Ethnic Variation in Knee Replacement

Patient Preferences or Uninformed Disparity?

Maria E. Suarez-Almazor, MD, PhD; Julianne Soucek, PhD; P. Adam Kelly, PhD; Kimberly O’Malley, PhD; Margaret Byrne, PhD; Marsha Richardson, MSW; Chong Pak, MPH

Background: Despite the efficacy and cost-effectiveness of total knee replacement (TKR), minority patients with knee osteoarthritis (OA) are half as likely as their white counterparts to undergo this procedure. Patient preferences may play a large role in the variations in utilization of TKR. We evaluated the preferences and beliefs of patients with knee OA from diverse ethnic backgrounds in relation to TKR.

Methods: The 198 patients with knee OA surveyed were of different ethnicities. Patients were asked about physician recommendations of TKR and whether they had considered having the procedure, their perceptions about the benefits and risks of TKR, their expectations if they were to undergo the procedure, and their trust in physicians and the health system. Bivariate and multivariate analyses were performed.

Results: A physician had discussed TKR with 27% of African Americans, 15% of whites, and 11% of Hispanics ($P = .04$). White patients were more likely than minority patients to have considered undergoing TKR ($P = .04$), more likely to consider TKR if their OA worsened and the procedure were recommended by their physician ($P = .002$), and more likely to consider TKR as a beneficial procedure ($P = .02$). Ethnic differences in preferences remained after controlling for severity of OA.

Conclusions: Ethnic minority patients with knee OA are less likely to consider TKR. In our study, these differences were not related to physician recommendation biases. The ethnic variation in preferences was associated with differences in perception of benefit, lack of personal experiences with TKR, and trust.

Arch Intern Med. 2005;165:1117-1124

Ethnic variations in health care are well documented. Minority patients are less likely to receive preventive, diagnostic, medical, or surgical interventions, after adjusting for severity of illness. In many cases, differences persist after adjusting for access to care and poverty. Knee osteoarthritis (OA) is one of the major causes of pain and disability in older individuals. Total knee replacement (TKR) is an effective option for patients who have not responded to medical therapy, offering substantial pain relief and improvement in quality of life.

Despite these benefits, marked differences in the utilization of TKR have been documented. A common pattern of persistent underutilization by ethnic minorities is evident.

Whites are twice as likely as African Americans or Hispanics to undergo TKR, and these differences cannot be attributed to the prevalence or severity of OA. The burden of OA is at least as prevalent and possibly greater in African Americans as in whites. Hispanic patients have not been studied to the same degree as African American patients, but the available evidence suggests that joint replacement utilization is also low in this group.

Access to care is a major determinant of health care utilization, and it can indeed play a role in ethnic disparities. However, the differences in TKR utilization remain after controlling for health insurance status. Other factors that may explain this disparity include physician indication biases and patient preferences. In a study of veterans with knee OA, African Americans were half as likely as whites to be willing to undergo TKR, and the difference was partially mediated by their expectations about surgery. No information about willingness to undergo TKR is available for Hispanics.
We conducted a survey of white, African American, and Hispanic patients with knee OA to assess variation in physician recommendations and patient preferences for TKR, and to elucidate possible explanations for the observed ethnic variation, including outcome expectations and trust.

