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Relationships between obesity management and depression management in a university-based family medicine center

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Abstract

Purpose—The purpose of this study is to describe and examine relationships among sociodemographics, obesity, and depression management in Appalachian adults.

Data sources—This study was conducted in a primary care center and used a cross-sectional, quantitative, nonexperimental descriptive, and predictive design. Data were obtained from a random sample of 240 adult records that were stratified by gender. Analysis included exploration of all variables for descriptive information followed by bivariate analyses to determine significant relationships between variables, and regression analysis using variables with significant relation to obesity and depression management.

Conclusions—Obesity was prevalent (48%) though less than 1% had documented diagnosis. Over 98% of the 65 participants diagnosed with depression did not have documentation of use of a depression screening tool. Diagnosis of depression correlated significantly with elevated body mass index (BMI) and diagnosis of obesity. Gender bias was evident with males having more documentation of weight-loss discussions and planning, and women receiving more referrals to behavioral health for counseling.

Implications for practice—Innovations to enhance the diagnosis of obesity could lead to consistent provider-led management. Implementation studies of valid depression screening tools in the electronic medical record could enhance the identification of depressive symptoms and could promote health equity.

Keywords

Obesity; depression; primary care; research; Appalachia; screening

Obesity and depression make a significant contribution to the morbidity and mortality of populations in the United States and globally. Depression and obesity are consistently linked in a bidirectional relationship with each other in quantitative studies (Green, Bazata, Fox, & Grandy, 2012; Harrison, Miller, Schmitt, & Touchet, 2010; Pan et al., 2012). When both

diseases occur, a detrimental synergistic effect on overall health and treatment response is often seen (Ma & Xiao, 2010). Both obesity and depression, occurring independently or concurrently, are consistently linked to increased healthcare costs placing an increased burden on the healthcare system (Simon et al., 2011).

The prevalence of overweight and obesity has steadily increased over the past several decades. As of 2010, 63.9% of the U.S. population was overweight, with 27.6% was obese (McGregor et al., 2010). As a consequence of the increasing prevalence of obesity, diseases and disabilities associated with excess weight such as coronary heart disease, stroke, diabetes, hypertension, hyperlipidemia, musculoskeletal disorders, certain cancers, and depression have become more prevalent (Jerrell, McIntyre, & Tripathi, 2010; Keyser & Pincus, 2010; Vgontzas et al., 2009). Because obesity is associated with increased morbidity and mortality, obesity diagnosis and treatment should be a priority in primary care. Despite clear recommendations to assess all adults for overweight and obesity with BMI (Gustafson et al., 2006), primary care providers significantly underdiagnose and undertreat excess weight (Ding, Lehrer, Rosen-quist, & Audrain-McGovern, 2009; Watkins et al., 2006). The baseline data for Healthy People 2020 document that only 48.7% of primary care physicians regularly assess body mass index in their adult patients in 2008 (Healthy-People.gov, 2013).

The prevalence of depression in the United States has been reported to be over 8% (Li, Ford, Strine, & Mokdad, 2008). The estimated lifetime prevalence for major depressive disorder is 13.2% (O'Connor et al., 2009). Depression is estimated to be the number one cause of disability in the United States within the next two decades (Whooley, 2012). The U.S. Preventive Services Task Force recommends screening adults for depression in clinical practices that have systems in place to assure accurate diagnosis, effective treatment, and follow-up (U.S. Preventive Services Task Force [USPSTF], 2009). Despite the significant impact of depression on patient outcomes, data show that only 2.2% of primary care office visits screened adults for depression in 2007 (Prins et al., 2010).

Expanding what is known about obesity and depression management in primary care centers in Appalachia is consistent with the most recent priorities set forth by the National Institutes of Health and Healthy People 2020, which puts emphasis on understanding relationships between psychosocial and behavioral determinants of health and chronic illnesses in groups that experience health disparities (Pancoska et al., 2009). Understanding what influences the health and function of Appalachian adults is essential so that both healthcare providers and policymakers can appropriately meet patient needs. It is important that obesity and depression be studied within Appalachian culture because culture is a contributor to obesity and depression (Everson, Maty, Lynch, & Kaplan, 2002; Pancoska et al., 2009). The purpose of this study is to describe and examine relationships among sociodemographics, obesity, and depression management in Appalachian adults receiving care at a university-based family practice clinic.

