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Osteoporosis Screening Preferences of Older Adults

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Abstract

We aimed to examine older adults' osteoporosis screening test preferences, willingness to travel for screening, and willingness to pay for screening. A survey was mailed to 1830 women and men ≥ 60 years old in Pennsylvania, assessing screening test preference (among dual-energy x-ray absorptiometry (DXA), heel quantitative ultrasound (QUS), and risk assessment tools), willingness to travel 20 miles for a better screening test, and willingness to pay \$100 for a better screening test, as well as sociodemographic and health-related characteristics. Analyses included descriptive statistics and multivariable logistic regression analyses to evaluate association between screening test preference, willingness to travel, willingness to pay, and potential explanatory variables. Surveys were completed by 1268 individuals (69.3%). Most respondents indicated a screening test preference (73.9%), and of these 78.1% preferred DXA. 78.8% of respondents indicated they may be willing to travel 20 miles for a better test, and 51.2% indicated they may be willing to pay \$100 for a better test. Similar trends were observed in analyses including only individuals who had not had prior osteoporosis testing or diagnosis. Many older individuals would prefer the "best" test for osteoporosis screening, and may be willing to travel or pay more to obtain a better test.

Keywords

bone mineral density; geriatrics; osteoporosis; quantitative ultrasound; risk factors; screening

Introduction

Osteoporosis affects approximately 10 million individuals in the United States (1,2), and osteoporotic fractures are associated with significant morbidity or mortality (3-6). In 2005, over 2 million osteoporotic fractures were sustained, with direct costs of nearly \$17 billion (7). Despite the high prevalence of osteoporosis among older adults, most individuals with osteoporosis are asymptomatic, undiagnosed, and untreated. Osteoporosis screening for older adults has been endorsed by the US Preventive Services Task Force (USPSTF), the National Osteoporosis Foundation, the International Society for Clinical Densitometry, and the American College of Physicians, among other organizations (8-11). Despite these recommendations, screening and treatment rates remain low (12-14).

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There are multiple osteoporosis screening modalities currently in clinical use, including dual-energy x-ray absorptiometry (DXA), quantitative ultrasound (QUS), and risk assessment instruments (tools that assess risk factors to identify high risk individuals for further evaluation or treatment). There is lack of a consensus on an optimal population screening strategy for osteoporosis, although many consider DXA to be a “gold standard” test for diagnosis, and many screening recommendations mention this test in particular (8-11). Few studies have evaluated patient preferences for the different available osteoporosis screening modalities, willingness to travel for osteoporosis screening, and willingness to pay for osteoporosis screening. Patient preferences for a screening test, willingness to travel, and willingness to pay may affect compliance with screening recommendations; thus, accommodation of screening preferences when feasible could improve health outcomes (15). The objective of this study was to examine older adults' preferences for osteoporosis screening modalities, willingness to travel for screening, and willingness to pay for screening.

Methods

Study Participants and Procedures

We performed a cross-sectional survey of 1830 women and men who were aged 60 and older, living in the greater Pittsburgh region, and listed in the university's Claude D. Pepper Registry for studies on mobility and balance in older adults. Individuals had been recruited for the registry through mailings to university alumni, faculty, and staff, community events at senior citizen centers and a continuing care facility, newspaper advertisements, and other clinical studies at the university. Most registry participants were community-dwelling.

In November 2007, all registry participants were mailed a 44-item survey, along with information describing the purpose of the study. Participants were provided with a prepaid return envelope, and asked to return their surveys anonymously. No incentive payments were offered or reminders were sent. Completed surveys were collected over a 6-month period, and the survey responses were entered into a database independently by two individuals and validated to ensure data integrity.

The survey included questions about sociodemographics, osteoporosis risk factors, mobility, falls, prior osteoporosis screening, and personal history of osteoporosis. It also included brief descriptions of DXA, QUS, and risk assessment tools, followed by questions about preference among these screening modalities, reasons for preference, willingness to travel 20 miles for a better screening test, and willingness to pay \$100 for a better test. We assessed survey respondents' willingness to travel because central DXA, currently considered the “gold standard” for osteoporosis diagnosis, is not portable and not commonly available in primary care or chronic care settings. Thus, many individuals would need to travel to obtain a DXA test, and we sought to explore whether older individuals would be willing to do so. We assessed willingness to pay \$100 for a better test to assess how cost might affect older adults' willingness to be screened, assuming they had to pay out of pocket. \$82 is the approximate difference in cost between a central DXA test and heel QUS, as estimated by 2008 Medicare reimbursement rates (16). We assumed that the difference in cost between a central DXA test and a risk assessment tool would be even greater (only cost associated with a risk assessment tool is the time it takes to administer, typically less than 5 minutes). Thus, we used \$100 as an approximation of the cost difference between a “better” osteoporosis screening test and another test. Figure 1 provides the survey descriptions of the screening tests, along with items asking about screening test preference, reasons for preference, willingness to travel, and willingness to pay.

