

## Non-steroidal Anti-inflammatory Drug Use in Chronic Arthritis Pain: Variations by Ethnicity

**Running head:** Non-steroidal anti-inflammatory drugs and ethnicity

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## **ABSTRACT**

**Objectives:** Determine if there are ethnic differences in the use of over-the-counter (OTC) and prescription oral non-steroidal anti-inflammatory drugs (NSAIDs), and if observed ethnic differences persist after adjustment for sociodemographic and clinical factors

**Methods:** Knee/hip osteoarthritis study participants were identified. Surveys were administered to collect sociodemographics, clinical information, and oral treatment methods for arthritis . Multivariable logistic regression models were created using a fully conditional method.

**Results:** Hispanics (n=130), compared to non-Hispanic Whites (n=204), were less likely to have a high school education (26.9% vs. 63.2%,  $p<0.001$ ), less likely to have private medical insurance ( $p<0.001$ ), and more likely to have worse health (  $p=0.004$ ). OTC oral NSAID use was less common (52.9% vs. 66.3%,  $p=0.019$ ) while prescription oral NSAID use was more common (43.4% vs. 31.7%,  $p=0.042$ ) among Hispanics than non-Hispanic Whites in the last 6 months. The ethnic difference in using an OTC NSAID instead of not using any oral NSAID was attenuated and no longer significant when adjusted for age, sex, education, and medical insurance (OR 0.54 [95% CI: 0.28-1.02]). The odds of using a prescription instead of an OTC NSAID remained significantly higher among Hispanics than non-Hispanic Whites when adjusted for the same variables (OR 2.17 [95% CI: 1.16-4.05]).

**Conclusions:** Among osteoarthritis patients, OTC NSAIDs were less commonly used but prescription NSAIDs were more commonly used by Hispanics than non-Hispanic Whites. Sociodemographic factors partially mediate ethnic differences in the use of oral NSAIDs.

**Key words:** non-steroidal anti-inflammatory drugs, osteoarthritis, Hispanic

In the United States (US), osteoarthritis is a leading cause of disability.<sup>1</sup> The country has also experienced an increase in the prevalence of osteoarthritis, due in part to the aging population and the growing obesity epidemic.<sup>2</sup> Non-steroidal anti-inflammatory drugs (NSAIDs) are the mainstay of pharmacologic therapy for osteoarthritis as a result of their efficacy, onset of action, and low cost.<sup>3</sup> The use of NSAIDs has also been endorsed by the American College of Rheumatology and other organizations for the treatment of osteoarthritis.<sup>4,5</sup> Although there are potential adverse effects (e.g., peptic ulcer, renal dysfunction, and hypertension), NSAIDs are the most commonly used pharmacologic treatment for osteoarthritis.<sup>3</sup>

According to a national study, Hispanics are less likely to report regular use of NSAIDs than non-Hispanic Whites.<sup>6</sup> It is unclear whether there are ethnic differences in the use of both prescription and over-the-counter (OTC) NSAIDs, however. In another study, Dominick *et al.*<sup>7</sup> found that Hispanics with osteoarthritis were prescribed non-selective or preferentially cyclooxygenase (COX)-1 selective NSAIDs more often than non-Hispanic Whites with osteoarthritis. It is possible that only OTC NSAIDs, and not prescription NSAIDs, are being underutilized by Hispanics. Evidence has shown that the prevalence of joint pain, disability and other arthritis-related symptoms are higher among Hispanics than among non-Hispanic Whites,<sup>8</sup> and disparities in osteoarthritis-related outcomes may be partly due to underutilization of evidence-based therapies.<sup>9</sup>

Hence, it is important to determine the extent of and understand the reasons for ethnic disparities in the use of NSAIDs. There are several sociodemographic and clinical factors that may affect NSAID use and differ by ethnic identity, and these factors may mediate observed ethnic differences in NSAID treatment use. Older age,<sup>10,11</sup> male sex,<sup>7</sup> and lower level of education<sup>12</sup> have been associated with decreased use of NSAIDs. Low income<sup>11,13</sup> and not having prescription drug coverage<sup>12</sup> have also been linked to not receiving prescription therapy for arthritis. In contrast, greater osteoarthritis disease severity<sup>10,14</sup> and increased number of comorbidities<sup>7</sup> have been associated with increased use of NSAIDs. There is also evidence that Hispanics living in the US tend to have lower socioeconomic profiles<sup>15</sup> and worse osteoarthritis clinical outcomes than non-Hispanic Whites.<sup>8</sup>

The main objectives of this study were to determine 1) if there are ethnic differences in the use of OTC and prescription oral NSAIDs for osteoarthritis treatment; and 2) if observed ethnic differences in the use of oral NSAIDs persist after adjustment for relevant patient sociodemographic and clinical factors.