Screening practices in Appalachia

In West Virginia, the prevalence of depression has been reported to be higher than the national average at 14.8% (Winkelmayer et al., 2005). There may be even more adults in

Appalachia who are suffering with untreated depression. Lack of screening for depression in primary care sites likely contributes to the prevalence of untreated depression. Additionally, adults in Appalachia have been reported to engage less often in help-seeking behaviors that may contribute to diminished encounters with the healthcare system (Huttlinger et al., 2004). Postponing health care could lead to problem-focused visits where the priority is treatment of acute problems, leaving Appalachian adults without appropriate preventive screenings. In addition, studies of rural adults indicate that screening practices may be biased toward young women and screening patterns tend to be informal rather than evidence-based reliable and valid depression screening tools (Melnik et al., 2006).

Methods

This study was conducted using a cross-sectional, quantitative, nonexperimental descriptive, and predictive design. Data were collected from a random sample of 240 adults drawn from a population who lived in a federally designated Appalachian county and who attended primary care visits at a university family medicine clinic within a 12-month period. Adults who were homeless, pregnant, or diagnosed with dementia or debilitating psychiatric illness were excluded from the study. Data were collected from outpatient electronic medical records (EMRs). The study was approved by the West Virginia University institutional review board. The study was guided by two research questions.

Research questions

- What are the relationships among sociodemographics, obesity management, and depression management in a sample of Appalachian adults?
- What are the current practices for obesity management and depression management in a university-based family practice clinic in a sample of Appalachian adults?

The two study questions were answered by implementing the following specific aims: (a) describe the demographics of the sample, (b) describe obesity and depression screening, diagnosing, and treatment practices in a sample of Appalachian adults who receive care at a university-based family practice clinic, (c) identify relationships among sociodemographics and obesity management and depression management in this sample, and (d) evaluate sociodemographic data as potential explanatory variables of obesity management and depression management.

Sampling

Based on the clinic population of 1900 adult patients, a sample size calculator was used to estimate the necessary sample. With a 5% margin of error and 95% confidence interval, an estimated minimum sample of 237 was needed to represent the adult population in this clinic. The sample was selected based on random drawing of all adult medical record numbers. The first 240 medical records for patients that met the inclusion criteria, stratified by gender, were used to gather data. Data collectors were trained to meet participant confidentiality requirements.

Measures

A data collection document was developed to record data from the EMR. The variables collected were based on national guidelines for screening practices related to obesity and depression in primary care.

Sociodemographics—Age, gender, marital status, education level, annual household income, employment status, and living situation were collected. Age was measured as years at the time of data collection and gender was self-reported. Marital status was categorized as *never married, widowed, separated/divorced, married with spouse absent from home, married with spouse living at home*. Education was assessed as total number of years of formal education. Employer was collected categorically to reflect employment situation.

Obesity management—The four variables collected to reflect obesity screening were BMI, height, weight, and waist circumference for BMI > 25 and 30. BMI is a calculated measure based on height and weight that is used to diagnose obesity (World Health Organization [WHO], 2013). Waist circumference was included because the National Institutes of Health (1998) guidelines for management of obesity include recommendations using this measure. Five additional variables related to risk factors were derived from the national obesity guidelines (NIH, 1998). These included blood pressure, family history of premature coronary heart disease, fasting glucose, low-density lipoprotein, and high-density lipoprotein. These variables were collected from the medical records based on whether or not the documentation was present.