The study protocol was approved by the University of Pittsburgh Institutional Review Board.

Statistical Analyses

We computed descriptive statistics for each survey item, and summarized qualitative responses. We also performed bivariate logistic regression analyses to determine associations between response variables of screening test preference, willingness to travel 20 miles for a better test, and willingness to pay \$100 for a better test and potential explanatory variables, including: age (coded in 5-year ordinal categories), sex, self-reported race (white vs. black), educational level (completed college vs. did not complete college), self-rated health status (good/very good/excellent vs. poor/fair), prior screening or testing for osteoporosis, personal history of osteoporosis, family history of osteoporosis, history of oral steroid use for > 1 month, height loss > 2.54 cm (1 inch) over the lifetime, use of arms to get up from a chair most of the time, history of a fall within the past 5 years, history of a low-trauma fracture (fracture resulting from a fall from standing height or less), use of an assistive device (i.e., cane, walker, or wheelchair) for mobility, and difficulty traveling to doctors' appointments on one's own (no difficulty vs. some difficulty or cannot travel on own).

We included explanatory variables that showed a significant association with each response variable ($P \leq .10$) as variable candidates in stepwise, backward selection, multivariable logistic regression models. We checked for interactions between variables and multicollinearity. We considered variables and interaction terms with P values of $\leq .05$ to be significant in the multivariable models. For each response variable, we first performed these regression analyses including data from all study respondents, and then performed separate analyses using data from only the subset of respondents who had not had prior osteoporosis testing or diagnosis. We used Stata version 10.0 (StataCorp, College Station, Texas) to perform all analyses.

Results

Characteristics of Survey Respondents

1268 of the 1830 individuals to whom surveys were sent responded (69.3%). The mean age of respondents was 73.3 years (range, 60-93; SD, 7.3), and most were white (92.9%), female (58.7%), and stated that they were in good to excellent health (88.2%). 62.6% of survey respondents reported being tested for osteoporosis, and 22.6% reported being diagnosed with osteoporosis. Table 1 summarizes the characteristics of survey respondents.

Osteoporosis Screening Test Preferences

73.9% of survey respondents indicated they had a preference for an osteoporosis screening test, while 26.1% of respondents indicated they had no preference. Of the individuals who indicated a preference, 78.1% preferred DXA, 15.6% preferred QUS, and 6.3% preferred a risk assessment tool. Figure 2 shows the distribution of survey respondents' screening test preferences.

Results of bivariate logistic regression analyses for osteoporosis screening test preference are shown in Table 2. Individual factors significantly associated with indicating a preference for a screening test included age, sex, educational level, prior osteoporosis testing, personal history of osteoporosis, family history of osteoporosis, history of oral steroid use for > 1 month, use of arms to get up from a chair, history of a fall within the past 5 years, history of a low-trauma fracture, and use of an assistive device for mobility. Age, prior osteoporosis testing, and personal history of osteoporosis remained significantly associated with indication of a screening test preference in our multivariable model (Table 3). Respondents were more likely to indicate a screening test preference if they had been diagnosed with osteoporosis or had prior testing for osteoporosis, and were less likely to indicate a preference for a screening test (i.e., more likely to indicate no test preference) if they were older. Because of multicollinearity, we had to remove one interaction term from the model; thus, we could not test all possible

interactions between the variables associated with indication of a screening test preference. Of the interactions we tested, none were significant.

Of the individuals who reported previous testing for osteoporosis, most (74.6%) had prior DXA testing. Of the subset of individuals who had never been tested for osteoporosis or diagnosed with osteoporosis (n=471), 62.5% indicated a screening test preference; of those, 59.8% preferred DXA, 27.5% preferred QUS, and 12.7% preferred risk assessment tools. Among these individuals, age was the only variable significantly associated with screening test preference, with older individuals being less likely to indicate a preference (OR, 0.82 per 5-yr increase in age; 95% CI 0.72-0.94).

