

Intrarace Differences Among Black and White Americans Presenting for Chronic Pain Management: The Influence of Age, Physical Health, and Psychosocial Factors

Tamara A. Baker, PhD,* and Carmen René Green, MD†

*University of South Florida, School of Aging Studies, Tampa, Florida; †University of Michigan, Department of Anesthesiology, Medical School, Ann Arbor, Michigan, USA

ABSTRACT

Objective. Emerging comparative literature documents significant racial differences in the chronic pain experience in terms of physical, psychological, and social well-being. However, the intrarace differences of chronic pain among black Americans and white Americans has not been extensively investigated. The purpose of this investigation was to examine the potential within-race-group differential effects and the psychosocial aspects of chronic pain in black and white Americans across age groups.

Design. A retrospective study of patients presenting for chronic pain management.

Setting. A tertiary care multidisciplinary pain center.

Patients. Patients were younger (<50 years) (mean \pm SD: 36.7 \pm 8.4) and older (\geq 50 years) (60 \pm 9.3) black Americans (N = 525), and younger (36.6 \pm 8.1) and older (63 \pm 9.8) white Americans (N = 5,298).

Outcome Measures. Participants were measured on depressive symptoms, social functioning, pain intensity, pain-related disability, and physical comorbidities.

Results. Younger black Americans reported more depressive symptoms, pain intensity, and were less successful at coping with pain when compared to older black Americans. Similar within-group differences were also observed for reports of depressive symptoms, pain intensity, and coping abilities among white Americans. Results further showed that younger white Americans also experienced more symptoms related to post-traumatic distress than older white Americans.

Conclusion. Examining within-race-group variability suggests that chronic pain differentially affects the quality of life and health status of black Americans and white Americans across age groups. This study emphasizes the need for further chronic pain studies examining pain indicators within defined racial and ethnic groups.

Key Words. Within-Race-Group Differences; Race; Chronic Pain; Physical Health; Psychosocial Factors

Reprint requests to: Carmen R. Green, MD, Associate Professor, University of Michigan Medical Center, Department of Anesthesiology, 1500 East Medical Center Drive, 1H247 UH – Box 0048, Ann Arbor, MI 48109-0048, USA. Tel: (734) 936-4280; Fax: (734) 936-9091; E-mail: carmeng@umich.edu.

Introduction

Chronic pain (e.g., nonmalignant or benign) is a common health concern that impacts an individual's physical functioning, psychological health, and social well-being [1–6]. The reduction in health status due to chronic pain is a growing public health concern. This is particularly important considering the impact pain will have on the abilities of minorities and older persons to function physically, psychologically, and socially in their environment [7]. While racial and ethnic minorities as well as older adults are more vulnerable and suffer increased morbidity due to pain, they are also at an increased risk for the undertreatment of pain [8–13]. However, the factors associated with chronic pain management among diverse racial populations are poorly understood, given that black Americans are disproportionately diagnosed with more severe and debilitating illnesses [14–16]. Although there is limited information regarding the clinical pain experiences of black Americans and older black Americans in particular, disturbing racial disparities in pain management have been demonstrated [17–19]. Bernabei et al. showed that pain assessment and treatment among older black Americans living in nursing homes was less than that for older white Americans [20]. Similarly, Cleeland and colleagues found that racial and ethnic minority persons were at risk for the undertreatment of cancer pain [21]. Using a chronic pain population, Green and Baker found that both older and younger black Americans reported more pain, suffering, and less control over their pain than a comparative group of white Americans [22].

Despite the significant conceptual and methodological findings of these comparative investigations, chronic pain research is limited in several respects. First, the research does not identify the magnitude of within racial or ethnic group variability. Previous studies primarily focused on differences between white and black Americans [23,24] or differences between white Americans and other racial and ethnic groups in chronic pain using experimental models [25,26]. It has been recognized that there is considerable sociodemographic heterogeneity within a given racial or ethnic group, suggesting that there are varying biological, social, and psychological factors that may influence the pain experience [27]. This observation suggests a need to thoroughly identify and examine pain indicators within defined racial and ethnic groups for developing a body of knowl-

edge that will yield more meaningful and valid comparisons between different race groups [28].

There is a paucity of empiric research identifying the physical and psychosocial factors (e.g., symptoms associated with chronic pain, pain characteristics, disability due to pain) that influence within-race-group differences across age groups in pain management. As an exploration of intrarace variability in the chronic pain experience, this study was designed to examine the influence of various physical, psychological, and social factors within a sample of black Americans and within a sample of white Americans who sought treatment at a tertiary care Multidisciplinary Pain Center. The intent was not to compare the health and psychosocial influences between black and white Americans who presented with chronic pain, but rather to examine specific within-race-group differences in independent samples of black and white Americans across age groups. Thus, the primary objective of this investigation was to determine whether differences exist within independent samples of black and white Americans in: (1) depressive symptoms as determined by the Beck Depression Inventory (BDI); (2) symptoms of post-traumatic stress (PTSD) among pain patients as measured by the Post-traumatic Chronic Pain Test (PCPT); (3) pain intensity as determined by the McGill Pain Questionnaire (MPQ); (4) physical disability due to pain via the Pain Disability Index (PDI); and (5) physical comorbidities. Several single item questions also assessed coping abilities with pain, control over pain, suffering due to pain, and social behaviors (i.e., alcohol use for pain, sleep patterns). In examining these intrarace group differences, this research was guided by the overriding hypothesis that older black and white Americans will report similar comorbidities as well as patterns of pain intensity, depressive symptoms, post-traumatic stress symptoms, physical disability and coping ability when compared to younger black and white Americans.

