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Research Article

Disparities in Guideline Recommended Care among Women with Asthma

Minal R Patel[1]*, Georgiana M Sanders[2], Ye Yang[3], Randall W Brown[1,4] and Kausar Hafeez[4]

[1]Department of Health Behavior & Health Education, University of Michigan, USA
[2]Department of Internal Medicine, University of Michigan, USA
[3]Department of Biostatistics, University of Michigan, USA
[4]Center for Managing Chronic Disease, University of Michigan, USA

***Corresponding author:** Minal R Patel, Department of Health Behavior and Health Education, University of Michigan School of Public Health, 1415 Washington Heights, Ann Arbor, MI 48109-2029, USA

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Abstract

Purpose: To examine racial differences in the provision of guideline recommended care among women with asthma, and whether disparities in outcomes are evident despite guideline recommended care.

Methods: Data came from African American and White participants from baseline assessments of two randomized controlled trials for women with persistent asthma (n=724). Participants reported demographic and clinical information, and asthma-related outcomes.

Results: More White than African American women (67% vs. 36%, p<0.001) reported seeing a specialist for their asthma. African Americans were significantly more likely to have received an asthma action plan (OR, 2.93; 95% CI, 2.0-4.28, P<.01), prescription of a controller medication (OR, 4.06; 95% CI, 2.74-6.01, P<.001), and were more likely to ask their doctor questions about asthma (OR, 1.83; 95% CI, 1.26-2.65, P<.001) compared to Whites when adjusted for asthma control, income, education, and specialty care. African Americans experienced more emergency department visits for asthma (RR 1.44; 95% CI (1.07 to 1.95), p<0.01), and worsening asthma control (OR, 2.27; 95% CI, 1.57-3.29, P<.001), compared to Whites when adjusted for four aspects of guideline recommended care (asthma action plan, ownership of a peak flow meter, talking with a physician, receipt of controller medication for persistent asthma), income, educational attainment, and specialty care.

Conclusion: Fewer African American women reported seeing a specialist compared to White women, but received more guideline recommended care. Despite this, asthma outcomes for African American women were worse than Whites. Greater attention is needed to support the self-management efforts of high-risk groups.

Keywords: Asthma; Self-management; Women; Clinical guidelines; Outcomes; Disparities

Abbreviations

NAEEP: National Asthma Education and Prevention Program

Introduction

Asthma affects 8% of U.S. adults, with prevalence higher in women compared to men (9.5% vs. 7%) [1]. Despite over two decades of advancements in the diagnosis, treatment, and management of asthma, disparities in outcomes and asthma-related health care costs remain high in the United States [1]. Two such disparities of particular concern are the higher prevalence and worse outcomes in adult women and minority communities. African-American populations bear a significantly greater prevalence of asthma and burden of disease as demonstrated by higher emergency department rates, hospitalizations, and deaths attributable to asthma compared to Whites [1]. Contributing to these data may be that African-American patients report less use of anti-inflammatory medicines, especially inhaled corticosteroids [2-5]. Other reasons for differences between African-American and other populations have been discussed, including lack of access to quality medical care, lack of asthma education and support, social environment, economic status, cultural influences, racial discrimination, and underestimation of patients' asthma severity [6-9].

Disparities in asthma outcomes in women merit particular attention because they get worse with age. Older asthmatic women have higher mortality rates due to asthma compared to men and use more urgent care services [10 -13]. These outcomes are particularly worse for African American women [12]. Given greater awareness and efforts over the past decade to reduce health disparities through dissemination of the National Asthma Education and Prevention Program (NAEEP) clinical asthma guidelines, and providing training in culturally sensitive care, we sought to examine whether racial differences in provision of guideline recommended care among women with asthma persist, and whether disparities in outcomes persist between African American and White women despite guideline recommended care. These findings may provide more nuanced information of where greater efforts are needed to reduce disparities in asthma outcomes, particularly among African American women.

