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Sex differences in osteoporosis self-efficacy among community-residing older adults presenting for DXA

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Abstract

Summary—The Osteoporosis Self Efficacy Scale was determined to equivalently measure calcium and exercise beliefs in both sexes. Despite data illustrating men's and women's similar self-efficacy, gender differences in clinical predictors of self-efficacy imply that efforts to improve care must account for more than self-efficacy.

Introduction—To understand the extent to which the Osteoporosis Self Efficacy (OSE) Scale is reliable for both men and women. A secondary objective was to evaluate sex differences in OSE.

Methods—For this cross-sectional study, we analyzed data collected as part of the Patient Activation after DXA Result Notification (PAADRN) pragmatic trial which enrolled 7749

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community-residing adults aged 50 and older reporting for bone densitometry. We used univariable methods, item analysis, exploratory and confirmatory factor analyses, and linear regression to evaluate sex differences in OSE responses and measurement.

Results—In this sample, the confirmatory factor analysis model for OSE both overall and within groups indicated a poor fit. The sex differences in the measurement model, however, were minor and reflected configural invariance (i.e., constructs were measuring the same things in both men and women), confirming that the OSE was measuring the same constructs in men and women. Men overall had higher exercise self-efficacy and women higher calcium self-efficacy. Overall, education, hip fracture, and self-reported health status predicted exercise self-efficacy whereas prior DXA, self-reported osteoporosis, and history of pharmacotherapy use did not. Predictors of calcium self-efficacy differed by gender.

Conclusion—The OSE can be used to measure calcium and exercise self-efficacy in all older adults. However, gender differences in clinical predictors of self-efficacy and the lack of an association of prior DXA with self-efficacy imply that interventions to improve self-efficacy may be insufficient to drive significant improvement in rates of osteoporosis evaluation and treatment.

Trial registration—Patient Activation after DXA Result Notification (PAADRN), NCT01507662, https://clinicaltrials.gov/ct2/show/NCT01507662

Keywords

Calcium; Exercise; Gender; Fracture; Prevention

Introduction

Self-efficacy reflects one's confidence in the ability to perform a specific activity, and is considered an important driver of diet- and exercise-related health behaviors. Recent research conducted with older adults has demonstrated the predictive power of self-efficacy in the adoption of dietary- and activity-based preventive health behaviors in applications including fall prevention [1] and exercise initiation or intentions [2–4]. In the case of osteoporosis, bone-strengthening health behaviors such as exercise or consuming adequate dietary calcium and vitamin D are of particular importance because of the high prevalence of osteoporosis in older adults. Primary prevention of osteoporosis emphasizes the importance of establishing maximal peak bone mass in young adults and continuation of these behaviors into later life to maintain bone mass. Age, medications (e.g., corticosteroids), and lifestyle factors (e.g., tobacco or alcohol use) contribute to decreasing bone mass in later life, which can be mitigated through exercise and mineral supplementation. Exercise can further improve osteoporosis outcomes by reducing the incidence and consequences of falls, and thus fall-associated fractures [1].

Exercise and dietary supplements are low-cost strategies individuals can adopt to maintain healthy bones and prevent or forestall osteoporosis. Despite the accessibility of these preventive interventions, the prevalence of osteoporosis is increasing [5], and osteoporotic fractures account for more hospitalizations than those for myocardial infarction and stroke [6]. Moreover, while osteoporosis is more common among women than men, older men with osteoporosis have worse outcomes. For example, men suffer significantly worse fracturerelated outcomes than women, with some estimates of 1-year survival after hip fracture as low as 35% [7].

Explanations for the sex difference in osteoporosis outcomes include sex-based differences in access to bone densitometry evaluation (i.e., dual-energy X-ray absorptiometry (DXA)) [8, 9]; the social construction of osteoporosis as a "women's" disease and the effect of this gendering on men's perceived susceptibility [10, 11]; lack of consensus among professional clinical societies as to effective criteria for osteoporosis evaluation in men [12]; professional uncertainty regarding clinical ownership of diagnosis and treatment [12]; the competition of comorbidities for individual patient and provider attention; provider's lack of confidence in the efficacy of existing interventions to improve osteoporosis outcomes in men; patient's fear of rare side effects associated with some bisphosphonates [12, 13]; and poor patient and provider knowledge about osteoporosis risk factors [13, 14].

