialist areas: no; number of performed total knee or hip replacements per year in adults: 98; and information provision approach: only written information.

[b]Based on the size of the estimated regression coefficients.

Table 5 Significant Interaction Effects of Respondent Characteristics and Hospital Attributes on Respondents' Hospital Choice

Attribute[a]	Estimate of Regression Coefficient (*B*)	Standard Error	Significance (*P* Value)
Cataract survey (n = 7140)			
Distance to the hospital (23 kilometers) × preference for active choice behavior	0.47	0.08	0.000
Conduct of ophthalmologists (1 star) × highly educated	−0.43	0.13	0.001
Complications (capsular rupture) (4%) × highly educated	−0.37	0.12	0.002
The same ophthalmologist for examinations and surgery (yes) × highly educated	0.36	0.12	0.002
Hip/knee survey (n = 5890)			
Distance to the hospital (23 kilometers) × highly educated	0.43	0.12	0.001
Distance to the hospital (23 kilometers) × focused on trust	−0.43	0.11	0.000
Waiting time for surgery (11 weeks) × preference for active choice behavior	0.31	0.09	0.001
Conduct of physicians (3 stars) × age	−0.02	0.01	0.002
Conduct of physicians (3 stars) × focused on trust	0.34	0.12	0.006
Pain control (1 star) × age	0.02	0.01	0.004
Number of performed total knee or hip replacements per year in adults (314) x age	0.03	0.01	0.000

[a]The reference categories of the independent variables (the attributes, demographic variables, and choice orientation variables) were as follows: distance to the hospital: 3 kilometers; waiting time for surgery: 4 weeks; conduct of ophthalmologists and physicians: 2 stars; complications: 1%; the same ophthalmologist for examinations and surgery: no; pain control: 2 stars; number of performed total knee or hip replacements per year in adults: 98; education: low education; and choice attitude: focus on outcomes. The variables age and preference for active choice behavior were analyzed as continuous variables.

APPENDIX
Example of the Experimental Choice Task

	Hospital A	Hospital B
Distance to the hospital	3 kilometers	3 kilometers
Waiting time for surgery	11 weeks	4 weeks
Conduct of ophthalmologists	***	*
Conduct of nurses	*	*
Information about medication	***	*
Complications (capsular rupture)	1%	1%
Registration system for treatment outcomes	Yes	No
All diagnostic examinations and diagnosis on 1 day	No	No
The same ophthalmologist for examinations and surgery	Yes	No
Length of first appointment with the ophthalmologist	15 minutes	10 minutes
I would choose:	☐	☐

* = worse than average performance; ** = average performance; *** = better than average performance