## METHODS

### *Setting and Sample*

This was a cross-sectional study of patients with knee or hip osteoarthritis. Details of the study design were previously described.<sup>16</sup> Briefly, patients were recruited from Banner University Medical Center (BUMC) Rheumatology, Internal Medicine, and Sports Medicine Clinics (Tucson, Arizona), and from the University of Arizona Arthritis Center research registry from July 2015 until April 2018. Our target sample included patients with the following characteristics: ≥50 years old; self-identified as Hispanic/non-Hispanic White; had a diagnosis of knee or hip osteoarthritis; and without cognitive dysfunction. The study protocol was approved by the Institutional Review Board of the University of Arizona.

### *Screening and Recruitment*

Patients with knee and/or hip osteoarthritis were identified through medical record reviews or a research registry and were screened by telephone for eligibility. Presence of chronic frequent pain due to knee or hip osteoarthritis was based on questions from the Arthritis Supplement of the National Health and Nutrition Examination Survey (NHANES) I<sup>17</sup> and NHANES III<sup>18</sup>, respectively. Confirmatory diagnosis of knee osteoarthritis was based on presence of chronic frequent knee pain, age ≥50 years, and radiographic evidence of osteoarthritis.<sup>19</sup> Confirmatory diagnosis of hip osteoarthritis was based on presence of hip pain and having femoral and/or acetabular osteophytes on radiograph.<sup>20</sup> Patients who had moderate-severe cognitive dysfunction, total hip and knee arthroplasty history, or inflammatory arthritis (e.g. rheumatoid arthritis) were excluded. Non-Hispanics who self-identified as a race other than White were also excluded from this analysis, as ethnic differences in the use of NSAIDs was the focus of this study and the small percentage of non-Hispanic, non-White residents in the study sample precluded additional racial comparisons.

Eligible individuals were given a survey to complete on site. They were also given an option to complete the survey at home. Both English and Spanish language versions of surveys were available. Each survey participant was given a \$25 gift card.

### *Outcomes of Interest*

The primary outcome variable was use of oral NSAIDs (OTC and prescription) for osteoarthritis in the last 6 months. The question was asked, “Have you used or participated in any of the following treatments for joint pain or arthritis in the last 6 months?” It was asked in reference to the following treatments: a) “Non-steroidal anti-inflammatory drug, also called NSAID, that you can get without a prescription, such as Aspirin, Ibuprofen (Advil, Nuprin, Motrin) or Naproxen (Aleve)” and b) “Non-steroidal anti-inflammatory drug, also called NSAID that you get with a prescription, such as Ibuprofen (Motrin), Diclofenac (Voltaren) or Naproxen (Naprosyn)”. The secondary outcome variables determined oral NSAID treatment utilization “currently” and “the last 5 years”.

### *Exposure Variable*

Ethnicity (Hispanic/Latino or non-Hispanic/Latino) was based on self-report.

### *Covariates*

Sociodemographic The following characteristics were collected: age, sex, race, education, employment, marital status, annual income, and medical insurance.

Clinical Quality of life was assessed by asking, “How would you rate your overall quality of life?” The question is scored on a 5-point ordinal scale ranging from poor to excellent.<sup>21</sup> Depression was assessed using the Patient Health Questionnaire-8 (range: 0-24).<sup>22</sup> Medical comorbidity was assessed by self-report using a modified Charlson Comorbidity Index.<sup>23</sup> From this Comorbidity Index, the presence of digestive problems (ulcer, colitis, gallbladder disease) was determined. Osteoarthritis -related disease severity was measured using the 24-item Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).<sup>24</sup> This measure contained two subscales: pain and disability. Subscale scores were rescaled to 0-100, with higher scores indicating greater disease severity. Radiographic knee or hip osteoarthritis disease severity was determined using the Kellgren-Lawrence grading system.<sup>25</sup>

### *Statistical Analysis*

Participant characteristics were summarized using means and standard deviations for continuous measures and number and percent for categorical variables, separately for Hispanics and non-Hispanic Whites, to identify potential ethnic-specific sources of confounding in our sample. To determine if ethnicity was associated with various participant characteristics, the following tests were conducted: Fisher’s exact used for dichotomous and categorical variables, Wilcoxon-Mann-Whitney exact test for ordinal variables, and t-test for continuous variables.

