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## Factors Associated with Asthma Self-management in African American Adolescents

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### Introduction

Asthma self-management among African American adolescents is vitally important for preventing morbidity and mortality (Bruzzese et al., 2012; Naar-King et al., 2014). Asthma self-management refers to the problem solving behaviors that individuals use to manage asthma and includes self-care practices of symptom management, medication management, and environmental control (Fitzpatrick & Frey, 1993; Rand et al., 2012). Compared to Caucasians, African American adolescents demonstrate fewer self-management behaviors and have more uncontrolled asthma, significantly more difficulty with symptom and medication management, and more negative beliefs about their medication management (Bruzzese et al., 2012; Rhee, Belyea, Ciurzynski, & Brasch, 2009). Poor asthma self-management is associated with higher death rates, more emergency department visits, and more hospitalizations among African American youth compared to Caucasian youth (Akimbami, Moorman, Garbe, & Sondik, 2009; Gorina, 2012).

Middle adolescence, defined as ages 14–16 years (Radzik, Sherer, & Neinstein, 2008), may be a particularly challenging time for asthma self-management. Middle adolescence is a time when the fundamental attributes needed to manage asthma emerge (Sadof & Kaslovsky,

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2011). Middle adolescents start to spend more time away from home and assume more of their asthma self-management (Jonsson, Egmar, Haller, & Kull, 2014; Mammen & Rhee, 2012). They also want to be “normal” and like their peers but have complex asthma treatment regimens (Rhee, McQuillan, & Belyea, 2012). Self-management can be fostered or compromised by middle adolescents’ emerging abstract thinking abilities and more universal cognitive factors such as beliefs about the disease (Mammen & Rhee, 2012; Naimi et al., 2009).

Only a limited number of asthma studies have focused on factors associated with self-management among African American middle adolescents (Bruzzese et al., 2011). Other self-management studies have been conducted with African American adolescents ranging from 13–19 years (Bruzzese et al., 2012; Clark et al., 2010; Joseph et al., 2013; Naar-King et al., 2014; Velsor-Friedrich et al., 2012) without evaluating the specific group of middle adolescents. Because asthma self-management can improve outcomes and reduce health care system burden, it is important to identify factors associated with asthma self-management among African American middle adolescents (Chipps, Zeiger, Borish, et al., 2012; Nurmagambetov et al., 2011; Rhee, Pesis-Katz, & Xing, 2012). Therefore, the purpose of this study was to examine factors associated with asthma self-management in African American middle adolescents (14–16 years of age).

## Review of the Literature

In this review of literature, several factors potentially associated with asthma self-management were identified and are discussed. These include gender, levels of asthma impairment, prior asthma education, and more positive cognitive and emotional illness representations. Each of these factors is discussed below followed by a summary paragraph containing the study hypothesis.

### Gender

Gender may be associated with asthma self-management. Some studies have shown that, compared to adolescent males, adolescent females have greater asthma prevalence, more emergency room visits, and hospitalizations (Clark et al., 2010; MacKay & Duran, 2008). One study showed that adolescent females had poorer medication self-management, including less overall usage of their asthma medication(s) (Bruzzese et al., 2012). In contrast, conflicting data show that compared to females, adolescent males have higher asthma mortality rates, are more likely to delay treatment than females (Murray, Stang, & Tierney, 1997; Pawar & Smith, 2006). In addition, one study suggests that males appear to have poorer overall self-management (Joseph, Havstad, Johnson, Vinuya, & Ownby, 2006).

### Level of Asthma Impairment

Another factor potentially associated with self-management is asthma impairment, defined as “the frequency and intensity of symptoms and functional limitations the patient is experiencing currently or has recently experienced” (NHLBI, 2007, p. 2). Relationships have been established between lower levels of asthma impairment and better self-management behaviors (Murphy et al., 2012; Nguyen, Zahran, Iqbal, Peng, & Boulay,

2011). Adolescents' positive self-management behaviors, particularly symptom and medication management as well as environmental control, positively influence their level of asthma impairment (Britto et al., 2014; Chipps, Zeiger, Dorenbaum, et al. 2012; NHLBI, 2007).

### **Prior Asthma Education**

Comprehensive asthma education programs for adolescents have been shown to improve knowledge, symptom management, medication adherence, environmental control, and inhaler techniques as well as decrease asthma impairment (Britto et al., 2014; Mosnaim et al., 2011). Unfortunately, there are limited numbers of comprehensive asthma education programs for adolescents and not all adolescents participate in those existing programs (Srof, Taboas, & Velsor-Friedrich, 2012; Zahran, Person, Bailey, & Moorman, 2012). These programs can be offered in diverse settings including schools (National Association of School Nurses, 2014; Srof, Taboas, & Velsor-Friedrich, 2012).

