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Headache in African Americans: An Overlooked Disparity

Bernadette Davantes Heckman, Ph.D., Ashley Joi Britton, M.S.Ed.

Purpose: The persistence of health disparities in the U.S. has necessitated additional research on race-related health disparities among Americans. Remarkably little research has examined race differences in persons with headache disorders, even though 45 million Americans experience episodic or chronic headaches annually. This review paper examined peer-reviewed publication to examine potential race differences in persons with headache disorders in the areas of headache epidemiology, headache characteristics, psychiatric comorbidity, treatment utilization, and treatment outcomes.

Procedures: A multi-database search (PubMed, Web of Science, PsychINFO) identified U.S. studies that enrolled racially diverse samples of persons with headache disorders and qualitatively examined potential race-related disparities.

Main Findings: Compared to their Caucasian counterparts, African American headache patients are more likely to (i) be diagnosed with comorbid depressive disorders; (ii) report headaches that are more frequent and severe in nature, (iii) have their headaches under-diagnosed and/or undertreated; and (iv) discontinue treatment prematurely, regardless of socioeconomic status.

Principal Conclusions: State of the science treatments for chronic headaches are efficacious; unfortunately, race–related disparities prevent African American headache patients from benefiting from these treatments. Research is needed that enables African Americans with severe headaches to access current headache treatments to alleviate headache burden on the African American community.

Keywords: Headache ■ Race ■ Health Disparities ■ African Americans ■ Ethnicity

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A "health disparity" involves "differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that disproportionately affect specific populations in the United States."[1] In this definition, populations are often defined by factors such as socioeconomic status, gender, geographic residence and, very often, race or ethnicity. While there is no known biological reason why race should produce health disparities, race is an important determinant of health status, the receipt of and adherence to health care services, and treatment outcomes in clinical populations in the United States.[2–6]

Over the past decade, the persistence of health disparities in the U.S. has necessitated the conduct of considerable research to better identify and intervene upon race-related health disparities in Americans. Much of this research has focused on "high profile" chronic health conditions, such as diabetes, cancer, and HIV/AIDS. Compared to the majority population (i.e., Caucasians), U.S. ethnic minority populations have shorter overall life expectancies and higher prevalence rates of cardiovascular disease, cancer, infant mortality, birth defects, asthma, HIV/AIDS, diabetes, stroke, and STDs.[7] However, given the high prevalence rates of pain conditions in Americans (i.e., 14–64%),[8–10] surprisingly few studies have examined race differences in persons with pain conditions.

The scant amount of research that has examined race differences in pain have been conducted in laboratory and clinical settings. In laboratory-based studies, research examining race differences in experimentally-induced acute pain consistently found higher ratings of heat pain unpleasantness in African Americans relative to Caucasians.[11] Additionally, African Americans were more likely to report significantly lower pain tolerances across various types of pain stimuli, including heat pain, ischemic pain and cold-pressor pain.

In clinical settings, a growing amount of research has found that racial-ethnic minorities are more likely to be under-diagnosed and under-treated for their chronic pain conditions.[11–15] African American women with chronic pain reported more functional impairment, more PTSD, and less depression than Caucasian women with chronic pain. Greater pain-related disability was associated with increased emotional impairment in African American women compared to Caucasians.[13] Among males, African American men with chronic pain reported more severe pain, greater disability, elevated rates of depression, and poorer treatment outcomes compared to Caucasian men.[16]

In the area of health care utilization in persons with chronic pain conditions, African Americans are more likely to seek treatment for the pain in emergency rooms compared to Caucasians. Factors such as delayed treatment seeking behaviors[13] and/or limited and inadequate access to pain medications through one's local pharmacy may explain why African Americans present to emergency rooms for pain treatment at disproportionately higher rates than Caucasians.