Differences in men's and women's osteoporosis self-efficacy may be yet another contributor to sex differences in osteoporosis screening, self-management, and treatment. The Osteoporosis Self Efficacy (OSE) Scale was developed to measure the extent to which adults feel confident in initiating and maintaining the bone health behaviors of exercise and consuming dietary calcium and "vitamin" D [15]. The OSE is comprised of 21 items organized into exercise and calcium subscales. For each item, respondents are asked, "If it were recommended that you do any of the following this week, how confident would you be that you could…" using a 10-point numeric rating scale (NRS) with descriptive anchors "not at all confident" (1) and "very confident" (10) [15]. The original validation study of the OSE demonstrated high internal consistency for both subscales (reliability coefficients of 0.94 for exercise and 0.93 for calcium) [15] which has been supported in other studies [16]. Consistent with public health and scholarly emphasis on examining osteoporosis in women, the OSE was validated in a sample of 201 women, a majority of whom reported white race, no prior osteoporosis diagnosis, and who ranged in age from 35 to 95 years [15]. Few studies have reported OSE results from large samples representing the general population of community-dwelling men and women. Therefore, our primary objective was to understand the extent to which OSE reliably measured self-efficacy in both men and women. A secondary objective was to evaluate sex differences in osteoporosis self-efficacy using the OSE [17] in a large, diverse sample of older adults.

Methods

The cross-sectional data used in this study are taken from the baseline interviews for the Patient Activation after DXA Result Notification (PAADRN) pragmatic trial [18]. PAADRN was conducted to evaluate the effect of directly reporting DXA results to patients by mail on receipt of guideline concordant therapy for osteoporosis [19]. In brief, PAADRN enrolled 7749 community-residing adults aged 50 and older reporting for DXA at three medical centers in geographically dispersed states. Patients were randomized to an intervention arm in which they received usual care accompanied by an osteoporosis brochure and individualized letter describing their DXA results and fracture risk, or to a control arm, in which they received usual care per the ordering clinician. Consistent with the approach used in the original validation of the OSE, baseline data were collected from participants by trained interviewers [15].

Participants

Participants for this study included all 7749 adults aged 50 years and older who completed the OSE at their PAADRN baseline interviews. The PAADRN protocol is described elsewhere [19, 20]. Briefly put, PAADRN's pragmatic design used minimal exclusion criteria, namely limiting enrollment to English speakers who were able to provide consent (i.e., no prisoners or cognitively impaired). All older adults reporting for DXA at three sites or medical centers were approached for participation. DXA orders represented those normally occurring in these healthcare systems; and thus, potential participants varied as to whether they were naive with respect to DXA, osteoporosis diagnosis, fracture, or pharmacotherapy. Informed consent was obtained from all participants with one site obtaining written consent and two sites obtaining verbal consent per each site's Institutional Review Board.

Measures

Interviewers collected self-reported history of osteoporosis, prior use of DXA, osteoporosis medications, sociodemographics, and OSE from participants at baseline using REDCap [21]. OSE responses were scored as per the original study with subscale scores reflecting the summed item responses on the two subscales, with scores ranging from 0 (no confidence) to 100 for OSE exercise subscale or 110 for the OSE calcium subscale (complete confidence) [22].

Analysis

Our objective to determine the reliability of the OSE in measuring self-efficacy in both men and women was achieved through exploratory and confirmatory factor analyses. All baseline respondents were included in this cross-sectional analysis and values for missing responses and refusals were imputed using the fully conditional specification approach [23]. First, exploratory factor analysis (EFA) using maximum likelihood extraction and oblique rotation was performed to determine the underlying structure of the items. A simple factor structure was hypothesized with a cutoff ≥ 0.50 to identify principal loadings. Internal consistency was measured for the overall scale and each subscale using Cronbach's alpha. Next, confirmatory factor analysis (CFA) was used to determine whether the original measurement model as described by Horan et al. [15] was replicated in our study population. Configural measurement invariance was then examined to compare the validity of the scale between sexes. Invariance tests indicated whether the same constructs were being measured for men and women by simultaneously estimating model fit assessed by goodness-of-fit statistics (RMSEA < 0.06, $\Delta\chi^2 > 0.05$, and CFI > 0.95).