**METHODS**

Participants were patients with knee OA attending a single multiclinic institution in the Houston, Tex, area, thus limiting potential differences in access to care. Kelsey-Seybold is the largest outpatient multispecialty medical organization in Houston, with 23 neighborhood clinics and 326 physicians, providing care for health management and preferred provider organizations, Medicare, Medicaid, US Department of Defense, and NASA. Patients seen at Kelsey-Seybold broadly represent the demographics of individuals with health insurance in Houston. Houston is an ethnically diverse city; in the 2000 census, 49.3% of the population was white, 25.3% black, and 37.4% Hispanic (totals do not add to 100% because self-classification is not included in the census). This study was approved by the Baylor College of Medicine institutional review board. We identified consecutive patients with a physician diagnosis of knee OA (International Classification of Diseases, Ninth Revision, Clinical Modification code 715.90) from administrative databases. To comply with the Health Insurance Portability and Accountability Act of 1996, which regulates access to patients and their medical records, we followed structured procedures approved by our institutional review board. Kelsey-Seybold mailed letters explaining the study to the identified subjects and included a stamped card that patients could mail back if they did not wish to be contacted. We calculated a priori that, to detect differences in preferences on the basis of the reported utilization (less than half in minorities), we needed to include 66 participants in each ethnic group: white, African American, and Hispanic. Our recruitment protocol was to continue accrual until the ethnic quotas were achieved. After the mailing, individuals were contacted by telephone to obtain verbal consent and to determine whether they met the following inclusion criteria: (1) physician diagnosis of knee OA; (2) ethnicity: white, African American, or Hispanic; (3) age of 55 years or more; (4) no previous TKR; (5) English or Spanish proficiency; and (6) adequate cognitive ability. Ethnicity is not included in the Kelsey-Seybold database, so once patients verbally agreed to participate, they were asked their ethnicity. If the quota had not been met for the patient's ethnic group, the patient was included. If the quota had been met, we thanked them and terminated the call. At least 5 attempts were made at varying times of day to reach each subject. When the quotas were achieved, we stopped attempting to contact patients. To limit selection bias, patients were contacted in order, starting with the most recently seen and going consecutively backward until the target sample was accrued. All patients were recruited between September 2001 and December 2002.

Of 1286 patients identified in the database, 83 mailed back the card stating that they did not wish to participate, which precluded us from contacting them or obtaining their medical records. Of the remaining 1203, 360 were ineligible to participate, 9 were deceased, 95 had moved, and 203 declined to participate. Multiple attempts were made to contact the remaining patients until the quota of 66 per group was reached. At that point, no further attempts were made. No statistically significant differences were observed in age or sex between participants and nonparticipants: mean age (SD) was 64.1 (6.2) and 64.1 (7.1) years, respectively; 63.1% of participants and 62.9% of nonparticipants were female. Other demographic and clinical comparisons are not available because regulations to protect patient confidentiality in the Health Insurance Portability and Accountability Act of 1996 precluded us from reviewing the records of nonparticipants.

Subjects were interviewed in person but were asked to self-report to the health and preferences questionnaires to allow them to take as much time as needed to complete the forms. All questionnaires used in this study were translated into Spanish by means of standard forward-backward translation by independent bilingual translators, followed by consensus on item translation. Eight (12%) of the 66 Hispanic patients elected to respond in Spanish, suggesting that this cohort was well acculturated. The following variables were used.

**Demographics:** Data were collected on age, sex, self-reported ethnicity, educational level, marital status, household income, religion, and religious beliefs (scored on a scale of 1 [no beliefs] to 5 [very strong beliefs]).

**Clinical status:** Global health was assessed with a visual analog scale where 0 indicates death and 100, perfect health. Health status was assessed with 2 Short Form–12 subscales: Physical Component Summary Scale and Mental Component Summary Scale. The severity of OA was measured with the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), which is the most common patient-reported measure in studies of knee OA. It has 3 subscales: pain, stiffness, and activity limitation. Its reliability and validity have been extensively tested. Scores range from 0 (best) to 100 (worst).

**Previous physician recommendation:** Participants were asked, “Has a doctor ever recommended or suggested that you undergo TKR surgery?” and “If your doctor recommended knee replacement, why did you decide not to have the surgery?”

**Preferences:** Two questions were asked: “Have you ever considered having knee replacement?” and “If your knee arthritis became worse and your doctor recommended a knee replacement, would you consider having this surgery?”

**Familiarity with TKR:** Patients were asked whether they had heard about TKR and whether they had close friends or relatives who had undergone knee or hip replacement.

**Perceptions of efficacy and risk of TKR:** Perception of efficacy was ascertained with the following questions, with possible ordinal responses of 1 to 5: (1) In general, how helpful or beneficial do you think a knee replacement can be for patients with knee arthritis? (2) If your condition worsened and you decided to have a knee replacement, how helpful or beneficial do you think the surgery would be for you? (3) If your condition worsened and you decided to have a knee replacement, how much pain relief do you think you would get from the surgery? (4) If your condition worsened and you decided to have a knee replacement, how much improvement in your ability to function do you think you would get from the surgery? Cronbach α reliability coefficient for the items was 0.88. Responses were averaged to obtain a scale of 1 to 5, where higher values indicate increased perception of efficacy.