HEADACHES AND THE AFRICAN AMERICAN COMMUNITY

Although 45 million Americans experience episodic or chronic headaches each year,[18] surprisingly little research has examined race differences in persons with headache disorders, The National Institute of Neurological Disorders and Stroke (NINDS), the institute of NIH that is most responsible for funding headache research, directed less than $10 million to headache research in 2009. Of this $10 million, very little was allocated to the examination of race differences in persons with headache disorders.[19,20]

Headache disorders are of considerable public health importance to the African American community. In the United States, approximately one in six African Americans is diagnosed with migraine disorder and one in five is diagnosed with tension-type headache.[21] Headaches are associated with high rates of employee absenteeism, reduced work efficiency (i.e., being mentally present), poorer emotional and social well-being, and may be comorbid with heart disease, hyperlipidemia, hypertension, and diabetes.[22–24] Moreover, the life quality of persons with headache disorders is poorer than those reported by persons with hypertension, diabetes, and osteoarthritis.[25] The economic impact and psychosocial burden of headache on individuals and society in general is well-documented.[26–29] However, research investigating race-related differences and potential health care disparities in persons with headache disorders is essentially non-existent.

This paper will characterize and discuss race-related disparities in persons with headaches, particularly in the areas of headache epidemiology, headache characteristics, psychiatric comorbidity, treatment utilization, and treatment outcomes. Understanding potential race-related differences in headache patients can inform the development of health care policies and interventions that are culturally-contextualized and are more likely to mitigate, or eliminate entirely, race-related headache disparities.

LITERATURE REVIEW METHODOLOGY

A multi-database search was conducted to identify published articles that enrolled racially-diverse samples and reported on race-related differences between African Americans and members of other racial groups. No limit was placed on publication period and articles were included from the following diverse areas: neurology; primary care medicine; psychiatry; behavioral medicine; epidemiology; health sciences; and public health using. The PubMed, Web of Science and PsychINFO databases were searched using the following keywords: race; racial; pain; chronic pain; African Americans; ethnicity; headache; migraine; and tension-type headaches. Research reports were included in the review if they reported on race differences in one or more of the following areas: (i) prevalence and incidence rates; (ii) headache diagnoses and characteristics; (iii) psychiatric disorders; (iv) treatment adherence; (v) access to treatment; and (vi) treatment outcomes. Only articles published in English were included in the review.

HEADACHE EPIDEMIOLOGY: ARE HEADACHES UNDER-DIAGNOSED IN AFRICAN AMERICANS?

The first part of the literature review focused on race-related differences in prevalence and incidence rates of headache disorders. Epidemiologic headache research plays a critical role in identifying: (i) sociodemographic, genetic, and environmental factors associated with headache disorders; (ii) potential causal links between intrapersonal, interpersonal, and environmental factors and headache disorders; and (iii) groups in greatest need of medical and psychological treatments to reduce their headache activity and improve their quality of life.[30,31]

Tension type headache (TTH) and migraine. Research with U.S. samples has consistently found higher prevalence rates of migraine and tension type headache (TTH) disorders in Caucasian Americans compared to African Americans. One-year prevalence rates of episodic TTH (ETTH) are higher in Caucasian Americans (46% women, 40% men) than African Americans (30.9% women, 22.8% men; 19). African American men (22.8%) and women (30.9%) also have lower prevalence rates of chronic TTH (CTTH) than Caucasian American men (40.1%) and women (46.8%; 19). Epidemiologic studies also consistently find higher prevalence rates of migraine in Caucasian Americans (20.4% women, 8.6% men) compared to African Americans (16.2% women, 7.2% men.[29,32–34]

Probable migraine. Probable migraine, a subtype of migraine that satisfies all but one criterion of a migraine diagnosis, has received little attention in the headache literature. This is troubling given that probable migraine produces impairments in physical and psychosocial functioning that are comparable to conventional migraine disorders. Probable migraine is also under-diagnosed and under-treated in the general population, with 79% of individuals who receive a probable migraine diagnosis being unaware that they are living with the disorder.[35,36]

While only one published study could be found that reported on race differences in probable migraine, this study found a higher prevalence rate of probable migraine in African Americans (64%) than Caucasian Americans (43%).[35]

Cluster headache. Cluster headaches are the most severe of the primary headaches and are characterized by one-sided head pain that is often experienced as severe and sudden in onset, and, in many cases, restlessness. Cluster headaches have a lifetime prevalence of 124 per 100,000 and a 1-year prevalence of 53 per 100,000 (CI 26, 95). Males are disproportionately affected by cluster headaches with an overall sex ratio (male to female) of 4.3. Unfortunately, racial differences in the epidemiology of cluster headaches are poorly understood. It has been determined that African Americans with cluster headaches are more likely to receive a delayed diagnosis for their condition compared to Caucasian Americans.[37]