We analyzed reasons stated for a screening test preference for individuals who had not had prior osteoporosis testing or diagnosis. Most common reasons indicated by individuals who preferred DXA were that it was more well studied (72.0% of individuals who preferred DXA indicated this), and more accurate/a better test (21.2% of individuals who preferred DXA wrote in responses indicating that they thought it was a superior test). Most common reasons indicated by individuals who preferred QUS were convenience (71.6%) and comfort (51.4%). Most common reasons stated by individuals who preferred risk assessment tools were convenience (40.0%) and belief that this would be an appropriate initial screening test because of perceived low risk for osteoporosis (14.3%).

Willingness to Travel 20 Miles for Screening

61.9% of survey respondents indicated they would be willing to travel 20 miles for a better osteoporosis screening test, 16.9% indicated “it depends”, and 21.3% of respondents indicated unwillingness to travel.

Results of bivariate logistic regression analyses for willingness to travel 20 miles for a better screening test are shown in Table 2. Individual factors significantly associated with willingness to travel included age, race, educational level, self-rated health status, family history of osteoporosis, use of an assistive device for mobility, and difficulty traveling to doctors' appointments on one's own. Race, family history of osteoporosis, and difficulty traveling to doctors' appointments on one's own remained significantly associated with willingness to travel 20 miles for a better screening test (“yes” or “it depends” groups combined, vs. not willing) in our multivariable model (Table 3). Respondents were more likely to indicate willingness to travel if they were white rather than black, if they indicated no difficulty in traveling to doctors' appointments on their own, or if they reported a family history of osteoporosis. There was no evidence of multicollinearity or significant interactions between the variables included in this model.

Of the individuals who had never had prior osteoporosis testing or diagnosis, 61.0% indicated they would be willing to travel, 16.5% indicated “it depends”, and 22.6% indicated unwillingness to travel. Among these individuals, sex and difficulty in traveling to doctors' appointment on one's own were the only variables significantly associated with willingness to travel. Women who had never had prior osteoporosis testing or diagnosis were less likely than men to indicate willingness to travel (OR, 0.49; 95%CI 0.28-0.84), while individuals who reported no difficulty travelling to doctors appointments on their own were more likely to indicate willingness to travel (OR, 3.98; 95% CI 1.82-8.72). There was no evidence of multicollinearity or significant interactions between the variables included in this model.

Analysis of reasons stated by individuals who had never had prior osteoporosis testing or diagnosis and indicated that their willingness to travel “depends” revealed the most common reasons to be perception of the necessity of the test based on their risk level (23.9% of

individuals who stated “it depends” indicated this), and whether their doctor would recommend the test (20.9% of individuals who stated “it depends” indicated this).

Willingness to Pay \$100 for Screening

23.2% of survey respondents indicated they would be willing to pay \$100 for a better osteoporosis screening test, 28.0% indicated “it depends”, and 48.9% indicated unwillingness to pay.

Results of bivariate logistic regression analyses for willingness to pay \$100 for screening are shown in Table 2. Individual factors significantly associated with willingness to pay included age, race, educational level, self-rated health status, prior osteoporosis testing, family history of osteoporosis, use of arms to get up from a chair, history of a fall within the past 5 years, and use of an assistive device for mobility. Self-rated health status, educational level, family history of osteoporosis, and history of a fall within the past 5 years remained significantly associated with willingness to pay \$100 for screening (“yes” or “it depends” groups combined vs. not willing) in our multivariable model (Table 3). Respondents were more likely to indicate willingness to pay \$100 for a better osteoporosis screening test if they reported their health status as good, very good, or excellent, or graduated from college. There was a significant positive interaction between fall in the past 5 years and family history of osteoporosis. When we included this interaction term in the model, family history of osteoporosis or fall within the past 5 years were not by themselves significant predictors of willingness to pay. There was no evidence of multicollinearity in this model.