Methods

Participants and Methods

This investigation was approved by the University of Michigan Health System's (UMHS) Institutional Review Board (IRB) and written informed consent was waived. A secondary analysis of a database containing self-report information on pain and psychosocial variables from persons with chronic pain was performed. Adult patients who were black Americans or white Americans

≥18 years old who initially presented for evaluation and treatment at the University of Michigan's Multidisciplinary Pain Center from 1993 to 2000 were included in this sample and analyses.

Measures

Pain Intensity, Symptoms, Disability

Pain intensity was evaluated using the McGill Pain Inventory (MPQ). The Pain Rating Index (PRI) scale of the MPQ consists of 78 pain descriptors that provides an overall index of pain (based on its position in the word set) [4,29–31]. A mean score value was obtained by summing the ranked intensities of all the words chosen by the respondent, and then averaged to obtain a single score. A high score indicates greater pain intensity ($\alpha = 0.828$).

Pain disability due to pain was assessed using the Pain Disability Index (PDI). The PDI measures the amount of interference a patient has with normal role functioning or daily activities caused by pain. This seven-item instrument assesses family/home responsibility, recreation, social activity, occupation, sexual behavior, self-care, and life-support activity. Summation of the seven questions on an 11-point Likert scale (0 = no disability, 10 = total disability) is used to evaluate the impact of pain on the individual [32,33]. The PDI yields a composite score that ranges from 0 to 70, with higher scores indicating maximum disability ($\alpha = 0.848$).

Three single-item questions were also included to assess level of suffering due to pain (e.g., How much suffering do you experience because of your pain?; 0 = no suffering, 6 = extreme suffering), coping ability (e.g., How successful are you at coping?; 0 = not at all successful, 6 = extremely successful), and control over pain (How much control do you feel that you have over your pain?; 0 = no control at all, 6 = a great deal of control).

Psychological Measures

The Beck Depression Inventory (BDI) was used to measure depressive symptoms via 21 items that assessed depressed affect, positive affect, somatic complaints, and interpersonal problems. This assessment tool has excellent reliability and validity as an index for measuring depressive symptoms among patients with chronic pain [34]. The PCPT assessed symptoms consistent with post-traumatic stress (PTSD) via six questions on a 7-point Likert scale (0 = not at all, 6 = very much) [35–38]. The PCPT yields a composite score that ranges from 0 to 36; higher scores indicate more symptoms consistent with PTSD ($\alpha = 0.897$).

Physical Health, Sleep Patterns, and Social Behaviors

A checklist of physical comorbidities assessed the presence of common medical problems and symptoms such as high blood pressure (HBP), chest pain, irritable bowel syndrome, colitis, dizziness, and gastric ulcers. Four single-item questions were also included to determine problems with sleep and sleep patterns (e.g., Do you have trouble falling asleep?; Do you have problems staying asleep?; 0 = no, 1 = yes; In the morning, how rested or refreshed do you feel?; 0 = not at all rested or refreshed, 6 = completely rested or refreshed; and During a typical day, how tired and fatigued do you feel?; 0 = not at all tired or fatigued, 6 = extremely tired or fatigued). A single-item question was also included to assess specific social behaviors (e.g., Do you use alcohol to help you relieve pain?; 0 = never, 1 = sometimes, 2 = frequently).

Demographic Characteristics

Five demographic variables were included in the analyses: age, sex, education, income, and marital status. Age was measured in a categorical format (<50 years old and ≥50 years old). Sex was treated as a dichotomous variable (0 = males; 1 = females). Education was assessed as categorical data reflecting less than a high school degree, high school graduate, and college graduate. Income was coded as the annual median household income (as determined by the zip code analyses from the U.S. census data). Marital status was assessed as a dichotomous variable (0 = single/divorced/separated; 1 = married).

Statistical Analysis

Separate data analyses were conducted in several stages for both race groups. First, descriptive statistics were computed to provide a profile on each sample's demographic characteristics and to differentiate the characteristics for each race by age groups (e.g., <50 years vs ≥50 years). Second, to yield higher levels of power and to account for the non-normal distribution of some of the variables, a Mann-Whitney *U*-test was employed to test the null hypotheses of no difference between the younger and older black Americans and between the younger and older white Americans on mean scores for the BDI, PDI, MPQ, and PCPT. Means and confidence intervals (CI) were reported for questions measured via Likert scales. All categorical data were analyzed using 2 × 2 tables, chi-square or Fisher exact test statistic. Odds ratios

(OR) (Logistic regression models) were calculated to evaluate the relationship between the two age groups and depressive symptoms and ability to cope. All statistical analyses were performed with the Statistical Package for Social Sciences (SPSS) version 12.0. Statistical significance for all analyses were determined with the probability of a type I error, $P = 0.01$.