LIMITATIONS IN EPIDEMIOLOGIC HEADACHE RESEARCH

Several methodological limitations of headache epidemiologic research may preclude an accurate understanding of race differences in headache epidemiology in the U.S. First, some studies do not categorize headache prevalence rates separately for Caucasian Americans, African Americans, and other racial groups.[38] Second, in epidemiologic research that does consider race/ethnicity, many studies include only very small numbers of racial minority participants, limiting the representativeness of these samples.[29,39] This research also tends to over-sample higher SES groups. For example, Lipton and colleagues[29] American Migraine Study's sample was comprised of only 6% African Americans, far less than the 12–13% of African Americans that currently constitute the country's population. The over-sampling of high SES samples may prohibit sufficient inclusion of lower SES African Americans, a group that may be particularly vulnerable to headache disorders.[27,29,33] Indeed, Lipton and colleagues[29] acknowledged that their sample over-represented upper-income Caucasian Americans. As such, this widely-cited study may under-estimate headache prevalence rates in African Americans because of the small number of African Americans included in its sample.

Another limitation of past epidemiologic headache research is how headaches are identified and the reliance on the use of *case definitions* to determine whether symptoms reported by an individual warrant a headache diagnosis based on the International Headache Classification system.[40] Case definitions rely on the subjective reporting of headache-related symptoms and experiences.[41] It is unclear if contemporary diagnostic criteria for headache disorders used in case definitions are valid for use with African Americans.

Findings from community-based studies of psychiatric disorders suggest that the use of interviews to diagnosis headaches in African Americans may be subject to clinician-related and cultural biases.[42] These studies show disproportionately higher rates of schizophrenia diagnoses and an under-diagnosis of depressive disorders in African Americans.[12,43] Like the diagnosis of headache disorders, the identification of psychiatric disorders relies on self-report case definitions. Cultural factors that influence the ways in which African Americans differentially express their psychiatric symptoms may be responsible, at least in part, for the over-diagnosis of schizophrenia in this group. Whaley suggests that historical and contemporary experiences with racism and oppression have led to the development of cultural norms for U.S. African Americans to express concerns associated with paranoia, suspiciousness, and distrust during interracial clinical interactions.[42] The mistrust that African Americans express to clinicians results in many African Americans receiving an unwarranted diagnosis of schizophrenia.[43–48]

A similar type of differential race-related reporting may contribute to erroneous headache prevalence rates in African Americans. Some epidemiologic research on migraine suggests that African Americans are less likely to endorse the symptoms of nausea and vomiting, symptoms that are weighted heavily when making a diagnosis of migraine, particularly in the absence of aura.[49] If, for cultural or other reasons, African Americans are less likely to report nausea or vomiting, this could lead to an under-diagnosis of migraine headaches in African Americans. In fact, perhaps the potentially higher rate of probable migraine found in African Americans is related to this group's tendency to not report, or under-report, symptoms of nausea or vomiting. If more African Americans accurately reported the nausea and/or vomiting they experienced, these individuals might be reclassified from probable migraine to episodic or chronic migraine and prevalence estimates of migraine in African Americans might increase. Because individuals diagnosed with probable migraine may receive qualitatively different treatments than persons diagnosed with episodic or chronic migraine, it is important to determine if many African Americans with probable migraine are actually experiencing "full-blown" migraines. Finally, because many probable migraine sufferers often self-medicate through over-the-counter medications,[33] greater rates of medication overuse headaches may exist in African Americans with probable migraines.

Lastly, it is unclear what the race-related headache prevalence rates are for individuals who are considered "mixed" or "biracial". Ultimately, it may be necessary to delineate headache prevalence rates in Caucasians, non-Hispanic African Americans, Asian American-Pacific Islanders, Native Americans, and *"mixed"* or "*biracial"* individuals. Including a greater number of racial/ethnic groups in headache epidemiologic research may provide a more accurate picture of the relationship between race/ethnicity and headache in the United States.