### **Cognitive and Emotional Illness Representations**

Previous studies suggest that adolescents' beliefs about their asthma are related to asthma self-management (Clark et al., 2010; Rhee et al., 2009); however, no studies have examined the association of illness representations (i.e. beliefs) to adolescents' asthma self-management. Illness representations are mental representations of knowledge and experience or beliefs about an illness (Cameron & Leventhal, 2003). Leventhal, Leventhal, and Schaefer (1992) classified illness representations as cognitive (identity [*perceived*] symptoms, cause, timeline, consequences of *illness*, and control) or emotional (Cameron & Leventhal, 2003). Moss-Morris et al. (2002) revised the Illness Representations Questionnaire, to include the additional following representations: acute versus chronic timeline, cyclical timeline, personal and treatment control, and illness coherence, that is, one's understanding of the illness. More positive cognitive illness representations are associated with better self-management in adults (Hagger & Orbell, 2003; Halm, Mora, & Leventhal, 2006; Horne & Weinman, 2002) including better perception and presumably better management of symptoms (Ohm & Aaronson, 2006), as well as better medication adherence or self-management (Horne & Weinman, 2002). However, the limited number of studies in adolescents did not evaluate cognitive illness representations of asthma (Bucks et al., 2009; Gaston, Cottrell, & Fullen, 2011; Zugelj et al., 2010). Emotional illness representations (depression, anxiety, anger) have been associated with the self-management behaviors of chronically ill adolescents with hypertension (Zugelj et al., 2010), but they have not been studied in adolescents with asthma as illness representations.

### **Summary**

In summary, based on the review of literature, the hypothesis for this study was that being female, having lower levels of asthma impairment, prior asthma education, and more positive cognitive and emotional illness representations would be associated with greater asthma self-management among African-American middle adolescents aged 14–16 years. We controlled the influence of race and age on asthma self-management by limiting the sample to African Americans aged 14–16 years.

## Methods

### Study Design and Sample

This was a descriptive, cross-sectional, correlational study of 133 African American middle adolescents with asthma that was approved by the university's Institutional Review Board. Inclusion criteria (per self-report) were African American, aged 14–16, had received asthma treatment within the past year, were being schooled in regular classrooms, had no cognitive or developmental delays (by parental report), were English-speaking, and had no other serious chronic illnesses that would interfere with asthma self-management.

A total of 209 adolescents aged 14 to 16 years were approached for the study; 19 were found to be ineligible due to age or not receiving any asthma treatment in the past year. Fifty-seven potential subjects declined to participate because they were too busy or lacked interest. The final sample included 133 participants (64% of those approached): 65 males and 68 females.

### Procedures

Participants were recruited from schools, medical clinics, and the community (pediatricians' offices, minority health coalitions, churches, community organizations, and events where large numbers of African Americans were in attendance). Recruitment was conducted via flyers, brochures, and word of mouth. Signed assents were obtained from the participating adolescents and signed consent from their parents or guardians.

Data were collected by the lead investigator during meetings in schools, clinics, libraries, churches, or other locations mutually agreed upon by participants and the data collector. In all settings, data were collected in person in a private room using paper-and-pencil versions of the instruments. Parents could be present but were not allowed to provide answers for the adolescent. The data collector was present to help interpret word meanings or read items aloud as necessary without influencing answers. Participants who completed all data collection instruments were given a \$20.00 gift card.

### Measures

**Demographic Information**—Using an investigator-developed form, participants provided demographic data, including the year and length of any formal asthma education program.

**Self-management**—Asthma self-management was measured using the 21-item Asthma Self-Care Practice Instrument (ASCPI), which measures the amount of time children and adolescents spend performing 21 different behaviors related to asthma symptom management, medication management, environmental control, and overall self-management (Fitzpatrick & Frey, 1993). A ratio scale of 0% to 100% was used for each item to indicate the percentage of time the behavior was performed. Higher ASCPI scores indicate better self-management. A panel of physicians and pediatric nurses established content validity for the original instrument. Out of the limited number of asthma self-management instruments available at the time of this study, this instrument was selected because it had been previously used among children and adolescents, including African Americans, with

Cronbach's alphas ranging from 0.82 to 0.92 (Kouba et al., 2013; Velsor-Friedrich et al., 2012; Velsor-Friedrich, Piggott, & Louloutes, 2004; Velsor-Friedrich, Piggott, & Srof, 2005). Cronbach's alpha in this study was 0.87.