Methods

Data

Data came from baseline assessment of two self-management

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interventions for women with asthma conducted at the University of Michigan Health System (subsequently referred to as cohort 1 and cohort 2). Details of the self-management interventions are described elsewhere [14,15]. The protocols for both studies were approved by the Institutional Review Board at the University of Michigan Medical School.

Analytic sample

Survey data from both cohort 1 and cohort 2 were pooled in the current analysis to increase the sample size and reliability of estimates to examine differences between African American and White women on outcomes of interest. For cohort 1, of the 2,336 women who were initially approached for the study, 997 consented to participate. Ultimately, 808 women returned the completed consent forms by mail, and provided baseline data. For cohort 2, a total of 1,315 women were initially approached. Of those, 843 women were successfully reached via telephone and mail, and a total of 444 (53%) women consented to participate. Ultimately, 422 of those who consented to participate provided baseline data. The pooling of the sample between cohort 1 and cohort 2 resulted in 1,230 women with asthma. The analytic sample comprised women with the following inclusion criteria 1) 18 years of age older; 2) physician diagnosis of persistent asthma; 2) not pregnant; 3) access to a telephone; and 4) self-identify as White or African American. The final analytic sample of individuals who met inclusion criteria was 724 women (White = 303; African American = 421).

Measures

Outcomes investigated in this study included aspects of NAEPP guideline recommended care: receipt of an asthma action plan, ownership of a peak flow meter, collaborating with a physician in self-management, and receipt of controller medication for persistent asthma. We also examined asthma-related emergency department visits, hospitalizations, and asthma control as outcomes when adjusting for the aforementioned NAEPP guideline factors.

Asthma action plan

Asthma Action Plan (AAP) was defined as a written treatment plan for asthma. To assess whether participants had an AAP, we asked them the following question on a binary (yes/no) scale: "Do you have a treatment plan or asthma care plan that you and your doctor worked out together for you to adjust your medication use when symptoms change?"

Owning a peak flow meter

To assess whether participants owned a peak flow meter to monitor their asthma symptoms, we asked the following question on a binary (yes/no) scale: "Do you own a peak flow meter?"

Initiating discussion about asthma with their physician

To assess whether participants initiated discussion about their asthma with their physician, we asked the following question: "Would you say that you asked the doctor questions about asthma often, sometimes, rarely, or never?" Based on the distribution of responses, responses were collapsed into yes/no.

Asthma medications

The participant was asked to assemble medicines to refer to during the interview. We assessed which asthma medications, both controller and quick relief forms, were prescribed to the participant by obtaining the names of medications through open-ended responses. Medicines were then categorized as controller or reliever.

Asthma-related health services use

We assessed frequency of asthma-related urgent health care use (ED visits, hospitalizations) in the past 12 months through self-report and verified these data with medical records.

Asthma control and frequency of asthma symptoms

Asthma control and symptom frequency were assessed based on self-report of the presence of daytime and nighttime symptoms in the previous month, as recommended by the NAEPP guidelines for the diagnosis and management of asthma [16]. Asthma control was calculated by the worst impairment category of daytime or nighttime symptoms, and was classified into three categories: poorly controlled, not well controlled, or well controlled. The NAEPP guidelines were used to classify the symptom frequency reported by participants into four categories: ≤ 1 day per week, 2 days per week, ≥3 days per week, and throughout the day.

Social support

We measured social support for asthma, using 5 items with responses on a 5-point Liker scale that identify the frequency with which social support is perceived. The items were organized to cover five dimensions of social support: material, affective, positive social interaction, emotional and informational. All items were summed with a higher score indicating greater perception of social support.

Demographic and clinical data from participants were also collected. All data were collected through one-hour long telephone interviews by trained interviewers.

Data analysis

Data were analyzed in SAS 9.3. Descriptive statistics were computed for all demographic and clinical characteristics of the sample as well as the outcome variables of interest. Frequencies were computed for all categorical variables, and means and standard deviations were computed for all continuous variables. Estimates for differences between white and African Americans on demographic, clinical, and outcome variables were assessed using Student's t test or chi-square tests.