Perception of risk was measured with 3 items: (1) How risky or dangerous do you think a knee replacement operation might be? (2) How serious do you think are the complications from knee replacement surgery? (3) If your condition worsened and you decided to have a knee replacement, how concerned would you be about potential complications from the surgery? Cronbach α for the items was 0.78. Responses were averaged, with higher values indicating higher perception of risk.

**Trust:** We used a 7-item scale to assess trust in physicians and a 2-item subscale for trust in the health system. Items were selected from longer scales on the basis of their reliability. Both subscales showed excellent reliability: 0.86 and 0.88, respectively. Scores range from 0 (low) to 10 (high).

**Multidimensional Health Locus of Control**

This instrument has 18 items and 3 subscales: internal (I am in control of...
my health), chance (my health is related to chance), and powerful others (others have control over my health). Scores range from 6 to 36.

**RESULTS**

Participants' sociodemographic and clinical characteristics are shown in Table 1. Statistically significant differences were observed among ethnic groups, which reflected the demographics of Houston. Ethnic minorities were younger, were less educated, and had lower income than whites. African Americans reported statistically significantly worse health status and WOMAC scores than the other patients. All patients confirmed their diagnosis of OA, and 194 (98%) stated that it had been confirmed radiologically.

A physician had recommended TKR to 27% of the African Americans, compared with 15% of whites and 11% of Hispanics (P = .04). After adjusting for demographics (age, sex, and education) and WOMAC scores, no significant differences were observed in physician recommendations of TKR across ethnic groups. Using white participants as the referent, the odds ratio (OR) for African Americans was 1.8 (95% confidence interval, 0.72-4.5), and for Hispanics, 0.94 (95% confidence interval, 0.28-3.1).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>White (n = 66)</th>
<th>African American (n = 66)</th>
<th>Hispanic (n = 66)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>65.7 (6.6)</td>
<td>63.4 (6.1)</td>
<td>63.0 (5.5)</td>
<td>.03</td>
</tr>
<tr>
<td>Sex, No. (%) F</td>
<td>41 (62)</td>
<td>41 (62)</td>
<td>42 (64)</td>
<td>.98</td>
</tr>
<tr>
<td>Education, y</td>
<td>15.0 (2.4)</td>
<td>14.3 (2.8)</td>
<td>11.3 (3.5)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Income, $1000</td>
<td>52 (23)</td>
<td>39 (23)</td>
<td>39 (26)</td>
<td>.04</td>
</tr>
<tr>
<td>Disease duration, y</td>
<td>5.9 (7.7)</td>
<td>4.7 (5.1)</td>
<td>4.6 (5.1)</td>
<td>.46</td>
</tr>
<tr>
<td>Overall health†</td>
<td>76.2 (19.5)</td>
<td>68.6 (18.1)</td>
<td>75.1 (16.7)</td>
<td>.04</td>
</tr>
<tr>
<td>Short Form–12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCS</td>
<td>39.0 (10.3)</td>
<td>34.3 (9.7)</td>
<td>39.2 (8.8)</td>
<td>.006</td>
</tr>
<tr>
<td>MCS</td>
<td>55.2 (7.4)</td>
<td>51.2 (9.9)</td>
<td>53.2 (8.4)</td>
<td>&lt;.04</td>
</tr>
<tr>
<td>WOMAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>43.4 (23.2)</td>
<td>53.3 (21.3)</td>
<td>37.5 (20.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Stiffness</td>
<td>52.5 (25.7)</td>
<td>59.5 (25.9)</td>
<td>37.5 (22.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Function</td>
<td>42.8 (23.4)</td>
<td>52.1 (20.9)</td>
<td>35.9 (21.6)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviations: MCS, Mental Component Summary Scale; PCS, Physical Component Summary Scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

*For continuous variables, results are shown as mean (SD). Significant P values are given in boldface type.
†Rated on a visual analog scale from 0 to 100.

Table 2 shows patient preferences and familiarity with TKR. More whites than minorities (African Americans and Hispanics combined) had considered TKR (42% vs 28%; P = .04). No significant differences were observed between African Americans and Hispanics. When participants were asked whether they would consider TKR if their arthritis became worse and their physician recommended the procedure, significant differences were observed: 97% of whites, 85% of African Americans, and 76% of Hispanics responded that they would consider having surgery (P = .002). White participants were also more familiar with TKR; all whites had heard about the procedure, compared with 91% of African Americans and 80% of Hispanics (P < .001). They were also more likely to have a relative or close friend who had undergone the procedure (88% vs 70% and 58% in the other groups; P = .001).

