HHS Public Access

Author manuscript

Pain Manag Nurs. Author manuscript; available in PMC 2019 February 01.

Published in final edited form as:

Pain Manag Nurs. 2018 February ; 19(1): 79–87. doi:10.1016/j.pmn.2017.11.008.

Pain, Racial Discrimination, and Depressive Symptoms among African American Women

Janiece L. Walker Taylor, PhD, RN[*], **Claudia M. Campbell, PhD**[†], **Roland J. Thorpe Jr, PhD**[‡,§,‖], **Keith E. Whitfield, PhD**[‖], **Manka Nkimbeng, MPH, RN**[*], and **Sarah L. Szanton, PhD, ANP FAAN**[*,‡,‖]

[*]School of Nursing, Johns Hopkins University, Baltimore, Maryland [†]School of Medicine, Psychiatry and Behavioral Sciences, Johns Hopkins University, Baltimore, Maryland [‡]Hopkins Center for Health Disparities Solutions, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland; [§]Department of Health, Behavior, and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland; [‖]Wayne State University, Detroit, Michigan.

Abstract

African American women with osteoarthritis (OA) are at high risk of experiencing pain. They report more pain than non-Hispanic White women and men of other racial/ethnic groups. This pain can limit independence and diminish their quality of life. Despite the detrimental effects that pain can have on older African American women with OA, there is a dearth of literature examining factors beyond the OA pathology that are associated with pain outcomes within this population. The purpose of this study was to examine the relationships between racial discrimination and depressive symptoms with pain intensity in African American women with OA. The sample comprised of 120 African American women, aged 50–80 years, with OA, from Texas and New Mexico. The women completed survey booklets to answer study questionnaires. We used multiple linear regression to test associations between racial discrimination, depressive symptoms, and pain intensity. We tested whether depressive symptoms mediated the relationship between racial discrimination and pain intensity by using bootstrapping. Results indicated that racial discrimination was significantly associated with pain intensity and that this relationship was mediated by depressive symptoms, even after controlling for body mass index, years of education, and length of time with OA. Both depressive symptoms and racial discrimination may be modifiable. If these modifiable factors are addressed in this population, there may be decreased pain in middle-aged and older African American women.

Pain is highly prevalent among older African Americans, with 56% > 65 years of age reporting pain (Patel, Guralnik, Dansie, & Turk, 2013). There is a growing body of research supporting the existence of disparities in detection and treatment of pain in African Americans. Older African Americans report more unresolved pain than other racial/ethnic groups and less control over their pain (Allen et al., 2012; Bruce, Fries, & Murtagh, 2007; McCracken, Matthews, Tang, & Cuba, 2001; Parmelee, Harralson, McPherron, DeCoster, &

Address correspondence to Janiece L. Walker Taylor, PhD, RN, 525 North Wolfe Street, SON House Room 301, Baltimore, MD 21205. jwalke90@jhu.edu.

Schumacher, 2012). If left unresolved, pain is associated with debilitating effects, including declining physical function, more disability, and higher morbidity and mortality rates among older African Americans (Baker & Whitfield, 2006; Cano, Mayo, & Ventimiglia, 2006).

Older and middle-aged African American women are at a particularly high risk of experiencing pain and subsequent pain-related disability because of the intersection of their sex, age, race, and high rates of chronic conditions such as osteoarthritis (OA) (Baker & Green, 2005; Baker, Buchanan, & Corson, 2008; Baker, Buchanan, Small, Hines, & Whitfield, 2011; Walker et al., 2016b). Furthermore, pain is common among adults with OA (Arthritis Foundation, 2015), and women experience higher rates of OA after the age of 50 than men (Buckwalter, Saltzman, & Brown, 2004). This places African American women with OA at high risk of experiencing pain caused by OA and possibly other chronic conditions (Baker et al., 2011; Walker et al., 2016b). Among African American women, pain is related to poor physical function and more disability (Allen et al., 2012; Baker & Whitfield, 2015; Bolen et al., 2010; Jordan et al., 2007; Keefe et al., 2000; Parmelee et al. 2012). Pain in older African American women can limit their independence and diminish their quality of life (Horgas, Yoon, & Grall, 2008; Park, Engstrom, Tappen, & Ouslander, 2015).

Despite the detrimental effects that pain can have on older African American women, there is a dearth of literature examining factors such as racial discrimination and depressive symptoms that are associated with pain outcomes within this population. Pain may be related to racial discrimination and depressive symptoms in African American women with OA. African American women often experience racial discrimination throughout their lives (Collins, David, Handler, Wall, & Andes, 2004; Mays, Cochran, & Barnes, 2007; Stevens-Watkins, Perry, Pullen, Jewell, & Oser, 2014; Vines et al., 2006). In addition, given the relationship that depressive symptoms have with pain (Bair, Robinson, Katon, & Kroenke, 2003; Bazargan, Yazdanshenas, Gordon, & Orum, 2016; Harvard Medical School, 2009), racial discrimination may be related to pain by way of depressive symptoms.