Multinomial logistic regression models were used to estimate the unadjusted and adjusted odds ratios (ORs) of using only an OTC or only a prescription oral NSAID (vs. no oral NSAID), comparing Hispanics and non-Hispanic Whites. Separate models were used to estimate the unadjusted and adjusted ORs of using a prescription oral NSAID vs. only an OTC oral NSAID, also comparing Hispanics vs. non-Hispanic Whites. The initial models included ethnicity as the only independent variable. The second set of models tested for the effect of ethnicity after further adjustment for age, sex, education , and private medical insurance coverage. A final set of multivariable models was then constructed which additionally adjusted for WOMAC total and Comorbidity Index scores. All variables that were previously associated with NSAID use<sup>7,10-14</sup> and ethnicity were considered as covariates. Income was considered but dropped from the model due to significant missing data and decreased variation in conjunction with ethnicity and medical insurance. All adjusted models used multiple imputation for missing values.

Analyses were performed using SAS® version 9.4 (SAS Institute Inc. Cary, NC).

## RESULTS

Among 1430 people considered for the study, 510 were eligible for study participation (Figure 1). A total of 320 were excluded during screening based on the exclusion criteria, 269 declined study participation/opted out, and 331 could not be contacted for study screening. Among eligible study participants, 408 consented to participate, and others either changed their mind about participation, could not be re-contacted, or were excluded for undergoing joint replacement surgery. 362 surveys were received among study participants who consented. Surveys of 28 non-Hispanic, non-White participants were excluded, and 334 surveys were analyzed.

### *Study Participants by Ethnicity*

Among Hispanics (n=130), 30.8% self-identified as White, 7.7% as American Indian/Alaskan Native, 1.0% as Black/African American, and 39.2% as belonging to another race (Table 1). Hispanic, in comparison to non-Hispanic White (n=204), participants were younger (mean age 61.8 vs. 65.7,  $p<0.001$ ) and had lower educational attainment ( $p<0.001$ ). They were also more likely to be unemployed (14.1% vs. 3.5%,  $p<0.001$ ) and less likely to have an income  $\geq$ \$40,000/year ( $p<0.001$ ). They were more likely to have Medicaid but less likely to have Medicare (Table 1).

Hispanics, compared to non-Hispanic Whites, were more likely to report having “fair” or “poor” health (25.0% vs. 13.2%, and 9.4% vs. 4.9%, respectively,  $p=0.004$ ). Mean WOMAC pain and disability scores were higher and having a knee/hip x-ray with a Kellgren-Lawrence grade  $\geq$ 3 was slightly more likely among Hispanics than non-Hispanic Whites (Table 1).

### *Oral NSAID Use by Ethnicity*

OTC oral NSAID use for joint pain or arthritis was less common among Hispanics than non-Hispanic Whites in the last 6 months (52.9% vs. 66.3%,  $p=0.019$ ), currently (43.3% vs. 54.8%,  $p=0.050$ ), and in the last 5 years (63.1% vs. 77.9%,  $p=0.005$ ). In contrast, prescription oral NSAID use for arthritis was more common among Hispanics than non-Hispanic Whites in the last 6 months (43.4% vs. 31.7%,  $p=0.042$ ) and currently (39.3% vs. 28.2%,  $p=0.050$ ), but not in the last 5 years (54.4% vs. 50.0%,  $p=0.568$ ) (Table 2).

The odds of using an OTC oral NSAID, instead of not using any oral NSAID, in the last 6 months were significantly lower among Hispanics than non-Hispanic Whites (OR 0.33 [95% CI: 0.18-0.61]). When adjusted for age, sex, education, and private medical insurance status, this observed difference was attenuated and not statistically significant (OR 0.54 [95% CI: 0.28-1.02]). There were no statistically significant adjusted or unadjusted differences in the odds of prescription, instead of no, oral NSAID use in the last 6 months between Hispanics and non-Hispanic Whites (Table 3).