Four multiple variable logistic regression models adjusted for education, income, age, specialty care, and asthma control were used to examine differences between white and African American women in the odds of receiving aspects of guideline recommended asthma care (asthma action plan, ownership of a peak flow meter, collaborating with a physician in self-management, receipt of controller medication).

Three multiple variable regression models adjusted for aspects of guideline recommended care (asthma action plan, ownership of a peak flow meter, collaborating with a physician in self-management, receipt of controller medication), education, income, age, and specialty care to examine differences between White and African American women in asthma-related emergency department visits (Poisson regression), hospitalizations (Poisson regression), and asthma control (cumulative logistic regression).

Table 1: Demographic and clinical characteristics of White vs. African American women with asthma.

Variable	Total sample (n=724)	White (n=303)	African American (n=421)	p- value
Demographic Characteristics				
Age (mean, SD)	44.7 (14.15)	47.8 (12.9)	42.5 (14.6)	<0.001
Marital status (% Married)	45% (321)	67% (203)	28% (118)	<0.001
Educational attainment				<0.001
High school degree/ GED or less	27% (195)	34% (101)	23% (94)	
2- year college/ vocational school	34% (245)	19% (58)	45% (187)	
College degree	23% (166)	28% (86)	19% (80)	
Advanced graduate degree	16% (115)	19% (58)	13% (57)	
Employment Status (% yes)	65% (468)	64% (194)	65% (274)	*NS*
Household income				<0.01
<$20,000	30% (208)	13% (38)	43% (170)	
$20,001 - $40,000	21% (150)	16% (49)	26% (101)	
$40,001 - $60,000	17% (117)	21% (65)	13% (52)	
$60,001 - $80,000	11% (75)	17% (52)	6% (23)	
>$80,001	21% (148)	33% (99)	12% (49)	
Social Support (mean, SD)	2.66 (1.03)	2.55 (1.00)	2.74 (1.05)	<0.01
Clinical Characteristics				
Asthma specialist (% yes)	49% (351)	67% (198)	36% (153)	<0.001
Has asthma action plan	57% (407)	46% (138)	65% (269)	<0.001
Asks doctor questions (% yes)	44% (315)	39% (116)	48% (199)	<0.001
Owns peak flow meter (% yes)	67% (480)	72% (216)	63% (264)	<0.01
Has controller medication (% yes)	58% (418)	43% (130)	68% (288)	<0.001
Has rescue medication (% yes)	74% (535)	49% (151)	91% (384)	<0.001
Has controller and rescue medication (% yes)	46% (334)	22% (67)	63% (267)	<0.001
BMI (mean, SD)	32.2 (15.9)	30.3 (8.2)	33.7 (8.7)	<0.001
Asthma control				<0.001
Well controlled	26% (184)	13% (40)	34% (144)	
Not well controlled	49% (355)	56% (171)	44% (184)	
Very poorly controlled	25% (185)	30% (92)	22% (93)	
Daytime symptoms				<0.001
2 days per week	28% (316)	15% (97)	46% (219)	
≥3 days per week	27% (304)	23% (151)	32% (153)	
Throughout the day	9% (104)	8% (55)	10% (49)	
Activity limitation				*NS*
All of the time	12% (86)	11% (34)	13% (52)	
Some of the time	27% (196)	28% (84)	27% (112)	
Rarely/never	61% (440)	61% (183)	60% (257)	
Nighttime symptoms				<0.01
≤2 days per month	43% (309)	34% (104)	49% (205)	
1-3 days per week	40% (289)	48% (144)	35% (145)	
≥4 times per week	17% (123)	18% (54)	16% (69)	
Emergency department visits (mean, SD)	0.91 (2.01)	0.63 (1.46)	1.12 (0.90)	<0.001
Hospitalizations (mean, SD)	0.36 (1.18)	0.27(0.98)	0.43 (1.30)	NS

Chi-square tests were performed on economic, demographic, and clinical variables of interest to identify differences between the groups. NS= Not Significant.