A growing body of research illustrates that pain is related to experiences of racial discrimination in African Americans. For example, racial discrimination is related to more bodily pain in older African American men (Burgess et al., 2009). Racial discrimination is related to lower heat pain tolerance in African Americans with OA (Goodin et al., 2013) and increased low back pain in African Americans (Edwards, 2008). Racial discrimination is also related to a greater burden of pain and more pain sensitivity in those with sickle cell disease (Haywood et al., 2014; Mathur et al., 2016).

Racial discrimination is related to poor mental health outcomes such as depressive symptoms among African Americans (Gibbons et al., 2014; Hoggard, Byrd, & Sellers, 2015; Hudson, Puterman, Bibbins- Domingo, Matthews, & Adler, 2013; Schmitt, Branscombe, Postmes, & Garcia, 2014; Walker, Salami, Carter, & Flowers, 2014; Williams & Williams-Morris, 2000; Williams, Yan, Jackson, & Anderson, 1997). The relationship between racial discrimination and depressive symptoms is related to physical health status among African American women (Gibbons et al., 2014). Gibbons and colleagues reported that racial

discrimination is associated with more depression and that this depression, in turn, is related to deteriorating health status among African American women (Gibbons et al., 2014).

There is also a relationship between pain and depressive symptoms. Pain and depressive symptoms are related in women with arthritic conditions (Lee et al., 2009; Onubogu, 2014; Smith & Zautra, 2008) and African American women (Baker et al., 2011; Parmelee et al., 2012). Having depression triples the risk of experiencing pain (Harvard Medical School, 2009). Pain and depressive symptoms share biological pathways and neurotransmitters (Bair et al., 2003; Goesling, Clauw, & Hassett, 2013). Hence, in looking for ways to address pain in African Americans it is important to consider the relationship that depressive symptoms have to pain outcomes.

The purpose of this study was to examine the relationships between racial discrimination and depressive symptoms with pain intensity in middle-aged and older African American women with OA. We tested whether racial discrimination and depressive symptoms were associated with pain intensity and whether depressive symptoms mediated the relationship between racial discrimination and pain. We used the biopsychosocial effects of racism among African Americans model as a theoretical guide for this study (Clark, Anderson, Clark, & Williams, 2013). Clark and colleagues (2013) posit that psychological responses to racial discrimination may be related to numerous health outcomes. This study is a secondary analysis from a previous study in which we examined factors related to disability among African American women with OA (Walker, Harrison, Brown, Thorpe, & Szanton, 2016a). The findings from this study can help to identify factors related to pain in the same group of women. Pain is a complex and undermanaged condition among African American women with chronic conditions such as OA. If we can reduce their pain by addressing other factors such as depressive symptoms, we may decrease disability rates and improve their quality of life.

We chose to examine the relationships of pain, racial discrimination, and depressive symptoms *within* a sample of African Americans instead of comparing African Americans with other racial/ethnic groups. Researchers have focused on understanding pain outcomes in older African American women by comparing them with other racial/ethnic groups (Jordan et al., 2007; Parmelee et al., 2012). Although these comparison studies are important, using a within-group approach can indicate how specific factors may adversely affect a specific group across the range of sociodemographic and medical variability within the group (Whitfield, Allaire, Belue, & Edwards, 2008).

METHODS

Data Collection and Sample Design

All aspects of this study were reviewed and approved by the University of Texas at Austin institutional review board. Convenience sampling was used for this study. Participants in this study were recruited through professional organizations (e.g., sororities and organizations for retired seniors) and churches in Texas and New Mexico using fliers, community leaders, health fairs, and word-of-mouth. Participants expressed interest by calling a toll-free number, and were then screened for eligibility. Verbal consent was obtained, and then

participants were mailed or given in person a written consent form to complete. Eligible individuals were asked to complete a survey booklet. The booklet was administered via mail or in person, depending on the request of the participant. Participants were given $50 compensation on completion and return of the booklet. We measured for other variables in the survey booklet that were not included in this study and not related to our study purpose, but are described elsewhere (Walker et al. 2016a).

Participants

The participants for this study consisted of 120 African American women 50–80 years of age (mean age = 63.04, standard deviation [SD] = 8.57), who self-reported having a diagnosis of OA. The inclusion criteria for the initial study included participants reporting a diagnosis of OA, age (between 50 and 80), sex (women), race (African American), and limitations on physical function (reported having two of four functional limitations derived from the National Health Interview Survey), unable to stand for 20 min, bend from a standing position, walk a quarter of a mile, or walk 10 steps without resting (Centers for Disease Control and Prevention, 2000; Walker et al. 2016a). Given the focus of this study we did not look at physical function. We chose not to include participants older than 80 because African Americans older than 80 represent a different population (octogenarians). Those older in the African American population can be considered exceptional survivors, and they likely differ from younger cohorts in prevalence of pain and other health conditions (Whitfield et al., 2008).