**Illness Representations**—Illness representations were measured with the 56-item Illness Perceptions Questionnaire-Revised (IPQ-R) (Moss-Morris et al., 2002), which yields subscale scores for eight cognitive illness representations (perceptions of symptom identity, acute vs. chronic timeline, cyclical timeline, consequences, personal control, treatment control, cause, illness coherence) and one emotional illness representation. As recommended by Moss-Morris et al. (2002), the cause subscale score was based on factor analysis resulting in three perceived causal factors: psychological attributes (Cronbach's alpha = .75), risk factors (alpha = .67), and behavioral attributes (alpha = .63). To interpret IPQ-R scores, the following rules were used. High scores on the symptom identity, timeline, consequences, and cyclical dimensions respectively represent beliefs in more symptoms identified with the illness and beliefs that the condition is chronic, has more negative consequences, and is cyclical in nature. High scores on the personal control, treatment control, and coherence dimensions represent positive beliefs about the controllability of the illness and one's personal understanding of the condition (Moss-Morris et al., 2002). A high score on the emotion scale would mean that the person was responding to their asthma in a more negative way emotionally.

**Asthma Impairment**—Asthma impairment during the prior month was operationalized with the Asthma Control Test (ACT), which differentiates categories of impairment as *well controlled*, *not well controlled*, or *poorly controlled* (Nathan et al., 2004). These categories of asthma impairment are differentiated by degree of symptoms, level of activity, percentage of lung function, and exacerbations requiring oral corticosteroids (NHLBI, 2007). The asthma impairment categories were based upon a Likert type response scale used for five items that respectively address the level of disruption in school and home activities because of asthma symptoms, frequency of symptoms, nighttime awakenings, use of short-acting beta agonist medication, and self-evaluation of asthma control (Nathan et al., 2004).

Because the number of participants who scored *not well* or *very poorly controlled* was small, these data were collapsed into two categories, *well controlled* and *not well controlled*. Based on the ACT's cutoff recommendation, participants with scores of 19 or under were collapsed into the *not well controlled* category, and those with scores of 20 to 25 were classified as *well controlled*. The final asthma impairment categories consisted of 55 *well controlled* (35 males and 20 females) and 78 *not well controlled* adolescents (30 males and 48 females).

## Data Analysis

Differences in self-management by demographics were analyzed using analysis of variance for categorical variables and Pearson correlations for interval- and ratio-level variables. Descriptive statistics (means, standard deviations) were used to evaluate illness representations. Relationships between self-management total scores and the illness representations were measured using Pearson correlations. Variables identified as significantly ( $p < .05$ ) related to asthma self-management were included in a standard

regression model. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. All significant variables were entered into the regression model at once.

## Results

### Bivariate Associations

Table 1 shows differences in asthma self-management scores by demographics. The only factor related to self-management was that adolescents who had completed a formal asthma education program had significantly higher self-management scores than those who had not. Of those 26 participants who had had a formal asthma education program, most had participated in programs that occurred 1–2 years prior to the study (*SD* 2.16, range 1–11) and lasted for approximately 1 hour (*SD* 2.73, range 1–16). The three most reported settings for asthma education were hospitals (11.2%), camps for children and adolescents with asthma (3.8%), and schools (2.3%).

As shown in Table 2, illness representations scores were moderately high on illness coherence, personal control, and treatment control indicating fairly positive beliefs overall about their understanding of asthma and its controllability. Participants were likely to attribute the cause of their asthma to psychological attributes (such as attitudes about asthma and stress or worry about their asthma). Scores were low to moderate for the identity, emotional, and consequences subscales, indicating that most of the adolescents did not associate a large number of symptoms with their asthma, did not have many negative emotions about asthma, and did not perceive many negative consequences of asthma. Asthma was perceived as chronic with episodic exacerbations on the timeline dimensions.

Also shown in Table 2, there were small, but significant correlations between self-management and the cognitive illness representations of perceived consequences, treatment control, and illness coherence. Specifically, better self-management was associated with more perceived illness consequences, stronger beliefs in the treatment controllability of the disease, and better understanding of the illness.