The odds of using a prescription, instead of an OTC, oral NSAID in the last 6 months were significantly higher among Hispanics than non-Hispanic Whites (OR 2.78 [95% CI: 1.57-4.92]). This observed difference was attenuated but remained statistically significant when adjusted for age, sex, education, and private medical insurance status (OR 2.17 [95% CI: 1.16-4.05]), and when further adjusted for WOMAC and comorbidity scores (OR 2.00 [95% CI: 1.04-3.82]).

## DISCUSSION

Our study is the first to evaluate potential ethnic differences in the use of OTC and prescription oral NSAIDs separately in a single cohort of patients with knee and/or hip osteoarthritis. We found that OTC oral NSAIDs were less often used by Hispanics than non-Hispanic Whites. However, prescription oral NSAIDs were more often used by Hispanics than non-Hispanic Whites. We also found patient-level factors that might account for ethnic differences in the use of oral NSAIDs. Adjustment for age, sex, education, and medical insurance status moderately attenuated the observed ethnic differences. Further adjustment for osteoarthritis disease severity and comorbidity scores, however, had minimal effect. Greater use of prescription, rather than only OTC, oral NSAIDs among Hispanics compared to non-Hispanic Whites persisted after adjustment for all relevant sociodemographic and clinical factors.

Our study findings are similar to what previous studies have found. Using NHANES data, Davis *et al.*<sup>6</sup> found that Mexican Americans were less likely than non-Hispanic Whites to report using NSAIDs based on a questionnaire and prescription medication information. While our study surveyed only knee/hip osteoarthritis patients, all NHANES study participants (with or without osteoarthritis) who had available information on NSAID use were evaluated. NSAID usage questions were also not restricted to NSAID use for arthritis in the NHANES study. In contrast, NSAID usage was restricted to NSAID use for arthritis in our study. Similar to the NHANES study, we found lower usage of oral NSAIDs among Hispanics, compared to non-Hispanic Whites, but only in the use of OTC NSAIDs. Using Veterans Affairs (VA) databases, Dominick *et al.*<sup>7</sup> found that Hispanics, compared to non-Hispanic Whites with osteoarthritis were more likely to receive a prescription for non-selective or COX-1 selective NSAIDs. We similarly found higher usage of these types of prescription NSAIDs among Hispanics than among non-Hispanic Whites.

We additionally found that ethnic differences in the use of OTC and prescription oral NSAIDs for arthritis were attenuated when adjusted for age, sex, education, and medical insurance. Yet, ethnic differences in the use of prescription over only OTC oral NSAIDs persisted after controlling for relevant sociodemographic and clinical variables. In comparison, lower use of all types of NSAIDs among Mexican Americans, compared to non-Hispanic Whites, persisted despite adjustment for multiple sociodemographic and clinical variables in the NHANES study.<sup>6</sup> In the VA study, observed ethnic differences in the use of COX-2 selective NSAIDs remained significant after controlling for age, sex, geographic region, comorbid conditions, and use of anti-coagulants and glucocorticoids. All of these findings suggest that sociodemographic characteristics may only partially mediate ethnic differences in the use of oral NSAIDs for osteoarthritis. They also suggest that clinical factors are not sufficient to account for ethnic differences in the use of NSAIDs. Differences in findings among the different studies are likely due to differences in study populations, how treatment use was measured (e.g., patient-reported vs. pharmacy database), and differences in time period studied.

We can only speculate on other reasons why Hispanics may be less likely to utilize OTC NSAIDs while more likely to utilize prescription NSAIDs compared to non-Hispanic Whites. Cost and affordability may be an issue. Prescription NSAIDs may be paid for and covered by their medical insurance while OTC NSAIDs need to be paid for out-of-pocket. Acculturation is “the process by which an individual raised in one culture enters the social structure and institutions of another, and internalizes the prevailing attitudes and beliefs of the new culture”.<sup>26</sup> It is possible that Hispanics with lower levels of acculturation have beliefs about the disease and/or OTC NSAIDs that make them less likely to try these types of medication. Common Hispanic cultural values may also affect Hispanic health and behavior.<sup>27</sup> *Respeto*

(or respect) for the healthcare provider may dissuade Hispanic patients from purchasing OTC medicines that are not explicitly recommended. In parallel, *respeto* may encourage Hispanic patients to start or continue taking a prescribed NSAID with minimal or no reservations.