Results

Sample characteristics

Demographic and clinical characteristics of the analytic sample are provided in Table 1. Forty-two percent of the sample (n= 303) were White and 58% (n= 421) were African American. The mean age of participants was 44.7(SD=14.15). Forty-five percent (n=321) reported being married, 39% (n=281) had a college education or higher, 65% (n=468) were employed, and 51% (n=358) reported an annual household income of $40,000 or less. The sample reported moderate levels of social support (mean 2.66 (SD=1.03)). Compared to White women, African American women were younger in age (p<0.001), and fewer were married (p<0.001) and attained a college degree or higher (p<0.001). African American women reported lower income (p<0.01), but reported higher levels of social support (p<0.01) compared to Whites.

The average BMI of all participants was 32.2 (SD=15.9). Thirty-six percent (n=408) of the sample reported experiencing daytime asthma symptoms 3 or more days per week. Seventy-four percent (n=540) of participants had not well or poorly controlled asthma. Fifty-seven percent (n= 407) of participants had an asthma action plan, 67% (n=480) owned a peak flow meter, and 58% (n=418) of participants reported prescription of controller medication. Forty-four percent (n=315) of women with asthma reported initiating discussion about asthma with their physician. Forty-nine percent (n=351) of the sample reported seeing a specialist, and significant racial differences were evident. More White women than African American women (67% vs. 36%, p<0.01) reported seeing a specialist for their asthma.

Racial differences in receipt of guideline recommended care

Table 2 shows the results of multiple variable logistic regression analyses comparing differences between White and African American women in receipt of four aspects of guideline recommended care when adjusted for educational attainment, income, age, level of asthma control, and specialty care. African Americans were significantly more likely to have received an asthma action plan (OR, 2.93; 95% CI, 2.0-4.28, p<0.01), prescription of a controller medication (OR, 4.06; 95% CI, 2.74-6.01, p<0.001), and were more likely to ask their doctor questions about asthma (OR, 1.83; 95% CI, 1.26-2.65, p<0.001) compared to White women.

Differences in asthma outcomes between African American and white women despite provision of guideline recommended care

Table 3 shows the results of cumulative logistic and Poisson regression analyses comparing differences between White and African American women in asthma outcomes. African American women experienced significantly more emergency department visits for asthma (RR 1.44; 95% CI (1.07 to 1.95), p<0.01), and worsening asthma control (OR, 2.27; 95% CI, 1.57-3.29, p<0.001), compared to Whites when adjusting for four aspects of guideline recommended care (asthma action plan, ownership of a peak flow meter, collaborating with a physician in self-management, receipt of controller medication for persistent asthma), income, educational attainment, and specialty care.

Table 2: Differences in aspects of guideline recommended care between African American and white women.

Race (African American vs. White)	Odds Ratio (95% CI)	p- value
Has an asthma action plan	2.93 (2.0-4.28)	<0.001
Has a peak flow meter	0.95 (0.64-1.40)	0.81
Has a controller medication	4.06 (2.74-6.01)	<0.001
Asks doctor questions about asthma	1.83 (1.26-2.65)	<0.001

Models controlling for age, education, income, specialist care, asthma control.

Discussion

To our knowledge, this is the first study that has specifically examined differences between African American and White women in the provision of guideline recommended care, and whether differences in outcomes between the two groups persist despite the type of asthma care provided. Our findings showed that despite having lower access to specialty care than White women, African American women were receiving more guideline recommended care than White women in this sample. However, asthma control was worse and asthma-related emergency department visits were still significantly higher among African American women compared to White women.

African American women were more likely to receive asthma action plans, prescription of controller medication, and ask their doctor more questions about asthma compared to White women. Although all women in this sample had persistent asthma, greater disease burden was more evident among African American women in our health system than White women based on symptom frequency. This may have heightened awareness among physicians of the need to use comprehensive guideline-recommended strategies to bolster disease control in this population. During the time of data collection, the health system also actively pushed the use of guideline-based care, which may have also influenced an increase in overall use of asthma action plans and controller medication, especially in a vulnerable population. However, African American women were still using more urgent health care services compared to White women, despite access to specialty services and receiving more guideline-based care. This raises concerns about standardized guideline-based care in this population, and several medical practice communication and/or behavioral factors should be considered.