Patients’ health attitudes and beliefs about TKR are shown in Table 3. Statistical differences were observed in the perception of efficacy across the groups. Whites were more likely to consider TKR to be beneficial. No significant differences were observed in perception of risk or trust in physicians. African Americans were more likely to trust the health system and had stronger religious beliefs. Whites had higher health locus of control in the “chance” and “powerful others” subscales.

Table 4 shows the relationship between subjects’ characteristics and beliefs and their preferences (all ethnic groups together). Patients who had considered having TKR had more severe OA and higher education than the others; they were more likely to have heard about TKR (97% vs 87%; P = .02), have a relative or friend with previous TKR (P = .004), and trust their physicians (P = .009). As expected, almost all patients who had discussed TKR with their physicians had considered undergoing surgery. When subjects were asked whether they would consider surgery if recommended by their physicians, a positive answer was significantly associated with their perceptions about benefits and risks, and whether they...
had a relative or friend with TKR. No significant differences were observed for locus of control or religious beliefs.

We conducted logistic regression analyses to evaluate the association between ethnicity and preferences for TKR (Table 5). To be parsimonious, we included variables previously shown to be related to preferences for TKR and variables showing a statistical association with both ethnicity and preferences. First, we examined bivariate ORs. In a second step, we conducted multivariate logistic regression to examine the effects of ethnicity after adjusting for demographic and clinical variables. Because of the strong collinearity among clinical variables, only WOMAC pain, the strongest predictor, was included. No major differences were observed in the ORs for ethnicity when we adjusted for these variables. In the third step, we conducted a multivariate analysis with all variables of interest, with the final model including only variables with statistical significance. When subjects were asked whether they had considered having TKR, the major determinant of an affirmative response was a previous recommendation by their physicians. The OR and confidence intervals were large because almost every patient who had discussed this had considered surgery; the coefficients for the other variables remained unchanged when this variable was excluded from the model. Other significant variables included male sex, knee pain, trust in physicians, and perception of efficacy. The OR for ethnicity was slightly reduced after inclusion of these covariates, indicating some negative confounding. When patients were asked whether they would consider TKR if recommended by their physicians, the only variables that remained statistically significant were ethnicity and perception of efficacy. The odds of a white person considering TKR if recommended by their physician were 3 times that of an African American and 6 times that of a Hispanic. Perception of efficacy was a strong independent effect. Because this variable was measured on a 1-to-5 scale, an OR of 5.5 indicates that for each 1-point increase in the overall positive perceptions about efficacy, there is a 5-fold increase in the odds that a patient would consider TKR.

Table 2. Physician Recommendations, Patients’ Willingness to Undergo Total Knee Replacement, and Familiarity With Procedure*

<table>
<thead>
<tr>
<th>Question</th>
<th>Total (N = 198)</th>
<th>White (n = 66)</th>
<th>African American (n = 66)</th>
<th>Hispanic (n = 66)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a doctor ever recommended or suggested that you undergo total knee replacement surgery?</td>
<td>35 (18)</td>
<td>10 (15)</td>
<td>18 (27)</td>
<td>7 (11)</td>
<td>.04</td>
</tr>
<tr>
<td>Have you ever considered having knee replacement?</td>
<td>64 (32)</td>
<td>28 (42)</td>
<td>20 (30)</td>
<td>16 (24)</td>
<td>.07</td>
</tr>
<tr>
<td>If your knee arthritis became worse and your doctor recommended a knee replacement, would you consider having this surgery?</td>
<td>170 (86)</td>
<td>64 (97)</td>
<td>56 (85)</td>
<td>50 (76)</td>
<td>.002</td>
</tr>
<tr>
<td>Had you heard about this procedure, total knee replacement, before?</td>
<td>179 (90)</td>
<td>66 (100)</td>
<td>60 (91)</td>
<td>53 (80)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Do you have any close friends or relatives who have undergone knee replacement?</td>
<td>142 (72)</td>
<td>58 (88)</td>
<td>46 (70)</td>
<td>38 (58)</td>
<td>.001</td>
</tr>
<tr>
<td>Do you have any close friends or relatives who have undergone hip replacement?</td>
<td>111 (56)</td>
<td>52 (79)</td>
<td>34 (52)</td>
<td>25 (38)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Results are shown as number (percentage) of patients who answered yes. Significant P values are given in boldface type.