Of the individuals who had never had prior osteoporosis testing or diagnosis, 22.0% indicated that they would be willing to pay \$100 for a better osteoporosis screening test, 25.3% indicated “it depends”, and 52.6% indicated unwillingness to pay. Among these individuals, self-rated health status and history of a fall within the past 5 years were the only variables significantly associated with willingness to pay. Individuals who rated their health status as good, very good, or excellent were more likely to indicate willingness to pay \$100 for a better osteoporosis screening test (OR, 3.17; 95% CI 1.65-6.10), as were individuals who reported a fall within the past 5 years (OR, 1.54; 95% CI 1.04-2.27). There was no evidence of multicollinearity or significant interactions between the variables in this model.

Analysis of reasons given by individuals who had not had prior osteoporosis testing or diagnosis and stated that their willingness to pay \$100 for a better screening test “depends” revealed the most common reasons to be whether the individual would perceive the test to be necessary or perceive themselves to be at risk (52.1% of individuals who stated “it depends” indicated this), and whether their doctor would recommended the test (24.0% of individuals who stated “it depends” indicated this).

Discussion

When we surveyed 1268 women and men aged 60 and older about osteoporosis screening test preference, most respondents indicated a preference, and most often the preference was for DXA. Among respondents who had not had prior osteoporosis testing or diagnosis, older individuals were less likely to express a screening test preference than younger individuals. Reasons most commonly given for preferring DXA were that it was better studied or a superior test. Among the minority of individuals who indicated a preference for QUS or risk assessment tools, most commonly stated reasons were convenience and comfort (QUS) and convenience and belief that they were at low risk for osteoporosis (risk assessment tools). These results suggest that among the majority of older adults who have a preference for an osteoporosis screening test, the issue of which test is best is a more important consideration than convenience or comfort.

We also found that the majority of survey respondents were willing to travel 20 miles to obtain a better screening test, and about half may be willing to pay \$100 out of pocket for a better test, depending on the circumstances. One notable factor associated with willingness to travel to obtain osteoporosis screening was ability to travel to doctors' appointments on one's own, with individuals indicating no difficulty traveling to doctors' appointments on their own reporting a greater willingness to travel. Respondents with better self-rated health status and higher educational attainment (graduation from college) were more willing to pay \$100 out of pocket for a better screening test. Survey respondents' qualitative comments indicated that perceived necessity of a test based on personal risk or recommendation of a test by their doctor may affect individuals' willingness to travel or pay for osteoporosis screening. These results suggest that although many older adults may be willing to travel or even pay a sizeable amount for a better osteoporosis screening test, for a significant percentage of older adults cost or travel requirements would be barriers to screening.

Overall, our results suggest that many older adults would be receptive to DXA as a screening test if recommended, even if they had to travel 20 miles or pay out of pocket. However, if an individual were to indicate reluctance to obtain a DXA test, reasons may include cost, necessity of travel, and/or issues of convenience, comfort, or perceived low personal risk of osteoporosis. Thus, in patients who indicate a reluctance to obtain DXA testing, it may be useful to investigate these possible reasons, and determine if another screening test would be more acceptable for them.

Our study is the only one that we are aware of that has assessed patient preferences among DXA, QUS, and risk assessment tools for osteoporosis screening, or patients' willingness to travel to obtain osteoporosis screening. Additionally, we know of only two U.S. studies that have assessed patients' willingness to pay for osteoporosis screening, both of which assessed willingness to pay for peripheral heel assessment in a pharmacy setting. One of these studies found a median willingness to pay of \$25 by postmenopausal women for heel DXA screening (17), and the other found that 41% of women age 18 and older were willing to pay \$20 or more for heel QUS screening (18).

Our study had several limitations. First, about 30% of individuals who were sent surveys did not respond, and there may have been response bias. Second, our study population consisted of research registry volunteers, and the population was disproportionately white, healthy, and highly educated. Thus, our survey population may not be representative of the general population as a whole, which may limit the generalizability of our results. Furthermore, although we aimed to present descriptions of osteoporosis screening tests in an unbiased way, our descriptions of screening tests may have been a source of biased responses. Finally, our survey could not measure all of the variables that are associated with screening test preference, willingness to travel for screening, and willingness to pay for screening.

In conclusion, our study found that most older adults would prefer the "best" test for osteoporosis screening, and many would be willing to travel 20 miles or even pay \$100 out of pocket to obtain a better test, if necessary. However, factors that are important to consider among patients who are reluctant to obtain a recommended osteoporosis screening test include cost, travel distance, and perceived test convenience, comfort, and risk of osteoporosis. Assessing these factors in patients who indicate a reluctance to obtain a recommended osteoporosis screening test may help determine another screening test that may be more acceptable to them.