Results

Demographic Characteristics by Race

For the black Americans ($N = 525$), the majority ($n = 361$, 69%) were <50 years of age. The mean age for the younger black Americans was 37.6 ± 8.4 years. The older black Americans (≥ 50 years of age) had a mean age of 60.0 ± 9.3 years. When compared to the younger age group, older black Americans were more frequently married (52.8% vs 40.9%, $P = 0.01$) and less frequently high school graduates (47.3% vs 65.8%, $P < 0.001$). No significant differences between the age groups were found in annual median household income or use alcohol for pain. Other demographic characteristics for the black Americans are provided in Table 1.

For the white Americans ($N = 5,298$), more than half ($n = 3,392$; 64%) were <50 years of age. The younger white Americans had a mean age of 36.6 ± 8.1 , and 63 ± 9.8 for the older (≥ 50 years) age group. Compared to the older group, younger white Americans were less likely to be married (61.8% vs 71.1%, $P < 0.001$) and were more fre-

quently high school graduates (60.7% vs 55.6%, $P < 0.001$) compared to younger white Americans. Older white Americans reported higher income and were more likely to never use alcohol for pain (90% vs 80%, $P < 0.001$). Demographic characteristics for white Americans are provided in Table 1.

Within-Race-Group Pain Characteristics

Younger black Americans reported higher MPQ (PRI scale) scores compared to older black Americans (29.3 ± 13.0 vs 25.4 ± 15.0 , $P < 0.01$). There were no significant differences reported between younger and older black Americans in level of suffering due to pain, control over pain, or pain-related disability (Table 2). Table 3 shows that older white Americans had lower MPQ scores than younger white Americans (23.6 ± 12.1 vs 26.9 ± 12.0 , $P < 0.001$). No significant differences were reported between the younger and older white Americans in level of suffering due to pain, control over pain, and pain-related disability.

Sleep and Psychological Functioning for Black and White Americans

Both groups reported sleep problems. Older black Americans reported less difficulty falling asleep (73.8% vs 85.3%; $P < 0.01$) and less trouble staying asleep (76.5% vs 84.7%; $P = 0.03$) than younger black Americans. Table 4 shows there were no significant differences between the two age groups in how rested or refreshed they felt in the morning or how tired or fatigued the patient was in a typical day. After adjusting for the ability

Table 1 Demographic and socioeconomic characteristics for black and white Americans by age

Socioeconomic and Demographic Information	Black Americans		Statistic* and P value	White Americans		Statistic* and P value
	<50 Years n = 361	≥ 50 Years n = 164		<50 Years n = 3,392	≥ 50 Years n = 1,906	
Age (mean years \pm SD)	36.7 ± 8.4	60 ± 9.3	<0.0005*	36.6 ± 8.1	63 ± 9.8	<0.0005*
Gender M/F (%)	30.0/70.0	40.5/59.5	0.018†	39.8/60.2	39.7/60.3	NS
Marital status						
Married (%)	40.9%	52.8%	0.017†	61.8%	71.1%	<0.0005†
S/D/S (%)	59.1%	47.2%		38.2%	28.9%	
Education						
<High school	18.3%	34.9%	<0.0005†	16.6%	23.8%	<0.0005†
High school graduates	65.8%	47.3%		60.7%	55.6%	
College graduates	15.8%	17.8%		22.6%	20.6%	
Annual median household income (mean \$ \pm SD)	$27,547 \pm 9,439$	$27,324 \pm 10,011$	NS	$34,910 \pm 9,908$	$36,693 \pm 11,118$	<0.0005*
Alcohol for pain (%)						
Frequently	0	0	NS	3%	1%	<0.0005†
Sometimes	13%	8%		16%	8%	
Never	87%	92%		80%	90%	

NS = not significant; M = male; F = female; S/D/S = single/divorced/separated.

* Mann-Whitney U for independent samples.

† Chi-square.

Table 2 Pain intensity, symptoms, and disability for black Americans by age

	Black Americans <50 Years			Black Americans ≥50 Years			Statistic	P value
	n	Mean ± SD	95% CI	n	Mean ± SD	95% CI		
MPQ	359	29.3 ± 13.0	32.6–35.4	163	25.4 ± 15.0	30.7–31.6	2.9	<0.01
PDI	277	44.4 ± 12.7	42.9–45.9	111	42.4 ± 14.0	39.7–44.9	-1.35	NS
Suffering with pain*	341	5.0 ± 1.0	4.99–5.20	150	5.1 ± 1.1	44.93–5.29	-0.50	NS
Control over pain†	340	1.2 ± 1.7	1.1–1.4	146	1.6 ± 1.3	1.54–1.83	-1.37	NS

CI = confidence interval; NS = not significant; MPQ = McGill Pain Questionnaire; PDI = Pain Disability Index: range = 0–70, 0 = no disability, 10 = total disability.