Table 3. Participants’ Beliefs and Attitudes

<table>
<thead>
<tr>
<th>Belief/Attitude</th>
<th>White Mean (SD)</th>
<th>African American Mean (SD)</th>
<th>Hispanic Mean (SD)</th>
<th>P Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of efficacy of TKR (1, lowest benefit; 5, highest benefit)</td>
<td>3.9 (0.7)</td>
<td>3.6 (0.8)</td>
<td>3.5 (1.0)</td>
<td>.02</td>
</tr>
<tr>
<td>Perception of risk of TKR (1, lower risk; 5, higher risk)</td>
<td>3.0 (0.8)</td>
<td>3.2 (0.9)</td>
<td>3.1 (0.8)</td>
<td>.42</td>
</tr>
<tr>
<td>Trust in physicians (1, lowest; 10, highest)</td>
<td>6.7 (1.6)</td>
<td>7.3 (1.8)</td>
<td>6.7 (2.1)</td>
<td>.13</td>
</tr>
<tr>
<td>Trust in health system (1, lowest; 10, highest)</td>
<td>6.4 (2.4)</td>
<td>8.2 (1.7)</td>
<td>7.7 (2.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Strength of religious beliefs (1, lowest; 4, highest)</td>
<td>2.9 (1.1)</td>
<td>3.0 (0.7)</td>
<td>3.2 (1.0)</td>
<td>.04</td>
</tr>
<tr>
<td>Locus of control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td>15.8 (5.3)</td>
<td>16.4 (7.2)</td>
<td>15.0 (6.1)</td>
<td>.49</td>
</tr>
<tr>
<td>Chance</td>
<td>26.6 (5.1)</td>
<td>24.6 (6.2)</td>
<td>23.7 (6.8)</td>
<td>.02</td>
</tr>
<tr>
<td>Powerful others</td>
<td>23.6 (5.4)</td>
<td>21.3 (6.1)</td>
<td>18.2 (6.4)</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Abbreviation: TKR, total knee replacement.

*Significant P values are given in boldface type.

Ethnic disparities in health care remain pervasive after controlling for income and access to care. It has been proposed that sociocultural beliefs play a role in the persistence of these differences. Joint replacements are elective procedures that provide substantial benefits in pain relief and quality of life.35 Despite these benefits, minor-
Table 4. Patient Characteristics and Attitudes in Relation to Preferences for TKR*

<table>
<thead>
<tr>
<th>Characteristic/Attitude</th>
<th>Have You Ever Considered Having Knee Replacement?</th>
<th>If Your Knee Arthritis Became Worse and Your Doctor Recommended a TKR, Would You Consider Having This Surgery?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (n = 134)</td>
<td>Yes (n = 64)</td>
</tr>
<tr>
<td>Age, y</td>
<td>63.6 (6.3)</td>
<td>64.9 (5.8)</td>
</tr>
<tr>
<td>Sex, No. (% F)</td>
<td>87 (65)</td>
<td>37 (58)</td>
</tr>
<tr>
<td>Education, y</td>
<td>13.2 (3.5)</td>
<td>14.2 (2.8)</td>
</tr>
<tr>
<td>Disease duration, y</td>
<td>4.8 (6.1)</td>
<td>5.8 (6.0)</td>
</tr>
<tr>
<td>Relative/friend with TKR, No. (%)</td>
<td>88 (66)</td>
<td>54 (84)</td>
</tr>
<tr>
<td>Trust in physicians</td>
<td>6.7 (1.8)</td>
<td>7.4 (1.9)</td>
</tr>
<tr>
<td>Trust in health system</td>
<td>7.3 (2.4)</td>
<td>7.7 (2.4)</td>
</tr>
<tr>
<td>Strength of religious beliefs</td>
<td>3.2 (1.0)</td>
<td>3.2 (1.0)</td>
</tr>
<tr>
<td>Internal</td>
<td>15.6 (6.1)</td>
<td>16.2 (6.5)</td>
</tr>
<tr>
<td>Chance</td>
<td>24.6 (6.0)</td>
<td>25.6 (6.5)</td>
</tr>
<tr>
<td>Powerful others</td>
<td>21.1 (6.5)</td>
<td>20.9 (6.2)</td>
</tr>
</tbody>
</table>

Abbreviations: MCS, Mental Component Summary Scale; PCS, Physical Component Summary Scale; TKR, total knee replacement; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

*Continuous variables are expressed as mean (SD). Significant P values are given in boldface type.
†Rated on a visual analog scale from 0 to 100.