Measures

Self-reported age was used as both a continuous and a dichotomous variable (middle-aged [50–65] and older [66–80]). The women reported their weight and height. Body mass index (BMI) was calculated using the following formula: BMI = weight (lb)/height (in) ^{2} × 703. Length of time with osteoarthritis was a continuous variable that the women reported in years. We included years of education and BMI as covariates in this study because it is well documented that they are related to poorer outcomes such as functional limitations among African American women with OA and may potentially be related to worse pain (Colbert et al., 2013; Dunlop et al., 2005). Length of time with OA was chosen as a covariate because OA symptoms including pain can worsen with time (Arthritis Foundation, 2015).

Pain intensity was measured using the short form of the McGill Pain Questionnaire (SF-MPQ). The SF-MPQ comprises 15 descriptive words; 11 of the words represent the sensory domain of the pain experience, and the remaining 4 represent the affective domain of the pain experience. These descriptive words are used to describe pain in the preceding 7 days, and each descriptor is ranked using a Likert scale, where 0 = none, 1 = mild, 2 = moderate, and 3 = severe. Total scores for the sensory and affective domains can range from 0 to 45. In addition, one question is used to measure current pain intensity on a Likert scale: 0 = none, 1 = mild, 2 = discomforting, 3 = distressing, 4 = horrible, and 5 = excruciating. Total scores for the current pain intensity question can range from 0 to 5 (Melzack, 1975, 1987). For this study, the scores from the descriptors were added to the scores from the current pain intensity question to calculate the total SF-MPQ pain intensity score, which is consistent

with scoring used in previous studies. (Ashbrook, Shacklady, Johnson, Yeowell, & Goodwin, 2017; Cox et al., 2017). In this sample, Cronbach's α for the pain intensity scale was .88.

Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D) (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). This 20-item scale is used to measure depressive symptoms across nine domains: sadness, loss of interest, appetite, sleep, thinking/concentration, guilt, fatigue, movement, and suicidal ideations (Eaton et al., 2004). Cronbach's α for the CES-D for this sample was .89. The CES-D scores can range from 0 to 60, with higher scores indicating more depressive symptoms.

Racial discrimination was measured using the General Ethnic Discrimination Scale (GED), an adaptation of the Schedule of Racist Events Scale (Landrine & Klonoff, 1996; Landrine, Klonoff, Corral, Fernandez, & Roesch, 2006). The scale was used to measure whether racist events were experienced over the preceding year using a Likert scale ranging from 1 = never to 6 = almost all of the time. Examples of questions from the GED include: 'How often have you been treated unfairly by strangers because of your race/ethnic group?' "How often have you been treated unfairly by people in helping jobs (by doctors, nurses, psychiatrists, case workers, dentists, school counselors, therapists, social workers, and others) because of your race/ethnic group?' In the present study, the GED recent events scale was used, which had a Cronbach α of .93.

Data Analysis

Descriptive statistics (means, SD, and frequencies) were used to describe the sample. Because of the positive skewness, both depressive symptom scores and racial discrimination scores were transformed. The scores for depressive symptoms were transformed by taking the square root of the scores; racial discrimination scores were transformed by multiplying each score by 10 and taking the log (Tabachnick & Fidell, 2013). As recommended by Tabachnik and Fidell (2013), each transformation method used was appropriate for the respective variables and ensured that scores were normally distributed. Pearson's correlations were used to detect relationships between independent and outcome variables. Linear regression was used to test the association between racial discrimination and pain intensity. We tested for mediation by using the method of Preacher and Hayes (2004). A set of multiple regressions were completed to test the indirect effects of racial discrimination on pain through depressive symptoms. SPSS Version 23 and the PROCESS SPSS macro by Andrew F. Hayes were used to complete the mediation analysis. Using mediation analysis in a cross-sectional study indicates that causality cannot be assumed.

RESULTS

A detailed characterization of the sample is presented in Table 1. Nine percent of the women (n = 11) were from New Mexico, and 91% (n = 109) were from Texas. The mean age was 63.04 (SD = 8.57, range: 50–80 years). The average number of years with OA was 11.33 (SD = 10.46, rang: from 6 months-64 years).

Racial discrimination was associated with pain intensity ($b = 9.45$, $p < .05$), controlling for BMI, years of education, and length of time with OA. Depressive symptoms mediated the

relationship between racial discrimination and pain intensity. The covariates controlled for in each model were BMI, years of education, and length of time with OA. First, pain intensity was associated with racial discrimination (b = 9.45, $p < .05$). Second, depressive symptoms were associated with racial discrimination (b = .71, $p < .05$). Next, pain intensity was regressed on depressive symptoms after controlling for racial discrimination (b = 5.45, $p < .05$; b = 5.62, $p > .05$). With depressive symptoms in the model, racial discrimination was no longer significantly associated with pain intensity. The full models are displayed in Table 2. We then applied the PROCESS SPSS macro allowing us to estimate the indirect effect of racial discrimination on pain through depression ($b = 3.83$) and obtain a bootstrapped confidence interval (CI = .47–7.44) indicating that the indirect effect is significantly different than zero. The total effect was $p < .05$.