* 0 = no suffering, 6 = extreme suffering.

† 0 = no control at all, 6 = a great deal of control.

Mann–Whitney *U*-statistic.

to cope with pain, affective distress, and demographic characteristics (i.e., gender, education, marital status), there were no significant differences between the two groups in trouble staying asleep. Results also showed that after adjusting for depressive symptoms, age was not significantly associated with trouble falling asleep or staying asleep. After adjusting for age, the ability to cope with pain was not associated with trouble falling asleep.

Older black Americans reported better ability to cope with pain (3.1 ± 1.6 vs 3.8 ± 1.5 , $P < 0.01$) than younger black Americans. There were no significant differences in their reports of symptoms related to post-traumatic stress between the younger and older black Americans. Both age groups reported a substantial number of depressive symptoms, with younger black Americans reporting more depressive symptoms than older black Americans (20.3 ± 11.9 vs 16.1 ± 11.3 , $P < 0.001$). After adjusting for gender and marital status, older age was negatively associated with depressive symptoms (BDI) (OR 0.511; CI 0.334–0.782; $P < 0.01$). After accounting for the total number of months with pain, gender, marital status, and education, older age remained negatively associated with depressive symptoms (OR 0.433; CI 0.249–0.752; $P < 0.01$), but not with pain

intensity (MPQ), pain-related disability (PDI), and symptoms related to post-traumatic stress (PCPT) (Table 4).

Table 5 shows that younger and older white Americans reported some sleep problems due to pain. The older age group reported less difficulty falling asleep (60% vs 73%, $P < 0.001$) and less trouble staying asleep (74% vs 78%, $P < 0.01$) when compared to the younger age group. Older white Americans reported being more rested or refreshed in the morning than younger white Americans (2.0 ± 1.4 vs 2.5 ± 1.6 , $P < 0.001$). No significant differences was observed between the younger and older white Americans in how fatigued or tired either group felt on a typical day.

After adjusting for coping ability, affective distress, and demographic characteristics (i.e., gender, education, marital status), older age was associated with less trouble falling asleep (OR 0.570; CI 0.495–0.657; $P < 0.001$), but not with trouble staying asleep. Further results showed that after adjusting for depression, age was significantly associated with trouble falling asleep (OR 0.602; CI 0.527–0.688; $P < 0.001$), with older white Americans reporting less difficulty falling asleep. Age was not significantly associated with trouble staying asleep after adjusting for depressive symptoms among white Americans.

Table 3 Pain intensity, symptoms, and disability for white Americans by age

	White Americans <50 Years			White Americans ≥50 Years			Statistic	P value
	n	Mean ± SD	95% CI	n	Mean ± SD	95% CI		
MPQ	3,387	27.0 ± 12.1	26.6–27.4	1,904	23.6 ± 12.2	23.1–24.2	-9.3	<0.001
PDI	2,797	38.3 ± 13.9	37.8–38.8	1,232	38.0 ± 14.8	37.2–38.9	-0.009	NS
Suffering with pain*	3,315	4.5 ± 1.2	4.4–4.5	1,798	4.4 ± 1.3	4.3–4.4	-2.0	<0.05
Control over pain†	3,303	1.5 ± 1.5	1.4–1.5	1,781	1.6 ± 1.6	1.5–1.7	-1.3	NS

CI = confidence interval; NS = not significant; MPQ = McGill Pain Questionnaire; PDI = Pain Disability Index: range = 0–70, 0 = no disability, 10 = total disability.

* 0 = no suffering, 6 = extreme suffering.

† 0 = no control at all, 6 = a great deal of control.

Mann–Whitney *U*-test statistic.

Table 4 Psychologic variables, sleep, and ability to cope with pain for black Americans by age

	Black Americans <50 Years			Black Americans ≥50 Years			Statistic	P value
	n	Mean ± SD	95% CI	n	Mean ± SD	95% CI		
PCPT	224	14 ± 12.0	32.61–35.47	83	12.2 ± 11.8	30.77–31.68	-1.71	NS
BDI	337	20.3 ± 11.9	4.62–4.97	150	16.1 ± 11.3	4.07–4.75	-3.81	<0.001
Ability to cope*	323	3.1 ± 1.6	2.93–3.30	143	3.8 ± 1.5	3.61–4.11	-4.43	<0.01
Rested in the morning†	330	1.6 ± 1.3	1.54–1.83	149	2.1 ± 1.5	1.84–2.25	-2.40	NS
How fatigued or tired‡	323	4.2 ± 1.4	4.10–4.41	142	4.3 ± 1.4	4.09–4.57	-0.68	NS

CI = confidence interval; NS = not significant; PCPT = Post-traumatic Chronic Pain Test; BDI = Beck Depression Inventory.

* 0 = not at all successful, 6 = extremely successful.

† 0 = not rested at all, 6 = extremely rested.

‡ 0 = not at all tired, 6 = extremely tired.