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Three different osteoporosis screening methods are described below. They differ in several ways, including how long they take and where they can be done. The descriptions are followed by several questions.

Dual-energy X-ray absorptiometry (DXA) is a test that uses low-dose X-rays (similar amount of radiation to taking a plane trip) to get a picture of your bones. DXA is the best-studied test for diagnosing osteoporosis; it is currently considered the gold standard test for diagnosis. DXA is often done at referral centers, such as medical centers, radiology centers, or an endocrinologist's office. DXA takes about 15 minutes to complete and is painless.

Heel ultrasound is a test that uses sound waves to determine bone density and quality. The ultrasound machine is smaller than a DXA machine and portable, and can be done in places such as your primary care doctor's office (examples: internal medicine, family practice, ob/gyn offices), community clinics, or pharmacies. A heel ultrasound takes approximately 5 minutes to complete and is painless.

Risk assessment tools are checklists or score sheets that your doctor can use to estimate your risk of osteoporosis based on information such as your age, weight, race/ethnicity, family history of osteoporosis, personal history of fracture (broken bones), and history of medical conditions or medication use. Your doctor can complete this checklist or score sheet based on information in your medical records or information obtained at a routine medical visit. Your score on a risk assessment tool can be used to determine whether your risk for osteoporosis is high enough that you need further testing (for example, a DXA or ultrasound). Risk assessment tools take 1–2 minutes for your doctor to complete.

1. Given the information above about DXA, heel ultrasound, and risk assessment tools, and assuming all else was equal (for example, cost), would you have a preference between these tests for an initial screening test for osteoporosis?

☐ Yes ☐ No

2. If your answer to question 1 was yes, which test would you prefer?

☐ Dual-energy X-ray absorptiometry (DXA)
☐ Heel ultrasound
☐ Risk assessment tool
☐ N/A

3. If you chose a particular test in question 2 (DXA, ultrasound, or risk assessment tool), please explain your choice. Select all of the following that were reasons why you chose that particular test:

☐ More convenient
☐ More comfortable
☐ Better studied
☐ My doctor or other health care provider has recommended this test to me
☐ Other (please explain) _____
☐ N/A

4. Would you be willing to travel 20 miles to get a better osteoporosis screening test done?

☐ Yes
☐ No
☐ It depends (please explain) _____

5. Would you be willing to pay \$100 more out of pocket to get a better osteoporosis screening test done?

☐ Yes
☐ No
☐ It depends (please explain) _____

Figure 1. Survey Descriptions of Osteoporosis Screening Tests, and Items Assessing Screening Test Preference, Willingness to Travel, and Willingness to Pay

Figure 2. Osteoporosis Screening Test Preferences of Older Adults

Distribution of preferences for an initial osteoporosis screening test. Options included dual-energy x-ray absorptiometry, heel quantitative ultrasound, a risk assessment tool, or no test preference.

Table 1**Characteristics of the Survey Respondents^{ab}**

Characteristics	Number (%)
<i>Sociodemographic characteristics</i>	
Female sex	664 (58.7)
White race	1148 (92.9)
Completed college	926 (75.0)
<i>Osteoporosis-related characteristics</i>	
Has heard of osteoporosis	1215 (96.1)
Has been screened or tested for osteoporosis	783 (62.6)
Has been diagnosed with osteoporosis	283 (22.6)
Has had a low-trauma fracture (resulting from fall from standing height or less)	236 (18.8)
Has a family history of osteoporosis	292 (23.8)
<i>Other health-related characteristics</i>	
Has a high self-rated health status (rated as good, very good, or excellent)	1114 (88.2)
Has a history of steroid use for more than 1 month	103 (8.2)
Has experienced a loss of height of >2.54cm over the lifetime	435 (35.3)
Mobile without the use of an assistive device (i.e., cane, walker, or wheelchair)	1152 (91.3)
Uses arms to get up from a chair most of the time	460 (36.8)
Has fallen within the past 5 years	609 (48.6)
Has difficulty traveling to doctor appointments on own	127 (10.1)

^aThere were 1268 survey respondents. However, there was some missing data for each of the characteristics in this table. Percentages shown for each characteristic are percentages of those individuals who reported an answer for that characteristic. Percentage of missing data for sex was 10.8%; percentages of missing data for all characteristics were < 4%.