Eleven variables were collected to reflect documentation of obesity treatment plans. These included documentation of a specific weight-loss plan, readiness to change, specific weight-loss goal, lifestyle modification regarding reduced energy intake, lifestyle modification regarding increased physical activity, behavioral therapy referral, nutrition therapy referral, and bariatric surgical referral. In addition, medical records were assessed for pharmacological treatment with prescriptions being coded categorically based on the Physician's Desk Reference (PDR) drug classification.

Depression management—Five variables were collected to reflect depression management: depression diagnosis, use of a depression screening tool, referral to psychiatry, referral to counseling/behavioral medicine, and pharmacotherapy use. These variables were collected from the medical records based on whether or not the documentation was present.

Data analysis

Data analysis was accomplished using SPSS. Data were entered into an SPSS file to facilitate collection and minimize error. Analysis to meet the specific aims of the study included exploration of all variables for descriptive information, bivariate data analysis as appropriate depending on variable type to determine significant relationships between variables, analysis of the relation of sociodemographics to obesity and depression management, and finally regression analysis using variables with significant relation to obesity and depression management, seeking explanatory variables of specific management types.

Results

Sample description

The sample consisted of 240 adults, 120 men and 120 women. The sample was 100% Caucasian, which is reflective of the demographics of West Virginia, currently report as 94% Caucasian (U.S. Census Bureau, 2013). Table 1 shows mean comparisons for continuous descriptive variables by gender. Women had an average of 2 years more education than men. Men and women did not differ significantly by age or number of clinic visits. The overall sample means for BMI, systolic and diastolic blood pressure, high density lipoprotein, low density lipoprotein (overall sample 158), and fasting glucose (overall 106) did not differ by gender. The sample averaged over two chronic illnesses with a range of 0–7. Table 2 reports the categorical sample characteristics by gender. A higher percentage of women were divorced or widowed and a significantly higher percentage of women worked in the healthcare setting while 50% of men were retired. The study participants had a mean BMI of 30.26 [SD 6.92; range 18–57]. Two hundred and thirty-six participants had BMI values recorded and 115 (48%) had BMI values of 30 or greater. Diagnosis of depression correlated significantly with elevated BMI ($r = 0.13$, $p = .046$) and diagnosis of obesity ($r = 0.186$, $p < .01$).

Management practices for obesity

Only 12 participants had an actual diagnosis of obesity despite the high prevalence of obesity. For those participants that were obese ($N = 115$), 18% had documentation of provider discussion of weight loss, 7.8% had a documented weight-loss plan, 7% had documentation of exercise instruction, 4% had documentation of readiness to change, less than 4% had documentation that they were instructed to take in fewer calories. None of the obese participants had documented weight-loss goals, referrals for nutrition therapy or behavioral therapy, referrals for bariatric surgery, or received prescriptions for weight loss. When comparing men to women for obesity management, of the obese participants, more men than women had documented provider discussions of weight loss ($\chi^2 = 4.53$, $p = .033$) and documented weight-loss plans ($\chi^2 = 5.78$, $p = .016$). For the overall sample, age negatively correlated with obesity diagnosis. When cases were selected for under age 65, age did not correlate with obesity diagnosis. Not one person 65 or older was diagnosed with obesity. Mean BMI for adults 65 and older was 29.3 ($N = 49$ [range 19.84–47.47]).

Management practices for depression

Sixty-five (24%) participants had a diagnosis of depression. These 65 participants had a mean of 2.65 ($SD = 3.35$) years since their last visit with primary diagnosis of depression. Over 98% of those diagnosed with depression did not have documentation of use of a depression screening tool to establish the diagnosis. Seven (16.6%) of the depressed women were referred for behavioral counseling but none of the men were referred. Over 82% of women and 70% of men with a depression diagnosis received suggestions for antidepressant medication. There was no relationship between age and depression diagnosis. Logistic regression analysis revealed that age, gender, education, marital status, religious affiliation, and employer were not predictive of obesity or depression management practices.