The prevalence of activity limitation, work limitation, and severe joint pain are higher among Hispanics than among non-Hispanic Whites.<sup>8</sup> Ethnic disparities in the experience of pain and disability due to osteoarthritis could be related to underutilization of effective therapies. Even after risk adjustment, Hispanics are less likely to exercise to treat osteoarthritis<sup>16</sup> and have lower rates of knee arthroplasty utilization.<sup>28</sup> As Hispanics are also less likely than non-Hispanic Whites to use OTC oral NSAIDs, clinical providers can specifically target osteoarthritis Hispanic patients and inform them of the medicine's potential benefits. Benefits, including rapid onset of action, analgesic property, and relative inexpensiveness may be discussed, along with potential side effects. As Hispanics with osteoarthritis may be more likely to receive and use prescription NSAIDs than non-Hispanics with osteoarthritis, it also important to screen them for complications, including gastrointestinal and kidney disease.

There are limitations to consider in interpreting our results. First, while self-report is an efficient way of measuring treatment utilization, it has limitations. Recall bias and social desirability bias may lead to inaccurate reporting.<sup>29</sup> Questionnaires which measure medication use behaviors generally exhibit high concordance with non-self-report methods, however.<sup>30</sup> Self-reported medication use also tends to correlate well with pharmacy data.<sup>31,32</sup> Second, our study findings may not be generalizable to Hispanics living outside of Arizona. The majority of Hispanics living in the southwestern US are of Mexican descent.<sup>33</sup> Socioeconomic status, level of acculturation, and prevalence of chronic diseases vary among Mexicans, Puerto Ricans, Cubans, and other Hispanic groups living in the US.<sup>15</sup> A limited number of African-Americans and Asian-Americans reside in southern Arizona, but there was not enough racial variation in the sample to evaluate race differences in NSAID use. There are known race differences in the use of NSAIDs.<sup>7,10</sup>

In summary, we found ethnic differences in the use of oral NSAIDs for arthritis among patients with knee and/or hip osteoarthritis. OTC oral NSAIDs were less commonly used by Hispanics than non-Hispanic Whites. Prescription oral NSAIDs, on the other hand, were more commonly used by Hispanics than non-Hispanic Whites. Sociodemographic factors partially mediate ethnic differences in the use of oral NSAIDs. Clinical factors do not seem to have a significant impact in mediating these observed differences in NSAID treatment use. Future research should evaluate the generalizability of these findings to other study populations and should also seek to identify additional factors that could further reduce ethnic disparities in the use of pharmacologic treatments for those with osteoarthritis.

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**TABLES**

Table 1. Sociodemographic and clinical characteristics

	Hispanics (n = 130)	Non-Hispanic Whites (n = 204)	p-value <sup>a</sup>
Age, Mean (SD)	61.8 (8.4)	65.7 (7.9)	<0.001
Sex, n (%) Female	87 (67.44)	150 (73.5)	0.264
Race, n (%)			N/A <sup>b</sup>
White	40 (30.8)	204 (100.0)	
Black or African-American	1 (0.8)	0 (0.0)	
American Indian or Alaskan Native	10 (7.7)	0 (0.0)	
Other	51(39.2)	0 (0.0)	
Missing/Refuse to answer	28 (21.5)	0 (0.0)	
Education, n (%)			<0.001
≤High school/General Equivalency Diploma	90 (69.2)	73 (35.8)	
>High school	35 (26.9)	129 (63.2)	
Other	5 (3.9)	2 (1.0)	
Employment, n (%)			<0.001
Full-time	22 (18.2)	39 (19.4)	
Part-time	7 (5.8)	19 (9.5)	
Unemployed	17 (14.1)	7 (3.5)	
Disabled	40 (33.1)	29 (14.4)	
Retired	35 (28.9)	107 (53.2)	
Marital Status, n (%) Married	57 (43.9)	94 (46.1)	0.736
Annual Income, n (%)			<0.001
<\$20,000	71 (64.0)	50 (26.2)	
\$20,000 - 39,999	16 (14.4)	33 (17.3)	
≥\$40,000	24 (21.6)	108 (56.5)	
Insurance, n (%)			
Medicaid	35 (26.9)	33 (16.2)	0.025
Medicare	58 (44.6)	118 (57.8)	0.024
Medigap	12 (9.2)	55 (27.0)	<0.001
Private	12 (9.2)	68 (33.3)	<0.001
Health Maintenance Organization	14 (10.8)	19 (9.3)	0.709
Other	34 (26.2)	19 (9.3)	<0.001
Overall Quality of Life, n (%)			0.004
Excellent	13 (10.2)	26 (12.8)	
Very Good	39 (30.5)	83 (40.7)	
Good	32 (25.0)	58 (28.4)	
Fair	32 (25.0)	27 (13.2)	
Poor	12 (9.4)	10 (4.9)	
Patient Health Questionnaire-8, Mean (SD)	6.32 (5.7)	4.86 (5.1)	0.032
Comorbidity Score, Mean (SD)	2.8 (2.3)	2.7 (2.3)	0.673
Digestive problems (ulcer, colitis, gallbladder disease)	25 (20.5)	57 (29.4)	0.088