DISCUSSION

The findings of this study provide evidence that in this sample of African American women with OA, racial discrimination is significantly related to pain intensity above and beyond the association with BMI, years of education, and the length of time with OA. This finding was consistent with previous literature that indicated a relationship between racial discrimination and pain in African American groups (Edwards, 2008; Goodin et al., 2013). The findings also indicated that depressive symptoms mediated the relationship between racial discrimination and pain intensity.

This study extends previous findings that support that the existence of a relationship between racial discrimination and depressive symptoms in African Americans (Cooper et al., 2003; Hoggard et al., 2015). Depressive symptoms may be related to experiences with racial discrimination, which may be related to pain intensity. Understanding factors related to pain intensity in this group may help identify ways to reduce pain.

We found that depressive symptoms mediate the relationship between racial discrimination and pain intensity, which suggests that depressive symptoms may be a key factor in understanding the relationships between racial discrimination and pain outcomes. Specifically, this study highlights that racial discrimination may have mental health implications, which may be related to health outcomes in late life among older African American women with OA. It is important to look beyond purely biological mechanisms related to pain in a population that experiences such high rates of undermanaged pain. Reducing pain in African American women with OA is important for their quality of life and health outcomes as they age.

African Americans are likely to experience racial discrimination (Edwards, 2008) and disparities in pain management (Campbell & Edwards, 2012). In addition, African Americans often experience structural forms of racism in society, such as social and geographical segregation and racial discrimination within the work force (Gee & Ford, 2011; Williams & Williams-Morris, 2000), that may influence their health outcomes. Societal investment in avenues of decreasing racial discrimination could possibly result in less depressive symptoms, pain, and health care utilization because this measure of racial discrimination is for the preceding year only. A more comprehensive understanding of the

cumulative consequences of racial discrimination on health across the life course are needed at this juncture (Smedley, 2012).

This body of knowledge highlights the importance of developing interventions to decrease discrimination, improving skills for coping with racial discrimination, and treating depressive symptoms among older African American women. Further research is needed to understand stress related to racial discrimination and its relationship to both depressive symptoms and pain (Berger & Sarnyai, 2014; Clark et al., 2013; Giscombé & Lobel, 2005; Williams & Williams-Morris, 2000). This population has a need for interventions targeting environmental and psychological factors because of their high rates of pain and depressive symptoms (Szanton et al., 2011).

This work also has important clinical implications. Given the complexity of pain, a holistic pain assessment can be performed that takes into account the role that psychological processes play in pain outcomes (Puente et al., 2015). Health care interventions targeting depressive symptoms in African American women should be holistic and should target coping skills, social management skills, and health promotion (Taylor, Henderson, & Jackson, 1991). Improving racial identity or satisfaction with race also may be effective interventions for depressive symptoms related to racial discrimination (Hughes, Kiecolt, Keith, & Demo, 2015). Lastly, engagement of coping strategies (e.g., problem solving or change reaction to situation) may be effective strategies for addressing the relationship between racial discrimination and depression (Schmitt et al., 2014).

Future work is needed to tease out these complex relationships in African American women as well as other groups. For example, future studies using longitudinal data and/or structural equation modeling may better describe the direction of the relationships between racial discrimination, pain, and depressive symptoms in African Americans. Also needed is an examination of the different types of discriminations such as sexism/gender and age discrimination in this group. Studies that separate out the types of discrimination may improve efforts to develop coping mechanisms for these different types of discrimination. These findings may not be specific to African American women; African American men also experience pain from various conditions, and racial discrimination is related to pain in this group (Burgess et al., 2009; Chae et al., 2014). Little is known about depressive symptoms in African American men and the relationships with pain and racial discrimination. Overall, given the consequences that racial discrimination can have on health outcomes, it is important that public health nurse researchers use methodologically sound theory-based studies to illustrate the overwhelming need to eradicate racial discrimination within society (Krieger, 2014).

Limitations

There were limitations to this study. The relationship between racial discrimination and depressive symptoms may be bidirectional; hence, racial discrimination could precede depressive symptoms or depressive symptoms could precede racial discrimination. In this study, however, racial discrimination over the preceding year was measured, and depressive symptoms over the preceding 7 days were measured; this supports the temporality in the

relationship between racial discrimination and depressive symptoms. Second, the results of this study might be limited to African American women with OA living in the Southwest United States; thus, the study may not be generalizable to samples from other regions. Third, the symptoms the women experienced (e.g., pain, limitations in physical function) may not have been related to their OA and may have been related to other chronic conditions, for which we did not screen. In the present study although pain may or may not have been related to OA, we looked at pain intensity regardless of the pathology. Lastly, although the sample mean for pain intensity was relatively low in this study, others have reported low mean scores for pain in OA patients (Campbell et al., 2015). It is even more powerful to find a relationship between past racial discrimination and pain when the current pain is of low intensity. It is well documented that African Americans experience pain intensity that is related to poor health outcomes (Baker, Buchanan, & Corson, 2008; Edwards, Moric, Husfeldt, Buvanendran, & Ivankovich, 2005; Park et al., 2015); hence, this work adds to the literature by finding that racial discrimination may be a factor related to pain intensity operating through depressive symptoms.