Our study found that African American and Hispanic patients were less likely than whites to consider TKR. These differences were not related to overall health or disease severity because they remained significant after controlling for these factors. African American patients were the least likely to consider surgery, despite reporting more severe symptoms and having discussed the procedure with their physician more often than the other groups. Ethnic variation did not appear to be related to physician recommendations, because ethnic differences in recommendations became nonsignificant after controlling for clinical status. Although the difference was nonsignificant, African Americans had a higher recommendation rate than whites (OR, 1.8), suggesting that physician bias was not a factor in this group. Major determinants of preferences were patients’ beliefs about the efficacy of the procedure and knowing individuals in their close social environment who had undergone TKR, and these 2 variables were also highly correlated (patients who knew others being more positive in their beliefs about efficacy).

Ibrahim et al.26,27 surveyed veterans with knee OA and reported that whites were twice as likely as African Americans to consider TKR. In their study, African Americans were also less likely to have family members or friends with replacements and were more likely to expect postsurgical pain and functional difficulties. These beliefs mediated their willingness to undergo surgery. Their study did not include Hispanics. Our findings were similar. In addition, our study found that trust in physicians and beliefs about efficacy (as opposed to postoperative problems) influenced the results in all ethnic groups and partially explained some, but not all, of the differences among them. The veterans study also showed that preferences for replacement were related to religiosity.23 African American patients were more likely than whites to perceive prayer as helpful for their arthritis and scored higher in a religiosity scale, which mediated their willingness to undergo surgery. In our study, we measured strength of religious beliefs with a single-item ordinal scale; despite finding that African Americans had significantly stronger religious beliefs than whites, this variable was not related to preferences for TKR.

In our study, participants less likely to consider TKR were also less educated, but this effect was small and mediated through perceptions about efficacy, and it became nonsignificant in multivariate models. In a Canadian study, among subjects with a potential need for TKR, education and income were not associated with willingness to consider surgery, although individuals with less education or income were more likely to have an unmet need for arthroplasty.37
To our knowledge, this is the first study to assess attitudes toward TKR in Hispanics, and to compare nonveteran minorities and whites with knee OA. We have confirmed that minority patients are less willing than whites to undergo replacement, after controlling for health status, pain, and disability, and that these preferences remain after controlling for attitudes about TKR, suggesting that other unidentified factors are important. Our findings are encouraging in that they suggest mechanisms to improve utilization of TKR. Whereas some of the differences described in the literature may be related to access to care and poverty, change in these domains is driven more by political will and less by the health care system. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to be an important determinant of adherence to medical recommendations. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health.

To our knowledge, this is the first study to assess attitudes toward TKR in Hispanics, and to compare nonveteran minorities and whites with knee OA. We have confirmed that minority patients are less willing than whites to undergo replacement, after controlling for health status, pain, and disability, and that these preferences remain after controlling for attitudes about TKR, suggesting that other unidentified factors are important. Our findings are encouraging in that they suggest mechanisms to improve utilization of TKR. Whereas some of the differences described in the literature may be related to access to care and poverty, change in these domains is driven more by political will and less by the health care system. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

Our study had some limitations. We were unable to evaluate clinical differences between participants and nonparticipants because of the regulations of the Health Maintenance Organizations. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

Our study had some limitations. We were unable to evaluate clinical differences between participants and nonparticipants because of the regulations of the Health Maintenance Organizations. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

Our study had some limitations. We were unable to evaluate clinical differences between participants and nonparticipants because of the regulations of the Health Maintenance Organizations. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

Our study had some limitations. We were unable to evaluate clinical differences between participants and nonparticipants because of the regulations of the Health Maintenance Organizations. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

To our knowledge, this is the first study to assess attitudes toward TKR in Hispanics, and to compare nonveteran minorities and whites with knee OA. We have confirmed that minority patients are less willing than whites to undergo replacement, after controlling for health status, pain, and disability, and that these preferences remain after controlling for attitudes about TKR, suggesting that other unidentified factors are important. Our findings are encouraging in that they suggest mechanisms to improve utilization of TKR. Whereas some of the differences described in the literature may be related to access to care and poverty, change in these domains is driven more by political will and less by the health care system. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

Our study had some limitations. We were unable to evaluate clinical differences between participants and nonparticipants because of the regulations of the Health Maintenance Organizations. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.