WOMAC-Pain, Mean (SD)			
Hip	57.8 (20.3)	46.9 (20.2)	0.029
Knee	59.6 (20.4)	41.6 (19.0)	<0.001
WOMAC-Disability, Mean (SD)			
Hip	55.2 (20.0)	45.2 (19.7)	0.045
Knee	59.4 (21.8)	41.1 (19.1)	<0.001
Kellgren-Lawrence Grade, n(%)			0.085
1	25 (20.2)	54 (27.3)	
2	43 (34.7)	69 (34.9)	
3	37 (29.8)	55 (27.8)	
4	19 (15.3)	20 (10.1)	

<sup>a</sup> Fisher's exact used for dichotomous and categorical variables, Wilcoxon-Mann-Whitney exact test for ordinal variables, and the t-test (Satterthwaite method) for continuous variables

<sup>b</sup> Not applicable: Differences in racial distribution largely due to study design

WOMAC= Western Ontario and McMaster Universities Osteoarthritis Index

Table 2. NSAID treatment use for joint pain/arthritis by ethnicity

	Hispanic (n= 130)		Non-Hispanic Whites (n= 204)		p-value <sup>a</sup>
	n	%	n	%	
<b>Last 6 Months</b>					
No Oral NSAID	43	35.5	49	24.3	0.031
OTC Oral NSAID	65	52.9	134	66.3	0.019
Prescription oral NSAID	53	43.4	64	31.7	0.042
<b>Current Use</b>					
No Oral NSAID	50	41.7	63	32.0	0.091
OTC Oral NSAID	52	43.3	108	54.8	0.050
Prescription oral NSAID	48	39.3	57	28.2	0.050
<b>Last 5 Years</b>					
No Oral NSAID	34	28.1	34	17.4	0.034
OTC Oral NSAID	77	63.1	155	77.9	0.005
Prescription oral NSAID	68	54.4	101	50.8	0.568

<sup>a</sup> Fisher's exact test

Table 3. Association between ethnicity and oral NSAID use in the last 6 months (using multinomial logistic regression models)

	Unadjusted <sup>a</sup> odds ratio (95% CI)	p-value	Adjusted <sup>b</sup> odds ratio 1 (95% CI)	p-value	Adjusted <sup>c</sup> odds ratio 2 (95% CI)	p-value
	N=323		N=323		N=323	
No Oral NSAID	Ref		Ref		Ref	
Only OTC oral NSAID	0.33 (0.18, 0.61)	0.0003	0.54 (0.28,1.02)	0.0593	0.56 (0.28, 1.11)	0.0961
Prescription oral NSAID <sup>d</sup>	0.93 (0.53-1.60)	0.7834	1.16 (0.63, 2.13)	0.6338	1.12 (0.59, 2.10)	0.7333
Only OTC oral NSAID	Ref		Ref		Ref	
Prescription oral NSAID <sup>d</sup>	2.78 (1.57, 4.92)	0.0004	2.17 (1.16, 4.05)	0.0154	2.00 (1.04, 3.82)	0.0373
<sup>a</sup> Univariate multinomial model <sup>b</sup> Adjusted multinomial model 1 adjusts for age, sex, education (> high school vs. high school education or less), medical insurance (private) <sup>c</sup> Adjusted multinomial model 2 adjusts for covariates in model 1 plus WOMAC total, comorbidity score <sup>d</sup> With or without OTC NSAID use						