CONCLUSIONS

This study adds to the literature on racial discrimination and pain in middle-aged and older African American women with OA. The findings suggest that racial discrimination is significantly associated with depressive symptoms in this group and that depressive symptoms mediated this relationship. The findings are important because of the disparities in pain that exist among middle-aged and older African American women and because racial discrimination is modifiable both from a perpetrator point of view and from a coping perspective. Knowledge from this study can assist researchers in developing tailored interventions that address factors related to pain outcomes in middle-aged and older African American women with OA.

Acknowledgments

This work was supported by the National Hartford Center of Gerontological Nursing Excellence Patricia G. Archbold Scholarship/ MayDay Award and the National Institutes of Health/National Institute of Nursing Research under Grant 1F131NR014399–01. J.L.W.T. was supported by Johns Hopkins University Interdisciplinary Training Program in Biobehavioral Pain Research Grant T32NS070201.

REFERENCES

Allen KD, Chen JC, Callahan LF, Golightly YM, Helmick CG, Renner JB, Schwartz TA, Jordan JM. Racial differences in knee osteoarthritis pain: Potential contribution of occupational and household tasks The Journal of Rheumatology. 2012; 39(2):337–344. [PubMed: 22133621]

Arthritis Foundation. (2015). *What is osteoarthritis*. Retrieved on November 7, 2017 from http://www.arthritis.org/about-arthritis/types/osteoarthritis/what-is-osteoarthritis. php.

Ashbrook JE, Shacklady C, Johnson S, Yeowell G, Goodwin PC. Is there an association between back pain and stress incontinence in adults with cystic fibrosis? A retrospective cross-sectional study Journal of Cystic Fibrosis. 2017; . doi: 10.1016/j.jcf.2017.04.006

Bair MJ, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity: A literature review Archives of Internal Medicine. 2003; 163(20):2433–2445. [PubMed: 14609780]

Baker TA, Buchanan NT, Corson N. Factors influencing chronic pain intensity in older Black women: Examining depression, locus of control, and physical health Journal of Women's Health. 2008; 17(5):869–878.

Baker TA, Buchanan NT, Small BJ, Hines RD, Whitfield KE. Identifying the relationship between chronic pain, depression, and life satisfaction in older African Americans Research on Aging. 2011; 33(4):426–443.

Baker TA, Green CR. Intrarace differences among Black and White Americans presenting for chronic pain management: The influence of age, physical health, and psychosocial factors Pain Medicine. 2005; 6(1):29–38. [PubMed: 15669948]

Baker TA, Whitfield KE. Physical functioning in older blacks: An exploratory study identifying psychosocial and clinical predictors Journal of the National Medical Association. 2006; 98(7):1114–1120. [PubMed: 16895281]

Baker TA, Whitfield KE. Intrarace group variability in characteristics of self-reported pain and sleep difficulty in older African Americans with arthritis Journal of Transcultural Nursing. 2015; 26(2): 171–177. [PubMed: 24829263]

Bazargan M, Yazdanshenas H, Gordon D, Orum G. Pain in community-dwelling elderly African Americans Journal of Aging and Health. 2016; 28(3):403. [PubMed: 26115668]

Berger M, Sarnyai Z. More than skin deep': Stress neurobiology and mental health consequences of racial discrimination Stress. 2014; 18(1):1–10. [PubMed: 25407297]

Bolen J, Schieb L, Hootman JM, Helmick CG, Theis K, Murphy LB, Langmaid G. Differences in the prevalence and impact of arthritis among racial/ethnic groups in the United States, National Health Interview Survey, 2002, 2003, and 2006 Preventing Chronic Disease. 2010; 7(3):A64. [PubMed: 20394703]

Bruce B, Fries JF, Murtagh KN. Health status disparities in ethnic minority patients with rheumatoid arthritis: A cross-sectional study The Journal of Rheumatology. 2007; 34(7):1475–1479. [PubMed: 17552045]

Buckwalter JA, Saltzman C, Brown T. The impact of osteoarthritis: Implications for research Clinical Orthopaedics and Related Research. 2004; 427(Suppl):S6–S15.