Discussion

In a majority of healthcare settings, particularly in Appalachia, providers will frequently see patients with obesity and depression. The results of this study indicate that there is insufficient treatment of obesity and depression. The undertreatment of obesity and depression is consistent with findings from other studies (Harrison, Miller, Schmitt, & Touchet, 2010; Romera et al., 2013) that suggest there may be gender bias in the diagnosis and treatment planning of depression in this specific population. Harrison et al. (2010) also reported undertreatment of depression and a gender bias against treatment for males (Harrison et al., 2010). Female gender, younger adult age, more severe degree of obesity, living in the Midwest, and being seen by a cardiologist have been identified as predictors of obesity diagnosis (Bleich, Pickett-Blakely, & Cooper, 2011). Further studies are needed to explore why the gender bias exists and to identify barriers to treatment of obesity and depression in primary care settings.

Given the obesity epidemic in the United States, it is imperative that providers document variables such as current weight, BMI, and obesity status in order to identify the disease process and initiate consistent, timely, and effective treatment. Recent literature has reported that increased documentation of obesity can lead to increased management of obesity, but not necessarily in overweight persons (Bordowitz, Morland, & Reich, 2007). Other reports have concluded that increased documentation of BMI resulted in increased management for both obesity and overweight status (Waring, Roberts, Parker, & Eaton, 2009). In this study, it is significant that older adults were less likely to be diagnosed with obesity. National trends suggest significant increases in obesity in older adults by 2050 (Fakhouri, Ogden, Carroll, Kit, & Flegal, 2012). Although body fat can be protective in older adults, morbid obesity contributes to functional impairment and poorer chronic illness outcomes, particularly with diabetes and heart disease, two areas of disparity in the Appalachian population.

It is clinically meaningful that only two of our 240 participants were screened for depression using a reliable and valid age-appropriate depression screening tool. USPSTF recommends screening adults for depression in clinics that have resources to assure accurate diagnosis, effective treatment, and follow-up (USPSTF, 2009). It is possible that the screening tool was not easily accessible in the EMR for provider use. Future work is needed on best practices for implementing national recommendations regarding depression management within the EMR.

In addition, the gender analysis of depression screening indicates that there may be a gender bias in diagnosing and in treatment methods for depression. These findings are concurrent with reports from the WHO indicating gender bias in the diagnosis and treatment of depression (WHO, 2013). This leaves an unfortunate and clinically significant gender gap in the diagnosis and treatment planning of men suffering from depression. It is possible that providers are more apt to diagnose women—who typically may share feelings more during a visit than men—with depression and start treatment earlier in this population. Although not statistically significant, the difference between the number of men and women getting referred for counseling and receiving pharmaceutical management for depression is

clinically relevant. Finally, while the sociodemographics available to be collected in this study from the EMR did not result in explanation for obesity and depression diagnosis or management, enhanced reliability and consistency of documentation of income would have allowed for accurate determination of economic status that may be predictive of obesity or depression.

Limitations of the study

Because of the racial homogeneity of the sample, a potential limitation of this study is it may not be generalizable to other populations. This study included a retrospective review of data collected from EMRs. It is possible that the data entered into the EMR were somehow inaccurate. In addition, while analysis of the sociodemographics available to be collected in this study from the EMR did not result in explanation for obesity and depression diagnosis or management, incorporating reliable documentation of income into the EMR would have allowed for accurate determination of economic status, which could have then been analyzed for prediction of obesity or depression.

Implications for practice

There is the potential for advanced practice nurses to significantly influence gaps in the management of obesity and depression. The implementation of appropriate screening processes based on the national preventive services guidelines would be appropriate. Easy access to valid and reliable depression screening tools in the EMR would serve to more accurately identify depressive symptoms. Early documented diagnosis of obesity and depression could facilitate lower costs for treatment, timely referrals, and could lead to improved outcomes of these diseases and the multitude of other chronic diseases associated with them.

We are facing a healthcare crisis in our country, especially in Appalachia, with obesity and mental illness. As primary care providers, it is imperative to consistently, efficiently, and inclusively screen for, diagnose, and accurately document treatment plans for these conditions. We must advocate for enhanced usability of EMRs as tools to help identify and track disease diagnosis and treatment progress. It may be possible to incorporate prompts for clinicians, readily available patient education materials, and mandatory data entry fields that reflect the national guidelines.