RACE-RELATED DIFFERENCES IN HEADACHE CHARACTERISTICS

Surprisingly, only two epidemiologic studies have examined differences between African American and Caucasian Americans in headache characteristics (e.g., headache frequency and disability). Stewart and colleagues found that, among migraineurs, African American women (27.2%) were more likely to experience "frequent" headaches compared to Caucasian women (19.8%) and that African Americans (49.1%) were more likely to experience "severe" headaches compared to Caucasian Americans (41.9%).[34] Interestingly,

and in spite of reporting greater pain severity, the work efficiency reported by African American men and women was less affected by their headaches compared to Caucasian Americans.[33,34]

Heckman et al. directly compared African American and Caucasian American headache patients in headache subspecialty treatment clinics and found that African Americans reported more headache days per month (mean=19.1 days) than Caucasian Americans (mean=16.5 days).[50] Furthermore, African Americans reported more severe headaches and poorer headache-specific quality of life than Caucasian Americans.[50] African Americans were also more likely to receive a primary headache diagnosis that was chronic in nature compared to Caucasian Americans. Decides t

RACE DIFFERENCES IN PSYCHIATRIC COMORBIDITY IN HEADACHE PATIENTS

Persons with migraine, TTH, and chronic daily headache are at elevated risk for mood and anxiety disorders. Migraineurs are 2.2 to 4.0 times more likely to be diagnosed with a depressive disorder and 3.5 to 5.3 times more likely to have a comorbid anxiety disorder than persons without migraine.[52,53] In a clinical sample of TTH patients, approximately 68% had a depressive episode and 19% had an anxiety disorder.[54] The comorbid link between psychiatric conditions and headache symptoms is more pronounced as one's headaches become more chronic.[55–57] Indeed, research with both migraine and TTH patients shows that as headache frequency increases, the likelihood of patients being diagnosed with a psychiatric disorder also increases.[21,45,46]

The relationship between headache frequency and psychiatric comorbidity appears to differ by race.[58] Specifically, Caucasian Americans who have a headache diagnosis that is chronic in nature (e.g., chronic TTH, chronic migraine) are no more likely to have a psychiatric diagnosis than Caucasian Americans who are diagnosed with episodic headaches (e.g., episodic TTH, episodic migraine). Conversely, African Americans who are diagnosed with chronic headache conditions (i.e., more than 15 headache days per month) are significantly more likely to be diagnosed with one or more psychiatric conditions than African Americans who are diagnosed with episodic headaches.

To date, no large-scale epidemiologic study has examined racial differences in psychiatric comorbidity in headache patients. However, in a study conducted with a racially-diverse sample of patients in headache subspecialty treatment clinics, Heckman and colleagues[57] found that African Americans (40.4%) were more likely than Caucasian Americans (24.1%) to be diagnosed with Major Depressive Disorder (African Americans=40.4%, Caucasians=24.1%), Dysthymia (African Americans=33%, Caucasians=15.3%), and Minor Depressive Disorder (African Americans=7.3%, Caucasians= 2.4%). Even when controlling for race differences in age and years of education completed, African American patients were still two times more likely to be diagnosed with Dysthymia.

Research conducted with patients who have co-occurring physical and psychiatric disorders (e.g., osteoarthritis and depression) often finds that patients' psychiatric disorders are overlooked or misdiagnosed due to the primary providers' preoccupation with the physical disorder.[59,60] If this is the case, it is possible that African American headache patients with comorbid psychiatric disorders are less likely to have their psychiatric condition(s) detected and treated, resulting in higher levels of physical and psychosocial impairment in this group.

Race Differences in Headache Treatment Utilization

In the United States, treatment appointment non-attendance rates range from 5 to 40% across different clinical populations.[61] Missed medical treatment appointments are problematic because they result in: (1) less effective delivery of outpatient healthcare; (2) substantial financial losses for healthcare systems; (3) suboptimal use of clinical and administrative staff; (4) longer waiting times for other patients; and (5) worse health outcomes for many patients.[61]

African American headache patients (50%) are twice as likely as Caucasians (34%) to discontinue their clinic-based headache treatments, even when adjusting for differences in socioeconomic status.[62] Because many African American headache patients in subspecialty care clinics discontinue treatment after attending just one or two treatment appointments, many do not receive state-of-the-science care and physicians cannot change or modify treatments needed to optimize their efficacy and minimize their negative treatment side effects. Therefore, while African Americans experience more frequent and severe headaches, they are also less likely to attend their scheduled medical appointments, resulting in less optimal treatment for their headaches.