Burgess DJ, Grill J, Noorbaloochi S, Griffin JM, Ricards J, Van Ryn M, Partin MR. The effect of perceived racial discrimination on bodily pain among older African American men Pain Medicine. 2009; 10(8):1341–1352. [PubMed: 20021596]

Campbell CM, Buenaver LF, Finan P, Bounds SC, Redding M, McCauley L, Robinson M, Edwards RR, Smith MT. Sleep, pain catastrophizing, and central sensitization in knee osteoarthritis patients with and without insomnia Arthritis Care & Research. 2015; 67(10):1387–1396. [PubMed: 26041510]

Campbell CM, Edwards RR. Ethnic differences in pain and pain management Pain Management. 2012; 2(3):219–230. [PubMed: 23687518]

Cano A, Mayo A, Ventimiglia M. Coping, pain severity, interference, and disability: The potential mediating and moderating roles of race and education The Journal of Pain. 2006; 7(7):459–468. [PubMed: 16814685]

Centers for Disease Control and Prevention (2000). *National health interview survey*. Retrieved on November 7, 2017 from http://www.cdc.gov/nchs/nhis/nhis_disability. htm.

Chae DH, Nuru-Jeter AM, Adler NE, Brody GH, Lin J, Blackburn EH, Epel ES. Discrimination, racial bias, and telomere length in African-American men American Journal of Preventive Medicine. 2014; 46(2):103–111. [PubMed: 24439343]

Clark R, Anderson NB, Clark V, R., & Williams DR, (2013). Racism as a stressor for African Americans: A biopsychosocial model In LaVeist TA. , & Isaac LA. (Eds.), Race, ethnicity, and health: A public health reader , (2nd. ed.) (pp. 79) New York: Wiley .

Colbert CJ, Almagor O, Chmiel JS, Song J, Dunlop D, Hayes KW, Sharma L. Excess body weight and four-year function outcomes: Comparison of African Americans and Whites in a prospective study of osteoarthritis Arthritis Care & Research. 2013; 65(1):5–14. [PubMed: 22833527]

Collins JW Jr., David RJ, Handler A, Wall S, Andes S. Very low birthweight in African American infants: The role of maternal exposure to interpersonal racial discrimination American Journal of Public Health. 2004; 94(12):2132–2138. [PubMed: 15569965]

Cooper LA, Gonzales JJ, Gallo JJ, Rost KM, Meredith LS, Rubenstein LV, Wang NY, Ford DE. The acceptability of treatment for depression among African-American, Hispanic, and White primary care patients Medical Care. 2003; 41(4):479–489. [PubMed: 12665712]

Cox DR, Ashby S, Mace JC, DelGaudio JM, Smith TL, Orlandi RR, Alt JA. The pain-depression dyad and the association with sleep dysfunction in chronic rhinosinusitis International Forum of Allergy & Rhinology. 2017; 7(1):56–63. [PubMed: 27552637]

Dunlop DD, Semanik P, Song J, Manheim LM, Shih V, Chang RW. Risk factors for functional decline in older adults with arthritis Arthritis & Rheumatism. 2005; 52(4):1274–1282. [PubMed: 15818691]

Eaton WW, Smith C, Ybarra M, Muntaner C, , & Tien A, (2004). Center for Epidemiologic studies depression Scale: Review and revision (CESD and CESD-R) In Maruish ME. (Ed.), The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults (pp. 363–377). Mahwah, NJ: Lawrence Erlbaum Associates .

Edwards RR. The association of perceived discrimination with low back pain Journal of Behavioral Medicine. 2008; 31(5):379–389. [PubMed: 18581224]

Edwards RR, Moric M, Husfeldt B, Buvanendran A, Ivankovich O. Ethnic similarities and differences in the chronic pain experience: A comparison of African American, Hispanic, and white patients Pain Medicine. 2005; 6(1):88–98. [PubMed: 15669954]

Gee GC, Ford CL. Structural racism and health inequities Du Bois Review: Social Science Research on Race. 2011; 8(1):115–132. [PubMed: 25632292]

Gibbons FX, Kingsbury JH, Weng C, Gerrard M, Cutrona C, Wills TA, Stock M. Effects of perceived racial discrimination on health status and health behavior: A differential mediation hypothesis Health Psychology. 2014; 33(1):11. [PubMed: 24417690]

Giscombe CL, Lobel M. Explaining disproportionately high rates of adverse birth outcomes among African Americans: The impact of stress, racism, and related factors in pregnancy Psychological Bulletin. 2005; 131(5):662. [PubMed: 16187853]

Goesling J, Clauw DJ, Hassett AL. Pain and depression: An integrative review of neurobiological and psychological factors Current Psychiatry Reports. 2013; 15(12):1–8.

Goodin BR, Pham QT, Glover TL, Sotolongo A, King CD, Sibille KT, Herbert MS, Cruz-Almeida Y, Sanden SH, Staud R, Redden DT, Bradley LA, Fillingim RB. Perceived racial discrimination, but not mistrust of medical researchers, predicts the heat pain tolerance of African Americans with symptomatic knee osteoarthritis Health Psychology. 2013; 32(11):1117–1126. [PubMed: 24219416]

Harvard Medical School. (2009). *Depression and pain. Hurting bodies and suffering minds often require the same treatment*. Retrieved on November 7, 2017 from https://www.health.harvard.edu/mind-and-mood/ depression-and-pain.