Implications for future research

Future studies on the efficacy of implementing screening procedures that are embedded in the EMR could potentially improve outcomes related to obesity and depression. Prospective longitudinal intervention studies evaluating the effect of EMR-based interventions on obesity and depression management will enhance our knowledge and could potentially improve these conditions and, consequently, associated comorbidities. In addition, future studies of the relationship between insurance reimbursement for obesity treatment and diagnosis and treatment of obesity could lead to health policy changes.

References

- Bleich SN, Pickett-Blakely O, Cooper LA. Physician practice patterns of obesity diagnosis and weight-related counseling. *Patient Education and Counseling*. 2011; 82(1):123–129.10.1016/j.pec.2010.02.018 [PubMed: 20303691]
- Bordowitz R, Morland K, Reich D. The use of an electronic medical record to improve documentation and treatment of obesity. *Family Medicine*. 2007; 39(4):274–279. Multicenter Study. [PubMed: 17401772]
- Ding W, Lehrer SF, Rosenquist JN, Audrain-McGovern J. The impact of poor health on academic performance: New evidence using genetic markers. *Journal of Health Economics*. 2009; 28(3):578–597. doi:S0167-6296(08)00190-2 [pii] 10.1016/j.jhealeco.2008.11.006. [PubMed: 19217678]
- Everson SA, Maty SC, Lynch JW, Kaplan GA. Epidemiologic evidence for the relation between socioeconomic status and depression, obesity, and diabetes. *Journal of Psychosomatic Research*. 2002; 53(4):891–895. Research Support, Non-U.S. Gov't Research Support, U.S. Gov't, P.H.S. Review. [PubMed: 12377299]
- Fakhouri THI, Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity among older adults in the United States, 2007–2010. *NCHS Data Brief*. 2012; 106:1–8. Retrieved from <http://www.cdc.gov/nchs/data/databriefs/db106.pdf>. [PubMed: 23102091]
- Green AJ, Bazata DD, Fox KM, Grandy S. Quality of life, depression, and healthcare resource utilization among adults with type 2 diabetes mellitus and concomitant hypertension and obesity: A prospective survey. *Cardiology Research and Practice*. 2012; 2012:404107.10.1155/2012/404107 [PubMed: 22762006]
- Gustafson TB, Gibbons LM, Sarwer DB, Crerand CE, Fabricatore AN, Wadden TA, Williams NN. History of sexual abuse among bariatric surgery candidates. *Surgery for Obesity and Related Diseases*. 2006; 2(3):369–374. discussion 375–366. doi:S1550-7289(06)00164-X [pii] 10.1016/j.soard.2006.03.002. [PubMed: 16925354]
- Harrison DL, Miller MJ, Schmitt MR, Touchet BK. Variations in the probability of depression screening at community-based physician practice visits. *Primary Care Companion to the Journal of Clinical Psychiatry*. 2010; 12(5):e1–e8. doi:10.4088/PCC.09m00911bluPCC.09m00911 [pii]. Retrieved from <http://www.psychiatrist.com/PCC/article/Pages/2010/v12n05/09m00911blu.aspx>.
- HealthyPeople.gov. Nutrition and weight status: Health care and worksite settings. 2013. Retrieved from <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=29>
- Huttlinger K, Schaller-Ayers J, Lawson T. Health care in Appalachia: A population-based approach. *Public Health Nursing*. 2004; 21(2):103–110.10.1111/j.0737-1209.2004.021203.x [PubMed: 14987209]
- Jerrell JM, McIntyre RS, Tripathi A. A cohort study of the prevalence and impact of comorbid medical conditions in pediatric bipolar disorder. *Journal of Clinical Psychiatry*. 2010; 71(11):1518–1525.10.4088/JCP.09m05585ora [PubMed: 20584522]
- Keyser DJ, Pincus HA. From community-based pilot testing to region-wide systems change: Lessons from a local quality improvement collaborative. *Progress in Community Health Partnerships*. 2010; 4(2):105–114. doi:S1557055x10200037 [pii]10.1353/cpr.0.0119. [PubMed: 20543485]
- Li C, Ford ES, Strine TW, Mokdad AH. Prevalence of depression among U.S. adults with diabetes: Findings from the 2006 behavioral risk factor surveillance system. *Diabetes Care*. 2008; 31(1):105–107. doi:dc07-1154 [pii]10.2337/dc07-1154. [PubMed: 17934145]
- Ma J, Xiao L. Obesity and depression in US women: Results from the 2005–2006 National Health and Nutritional Examination Survey. *Obesity (Silver Spring)*. 2010; 18(2):347–353. doi:oby2009213 [pii]10.1038/oby.2009.213. [PubMed: 19590500]
- McGregor J, Brooks C, Chalasani P, Chukwuma J, Hutchings H, Lyons RA, Lloyd K. The Health Informatics Trial Enhancement Project (HITE): Using routinely collected primary care data to identify potential participants for a depression trial. *Trials*. 2010; 11:39. Research Support, Non-U.S. Gov't. 10.1186/1745-6215-11-39 [PubMed: 20398303]
- Melnik BM, Small L, Morrison-Beedy D, Strasser A, Spath L, Kreipe R, Van Blankenstein S. Mental health correlates of healthy lifestyle attitudes, beliefs, choices, and behaviors in overweight