Older white Americans reported better ability to cope with pain (3.3 ± 1.5 vs 3.6 ± 1.6 , $P < 0.001$) than younger white Americans. Younger white Americans reported more symptoms related to post-traumatic stress (8.3 ± 9.8 vs 6.3 ± 8.9 , $P < 0.001$) compared to older white Americans. Both age groups reported a significant number of depressive symptoms. However, the younger age group reported more depressive symptoms when compared to older white Americans (17.2 ± 11.1 vs 14.3 ± 10.0 , $P < 0.001$). After adjusting for gender and marital status, younger age was significantly associated with reporting more depressive symptoms (BDI) (OR 0.614; CI 0.543–0.693; $P < 0.001$), pain intensity (MPQ) (OR 0.681; CI 0.606–0.766; $P < 0.001$) and symptoms related to post-traumatic stress (OR 0.650; CI 0.548–0.771; $P < 0.001$). After accounting for the total number of months with pain, gender, marital status, and education, older age remained negatively associated with depressive symptoms (OR 0.595; CI 0.518–0.683; $P < 0.001$), pain intensity (OR 0.684; CI 0.599–0.781; $P < 0.001$), and symptoms related to post-traumatic stress (OR 0.675; CI 0.556–0.819; $P < 0.001$).

Physical Comorbidities by Race

Older black Americans were twice as likely to have HBP (23% vs 16%, OR 3.55; CI 2.41–5.22; $P < 0.001$) as the younger age group. Although

not statistically significant, older black Americans had an increased prevalence of gastric ulcers ($P = 0.064$).

Older white Americans had a higher prevalence of chest pain (26% vs 20%, OR 1.47; CI 1.28–1.67; $P < 0.001$), colitis (7.6% vs 5.5%, OR 1.40; CI 1.21–1.75; $P < 0.01$), gastric ulcers (16% vs 11%, OR 1.43; CI 1.22–1.69; $P < 0.001$), and HBP (41% vs 16%, OR 3.49; CI 3.07–3.96; $P < 0.001$) when compared to younger white Americans. The younger age group had a higher prevalence of dizziness (29% vs 25%, OR 0.84; CI 0.74–0.96; $P < 0.01$) than the older age group.

Discussion

An emerging literature documents the impact of pain on physical, psychological, and social well-being among the general population [39]. Our results revealed considerable within-group variability in pain intensity, physical disability, depressive symptoms, symptoms related to post-traumatic stress, and sleep problems among independent samples of black and white Americans. This variability may result from differences in coping skills, social learning, and attitudinal differences, which are known to influence the ability to tolerate pain [40–43]. Beyond these psychosocial differences, documented variability in physician decision making based on age, race, and

Table 5 Psychologic variables, sleep, and ability to cope with pain for white Americans by age

	White Americans <50 Years			White Americans ≥50 Years			Statistic	P value
	n	Mean ± SD	95% CI	n	Mean ± SD	95% CI		
PCPT	1,975	8.3 ± 9.8	7.9–8.7	798	6.3 ± 8.9	5.7–6.9	-5.84	<0.001
BDI	3,186	17.3 ± 11.1	16.9–17.7	1,756	14.4 ± 10.0	14.0–14.9	-9.09	<0.001
Ability to cope*	3,240	3.3 ± 1.5	3.3–3.4	1,721	3.6 ± 1.6	3.5–3.7	-6.31	<0.001
Rested in the morning†	3,291	2.0 ± 1.4	1.9–2.0	1,773	2.5 ± 1.6	2.4–2.5	-10.93	<0.001
How fatigued or tired‡	3,253	4.0 ± 1.4	4.0–4.1	1,757	3.9 ± 1.5	3.9–4.0	-1.85	NS

CI = confidence interval; NS = not significant; PCPT = Post-traumatic Chronic Pain Test; BDI = Beck Depression Inventory.

* 0 = not at all successful, 6 = extremely successful.

† 0 = not rested at all, 6 = extremely rested.

‡ 0 = not at all tired, 6 = extremely tired.

gender may also contribute to our findings [18,44–49]. The literature suggests that there is often an attachment between the primary care professional and the black patient when they are racially or ethnically similar and that physician patient communication varies based on these demographic variables [50]. Thus, the way that minorities and older patients report their pain, describe pain symptoms, and cope with pain may influence how and whether they choose to discuss their pain complaints with their physician, thereby, contributing to variability in the pain experience and health outcomes as well as our findings. Nonetheless, it was interesting to find that variability followed similar patterns across both racial groups.

Another major finding was that older black Americans reported lower pain intensity scores and were more successful at coping than younger black Americans. Similar results were observed among white Americans. The literature suggests that older adults in general are more likely than their younger counterparts to develop more effective coping skills when encountered with varied mental and physical health perturbations [50]. These strategies may allow older patients to effectively adjust and respond to pain. Older adults may have also learned to implement various strategies that are beneficial in decreasing psychological distress while improving their overall quality of life [51]. Finally, older adults may have acclimated to higher pain thresholds while developing lower expectations concerning their physical abilities [51]. More research is needed to examine whether intrarace differences vary by age, physical impairment, coping styles, and pain perception among black Americans.