Haywood C, Diener-West M, Strouse J, Carroll CP, Bediako S, Lanzkron S, Haythornthwaite J, Onojobi G, Beach MC. Perceived discrimination in health care is associated with a greater burden of pain in sickle cell disease Journal of Pain and Symptom Management. 2014; 48(5):934–943. for the IMPORT Investigators. [PubMed: 24742787]

Hoggard LS, Byrd CM, Sellers RM. The lagged effects of racial discrimination on depressive symptomology and interactions with racial identity Journal of Counseling Psychology. 2015; 62(2):216–225. [PubMed: 25867694]

Horgas A, Yoon S, , & Grall M, (2008). Nursing standard of practice protocol: Pain management in older adults In Boltz M, Capezuti E; , Fulmer T, Zwicker D, , & O'Meara A. (Eds.), Evidence-based geriatric nursing protocols for best practice , (4th. ed.) New York: Springer .

Hudson DL, Puterman E, Bibbins-Domingo K, Matthews KA, Adler NE. Race, life course socioeconomic position, racial discrimination, depressive symptoms and self-rated health Social Science & Medicine. 2013; 97:7–14. [PubMed: 24161083]

Hughes M, Kiecolt KJ, Keith VM, Demo DH. Racial identity and well-being among African Americans Social Psychology Quarterly. 2015; 78(1):25–48.

Jordan JM, Helmick CG, Renner JB, Luta G, Dragomir AD, Woodard J, Fang F, Schwartz TA, Abbate LM, Callahan LF, Kalsbeek WD, Hochberg MC. Prevalence of knee symptoms and radiographic and symptomatic knee osteoarthritis in African Americans and Caucasians: The Johnston county osteoarthritis Project The Journal of Rheumatology. 2007; 34(1):172–180. [PubMed: 17216685]

Keefe FJ, Lefebvre JC, Egert JR, Affleck G, Sullivan MJ, Caldwell DS. The relationship of gender to pain, pain behavior, and disability in osteoarthritis patients: The role of catastrophizing Pain. 2000; 87(3):325–334. [PubMed: 10963912]

Krieger N. Discrimination and health inequities International Journal of Health Services. 2014; 44(4): 643–710. [PubMed: 25626224]

Landrine H, Klonoff EA. The schedule of racist events: A measure of racial discrimination and a study of its negative physical and mental health consequences Journal of Black Psychology. 1996; 22(2): 144–168.

Landrine H, Klonoff EA, Corral I, Fernandez S, Roesch S. Conceptualizing and measuring ethnic discrimination in health research Journal of Behavioral Medicine. 2006; 29(1):79–94. [PubMed: 16470345]

Lee YC, Chibnik LB, Lu B, Wasan AD, Edwards RR, Fossel AH, Helfgott SM, Solomon DH, Clauw DJ, Karlson EW. The relationship between disease activity, sleep, psychiatric distress and pain sensitivity in rheumatoid arthritis: A cross-sectional study Arthritis Research Therapy. 2009; 11(5):R160. [PubMed: 19874580]

Mathur VA, Kiley KB, Haywood C Jr., Bediako SM, Lanzkron S, Carroll CP, Buenaver LF, Peisa M, Edwards RR, Haythornthwaite JA, Campbell CM. Multiple levels of suffering: Discrimination in health-care settings is associated with enhanced laboratory pain sensitivity in sickle cell disease The Clinical Journal of Pain. 2016; 32(12):1076–1085. [PubMed: 26889615]

Mays VM, Cochran SD, Barnes NW. Race, race-based discrimination, and health outcomes among African Americans Annual Review of Psychology. 2007; 58:201–225.

McCracken LM, Matthews AK, Tang TS, Cuba SL. A comparison of Blacks and Whites seeking treatment for chronic pain The Clinical Journal of Pain. 2001; 17(3):249–255. [PubMed: 11587117]

Melzack R. The McGill pain questionnaire: Major properties and scoring methods Pain. 1975; 1(3): 277–299. [PubMed: 1235985]

Melzack R. The short-form McGill pain questionnaire Pain. 1987; 30(2):191–197. [PubMed: 3670870]

Onubogu UD. Pain and depression in older adults with arthritis Orthopedic Nursing. 2014; 33(2):102–108. [PubMed: 24651144]

Park J, Engstrom G, Tappen R, Ouslander J. Health-related quality of life and pain intensity among ethnically diverse community-dwelling older adults Pain Management Nursing. 2015; 16(5):733–742. [PubMed: 26206611]

Parmelee PA, Harralson TL, McPherron JA, DeCoster J, Schumacher HR. Pain, disability, and depression in osteoarthritis: Effects of race and sex Journal of Aging and Health. 2012; 24(1):168–187. [PubMed: 21693669]

Patel KV, Guralnik JM, Dansie EJ, Turk DC. Prevalence and impact of pain among older adults in the United States: Findings from the 2011 National health and aging Trends study Pain. 2013; 154(12):2649–2657. [PubMed: 24287107]

Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models Behavior Research Methods, Instruments, & Computers. 2004; 36(4):717–731.