Descriptive statistics were calculated for the sample overall and by sex. We compared men and women with respect to sociodemographic and clinical data using univariate methods (i.e., chi-square or Fisher's exact where appropriate). Sex differences in OSE responses were analyzed descriptively using item analysis, with the mean for each subscale question examined overall, and then stratified by sex.

Additionally, linear regression analysis stratified by sex using the subscale scores as the dependent variables and potentially confounding covariates as the independent variables was performed to investigate whether and how much these factors may have contributed to possible differences in subscale scores.

Descriptive and regression analyses were performed using SAS 9.4 (Cary, NC), while exploratory and confirmatory factor analyses were performed using IBM SPSS versions 23 and 24 (Armonk, NY).

Results

Population characteristics

As expected, given the epidemiology of osteoporosis, PAADRN enrolled more women than men and more adults reporting white race than those reporting black or other races. Women were significantly more likely to be younger and to report prior osteoporosis diagnosis or care. See Table 1 for the overview of participant characteristics.

Assessment of OSE model fit by sex

The Kaiser-Meyer-Olkin test indicated that the EFA of the OSE scale was adequate (p = 0.97). Evaluation of the principal loadings identified that the items loaded onto their hypothesized subscales and explained 76.0% of the variance in the items. In general, the overall model fit was poor according to standard model-fit cutoffs, indicating that overall the OSE had poor accuracy in differentiating between perceived self-efficacy in exercise and calcium supplementation. This poor fit, however, most likely is an artifact of the large population size. Chi-square statistics are inflated as sample size increases, resulting in greater likelihood of rejecting the null hypothesis of a good fit more often than it should [24]. As a result, we used alternative fit statistics. See Table 2 for model-fit results.

Allowing for the correlation on several item error terms (items 1 with 2, 11 with 12, 9 with 10, 5 with 8, and 19 with 20 in Table 3) appreciably improved model fit. The reliability for the scale overall and between the sexes was high, with Cronbach's alphas for exercise and calcium overall of 0.97 and 0.96, indicating a high level of inter-item reliability that did not meaningfully differ between men or women.

A chi-square difference test was used to examine whether the calcium and exercise constructs were measured equivalently between sexes. The models overall and by sex were statistically significant and thus suggested that measuring self-efficacy between men and women may differ, but as noted, the poor fit is likely an artifact of the large sample size. The model attained convergent validity (i.e., the extent to which individual items clustered according to their subscale), with the average factor loadings for exercise and calcium above the cut point of 0.50 (0.86 and 0.84, respectively). Discriminant validity (i.e., the extent to which the subscales indeed differed) was demonstrated because the items loaded onto their expected subscales, reflecting a simple factor structure. Discriminant validity was also evident in that the cut point of the correlation between the subscales (0.46) was lower than their reliability coefficients [25], and below the recommended cut point of 0.85 [26]. Taken together, these results indicate configural invariance, meaning that the same constructs were being measured similarly for both sexes.

Comparison of OSE by sex

Participants reported high degrees of exercise and calcium self-efficacy (77.41 and 94.38, respectively) (see Table 3 for mean item responses by sex). Scores were closer to responses indicating higher confidence in the behavior or activities supporting self-efficacy. On average, men reported higher self-efficacy regarding exercise than women, whereas women reported higher self-efficacy regarding dietary calcium intake. Among the individual items comprising the exercise scale, men were significantly more confident that they could perform difficult exercises, exercise for an appropriate length of time, perform exercise despite fatigue, maintain an exercise program, and perform exercises as recommended. Women reported higher self-efficacy than men for all items on the calcium subscale.