### Factors Associated with Asthma Self-management

Included in the regression model were completion of a formal asthma education program (*yes/no*) and cognitive illness representation scores for consequences, treatment control, and illness coherence (Table 3). The model explained 25% of the variance in the total self-management score, and all predictor variables were significant in the model except perceptions of treatment control. Completion of a formal asthma education program, stronger beliefs in the personal impact and severity of asthma, and having a better understanding of asthma were associated with better asthma self-management.

## Discussion

Overall, our findings contribute to a greater understanding of factors associated with asthma self-management in African American adolescents aged 14 to 16 years old. Our study



hypothesis was only partially supported: self-management was not related to (1) gender or (2) level of asthma impairment.

Gender was not associated with self-management in bivariate analyses. Although Bruzzese et al. (2012) found that females had poorer medication self-management than males, their study was done in a mixed racial group of early adolescents.

Asthma impairment was not associated with asthma self-management in our adolescent study, unlike other studies that primarily included adults (Murphy et al., 2012; Nguyen, Zahran, Iqbal, Peng, & Boulay, 2011). Due to the small number of participants in the *not well* and *very poorly controlled* groups, we collapsed these groups which have affected our results. Further research is needed to disentangle equivocal findings regarding the relationships among self-management, gender, and asthma impairment.

Consistent with our hypothesis, self-management was related to completion of a formal asthma education program. Similar to our study, other studies have shown that adolescent education programs have a positive impact on asthma self-management (Britto et al., 2014; Mosnaim et al., 2011). Our finding is interesting given that participants had been exposed to short programs (approximately 1 hour) in the recent past (average 1–2 years prior). What is not clear is the effects of additional clinical reinforcements that could have occurred for those adolescents following the formal program. Also of importance is the fact that less than 20% of our African American adolescent participants had completed such a program. These findings support the importance of facilitating access to and reinforcing asthma education that is tailored to the needs and ethnocultural beliefs and practices of each patient in keeping with recommendations in the 2007 Expert Panel Report of the National Asthma Education and Prevention Program and Healthy People 2020 (NHLBI, 2007; USHHS, 2012). The findings also support the importance of evaluating the effects of asthma education interventions among adolescents to determine the most effective content, strategies, and intervention delivery platform to promote asthma self-management (NHLBI, 2007; Srof, Taboas, & Velsor-Friedrich, 2012).

Partially consistent with our hypothesis, self-management was related only to some illness representations. Our finding that the illness representation of perceived consequences was related to self-management is similar to findings among adults with asthma (Ohm & Aaronson, 2006). Adults rating their asthma as more severe had better symptom perceptual accuracy, which would be expected to result in better self-management. Thus, the ability to identify more symptoms and more illness consequences seem to be important to asthma self-management. Similarly, other studies have shown that assessing the perceived negative impact of asthma (i.e., consequences) is important (Rhee et al., 2009).

Our study is the only one to date to identify the illness coherence representation as a factor associated with adolescents' asthma self-management. The illness coherence representation is assessed by such responses as how puzzling participants' symptoms are to them, whether the illness seems mysterious to them, and how well they understand their illness. In our sample, scores on illness coherence showed that our sample had moderately high understanding of their illness (72% of the maximum score possible), suggesting it was not

puzzling or mysterious to them. Future studies should attempt to replicate our findings in adolescents of other racial and ethnic groups as well as older and younger adolescents. Assuming such corroboration, our finding suggests that adolescents' understanding of their asthma should be assessed in the clinical setting and information provided as needed.

Other illness representations (treatment control, identity of symptoms, emotional illness representations) were not fully associated with self-management. The treatment control illness representation was significantly correlated with self-management in bivariate comparisons, but was not significant in the regression model, which contrasts with studies done in adults in which treatment control perceptions predicted medication self-management (Horne & Weinman, 2002). These differences could be attributed to the fact that other studies measured medication adherence whereas we used a more comprehensive measure of asthma self-management (symptom management, medication management, and environmental control). In addition, neither the identity of symptoms illness representation or emotional illness representations was significant in the current study. This may be due to adolescents' inability to recognize their asthma symptoms. It may be important to educate adolescents about recognizing and responding to their own specific asthma symptoms. As mentioned earlier, emotional illness representations were also not significant in the current study.

### Implications

Clinicians should recognize the need to support middle adolescents as they transition into greater personal responsibility for asthma self-management, particularly African-Americans who have higher asthma prevalence and death rates. Information about factors influencing middle adolescents' self-management can help identify those at risk for poor asthma self-management. Based on our findings, recommendations for clinicians working with African-American middle adolescents with asthma are to provide access to developmentally appropriate, asthma education programs and for this education to be reinforced at all points of care (clinics, schools, pharmacies, etc.) (NHLBI, 2007). Importantly, our study is the first to indicate that clinicians need to be aware of the importance of illness representations. In particular, adolescents' beliefs about the consequences of having asthma should be assessed. Furthermore, during middle adolescence, it is important that adolescents' understanding of their illness is assessed and enhanced in order to improve their asthma self-management.