First, other work suggests that African Americans are less likely to perceive and report breathlessness compared to White patients [17,18], thus posing potential challenges to following therapeutic protocols in an asthma action plan, where ethnic sensitivity may or may not be evident. Alternatively, the therapeutic plan may have not

Table 3: Differences in asthma outcomes between African American and white women despite provision of guideline recommended care.

	Race (Black vs. White) [95% CI]	p-value
ED visits (RR)	1.44 [1.07, 1.95]	<0.01
Hospitalizations(RR)	1.37 [0.94, 1.98]	0.09
Worsening asthma control(OR)	2.27 [1.57, 3.29]	<0.001

RR: Risk Ratio; OR: Odds Ratio; Models controlling for education, income, components of guideline recommended care (asking the doctor questions about asthma, provision of a controller med, peak flow meter, asthma action plan) specialist care.

been the right one to keep the individual's asthma under control, and required further adjustments. In our study, we did not have data on the quality and details of the asthma action plans women were provided. However, such information may shed light on patients' ability to follow through with the plan and thus provide insight into their self-management behavior and subsequent outcomes.

Although such data were not available in our data source, the quality of the interaction between African American women and their physicians may also explain why despite greater provision of guideline recommended care and access to specialty care, they still experience worse outcomes compared to White women. Although African American women were more likely to report asking their physician questions about their asthma compared to White women, greater attention may be needed to the unique self-management challenges of African American women during clinical visits.

Despite greater provision of controller medication among African American women, greater urgent care use and worse asthma control was still evident. Several factors may explain these findings including greater socioeconomic and health insurance barriers, high rates of co morbidity, and medication beliefs [19-21]. Compared to White patients, African Americans are more likely to report negative beliefs about controller medication, and such beliefs correlate highly with non-adherence [22]. Given the long history of race and ethnicity based challenges in health care interactions and the challenges of maintaining a usual source of care, the quality as well as quantity of interaction with providers lends insight to the causal mechanisms that may lead to the greater urgent care outcomes that were evident among African American women.

There are several limitations to this study that should be noted. This study was a secondary data analysis, and there may be limitations in reliable measurements of the variables of interest. Data were collected among women with asthma seen in one health system. Findings may not be generalizable to all individuals or women with asthma, or those seen in other delivery settings.

Despite the disparity in outcomes between African American and White women, guideline recommended care based on control and severity levels should still be provided to all individuals with asthma to support their self-management. Although the NAEPP guidelines provide evidence for specific cultural and ethnic considerations that may be needed in working with high-risk populations [16], this information may not be reaching providers in training programs and health systems that promote the use of guidelines. Greater emphasis on asthma education may be needed in vulnerable populations. Greater understanding of techniques to support the self-management efforts of African American women and complex patients are especially needed in order to target efforts to reduce the outcome disparities evident in this population, despite the provision of guideline recommendations.

Conclusion

In this study, fewer African American women reported seeing a specialist compared to White women, but received more guideline recommended. Despite receiving more guideline recommended care and having access to specialty services, asthma outcomes for African American women were worse than Whites. Greater attention is needed to support the self-management efforts of high-risk groups.