Tables 4 and 5 show the Bonferroni adjusted, predicted least squares means, and 95% confidence intervals for the characteristics potentially associated with OSE exercise and calcium scores, stratified by sex. For men and women, site ($p = 0.0139$, $p = 0.0388$, respectively), education ($p = 0.0013$, $p < 0.0001$, respectively), and self-reported health status (both $p < 0.0001$) were associated with exercise self-efficacy, as were prior hip fracture ($p = 0.0026$, $p < 0.0001$, respectively) and race ($p = 0.0034$, $p < 0.0001$, respectively). Age ($p < 0.0001$) but not baseline use of bone-related pharmacotherapies also predicted exercise self-efficacy in women. Alternatively, among men, baseline use of pharmacotherapies ($p = 0.0096$) influenced exercise self-efficacy but not age. Interestingly, in both sexes, prior DXA, self-reported osteoporosis, and history of pharmacotherapy use were not significantly associated with the exercise scores in both genders.

Analysis of the OSE calcium responses by sex showed that study site ($p < 0.0001$), education ($p < 0.0001$), self-reported health status ($p < 0.0001$), prior hip fracture ($p = 0.0471$), self-reported osteoporosis ($p = 0.0390$), and a history of bone-related pharmacotherapy use ($p = 0.0023$) were significant predictors among women. For men, site ($p = 0.0008$), education ($p < 0.0001$), and self-reported health status ($p < 0.0001$) were also associated with calcium score, but age ($p = 0.0190$) and self-reported pharmacotherapy use ($p = 0.0272$) were also significant. Race, prior DXA, and self-reported low bone density use did not predict calcium self-efficacy for either sex.

Discussion

Our analysis of baseline OSE responses in the PAADRN pragmatic trial confirms the work of others who have reported that the OSE can be used to reliably measure calcium and exercise self-efficacy in either sex [15, 16]. Overall, we found Cronbach's alphas of 0.94 and 0.93 for exercise and calcium [15]. However, the OSE accounted for 10% less variance in our study population compared with theirs. Our Cronbach's alphas were also found to be comparable to a Malay version of the scale (0.88 and 0.92 for exercise and calcium, respectively) [27], though they did not assess for differences based on sex [27]. Moreover, our linear regression analysis showed that educational attainment, self-reported health status, age, history of hip fracture, and use of osteoporosis medications predicted the OSE exercise and calcium subscale scores.

While the overall CFA model fit was relatively poor, this was most likely due to the large sample size effects on chi-square statistics. However, it was slightly worse for men. This is not surprising since the original scale was designed for a female population. The women from the original study [15] were also younger (mean = 56 years, SD = 14.8) than the women from PAADRN (mean = 66.1 years, SD = 8.2). Other factors influencing the poor CFA model fit were due to correlated measurement errors among several items within the subscales, although we attempted to account for this, freely estimating the largest of those errors. Analysis demonstrating configural invariance—the extent to which exercise and calcium constructs were measuring the same things in men and women—confirms that OSE can be used to compare men's and women's responses without further adjustments for measurement error.

These results are also consistent with a systematic review which found that men had higher self-efficacy regarding exercise while women exhibited higher dietary calcium self-efficacy, although that review included studies with adults of all ages [28]. In contrast, another study comparing OSE stratified by sex found higher exercise self-efficacy in men but no sex difference in calcium self-efficacy [29]. These inconsistencies may be due to different age cutoffs and minor variations in scoring methods. The PAADRN population consisted mostly of women who, relative to men, had more exposure to bone densitometry and were more likely to report a prior fracture, an osteoporosis diagnosis, or bone-related pharmacotherapy. While not clinically significant, a larger proportion of women were more likely to self-report at least very good health status compared with men (81.8 versus 78.7, respectively). Health status was associated with calcium intake but not exercise for both sexes. The higher perceived health status may dampen motivation to commit to new exercise behaviors or regimens among women. It has been shown than men are less likely to correctly identify dietary sources of calcium. One study found that only 21% of men correctly identified sources from choices provided and 40% did not know that cheese, fruits, and vegetables could also be a source of dietary calcium [30]. However, in a study conducted by Doheny et al., men aged 50–93 who received their DXA impression were found to have higher post-DXA calcium intake, but in that study there was no association between DXA and exercise [16]. Bone health studies conducted on young adults have shown more promising results, with exercise self-efficacy predicting initiation of actual exercise [31] and baseline exercise and calcium self-efficacy predicting future behaviors [32].