Our findings suggest there are health policy implications related to the availability and accessibility of formal asthma education programs for African American adolescents with asthma. There is also a need to have policies that require health care service plans to cover asthma self-management education for adolescents at all points of care including clinic-, home-, and school-based programs. Increasing participation in effective asthma self-management programs has the potential to improve such outcomes as level of asthma impairment, appropriate medication use, the number of hospitalizations and emergency department visits, school absences, and direct cost savings of emergency visits and hospitalizations (Meng, Pourat, Cosway, and Kominski, 2010; Rhee et al., 2012).



## Limitations

Study findings should be interpreted in light of study limitations. The study focused only on African Americans and therefore did not examine race as a factor associated with asthma self-management. The descriptive correlational design provided evidence about associations but not temporal prediction or causality. The sample size was moderate despite aggressive recruitment activities in a variety of settings. Even though the asthma impairment measure gave us three groups, we had to collapse these groups which could have affected the results. There were also limitations related to the initial publication and validity of the ASCPI. Finally, the regression analysis which only explained 25% of the variance in self-management suggests that other important factors may exist.

## Conclusion

In summary, our study identified factors associated with better self-management in 14–16 year old African American adolescents with asthma. These included having attended an asthma education program, perceiving more asthma consequences, and reporting greater understanding of the illness. These factors will be important to target in future longitudinal intervention research with larger samples. Further research is also needed regarding illness representations and other factors associated with improving African American adolescents' self-management. Such research could improve asthma outcomes and decrease health disparities for African American adolescents with asthma. Finally, the limited number of adolescent studies and resulting need to compare our findings with adult studies supports the need for developmentally appropriate studies of the illness representations and self-management of African American adolescents with asthma.

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## References

- Akimbami L, Moorman J, Garbe P, Sondik E. Status of childhood asthma in the United States, 1980–2007. *Pediatrics*. 2009; 123(Suppl 3):S131–S145. [PubMed: 19221156]
- Britto M, Vockell A, Munafo J, Schoettker J, Pruett R, Yi M, Byczkowski T. Improving outcomes for underserved adolescents with asthma. *Pediatrics*. 2014; 133(2):e418–e427. [PubMed: 24470645]
- Bruzzese J, Sheares B, Vincent E, Du Y, Sadeghi H, Levison M, Mellins R, Evans D. Effects of a school-based intervention for urban adolescents with asthma. *American Journal of Respiratory Critical Care Medicine*. 2011; 183(8):998–1006. [PubMed: 21139088]
- Bruzzese J, Stepney C, Fiorino E, Bornstein L, Wang J, Petkova E, Evans D. Asthma self-management is sub-optimal in urban Hispanic and African American/Black early adolescents with uncontrolled persistent asthma. *Journal of Asthma*. 2012; 49(1):90–97. [PubMed: 22149141]
- Bucks RS, Hawkins K, Skinner T, Horn S, Seddon P, Horne R. Adherence to treatment in adolescents with cystic fibrosis: The role of illness perceptions and treatment beliefs. *Journal of Paediatric Psychology*. 2009; 34(8):893–902.