African Americans diagnosed with headache disorders also encounter more barriers to headache treatments than do Caucasian Americans. In a study of 77 African Americans and 54 Caucasian Americans, all of whom had "moderate" to "severe" migraine symptoms and were awaiting treatment for a variety of health disorders in primary care waiting rooms, African Americans (46%) were less likely to receive care for their migraine disorder in their primary care clinic compared to Caucasian Americans (72%).[63] African Americans (14%) were also significantly less likely to be prescribed acute migraine medications (e.g., ibuprofen)

than Caucasian Americans (37%). Interestingly, African American and Caucasian headache patients do not appear to differ significantly in rates of adherence to preventive headache medications. Specifically, Heckman et al.[64] found that comparable proportions of African American (69%) and Caucasian headache patients (82%) reported consistent adherence to prophylactic headache medications over a six-month period.

Finally, one study examined for this review found that African Americans visiting emergency rooms with the presenting complaint of headache are 4.8 times less likely than Caucasian Americans presenting with the same complaint to receive computed tomography to diagnose the etiology of their headache.[65]

RACE DIFFERENCES IN HEADACHE TREATMENT OUTCOMES

Although African American headache patients appear to discontinue headache treatments at greater rates, new evidence suggests that African American and Caucasian headache patients who adhere to treatment regimens benefit equally from these treatments. Specifically, Heckman and colleagues found that, over the course of a six-month treatment period during which patients had been prescribed new prophylactic treatments (e.g., tricyclic antidepressants, beta blockers, anticonvulsants), African American and Caucasian Americans reported comparable reductions in headache frequency, severity, and disability over the course of treatment.[51] That said, after completing treatment and reporting comparable rates of reductions in headache characteristics, African American patients still experienced more frequent and severe headaches and a lower headache-specific quality of life than did Caucasian patients.[51]

FUTURE DIRECTIONS AND CHALLENGES

Health disparity research seeks to identify and reduce systematic inequalities in health and health care services and to optimize physical and mental health in affected groups. A growing, albeit still insufficient, compendium of research increasingly points to race-related disparities in persons with headache disorders, most notably in the areas of psychiatric comorbidity, headache characteristics, and access to care. To summarize, this qualitative review found that, compared to their Caucasian counterparts, African American headache patients are more likely to (i) be diagnosed with comorbid depressive disorders; (ii) report headaches that are more frequent and severe in nature, and (iii) fail to complete their prescribed clinic-based treatment regimens (i.e., they fail to attend all of their scheduled headache treatment appointments).

The current review summarized the contemporary literature on race differences in persons with headache disorders. One discovery that emerged during the conduct of this review is that surprisingly little research has examined the relationship between race and headache. In fact, searches of PubMed to identify the number of studies that examined how race relates to other chronic health conditions found the following number of published articles in each area: "race and HIV" (5,698 articles); "race and cancer" (22,494 articles); "race and multiple sclerosis" (505 articles); and "race and back pain" (255 articles). The same type of search for "race and headache) yielded only 199 articles. The impact of race on health care is a topic of immense public health importance.

To date, headache research has been guided primarily by biomedical and genetic approaches.[66] While this approach is understandable, this paper asserts that the diagnosis of headaches, headache characteristics (e.g., frequency, severity), and access to care for the treatment of headaches are all influenced by sociocultural factors that, to date, remain poorly understood (and under studied) by headache researchers and practitioners.