A strength of the current study is that it examined the OSE and self-reported self-efficacy using the largest population to date. The PAADRN population, however, was largely white, female, and well-educated. The results of EFA and CFA of the PAADRN OSE data largely paralleled the results of the original OSE validation study, supporting its high internal consistency. However, we were unable to analyze the construct validity of the OSE subscales using well-tested measures for exercise or for dietary calcium recall. While PAADRN collected information pertaining to self-reported exercise and nutrition, due to study design, we could not ascertain a relationship between OSE and actual self-reported behaviors.

Our findings demonstrate that OSE can be administered to both men and women and that factors predicting exercise and calcium self-efficacy differed by sex. Given that men report significantly higher osteoporosis-related mortality and lower osteoporosis-related quality of life than women [10, 33], it is important to consider the potential contribution of sex differences in self-efficacy regarding preventive behaviors of exercise and consumption of dietary calcium and vitamin D. At the same time, clinicians should be cognizant that differences in gender socialization may compel men to actively engage in behaviors that counteract their health interests [34]. Thus, while men may report competence in adopting and performing health behaviors, this competency may not translate into preventive health behavior [35]. Future research to understand the role of OSE on sex disparities in osteoporosis outcomes should incorporate other facets of the health belief model such as perceived susceptibility and severity, particularly given limited evidence that men report a sense of invulnerability to the condition and do not view it as a serious health concern [11, 36].

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Table 1

Participant characteristics

	Men (N = 1260)		Women (N = 6489)		*p* value
	n	%	*n*	%	
Site					<0.001
University of Iowa	268	21.3	1417	21.8	
University of Alabama Birmingham	232	18.4	2848	43.9	
Kaiser Permanente	760	60.3	2224	34.3	
Age					<0.001
<65	327	26.0	2681	41.3	
65–74	607	48.2	2758	42.5	
≥ 75	326	25.9	1050	16.2	
Race					0.0076
White	1011	80.2	4924	75.9	
Black	219	17.4	1437	22.1	
Other	30	2.4	128	2.0	
Educational attainment					0.0010
Some high school	42	3.4	259	4.0	
Completed high school	264	21.4	1391	21.6	
Some college	356	28.9	2203	34.2	
Completed college	263	21.3	1284	19.9	
Graduate school	308	25.0	1315	20.4	
Self-reported health status					<0.001
Excellent	141	11.2	798	12.3	
Very good	361	28.8	2172	33.5	
Good	485	38.7	2331	36.0	
Fair	193	15.4	944	14.6	
Poor	74	5.9	235	3.6	
Bone health					
Prior bone density test (i.e., DXA)	343	27.3	4853	74.8	<0.001
Prior fracture	288	23.0	1806	27.9	0.0002

	Men (N = 1260)		Women (N = 6489)		p value
	n	**%**	***n***	**%**	
History of osteoporosis	154	12.3	1549	24.1	<0.001
History of osteopenia	100	7.9	1516	23.4	<0.001
On medication at baseline	84	6.7	1011	15.6	<0.001
On medication in the past	172	13.7	2768	42.7	<0.001

Table 2

Model fit for factorial invariance by sex

	χ^2	df	χ^2/df	CFI	RMSEA	90% CI
Overall	13,033.290	188	69.326	0.932	0.094	0.093, 0.095
Sex						
Men	2630.087	188	13.990	0.921	0.102	0.098, 0.105
Women	10,897.252	188	57.964	0.932	0.094	0.092, 0.095
Configural invariance	13,627.186	395	37.499	0.930	0.066	0.065, 0.067