**FIGURES**

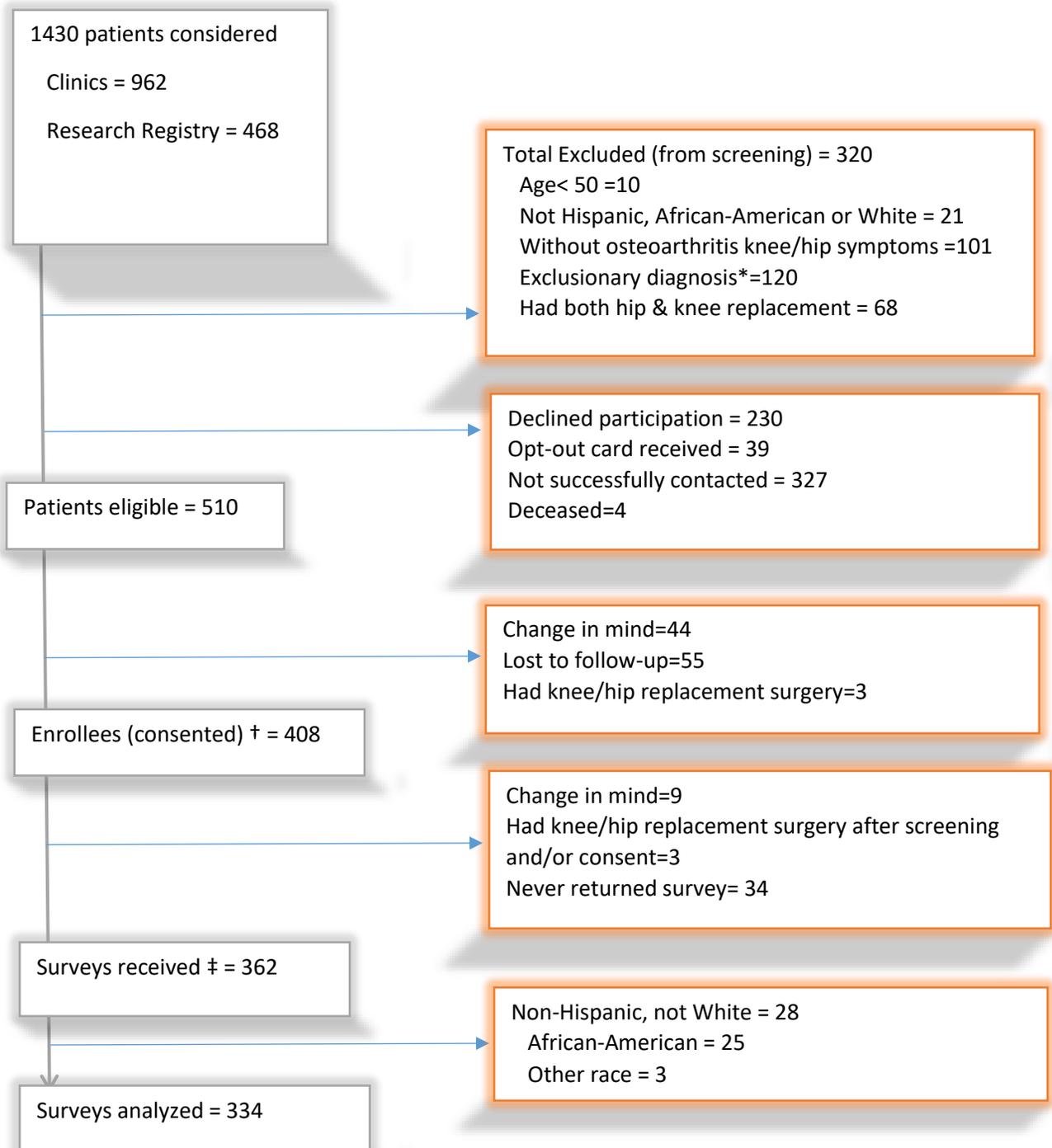


Figure 1. Study flow chart

\* Exclusionary diagnoses: rheumatoid arthritis, systemic lupus erythematosus, seronegative spondyloarthropathy, gout, pseudogout, senile dementia, vascular dementia, alcohol-induced dementia, drug-induced dementia. † Ethnicity of participants who consented: 153 Hispanic, 255 non-Hispanic. ‡ Ethnicity of participants with returned surveys: 139 Hispanic, 232 non-Hispanic

## **CLINICAL SIGNIFICANCE**

- Over the counter oral NSAID use for joint pain or arthritis is less common among Hispanics than non-Hispanic Whites.
- Prescription oral NSAID use, however, is more common among Hispanics than non-Hispanic Whites.
- Sociodemographic characteristics may partially attenuate ethnic differences in the use of NSAIDs.