- Cameron, L.; Leventhal, H. *Self-regulation, health, and illness: An overview*. New York, NY: Routledge; 2003.
- Chippis B, Zeiger R, Borish L, Wenzel S, Yegin A, Hayden M, Haselkorn T. Key findings and clinical implications from the epidemiology and natural history of asthma: Outcomes and treatment regimens (TENOR) study. *Journal of Allergy and Clinical Immunology*. 2012; 130(2):332–42. [PubMed: 22694932]
- Chippis B, Zeiger R, Dorenbaum A, Borish L, Wenzel S, Miller D, Haselkorn T. Assessment of asthma control and asthma exacerbation in the epidemiology and natural history of asthma: Outcomes and treatment regimens (TENOR) observational cohort. *Current Respiratory Care Reports*. 2012; 1(1): 259–269. [PubMed: 23136642]
- Clark N, Shah S, Dodge J, Thomas L, Andridge R, Little R. An evaluation of asthma interventions for preteen students. *Journal of School Health*. 2010; 80(2):80–87. [PubMed: 20236406]
- Fitzpatrick, M.; Frey, M. *Developing and testing of the Asthma Self-Care Practice Instrument*. Paper presented at the Midwest Nursing Research Society; Cleveland, OH. 1993.
- Gaston AM, Cottrell DJ, Fullen T. An examination of how adolescent-caregiver dyad illness representations relate to adolescents' reported diabetes self-management. *Child: Care, Health and Development*. 2011; 38(4):513–519.
- Gorina Y. Quick stats: Asthma death rates by race and age group—United States, 2007–2009. *Morbidity and Mortality Weekly Report*. 2012; 61(17):315.
- Guglani L, Havstad S, Ownby Y, Saltzgaber J, Johnson D, Johnson C, Joseph C. Exploring the impact of elevated depressive symptoms on the ability of a tailored asthma intervention to improve medication adherence among urban adolescents with asthma. *Allergy, Asthma, & Clinical Immunology*. 2013; 9(1):45–51.
- Hagger M, Orbell S. A meta-analytic review of the Common-Sense Model of Illness Representations. *Psychology and Health*. 2003; 18(2):141–184.
- Halm E, Mora P, Leventhal H. No symptoms, no asthma. *Chest*. 2006; 129(3):575–580.
- Horne R, Weinman J. Self-regulation and self-management in asthma: Exploring the role of illness perceptions and treatment beliefs in explaining non-adherence to preventer medication. *Psychology and Health*. 2002; 17(1):17–32.
- Jonnason M, Egmar A, Haller E, Kull I. Experiences of living with asthma—a focus group study with adolescents and parents of children with asthma. *Journal of Asthma*. 2014; 51(2):185–192. [PubMed: 24192017]
- Joseph CL, Havstad S, Johnson CC, Vinuya R, Ownby DR. Agreement between teenager and caregiver responses to questions about teenager's asthma. *Journal of Asthma*. 2006; 43(2):119–124. [PubMed: 16517427]
- Joseph CL, Ownby DR, Havstad SL, Saltzgaber J, Considine S, Johnson D, Johnson C. Evaluation of a web-based asthma management intervention program for urban teenagers: Reaching the hard to reach. *Journal of Adolescent Health*. 2013; 52(4):419–426. [PubMed: 23299008]
- Kouba J, Velsor-Friedrich B, Militello L, Harrison P, Becklenberg A, White B, Ahmed A. Efficacy of the I Can Control Asthma and Nutrition Now (ICAN) pilot program on health outcomes in high school students with asthma. *The Journal of School Nursing*. 2013; 29(3):235–247. [PubMed: 23169895]
- Leventhal, H.; Leventhal, E.; Schaefer, P. Vigilant coping and health behavior: A life span problem. In: Ory, M.; Abeles, R.; Lipman, P., editors. *Aging, health and behavior*. Newbury Park, CA: Sage; 1992. p. 109-140.
- MacKay, A.; Duran, C. DHHS Publication No. 2008–1034. Hyattsville, MD: U.S. Department of Health and Human Services; 2008. *Adolescent health in the United States, 2007*.
- Mammen J, Rhee H. Adolescent asthma self-management: A concept analysis and operational definition. *Pediatric Allergy, Immunology, and Pulmonology*. 2012; 25(4):180–189.
- Meng Y, Pourat N, Cosway R, Kominski G. Estimated Cost Impacts of Law to Expand Coverage for Self-Management Education to Children with Asthma in California. *Journal of Asthma*. 2010; 47(5):581–587. [PubMed: 20560832]
- Moss-Morris R, Weinman J, Petrie K, Horne R, Cameron L, Buick D. The Revised Illness Perception Questionnaire (IPQ-R). *Psychology and Health*. 2002; 17(1):1–16.