During the next decade, research that examines the following issues will make substantial contributions to the headache treatment literature:

1. Epidemiologic research that includes adequate numbers of racial minorities (including persons of "mixed" races) to determine with greater precision headache prevalence rates in the United States and throughout the world;
2. Research that examines if current ICHD-2 diagnostic guidelines are appropriate for persons of all racial groups or if race-related patient self-report and/or clinical biases influence headache diagnoses given to African American patients;
3. Research that examines why African Americans report more frequent and severe headaches than Caucasians and if these differences are truly due to race-related differences in headache frequency and severity or if other factors (e.g., lower pain thresholds and/or elevated rates of depressive symptoms in African Americans) are responsible for these differences;
4. Large scale psychiatric epidemiologic studies that delineate accurate rates of psychiatric diagnoses in Caucasian and African American headache patients;
5. If higher rates of psychiatric diagnoses are identified in African American headache patients, research is needed to determine why these higher rates exist and whether culturally-contextualized interventions can reduce headache activity and depressive/psychiatric symptoms in African American headache patients; and
6. Research is needed that enables the field to understand why African Americans in health care settings (e.g., primary care clinics) are less likely than Caucasians to have their

headaches diagnosed and treated and if interventions are needed to facilitate the efforts of primary care and family medicine physicians to more effectively diagnose and treat headaches in these settings.

As the number of African Americans with headache disorders continues to increase, investigators that respond to these research needs will enable our society to better understand causes of headache disorders in African Americans and develop more effective treatments to reduce the burden of headache disorders on the African American community.

REFERENCES

1. National Institutes of Health: NIH strategic research plan to reduce and ultimately eliminate health disparities. 2002, Oct 6. http:www.nih.gov/about/hd/strategic plan.pd
2. Comstock R, Castillo E, Lindsay SP. Four-year review of the use of race and ethnicity in epidemiologic and public health research. *Am J Epidemiol.* 2004;159:611–619.
3. Corbie-Smith G, St George D, Moody-Ayers S, Ransohoff DF. Adequacy of reporting race/ethnicity in clinical trials in areas of health disparities. *J Clin Epidemiol.* 2003;56:416–420.
4. Helms J, Jernigan M, Mascher J. The meaning of race in psychology and how to change it: a methodological perspective. *Am Psychol.* 2005;60:27–36.
5. Manly JJ. Deconstructing race and ethnicity: implications for measurement of health outcomes. *Med Care*. 2006;44(Suppl 11):S10–16.
6. Saha S, Freeman M, Toure J, Tippens K, Weeks C, Ibrahim S. Racial and ethnic disparities in the VA health care system: a systematic review. *J Gen Intern Med*. 2008;23:654–671.
7. 2009 National healthcare disparities report. Rockville, M.D.: Agency for Healthcare Research and Quality. US Dept. of Health and Human Services 1–293. http://www.ahrq.gov/qual/nhdr09/nhdr09.pdf.
8. Hardt J, Jacobsen C, Goldberg J, Nickel R, Buchwald D. Prevalence of chronic pain in a representative sample in the United States. *Pain Med*. 2008;9:803–812.
9. Portenoy RK, Ugarte C, Fuller I, Haas G. Population based survey of pain in the United States: differences among caucasian, african american, and hispanic subjects. *J Pain*. 2004;5:317–328.
10. Watkins EA, Wollan PC, Melton LJ III, Yawn BP. A population in pain: report from the olmsted county health study. *Pain Med.* 2008;9:166–174.
11. Anderson K, Green C, Payne R. Racial and ethnic disparities in pain: causes and consequences of unequal care. *J Pain*. 2009;10:1187–1204.
12. Baker T, Green CR. Intrarace differences among african american and caucasian americans presenting for chronic pain management: the influence of age, physical health, and psychosocial factors. *Pain Med*. 2005;6:29–38.
13. Ndao-Brumblay, S. K., Green, C. R. Racial differences in the physical and psychosocial health among black and white women with chronic pain. *J Natl Med Assoc*. 2005;97:1369–1377.
14. Green C, Anderson K, Baker T, et al. The unequal burden of pain: confronting racial and ethnic disparities in pain. *Pain Med*. 2003;4:277–294.
15. Green C, Baker T, Smith E, Sato Y. The effect of race in older adults presenting for chronic pain management: a comparative study of african american and caucasian americans. *J Pain.* 2003;4:82–90.
16. Green CR, Hart-Johnson T. The impact of chronic pain on the health of black and white men. *J Natl Med Assoc*. 2010;102:321–331.
17. Green CR, Baker TA, Ndao-Brumblay SK. Patient attitudes regarding healthcare utilization and referral: a descriptive comparison in african- and caucasian americans with chronic pain. *J Natl Med Assoc*. 2004;96:31–42.
18. National Institutes of Neurological Disorders and Stroke (NINDS). http://www.ninds.nih.gov/.
19. Shapiro R, Goadsby PJ. The long drought: the dearth of public funding for headache research. *Cephalalgia*. 2007;27:991–994
20. Alliance Headache Advocacy. http://www.allianceforheadacheadvocacy.org.
21. Schwartz B, Stewart W, Simon D, Lipton RB. Epidemiology of tension-type headache. *JAMA*. 1998;279:381–383.
22. Bigal M, Kurth T, Santanello N, et al. Migraine and cardiovascular disease: a population-based study. *Neurology.* 2010;74:628–635.
23. Holroyd K, Stensland M, Lipchik G, Hill K, O'Donnell F, Cordingley G. Psychosocial correlates and impact of chronic tension-type headaches. *Headache*. 2000;40:3–16.
24. Lipton R, Hamelsky S, Kolodner K, Steiner T, Stewart W. Migraine, quality of life, and depression: a population-based case-control study. *Neurology*. 2000;55:629–635.
25. Osterhaus J, Townsend R, Gandek B, Ware Jr. J. Measuring the functional status and well-being of patients with migraine headache. *Headache.* 1994;34:337–343.
26. Bigal M, Lipton RB. The epidemiology, burden, and comorbidities of migraine. *Neurol Clin.* 2009;27:321–334.
27. Lipton R, Bigal M, Diamond M, Freitag F, Reed M, Stewart W. Migraine prevalence, disease burden, and the need for preventive therapy. *Neurology*. 2007;68:343–349.
28. Hamelsky S, Lipton RB. Psychiatric comorbidity of migraine. *Headache*. 2006;46:1327–1333.
29. Lipton R, Stewart W, Diamond S, Diamond M, Reed M. Prevalence and burden of migraine in the united states: data from the american migraine study II. *Headache.* 2001;41:646–657.
30. Stovner LJ. Headache epidemiology: how and why? *J Headache Pain*. 2006;7:141–144.
31. Lusic I. Population variation in migraine prevalence--the unsolved problem. Coll. *Antropol.* 2001;25:695–701.
32. Lipton R, Stewart W, Scher AI. Epidemiology and economic impact of migraine. *Curr Med Res Opin*. 2001;17(Suppl 1):4–12.