Table 3

Osteoporosis self-efficacy item and subscale responses by sex

Item	Sample (N = 7749)		Men (N = 1260)		Women (N = 6489)		
	Mean	SD	Mean	SD	Mean	SD	*p* value
OSE exercise							
Overall	77.41	(21.88)	78.72	(20.48)	77.15	(22.14)	0.014
1. Begin a new or different exercise program.	7.86	(2.60)	7.88	(2.48)	7.85	(2.63)	0.68
2. Change your exercise habits	7.86	(2.48)	7.87	(2.38)	7.86	(2.50)	0.84
3. Put forth the effort required to exercise	8.03	(2.32)	8.04	(2.21)	8.03	(2.34)	0.85
4. Do exercises even if they are difficult	7.45	(2.55)	7.72	(2.35)	7.40	(2.58)	<0.0001
5. Maintain a regular exercise program	7.53	(2.52)	7.62	(2.42)	7.51	(2.54)	0.15
6. Exercise for the appropriate length of time	7.66	(2.47)	7.88	(2.29)	7.62	(2.50)	0.0006
7. Do exercises even if they are tiring	7.54	(2.49)	7.80	(2.30)	7.48	(2.52)	<0.0001
8. Stick to your exercise program	7.42	(2.53)	7.67	(2.39)	7.37	(2.55)	0.0003
9. Exercise at least three times a week	8.08	(2.47)	8.13	(2.40)	8.07	(2.48)	0.46
10. Do the type of exercise that you are supposed to do	7.99	(2.42)	8.11	(2.34)	7.97	(2.43)	0.06
OSE calcium							
Overall	94.38	(18.17)	91.34	(19.28)	94.97	(17.89)	<0.0001
11. Begin to eat more calcium-rich foods	8.53	(1.97)	8.23	(2.04)	8.59	(1.95)	< 0.0001
12. Increase your calcium intake	8.68	(1.89)	8.42	(1.96)	8.73	(1.87)	<0.0001
13. Consume adequate amounts of calcium-rich foods	8.54	(1.89)	8.33	(1.94)	8.58	(1.88)	<0.0001
14. Eat calcium-rich foods on a regular basis	8.57	(1.93)	8.29	(1.99)	8.63	(1.91)	< 0.0001
15. Change your diet to include more calcium-rich foods	8.58	(1.94)	8.27	(2.05)	8.64	(1.91)	<0.0001
16. Eat calcium-rich foods as often as you are supposed to	8.40	(1.97)	8.16	(2.05)	8.44	(1.96)	<0.0001
17. Select appropriate foods to increase your calcium intake	8.50	(1.94)	8.10	(2.10)	8.58	(1.90)	<0.0001
18. Stick to a diet which gives an adequate amount of calcium	8.43	(1.95)	8.26	(1.99)	8.46	(1.94)	<0.0001
19. Obtain foods that give an adequate amount of calcium	8.67	(1.84)	8.34	(2.00)	8.73	(1.80)	<0.0001
20. Remember to eat calcium-rich foods	8.57	(1.87)	8.25	(2.01)	8.64	(1.84)	<0.0001
21. Take calcium supplements if you don’t get enough calcium from your diet	8.90	(2.02)	8.69	(2.01)	8.94	(2.03)	<0.0001

Item score range: “1-Not at all confident” to “10-Very confident,” 0 scores corresponded to refusal Exercise subscale range, 10 to 100; calcium subscale range, 11 to 110