Our study shows that many minority patients would not be willing to consider surgery even if their physicians recommended it. Physician-patient communication was not assessed in this study, but trust in physicians appears to play an important role, at least in the initial considerations about surgery. Physician-patient communication is an important determinant of adherence to medical recommendations and has been proposed as a major determinant of ethnic disparities in health. We speculate that some of the differences in preferences are related to unidentified factors in the interactions of patients with their physicians. We did not ask participants whether they had been assessed by an orthopedic surgeon, but it is likely that the initial discussions about TKR occur during primary care consultations.

To our knowledge, this is the first study to assess attitudes toward TKR in Hispanics, and to compare nonveteran minorities and whites with knee OA. We have confirmed that minority patients are less willing than whites to undergo replacement, after controlling for health status, pain, and disability, and that these preferences remain after controlling for attitudes about TKR, suggesting that other unidentified factors are important. Our findings are encouraging in that they suggest mechanisms to improve utilization of TKR. Whereas some of the differences described in the literature may be related to access to care and poverty, change in these domains is driven more by political will and less by the health care system. However, change in patients' beliefs can be achieved through interventions in health communication, and by improving physician-patient interaction patterns.
Insurance Portability and Accountability Act of 1996, which precluded us from obtaining clinical data in nonparticipants. Because of our recruitment strategies, however, and the demographic similarities between participants and nonparticipants, we believe that the sample is representative of the health-insured population in our area. In addition, results were adjusted for differences in socioeconomic status, demographics, and clinical variables. We did not conduct radiologic assessments, and the diagnosis of OA was based on administrative physician claims and patient confirmation. Some misclassification in the diagnosis of OA may have occurred, but there is no reason to believe that this would be different among ethnic groups. In addition, we were unable to assess the radiologic severity of OA, which may influence physicians in their recommendations for surgery. However, the major focus of our study was patient perceptions and preferences, which are more likely to be influenced by their pain and clinical status than by radiologic changes. Finally, we did not ascertain comorbidities, other than through the assessment of general health status, but our findings show that the willingness to undergo TKR in minorities was independent of overall health or age.

This study shows that variation in willingness to undergo TKR is attributable in part to expectations about efficacy, familiarity with the procedure, and trust in physicians, but that ethnicity remains an independent predictor of preferences after controlling for these variables. These findings raise 3 major issues. First, as others have suggested,39 patient preferences in this context cannot truly be considered informed preferences, because they are partially dependent on lack of familiarity with TKR. Second, better education programs targeted at minorities could provide data on outcomes to improve expectations and decision making in these patients. Finally, an effective physician-patient interaction is crucial in providing information and reassurance. Additional research should be conducted to determine whether the implementation of culturally sensitive shared decision-making processes could decrease the gap in utilization of TKR between whites and ethnic minorities with knee OA.

Accepted for Publication: November 23, 2004.

Correspondence: Maria E. Suarez-Almazor, MD, PhD, Houston Center for Quality of Care and Utilization Studies, Michael E. DeBakey Veterans Affairs Medical Center (152), 2002 Holcombe Blvd, Houston, TX 77030 (mes@bcm.tmc.edu).

Funding/Support: This material is based on work supported by the Agency for Healthcare Research and Quality and the National Institutes of Health Office of Research on Minority Health through the EXCEED program (grant PO1HS108767), and in part by the Houston Center for Quality of Care and Utilization Studies, Health Services Research and Development Service, Office of Research and Development, Department of Veterans Affairs, Washington, DC.

Previous Presentations: This study was presented at the Ninth Annual International Meeting of the International Society for Pharmacoeconomics and Outcomes Research; May 17, 2004; Arlington, Va; and at the Ninth Biennial Conference of the European Society for Medical Decision Making; June 8, 2004; Rotterdam, the Netherlands.

Acknowledgment: We thank Laura Krishnan, MS, for her assistance in the preparation of the manuscript.

REFERENCES


23. Ang DC, Ibrahim SA, Burant CJ, Kwoh CK. Is there a difference in the percep-