Younger black and white Americans also reported more depressive symptoms than older black and white Americans. Previous research has shown that older black Americans with positive supportive emotional and physical relationships have a lower prevalence of depression [52]. However, there are considerable inconsistencies in the literature on the prevalence of depressive symptoms among black Americans. Previous research show the highest rate of depressive symptoms is among older black Americans, especially when they have a medical condition [53,54]. Despite these results significant difficulty remains in interpreting, defining, and diagnosing depressive syndromes and other mental and medical conditions in black Americans. One explanation is that primary emphasis in defining these mental conditions has focused on comparisons involving black and white Americans [55,56]. It is important to note

that these simple group comparisons do not take into account the sociodemographic heterogeneity within black and white American populations.

We also observed that older white and black Americans were more likely to report HBP than the younger age groups. This finding is consistent with the literature showing that hypertension is the second most common chronic disease among adults 70+ years of age [57]. It was observed that older white Americans reported more cases of chest pain, colitis, and gastric ulcers. Although the older black Americans were slightly older, it is unclear why these differences were not apparent in this group. Stress management, coping styles and ability, and other environmental factors may explain such difference both within and between the two race groups.

Because of the complexity of symptoms associated with certain chronic medical problems and depression, it is often difficult to disentangle somatic symptoms of depression as measured by the BDI and those secondary to a medical illness (e.g., chronic pain). This is a significant observation when diagnosing depression in adults in general and older adults in particular. Chronic conditions in some adults may cause the manifestation of somatic symptoms recognized as a medical illness rather than symptoms resulting from a psychological disorder [58]. This observation clearly underscores the importance of examining health among black Americans because they are diagnosed with more chronic illness, and are more physically debilitated due to chronic illness [14,15,59–61]. Furthermore, previous studies examining depression among black Americans focused primarily on institutionalized samples, making extrapolation to the general black American population difficult [60,61]. Other factors such as social and religious affiliations, economics, social networks, and positive familial relationships may significantly influence the prevalence of depressive symptoms as well as coping abilities among black Americans and older black Americans in particular [62].

Although we demonstrated intraracial differences in diverse populations, there are several study limitations that must be acknowledged. First, this was a retrospective analysis of a database that was developed primarily for clinical care among patients with a mixed pain etiology. Second, the patient's race was assigned by an admissions clerk and may not reflect how patients identify themselves. Self-report, representativeness, and nonresponses are inherent sources of potential biases, although questionnaires were

completed confidentially [22]. Furthermore, self-report is subject to error and may be masked by depressive symptoms and clinical conditions. Finally, the cross-sectional nature of the study made it difficult to test or assume the temporal order of the relationship between pain and depressive symptoms, pain-related disability; or the relationship between pain and chronic medical conditions. Further investigations are necessary to determine whether these findings can be generalized to a broader population of community-dwelling black and white Americans with chronic pain.

Our findings underscore the importance of continued research on disease processed as well as physical and mental health outcomes both within and between ethnically diverse adults across age groups. We established that younger black Americans as well as younger white Americans reported more depressive symptoms than older black and white Americans. We also found that older black Americans and white Americans were better able to cope with pain than the younger age groups. This and other investigations exploring pain indicators within defined racial and ethnic groups (e.g., black Americans, white Americans) are necessary for developing a body of knowledge that will yield more meaningful and valid comparisons between different groups in an aging society [28]. These research efforts would provide a scientific basis for understanding the physical and psychological implications of chronic pain in black and white Americans. Future work should be directed at developing models that assess how social, race and ethnicity, and environmental factors influence the daily experience of pain among adults from diverse populations.

Acknowledgments

We thank the participants of this study. We thank the faculty and staff of the Department of Anesthesiology and Multidisciplinary Pain Center, the Michigan Pain Outcomes Study Team (MPOST), and the Michigan Center for Urban African American Aging Research for their assistance with this project. We also thank Dr Brent Small for his statistical advice and comments.