33. Stewart W, Lipton R, Celentano D, Reed ML. Prevalence of migraine headache in the United States. Relation to age, income, race, and other sociodemographic factors. *JAMA.* 1992;267:64–69.

34. Stewart W, Lipton R, Liberman J. Variation in migraine prevalence by race. *Neurology.* 1996;47:52–59.

35. Silberstein S, Loder E, Diamond S, Reed M, Bigal M, Lipton R. Probable migraine in the United States: results of the american migraine revalence and prevention (AMPP) study. *Cephalalgia.* 2007;27:220–234.

36. Bigal ME; Kolodner KB; Lafata JE; Leotta C; Lipton RB. Patterns of medical diagnosis and treatment of migraine and probable migraine in a health plan. *Cephalalgia.* 2006;26:43–49.

37 Wheeler S, Carrazana EJ. Delayed diagnosis of cluster headache in african-american women. *J Natl Med Assoc*. 2001;93:31–36.

38. Diamond S, Bigal M, Silberstein S, Loder E, Reed M, Lipton R. Patterns of diagnosis and acute and preventive treatment for migraine in the United States: results from the american migraine prevalence and prevention study. *Headache.* 2007;47:355–363.

39. Carson A, Rose K, Sanford C, et al. Lifetime prevalence of migraine and other headaches lasting 4 or more hours: the atherosclerosis risk in communities (ARIC) study. *Headache*. 2004;44:20–28.

40. Headache Classification Subcommittee of the International Headache Society: The International Classification of Headache Disorders: 2nd edition. *Cephalalgia.* 2004, 24(Suppl 1):9–160.

41. Stovner L, Hagen K. Prevalence, burden, and cost of headache disorders. *Curr Opin Neurol.* 2006;19:281–285.

42. Whaley A, Geller PA. Ethnic/racial differences in psychiatric disorders: a test of four hypotheses. *Ethn Dis.* 2003;13:499–512.