Puente CP, Furlong LV, Gallardo CÉ, Mendez MC, Cruz DB, Fernandez-de-las-Penas C. Self-efficacy and affect as mediators between pain dimensions and emotional symptoms and functional limitation in women with fibromyalgia Pain Management Nursing. 2015; 16(1):60–68. [PubMed: 25179423]

Schmitt MT, Branscombe NR, Postmes T, Garcia A. The consequences of perceived discrimination for psychological well-being: A meta-analytic review Psychological Bulletin. 2014; 140(4):921. [PubMed: 24547896]

Smedley BD. The lived experience of race and its health consequences American Journal of Public Health. 2012; 102(5):933–935. [PubMed: 22420805]

Smith BW, Zautra AJ. The effects of anxiety and depression on weekly pain in women with arthritis Pain. 2008; 138(2):354–361. [PubMed: 18289792]

Stevens-Watkins D, Perry B, Pullen E, Jewell J, Oser CB. Examining the associations of racism, sexism, and stressful life events on psychological distress among African-American women Cultural Diversity and Ethnic Minority Psychology. 2014; 20(4):561–569. [PubMed: 25313434]

Szanton SL, Thorpe RJ, Boyd C, Tanner EK, Leff B, Agree E, Xue QL, Allen JK, Seplaki CL, Weiss CO, Guralnik JM, Gitlin LN. Community aging in place, advancing better living for elders: A bio-behavioral-environmental intervention to improve function and health-related quality of life in disabled older adults Journal of the American Geriatrics Society. 2011; 59(12):2314–2320. [PubMed: 22091738]

Tabachnick B, , & Fidell L. (2013). Using multivariate statistics (6th. Intl. Ed.). Boston: Pearson .

Taylor J, Henderson D, Jackson BB. A holistic model for understanding and predicting depressive symptoms in African-American women Journal of Community Psychology. 1991; 19(4):306–320.

Vines AI, Baird DD, McNeilly M, Hertz-Picciotto I, Light KC, Stevens J. Social correlates of the chronic stress of perceived racism among Black women Ethnicity & Disease. 2006; 16(1):101–107. [PubMed: 16599356]

Walker JL, Harrison TC, Brown A, Thorpe RJ Jr., Szanton SL. Factors associated with disability among middle-aged and older African American women with osteoarthritis Disability and Health Journal. 2016a; 9(3):510–517. [PubMed: 27052590]

Walker JL, Thorpe RJ Jr., Harrison TC, Baker TA, Cary M, Szanton SL, Allaire JC, Whitfield KE. The relationship between pain, disability, and sex in African Americans Pain Management Nursing. 2016b; 17(5):294–301. [PubMed: 27553130]

Walker RL, Salami TK, Carter SE, Flowers K. Perceived racism and suicide ideation: Mediating role of depression but moderating role of religiosity among African American adults Suicide and Life-Threatening Behavior. 2014; 44(5):548–559. [PubMed: 24690042]

Whitfield KE, Allaire JC, Belue R, Edwards CL. Are comparisons the answer to understanding behavioral aspects of aging in racial and ethnic groups? The Journal of Gerontology. Series B, Psychological Sciences and Social Sciences. 2008; 63(5):P301–P308.

Williams DR, Williams-Morris R. Racism and mental health: The African American experience Ethnicity & Health. 2000; 5(3–4):243–268. [PubMed: 11105267]

Williams DR, Yan Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: Socio-economic status, stress and discrimination Journal of Health Psychology. 1997; 2(3):335–351. [PubMed: 22013026]

Table 1.

Sample Characteristics of Middle-Aged and Older African American Women With OA

	Mean	SD	Frequency	Percentage
Age	63.04	8.57		
Yearly income				
<10,000			27	23%
10,001–50,000			67	56%
50,001–75,000			17	14%
>75,000			6	5%
Missing			3	2%
Employed			45	38%
Not employed			75	62%
Education (y)	14	2.9		
Married			36	30%
Divorced			43	36%
Widowed			27	23%
Never married			11	9%
Missing			3	2%
Pain intensity	9.58	7.21		
Had a joint replacement			25	21%

Table 2.

Factors Related to Pain Intensity in Middle-Aged and Older African American Women With Osteoarthritis

	B **Coefficient (Standardized Error)**	**Adjusted** R^2	***t***	***p*** **Value**
Model 1		.05		
Racial discrimination	9.45(4.31)		2.19	**.03** *
Years with osteoarthritis	.03 (.07)		2.19	.68
Years of education	−.14 (.24)		−.56	.57
Body mass index	.04 (.09)		.48	.62
Model 2		.09		
Depressive symptoms	5.45(2.60)		2.10	**.04**
Racial discrimination	5.62(4.62)		1.22	.23
Years with osteoarthritis	.02(.07)		.40	.69
Years of education	−.07(.24)		−.31	.76
Body mass index	.02 (.09)		.23	.82

* Significant *p* values are in boldface.