References

- 1 Crook J, Rideout E, Browne G. The prevalence of pain complaints in a general population. *Pain* 1984;18:299-314.
- 2 Elliott AM, Smith BH, Penny KI, Smith SW, Chambers WA. The epidemiology of chronic pain in the community. *Lancet* 1999;354:1248-52.
- 3 Ferrell BR. The impact of pain on quality of life: A decade of research. *Nurs Clin North Am* 1995;30:609-24.
- 4 Lathan J, Davis BD. The socioeconomic impact of chronic pain. *Disabil Rehabil* 1994;16:39-44.
- 5 Siegel JE, Weinstein MC, Russell LB, Gold MR. Recommendations for reporting cost-effectiveness and analyses: Panel on cost-effectiveness in health and medicine. *JAMA* 1996;276:1339-41.
- 6 Skevington SM. Investigating the relationship between pain and discomfort and quality of life, using the WHOQOL. *Pain* 1998;76:395-406.
- 7 Helme R, Gibson S. Pain in older people. In: Crombie IK, editor. *Epidemiology of pain*. Seattle, WA: IASP; 1999:103-12.
- 8 Brennan TA, Leape LL, Laird NM, et al. Incidence of adverse events and negligence in hospitalized patients: Results of the Harvard Medical Practice Study I. *N Engl J Med* 1991;324:370-6.
- 9 Erstad BL, Meeks ML, Chow HH, Rappaport WD, Levinson ML. Site-specific pharmacokinetics and pharmacodynamics in intramuscular meperidine in elderly postoperative patients. *Ann Pharmacother* 1997;31:23-8.
- 10 Pasero CL, Reed B, McCaffery M. How aging affects pain management. *Am J Nurs* 1998;98:12-13.
- 11 Allison JJ, Keife CI, Centro RM, Box JB, Farmer RM. Racial differences in the medical treatment of elderly Medicare patients with acute myocardial infarction. *J General Inter Med* 1996;11:736-43.
- 12 Mouton CP. Special health considerations in African American elders. *Am Fam Physician* 1997; 55:1243-53.
- 13 Petchers MK, Milligan SE. Access to health care in a Black urban elderly population. *Gerontologist* 1988;28:213-17.
- 14 Bazagan M, Hamm-Baugh VP. The relationship between chronic illness and depression in a community of urban Black elderly persons. *J Gerontol* 1995;50B:119-27.
- 15 Gibson RS, Jackson JS. The health, physical functioning and informational supports of the Black elderly. *Milbank Q* 1987;65:421-56.
- 16 Feldman RH, Fulwood R. The three leading causes of death in Black Americans: Barriers to reducing excess disparity and to improving health behaviors. *J Health Care for the Poor and Underserved* 1996;10:45-71.
- 17 Ruiz P, Venegas-Samuels K, Alarcon RD. The economics of pain: Mental health care costs among minorities. *Psychiatric Clin North Am* 1995;18: 659-70.
- 18 Todd K, Samaroo N, Hoffman J. Ethnicity as a risk factor in inadequate emergency department analgesia. *JAMA* 1993;269:1537-9.

- 19 Todd KH, Lee T, Hoffman JR. The effect of ethnicity on physician estimates of pain severity in patients with isolated extremity trauma. *JAMA* 1994;271:925–8.
- 20 Bernabei R, Gambassi G, Lapane K, et al. Management of pain in elderly patients with cancer: SAGE Study Group—Systematic assessment of geriatric drug use via epidemiology. *JAMA* 1998;279:1877–82.
- 21 Cleeland CS, Gonin R, Hatfield AK, et al. Pain and its treatment in outpatients with metastatic cancer (comments). *N Engl J Med* 1994;330:592–6.
- 22 Green CR, Baker TA, Sato Y, Washington TL, Smith EM. Race and chronic pain: A comparative study of young Black and White Americans presenting for management. *J Pain* 2003;4:176–83.
- 23 Chapman WP. Measurements of pain sensitivity in normal control subjects and in psychoneurotic patients. *Psychosomatic Med* 1944;6:252–7.
- 24 Edwards RR, Doleys DM, Filligim RB, Lowery D. Ethnic differences in pain tolerance: Clin implications a chronic pain population. *Psychosom Med* 2001;63:316–23.
- 25 Faucett JA, Gordon N, Levine J. Differences in postoperative pain severity among four ethnic groups. *J Pain Symptom Manage* 1994;9:383–9.
- 26 Weisenberg M, Kreindler ML, Schachat R, Werboff J. Pain: Anxiety and attitudes in Black, White, and Puerto Rican patients. *Psychosom Med* 1975;37:123–35.
- 27 Edwards CL, Fillingim RB, Keefe F. Race, ethnicity and pain. *Pain* 2001;94:133–7.
- 28 Whitfield KE, Baker-Thomas TA. Individual differences in aging among African Americans. *Intl J Aging Hum Dev* 1999;48:73–9.
- 29 Haefner HK, Khoshnevisan MH, Bachman JE, et al. Use of the McGill Pain Questionnaire to compare women with vulvar pain, pelvic pain and headaches. *J Reprod Med* 2000;45:665–71.
- 30 Kremer E, Atkinson JH Jr. Pain measurement: Construct validity of the affective dimension of the McGill Pain Questionnaire with chronic benign pain patients. *Pain* 1981;11:93–100.
- 31 Melzack R. The McGill Pain Questionnaire: Major properties and scoring methods. *Pain* 1975;1:277–99.
- 32 Jerome A, Gross RT. Pain disability index: Construct and discriminate validity. *Arch Phys Med Rehabil* 1991;72:920–2.
- 33 Tait RC, Chibnall JT, Krause S. The Pain Disability Index: Psychometric properties. *Pain* 1990;40:171–82.
- 34 Williams AC, Richardson PH. What does the BDI measure in chronic pain? *Pain* 1993;55:259–66.
- 35 Geisser ME, Roth RS, Bachman JE, Eckert TA. The relationship between symptoms of posttraumatic stress disorder and pain, affective disturbance and disability among patients with accident and non-accident related pain. *Pain* 1996;66:207–14.
- 36 Muse M, Frigola G. Development of a quick screening instrument for detecting posttraumatic stress disorder in the chronic pain patient: Construction of the Post-traumatic Chronic Pain Test (PCPT). *Clin J Pain* 1986;2:151–3.
- 37 Neal LA, Busuttill W, Herapath R, Strike PW. Development and validation of the computerized clinician administered posttraumatic stress disorder scale-1-revised. *Psychol Med* 1994;24:701–6.
- 38 Watson CG. Psychometric posttraumatic stress disorder measuring techniques: A review—Psychological assessment. *J Consult Clin Psychol* 1990;2:460–9.
- 39 U.S. Department of Health and Human Services. Mental health: Culture, race, and ethnicity—A supplement to mental health: A report of the surgeon general—Executive summary. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General; 2001.
- 40 Flor H, Turk DC, Scholz OB. Impact of chronic pain on the spouse: Marital, emotional and physical consequences. *J Psychosom Res* 1987;31:63–71.
- 41 Green CR, Flowe-Valencia H, Rosenblum L, Tait AR. Do physical and sexual abuse differentially affect chronic pain states in women? *J Pain Symptom Manage* 1999;18:420–6.
- 42 Johnson-Umezulike JM. A comparison of pain perception of elderly African Americans and Caucasians. *Nursing connections* 1999;12:5–12.
- 43 Roberto KA. Chronic pain in the lives of older women. *J Am Med Womens Assoc* 1997;52:127–31.
- 44 Green CR, Wheeler J, Marchant B, LaPorte F, Guerrero E. Analysis of the physician variable in pain management. *Pain Med* 2001;2:317–27.
- 45 Weisse CS, Sorum PC, Sanders KN, Syat BL. Do gender and race affect decisions about pain management? *J General Intern Med*, 2001;16:211–17.
- 46 Green CR, Wheeler J, LaPorte F. Clinical decision making in pain management: Contributions of physician and patient characteristics to variations in practice. *J Pain* 2003;4:29–39.
- 47 Green CR, Wheeler JR, LaPorte F, Marchant B, Guerrero E. How well is chronic pain managed? Who does it well? *Pain Med* 2002;3:56–65.
- 48 Johnson JC, Smith NH. Health and social issues associated with racial, ethnic, and cultural disparities. *Generations* 2002:26.
- 49 Melding PS. How do older people respond to chronic pain? A review of coping with pain and illness in elders. *Pain Rev* 1995;2:65–75.
- 50 Brantley PJ, O’Hea EL, Jones G, Mehan DJ. The influence of income level and ethnicity on coping strategies. *J Psycho Behav Assessment* 2002;24:39–45.