- Mosnaim G, Li H, Damitz M, Sharp L, Talate A, Mirza F, Powell L. Evaluation of the Fight Asthma Now (FAN) program to improve asthma knowledge in urban youth and teenagers. *Annals of Allergy, Asthma, and Immunology*. 2011; 107(4):310–316.
- Murphy K, Meltzer E, Blaiss M, Nathan R, Stoloff S, Doherty D. Asthma management and control in the United States: Results of the 2009 asthma insight and management survey. *Allergy and Asthma Proceedings*. 2012; 33(1):54–64. [PubMed: 22309716]
- Murray M, Stang P, Tierney W. Health care use by inner-city patients with asthma. *Journal of Clinical Epidemiology*. 1997; 50(2):167–174. [PubMed: 9120510]
- Naar-King S, Ellis D, King P, Lem P, Cunningham P, Secord E, Templin T. Multisystemic therapy for high-risk African American adolescents with asthma: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*. 2014; 82(3):536–545. [PubMed: 24588407]
- Naimi D, Freedman T, Ginsburg K, Bogen D, Rand C, Apter A. Adolescents and asthma: Why bother with our meds? *Journal of Allergy and Clinical Immunology*. 2009; 123(6):1335–1341. [PubMed: 19395075]
- Nathan R, Sorkness C, Kosinski M, Schatz M, Li J, Marcus P. Development of the Asthma Control Test: A survey for assessing asthma control. *Journal of Allergy and Clinical Immunology*. 2004; 113(1):59–65. [PubMed: 14713908]
- National Association of School Nurses. Joint statement on improving asthma management in schools. 2014. Retrieved from <http://www.lung.org/lung-disease/asthma/becoming-an-advocate/national-asthma-public-policy-agenda/joint-statement-improve-asthma-mgmt-schools.pdf>
- National Heart, Lung, and Blood Institute of the National Institutes of Health, United States Department of Health & Human Services. NIH Publication 97–4053. Author; 2007. Practical guide for the diagnosis and management of asthma: Expert Panel 3 Report.
- Nguyen K, Zahran H, Iqbal S, Peng J, Bouley E. Factors associated with asthma control among adults in five New England states, 2006–2007. *Journal of Asthma*. 2011; 48(6):581–588. [PubMed: 21668319]
- Nurmagambetov T, Barnett S, Jacob V, Chattopadhyay S, Hopkins D, Crocker D, Kinyola S. Economic value of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity a community guide systematic review. *American Journal of Preventive Medicine*. 2011; 41(2 Suppl1):S33–47. [PubMed: 21767734]
- Ohm R, Aaronson L. Symptom perception and adherence to asthma controller medications. *Journal of Nursing Scholarship*. 2006; 38(3):292–297. [PubMed: 17044348]
- Pawar V, Smith M. Asthma-related healthcare services utilization by African Americans enrolled in West Virginia Medicaid. *Respiratory Medicine*. 2006; 100(9):1579–1587. [PubMed: 16495039]
- Radzik, M.; Sherer, S.; Neinstein, L. Psychosocial development in normal adolescents. In: Neinstein, L.; Gordon, C.; Katzman, D.; Rosen, D.; Woods, E., editors. *Adolescent health care: A practical guide*. 5. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins; 2008. p. 27-31.
- Rand C, Wright R, Cabana M, Foggs M, Halterman J, Olsen L, Vollmer W, Taggart V. Mediators of asthma outcomes. *Journal of Allergy and Clinical Immunology*. 2012; 129(3):S136–S141. [PubMed: 22386506]
- Rhee H, Belyea M, Ciurzynski S, Brasch J. Barriers to asthma self-management in adolescents: Relationships to psychosocial factors. *Pediatric Pulmonology*. 2009; 44(2):183–191. [PubMed: 19142893]
- Rhee H, McQuillen B, Belyea M. Evaluation of a peer led asthma self-management program and benefits of the program for adolescent peer leaders. *Respiratory Care*. 2012; 57(12):2082–2089. [PubMed: 22710616]
- Rhee H, Pesis-Katz I, Xing J. Costs benefits of a peer-led asthma self-management program for adolescents. *Journal of Asthma*. 2012; 49(6):606–613. [PubMed: 22758599]
- Sadof M, Kaslovsky R. Adolescent asthma: A developmental approach. *Current Opinions in Pediatrics*. 2011; 23(4):373–378.
- Srof B, Taboas P, Velsor-Friedrich B. Asthma education programs for teens: Review and summary. *Journal of Pediatric Health Care*. 2012; 26(6):418–426. [PubMed: 23099308]
- U.S. Department of Health and Human Services. *Healthy People 2020*. Washington, DC: 2012. Office of Disease Prevention and Health Promotion. Available at [www.healthypeople.gov/2020](http://www.healthypeople.gov/2020)