43. Grier WH, Cobbs PM. *African American Rage:* 5th ed. New York, NY: Basic Books; 1968.

44. Delahanty J, Ram R, Postrado L, Balis T, Green-Paden L, Dixon L. *Differences in rates of depression in schizophrenia by race*. Schizophr Bull. 2001;27:29–38.

45. Maultsby MC. A historical view of african americans' distrust of psychiatry. In: Turner SM, Jones RT, eds. *Behavior modification in African American populations.* New York: Plenum; 1982:39–55.

46. Newhill CE. The role of culture in the development of paranoid symptomatology. *Am J Orthopsychiatry.* 1990;60:176–185.

47. Juang K-D, Wang S-J, Fuh J-L, Lu S-R, Su T-P. Comorbidity of depressive and anxiety disorders in chronic daily headache and its subtypes. *Headache.* 2000;40:818–823.

48. Whaley AL. African american psychiatric patients' reactions to the cultural mistrust inventory. *J Natl Med Assoc.* 1998;90:776–778.

49. Stewart W, Lipton R, Liberman J. Variation in migraine prevalence by race. *Neurology.* 1996;47:52–59.

50. Heckman B, Holroyd K, O'Donnell F, et al. Race differences in adherence to headache treatment appointments in persons with headache disorders. *J Natl Med Assoc.* 2008;100:247–255.

51. Heckman B, Holroyd KA. Tension-type headache and psychiatric comorbidity. *Curr Pain Headache Rep.* 2006;10:439–447.

52. Ridley CR. Clinical treatment of the nondisclosing african american client. a therapeutic paradox. *Am Psychol.* 1984;39:1234–1244.

53. Breslau N. Psychiatric comorbidity in migraine. *Cephalalgia.* 1998;18(Suppl 22):56–61.

54. Beghi E, Allais G, Cortelli P, et al. Headache and anxiety-depressive disorder comorbidity: the HADAS study. *Neurol Sci.* 2007;28(Suppl 2):217–219.

55. Wiendels N, van Haestregt A, Knuistingh Neven A, et al. Chronic frequent headache in the general population: comorbidity and quality of life. *Cephalalgia.* 2006;26:1443–1450.

56. Baskin S, Lipchik G, Smitherman TA. Mood and anxiety disorders in chronic headache. *Headache.* 2006;46(Suppl 3):76–87.

57. Heckman B, Merrill J, Anderson T. Race, psychiatric comorbidity, and headache characteristics in patients in headache subspecialty treatment clinics. *Eth and Health*,2012 Apr 30. [Epub ahead of print]

58. Heckman B. Lewis K. *Race, SES and psychiatric comorbidity.* Presented at the Society of Behavioral Medicine, Vancouver, Canada. April 2010.

59. Borowsky S, Rubenstein L, Meredith L, Camp P, Jackson-Triche M, Wells K. Who is at risk of nondetection of mental health problems in primary care? *J Gen Intern Med.* 2000;15:381–388.

60. Rost K, Nutting P, Smith J, Coyne J, Cooper-Patrick L, Rubenstein L. The role of competing demands in the treatment provided primary care patients with major depression. *Arch Fam Med.* 2000;9:150–154.

61. Downer S, Meara J, Da Costa A, Sethuraman K. SM.S. text messaging improves outpatient attendance. *Aust Health Rev.* 2006;30:389–396.

62. Heckman B, Holroyd K, Tietjen G, et al. Caucasians and african-americans in headache specialty clinics respond equally well to treatment. *Cephalalgia.* 2009;29:650–661.

63. Nicholson R, Rooney M, Vo K, Lughlin E, Gordon M. Migraine care among different ethnicities: do disparities exist? *Headache*. 2006;46:754–765.

64. Heckman BD, Ellis G. Preventive medication adherence in african american and caucasian headache patients. *Headache.* 2011;51:520–532.

65. American College of Emergency Physicians. Clinical policy: critical issues in the evaluation and management of patients presenting to the emergency department with acute headache. *Ann Emerg Med.* 2002;39:108–122.

66. Smedley A, Smedley BD: Race as biology is fiction, racism as a social problem is real: Anthropological and historical perspectives on the social construction of race. *Am Psychol.* 2005;60:16–266.

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