^bMean age of respondents was 73.3 years (range, 60-93; standard deviation, 7.3).

Table 2

Bivariate Associations of Patient Characteristics with Osteoporosis Screening Test Preference, Willingness to Travel 20 miles for a Better Test, and Willingness to Pay \$100 for a Better Test

Explanatory Variables	Response Variables			
	Has Osteoporosis Screening Test Preference	Willing to Travel 20 Miles for a Better Screening Test	Willing to Pay \$100 for a Better Screening Test	P value
	OR (95%CI)	OR (95%CI)	OR (95%CI)	P value
Increased age (in 5-year increments)	0.84 (0.77-0.92)	0.92 (0.83-1.00)	0.91 (0.84-0.98)	0.02
Female sex	2.11 (1.61-2.77)	0.88 (0.66-1.19)	1.13 (0.89-1.44)	0.31
White race	1.39 (0.81-2.38)	2.54 (1.51-4.28)	2.35 (1.38-3.99)	0.002
Completed college	1.49 (1.12-1.99)	1.55 (1.14-2.11)	2.01 (1.54-2.63)	<0.001
High self-rated health status	1.25 (0.85-1.83)	1.55 (1.05-2.30)	2.00 (1.39-2.86)	<0.001
Prior osteoporosis testing	2.36 (1.82-3.06)	1.18 (0.89-1.57)	1.29 (1.02-1.62)	0.03
Personal history of osteoporosis	2.24 (1.57-3.20)	1.31 (0.93-1.85)	1.11 (0.85-1.46)	0.43
Family history of osteoporosis	1.84 (1.32-2.56)	1.77 (1.24-2.55)	1.65 (1.26-2.17)	<0.001
History of oral steroid use > 1 month	1.67 (0.99-2.83)	1.29 (0.76-2.18)	1.32 (0.87-1.99)	0.19
Height loss > 2.54 cm over the lifetime	1.18 (0.90-1.56)	0.93 (0.70-1.25)	1.09 (0.86-1.39)	0.46
Use of arms to get up from a chair most of time	0.79 (0.60-1.02)	0.86 (0.65-1.15)	0.73 (0.58-0.92)	0.01
Fall within past 5 years	1.28 (0.99-1.66)	1.09 (0.83-1.44)	1.28 (1.02-1.61)	0.03
History of low-trauma fracture (resulting from fall from standing height or less)	1.56 (1.09-2.23)	1.33 (0.91-1.92)	1.11 (0.83-1.48)	0.48
Use of an assistive device (i.e., cane, walker, or wheelchair)	0.59 (0.39-0.90)	0.55 (0.35-0.85)	0.54 (0.36-0.82)	0.004
Has no difficulty traveling to doctor appointments on own	1.12 (0.74-1.71)	1.81 (1.20-2.73)	1.34 (0.92-1.95)	0.12

Table 3

Multivariable Associations of Patient Characteristics with Osteoporosis Screening Test Preference, Willingness to Travel 20 Miles for a Better Test, and Willingness to Pay \$100 for a Better Test

Explanatory Variables	Response Variables			
	Has Osteoporosis Screening Test Preference OR (95%CI)	Willing to Travel 20 Miles for a Better Screening Test OR (95%CI)	Willing to Pay \$100 for a Better Screening Test OR (95%CI)	P value
Increased age (in 5-year increments)	0.83 (0.75-0.92)	NR ^a	NR ^a	
White race	NR ^a	2.28 (1.32-3.92)	NR ^a	0.003
Completed college	NR ^a	NR ^a	1.86 (1.40-2.47)	<0.001
High self-rated health status	NR ^a	NR ^a	2.15 (1.46-3.17)	<0.001
Prior osteoporosis testing	1.67 (1.18-2.37)	NR ^a	NR ^a	
Personal history of osteoporosis	1.92 (1.25-2.96)	NR ^a	NR ^a	
Family history of osteoporosis	NR ^a	1.74 (1.18-2.55)	NR ^a	
Has no difficulty traveling to doctor appointments on own	NR ^a	1.83 (1.18-2.85)	NR ^a	0.005
Interaction Term				0.007
Family history of osteoporosis × fall within past 5 years	NR ^a	NR ^a	2.01 (1.13-3.56)	0.02

^aNot retained in final model