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References

1. Centers for Disease Control and Prevention (CDC). Vital signs: asthma prevalence, disease characteristics, and self-management education: United States, 2001-2009. MMWR Morb Mortal Wkly Rep. 2011; 60: 547-552.
2. American Lung Association. Trends in Asthma Morbidity and Mortality. United States, 2012.
3. Zoratti EM, Havstad S, Rodriguez J, Robens-Paradise Y, Lafata JE, McCarthy B. Health service use by African Americans and Caucasians with asthma in a managed care setting. Am J Respir Crit Care Med. 1998; 158: 371-377.
4. Haas JS, Cleary PD, Guadagnoli E, Fanta C, Epstein AM. The impact of socioeconomic status on the intensity of ambulatory treatment and health outcomes after hospital discharge for adults with asthma. J Gen Intern Med. 1994; 9: 121-126.
5. Adams RJ, Weiss ST, Fuhlbrigge A. How and by whom care is delivered influences anti-inflammatory use in asthma: Results of a national population survey. J Allergy Clin Immunol. 2003; 112: 445-450.
6. Brown RW, Cappelletti CS. Reaching beyond disparity: safely improving asthma control in the at-risk African-American population. J Natl Med Assoc. 2013; 105: 138-149.
7. Legorreta AP, Christian-Herman J, O'Connor RD, Hasan MM, Evans R, Leung KM. Compliance with national asthma management guidelines and specialty care: a health maintenance organization experience. Arch Intern Med. 1998; 158: 457-464.
8. Wright RJ, Mitchell H, Visness CM, Cohen S, Stout J, Evans R, et al. Community violence and asthma morbidity: the Inner-City Asthma Study. Am J Public Health. 2004; 94: 625-632.
9. Wright RJ, Rodriguez M, Cohen S. Review of psychosocial stress and asthma: an integrated biopsychosocial approach. Thorax. 1998; 53: 1066-1074.
10. Akinbami LJ, Moorman JE, Bailey C, Zahran HS, King M, Johnson CA, et al. Trends in asthma prevalence, health care use, and mortality in the United States, 2001-2010. NCHS Data Brief. 2012.
11. Schiller JS, Lucas JW, Ward BW, Peregoy JA. Summary health statistics for U.S. adults: National Health Interview Survey, 2010. Vital Health Stat 10. 2012; 1-207.
12. Moorman JE, Akinbami LJ, Bailey CM, Zahran HS, King ME, Johnson CA, et al. National surveillance of asthma: United States, 2001-2010. Vital Health Stat 3. 2012; 1-67.
13. Adams PE, Martinez ME, Vickerie JL, Kirzinger WK. Summary health statistics for the U.S. population: National Health Interview Survey, 2010. Vital Health Stat 10. 2011; 1-117.
14. Clark NM, Gong ZM, Wang SJ, Lin X, Bria WF, Johnson TR. A randomized trial of a self-regulation intervention for women with asthma. Chest. 2007; 132: 88-97.
15. Janevic MR, Ellis KR, Sanders GM, Nelson BW, Clark NM. Self-management of multiple chronic conditions among African American women with asthma: a qualitative study. J Asthma. 2014; 51: 243-252.
16. Williams SG, Schmidt DK, Redd SC, Storms W. National Asthma Education and Prevention Program. Key clinical activities for quality asthma care. Recommendations of the National Asthma Education and Prevention Program. MMWR Recomm Rep. 2003; 52: 1-8.
17. Hardie GE, Janson S, Gold WM, Carrieri-Kohlman V, Boushey HA. Ethnic differences: word descriptors used by African-American and white asthma

patients during induced bronchoconstriction. Chest. 2000; 117: 935-943.

18. Trochtenberg DS, BeLue R, Piphus S, Washington N. Differing reports of asthma symptoms in African Americans and Caucasians. J Asthma. 2008; 45: 165-170.

19. Patel MR, Caldwell CH, Song PX, Wheeler JR. Patient perceptions of asthma-related financial burden: public vs private health insurance in the United States. Ann Allergy Asthma Immunol. 2014.

20. Patel MR, Nelson BW, Id-Deen E, Caldwell CH. Beyond co-pays and out-of-pocket costs: perceptions of health-related financial burden in managing asthma among African American women. J Asthma. 2014.

21. Janevic MR, Sanders GM, Thomas LJ, Williams DM, Nelson B, Gilchrist E, et al. Study protocol for Women of Color and Asthma Control: a randomized controlled trial of an asthma-management intervention for African American women. BMC Public Health. 2012.

22. Le TT, Bilderback A, Bender B, Wamboldt FS, Turner CF, Rand CS, et al. Do asthma medication beliefs mediate the relationship between minority status and adherence to therapy? J Asthma. 2008; 45: 33-37.

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