Table 4

Exercise scores by sociodemographic and health measures

	Total			**Men**			**Women**		
	***N* = 7749**	**95% CI**		***N* = 1260**	**95% CI**		***N* = 6489**	**95% CI**	
Sociodemographic variables									
Age									
<65	75.8	74.5	77.0	75.7	71.6	79.8	75.3	73.9	76.6
65–74	74.9	73.6	76.2	74.8	71.0	78.7	74.3	72.9	75.7
≥ 75	71.2	69.7	72.7	72.8	68.5	77.0	70.0	68.3	71.7
Race									
White	72.7	71.6	73.7	72.3	68.9	75.8	71.7	70.6	72.9
Non-White	75.2	73.8	76.7	76.5	72.1	80.9	74.6	73.0	76.2
Educational attainment									
Some completed high school	71.3	69.9	72.7	72.1	68.0	76.2	70.7	69.2	72.2
Some completed college	73.6	72.4	74.8	73.6	69.7	77.5	72.9	71.6	74.2
Beyond college	77.0	75.5	78.4	77.6	73.4	81.7	76.0	74.4	77.6
Health measures									
Self-reported health status									
Excellent	89.2	87.5	90.9	88.5	83.8	93.3	88.9	87.1	90.7
Very good	82.2	81.0	83.5	82.0	77.9	86.1	81.8	80.4	83.2
Good	75.1	73.9	76.4	74.5	70.7	78.3	74.8	73.5	76.2
Fair	66.0	64.5	67.6	64.3	59.9	68.7	66.0	64.3	67.6
Poor	57.2	54.7	59.6	62.8	57.2	68.4	54.4	51.7	57.2
Prior DXA	73.9	72.8	75.0	73.8	70.4	77.2	73.7	72.6	74.9
Prior hip fracture	73.2	71.9	74.5	76.4	72.4	80.4	71.9	70.5	73.3
Self-reported osteoporosis	73.3	71.8	74.7	72.8	68.3	77.3	72.5	71.0	74.1
Self-reported osteopenia	74.8	73.3	76.3	73.7	68.7	78.7	74.1	72.5	75.8
Currently on osteoporosis treatment	73.6	72.0	75.2	71.2	65.8	76.6	73.4	71.6	75.1
Discontinued osteoporosis treatment	73.6	72.1	75.1	72.9	67.6	78.3	73.2	71.7	74.8

Table 5

Calcium scores by sociodemographic and health measures

	Total			Men			Women		
	N = 7749	95% CI		*N* = 1260	95% CI		*N* = 6489	95% CI	
Sociodemographic variables									
Age									
<65	93.8	92.7	94.9	91.8	87.7	95.9	93.5	92.4	94.7
65–74	93.3	92.2	94.4	89.4	85.5	93.3	93.6	92.4	94.8
≥ 75	91.4	90.1	92.7	87.1	82.9	91.4	92.2	90.7	93.6
Race									
White	92.5	91.5	93.4	88.6	85.1	92.1	93.0	92.0	94.0
Non-White	93.2	91.9	94.5	90.2	85.9	94.6	93.2	91.8	94.6
Educational attainment									
Some completed high school	90.8	89.6	92.0	85.8	81.7	89.9	91.1	89.8	92.4
Some completed college	93.5	92.5	94.6	90.1	86.2	94.0	93.8	92.7	94.9
Beyond college	94.1	92.9	95.4	92.4	88.3	96.5	94.4	93.0	95.7
Health measures									
Self-reported health status									
Excellent	100.0	98.5	101.4	97.5	92.8	102.2	100.2	98.6	101.7
Very good	95.6	94.5	96.8	91.2	87.1	95.3	96.1	94.9	97.3
Good	92.4	91.3	93.4	88.3	84.5	92.1	92.9	91.7	94.0
Fair	88.4	87.1	89.7	84.2	79.8	88.6	88.9	87.5	90.3
Poor	87.7	85.6	89.9	86.0	80.4	91.5	87.4	85.0	89.8
Prior DXA	93.4	92.5	94.4	88.7	85.3	92.1	93.5	92.5	94.5
Prior hip fracture	92.5	91.4	93.7	90.0	86.0	94.0	92.6	91.4	93.8
Self-reported osteoporosis	92.2	90.9	93.4	89.1	84.6	93.5	92.4	91.1	93.8
Self-reported osteopenia	92.5	91.1	93.8	89.7	84.7	94.7	92.6	91.2	94.0
Currently on osteoporosis treatment	93.0	91.6	94.5	86.7	81.3	92.0	93.6	92.1	95.1
Discontinued osteoporosis treatment	93.7	92.3	95.0	88.0	82.6	93.3	94.0	92.7	95.4