- adolescents. *Journal of Pediatric Health Care*. 2006; 20(6):401–406. doi:S0891-5245(06) 00151-9 [pii]10.1016/j.pedhc.2006.03.004. [PubMed: 17071371]
- National Institutes of Health (NIH). Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults. 1998. Retrieved from <http://www.ncbi.nlm.nih.gov/books/NBK2003/pdf/TOC.pdf>
- O'Connor PJ, Crain AL, Rush WA, Hanson AM, Fischer LR, Kluznik JC. Does diabetes double the risk of depression? *Annals of Family Medicine*. 2009; 7(4):328–335. doi:7/4/328 [pii]10.1370/afm.964. [PubMed: 19597170]
- Pan A, Sun Q, Czernichow S, Kivimaki M, Okereke OI, Lucas M, et al. Hu FB. Bidirectional association between depression and obesity in middle-aged and older women. *International Journal of Obesity*. 2012; 36(4):595–602. Research Support, N.I.H., Extramural. 10.1038/ijo.2011.111 [PubMed: 21654630]
- Pancoska P, Buch S, Cecchetti A, Parmanto B, Vecchio M, Groark S, et al. Branch R. Family networks of obesity and type 2 diabetes in rural Appalachia. *Clinical and Translational Science*. 2009; 2(6):413–421. Research Support, N.I.H., Extramural. doi:10.1111/j.1752-8062.2009.00162.x. [PubMed: 20443933]
- Physician's Desk Reference (PDR). Retrieved from <http://www.drugs.com/pdr/>
- Prins MA, Verhaak PF, Smolders M, Laurant MG, van der Meer K, Spreeuwenberg P, Bensing JM. Patient factors associated with guideline-concordant treatment of anxiety and depression in primary care. *Journal of General Internal Medicine*. 2010; 25(7):648–655. Comparative Study Research Support, Non-U.S. Gov't. 10.1007/s11606-009-1216-1 [PubMed: 20049547]
- Romera I, Gilaberte I, Montejo ÁL, Aragonés E, Arbesú JÁ, Iglesias-García C, Yruretagoyena B. Systematic depression screening in high-risk patients attending primary care: A pragmatic cluster-randomized trial. *BMC Psychiatry*. 2013; 13(1):1–9. Retrieved from <http://www.biomedcentral.com/content/pdf/1471-244X-13-83.pdf>. 10.1186/1471-244x-13-83 [PubMed: 23281653]
- Simon GE, Arterburn D, Rohde P, Ludman EJ, Linde JA, Operskalski BH, Jeffery RW. Obesity, depression, and health services costs among middle-aged women. *Journal of General Internal Medicine*. 2011; 26(11):1284–1290. Research Support, N.I.H., Extramural. 10.1007/s11606-011-1774-x [PubMed: 21710312]
- U.S. Preventive Services Task Force (USPSTF). Screening for depression in adults: U.S. preventive services task force recommendation statement. *Annals of Internal Medicine*. 2009; 151(11):784–792. Retrieved from <http://annals.org/article.aspx?articleid=745304>. 10.7326/0003-4819-151-11-200912010-00006 [PubMed: 19949144]
- Vgontzas AN, Liao D, Pejovic S, Calhoun S, Karataraki M, Bixler EO. Insomnia with objective short sleep duration is associated with type 2 diabetes: A population-based study. *Diabetes Care*. 2009; 32(11):1980–1985. doi:dc09-0284 [pii]10.2337/dc09-0284. [PubMed: 19641160]
- Waring ME, Roberts MB, Parker DR, Eaton CB. Documentation and management of overweight and obesity in primary care. *Journal of the American Board of Family Medicine*. 2009; 22(5):544–552. [PubMed: 19734401]
- Watkins LL, Blumenthal JA, Davidson JR, Babyak MA, McCants CB Jr, Sketch MH Jr. Phobic anxiety, depression, and risk of ventricular arrhythmias in patients with coronary heart disease. *Psychosomatic Medicine*. 2006; 68(5):651–656. doi:68/5/651 [pii]10.1097/01.psy.0000228342.53606.b3. [PubMed: 17012517]
- Whooley MA. Diagnosis and treatment of depression in adults with comorbid medical conditions: A 52-year-old man with depression. *Journal of the American Medical Association*. 2012; 307(17):1848–1857. doi:307/17/1848 [pii]10.1001/jama.2012.3466. [PubMed: 22550199]
- Winkelmayer WC, Fischer MA, Schneeweiss S, Wang PS, Levin R, Avorn J. Underuse of ACE inhibitors and angiotensin II receptor blockers in elderly patients with diabetes. *American Journal of Kidney Diseases*. 2005; 46(6):1080–1087. doi:S0272-6386(05)01211-4 [pii]10.1053/j.ajkd.2005.08.018. [PubMed: 16310574]
- World Health Organization (WHO). Mental health: Gender and women's mental health. 2013. Retrieved from http://www.who.int/mental_health/prevention/genderwomen/en/