- 51 Geerlings SW, Twisk JW, Beekman AT, Deeg DJH, van Tilburg W. Longitudinal relationship between pain and depression in older adults: Sex, age, and physical disability. *Soc Psych Psyc Epid* 2002;37: 323–30.
- 52 Dressler WW, Badger LW. Epidemiology of depressive symptoms in black communities: A comparative analysis. *J Nervous Mental Dis* 1972;173: 212–19.
- 53 Turnbull JE, Mui AC. Mental health status and needs of Black and White elderly: Differences in depression. In: Padgett DK, editor. *Handbook on ethnicity, aging, and mental health*. Westport, CT: Greenwood Press; 1995:73–98.
- 54 Smith-Ruiz D. Relationship between depression, social support, and physical illness among elderly blacks: Research notes. *J Natl Med Assoc* 1985;77:1017–19.
- 55 Husaini BA. Predictors of depression among the elderly. *Am J Orthopsychiatry* 1997;67:48–58.
- 56 Roberts RE, Stevenson JM, Breslow L. Symptoms of depression among Blacks and Whites in an urban community. *J Nervous Mental Dis* 1981; 169:774–9.
- 57 The state of aging and health in American. The Gerontological Society of American, Merck Institute of Aging & Health. *The State of Aging & Health in America*. Available at: <http://www.miahonline.org/resources/reports>.
- 58 Gatz M, Hurwicz M. Are old people more depressed? Cross-sectional data on Center of Epidemiologic Studies Depression Scale factors. *Psychol Aging* 1990;5:284–90.
- 59 Barzagan M, Hamm-Baugh VP. The relationship between chronic illness and depression in a community of urban Black elderly persons. *J Gerontol*, 1995;50B:119–27.
- 60 Markides KS. Minority status, aging, and mental health. *Intl J Aging Hum Dev* 1986;23:285–300.
- 61 Stanford EP. Mental health, aging, and Americans of African descent. In: Wykle ML, Ford AB, editors. *Serving minority elders in the 21st century*. New York: Springer Publishing; 1999:160–79.
- 62 Brown DR, Gary LE, Greene AD, Milburn NG. Patterns of social affiliation as predictors of depressive symptoms among urban Blacks. *J Health Social Behav* 1992;33:242–53.