Table 1

Mean comparisons of sociodemographics based on gender

Variable	Group	Mean	SD	F	Sig.
Age	Female	51.03	16.71	1.39	.24
	Male	51.16	15.17		
Years of education	Female	13.5	2.87	6.58	0.16*
	Male	11.5	0.97		
Number of clinic visits	Female	3.03	2.10	1.51	.22
	Male	2.96	1.84		
Number of chronic illnesses	Female	1.95	1.67	2.14	.14
	Male	2.08	1.45		
BMI	Female	29.95	7.37	5.76	.02*
	Male	30.57	6.46		

Note. Equal variances assumed.

Table 2
Chi-square comparisons of sample characteristics based on gender

Variable	Category	Male	Female	Chi-square, <i>p</i> -value
Marital status	Married/partnered	80 (67)	69 (58)	10.19, <i>p</i> = .006
	Widowed/divorced	8 (7)	25 (21)	
	Single	32 (27)	26 (22)	
Religion	None	58 (56)	46 (46)	1.95, <i>p</i> = .207
	Affiliation identified	46 (44)	54 (54)	
Employer	Healthcare worker	13 (13)	29 (37)	17.92, <i>p</i> = .001
	Retired	11 (11)	9 (12)	
	University employee	17 (18)	12 (15)	
	Employed other	48 (50)	19 (24)	
	Unemployed	8 (8)	9 (12)	

Note. Percentages may not add up to 100% because of rounding.