- Velsor-Friedrich B, Militello L, Richards M, Harrison P, Gross I, Romero E, Bryant F. Effects of coping-skills training in low-income urban African American adolescents with asthma. *Journal of Asthma*. 2012; 49(4):372–379. [PubMed: 22352813]
- Velsor-Friedrich B, Piggott T, Louloudes A. The effects of a school-based intervention on the self-care and health of African American inner city children with asthma. *Journal of Pediatric Nursing*. 2004; 19(4):247–256. [PubMed: 15308974]
- Velsor-Friedrich B, Piggott T, Srof B. A practitioner based asthma intervention program with African American inner-city school children. *Journal of Pediatric Health Care*. 2005; 19(3):163–171. [PubMed: 15867832]
- Zahran H, Person C, Bailey C, Moorman J. Predictors of asthma self- management education among children and adults-2006–2007 behavioral risk factor surveillance system asthma call back survey. *Journal of Asthma*. 2012; 49(1):98–106. [PubMed: 22216949]
- Zugelj U, Zupancic M, Komidar L, Kendar R, Varda N, Gregoric A. Self-reported adherence behaviour in adolescent hypertensive patients: The role of illness representations and personality. *Journal of Pediatric Psychology*. 2010; 35(9):1049–1060. [PubMed: 20430840]

### Highlights

- We contributed to the limited studies of African American adolescents with asthma
- We examined factors related to asthma self-management
- Completion of an asthma education program was associated with better asthma self-management
- Perceiving more asthma consequences was associated with better asthma self-management
- Having a greater understanding of asthma was associated with better asthma self-management

**Table 1**

Differences in Self-management Scores (ASCPI Total) by Demographics

Background Characteristics	n (%)	ASCPI Total	p
Gender			.602
Male	65 (48.9)	112.52 (34.27)	
Female	68 (51.1)	109.28 (35.05)	
Asthma Impairment			.264
Well Control	55 (41.4)	106.75 (33.71)	
Not Well Control	78 (58.6)	113.77 (35.84)	
Grade in School			.420
7 <sup>th</sup> , 8 <sup>th</sup> grades	31 (23.3)	110.58 (38.26)	
9 <sup>th</sup> grade	43 (32.3)	116.44 (36.69)	
10 <sup>th</sup> grade	44 (33.1)	104.14 (34.70)	
11 <sup>th</sup> , 12 <sup>th</sup> grades	15 (11.3)	115.20 (28.87)	
Sites of asthma care			.926
General physician	72 (54.1)	109.17 (34.61)	
Health department clinic	18 (13.5)	114.50 (33.33)	
Specialist	35 (26.3)	111.51 (44.92)	
Emergency department	8 (6.0)	115.13 (35.62)	
<b>Completion of formal asthma education</b>			<b>.001</b>
Yes	26 (19.5)	132.27 (29.99)	
No	107 (80.45)	105.66 (35.05)	
Frequency participant smokes			.188
Never	126 (94.7)	109.90 (36.11)	
Occasionally	7(5.3)	128.14 (19.76)	
Daily	0	110.86 (35.62)	
Number of smokers in the home			.490
0	85 (63.9)	109.16 (37.19)	
1	27 (20.3)	118.19 (35.41)	
2 or more	21 (15.8)	108.33 (29.09)	
Description of smoking in the home			.220
Allowed in any common room	13(9.8)	98.54 (34.35)	
Permitted in a part of the home where I rarely go	24 (18.0)	110.67 (37.22)	
No smoking at all	96(73.7)	110.33 (35.19)	
Smoking in family's car			.943
Allowed in car	8(6.0)	108.63 (32.17)	
Allowed if windows down	27 (20.3)	112.78 (35.31)	
No smoking at all	98 (73.7)	110.52 (36.28)	
Parents marital status			.285
Married	46 (34.6)	110.83 (35.98)	
Divorced	22 (16.5)	103.00 (39.61)	
Never married	35 (26.3)	106.29 (30.91)	



Background Characteristics	n (%)	ASCPI Total	p
Separated	24 (18.0)	119.88 (36.96)	
One or both parents have died	6(4.5)	130.67 (34.69)	
Who participants live with			.904
Mother	72 (54.1)	112.79 (34.22)	
Father	4(3.0)	111.25 (21.09)	
Both	52 (39.1)	108.85 (39.46)	
Guardian or both	5(3.8)	103.80 (26.93)	
Highest education of mother			.670
Less than High School	12(9.0)	117.50 (31.88)	
High School	56 (42.1)	107.43 (32.99)	
Assoc-Vocational	28 (21.1)	117.43 (37.11)	
BS/MS/ or Higher	30 (22.6)	107.17 (41.79)	
I don't know	7(5.3)	116.57 (30.66)	
Highest education of father			.232
Less than High School	16 (12.0)	93.25 (44.52)	
High School	50 (37.6)	112.24 (34.23)	
Assoc-Vocational	10(7.5)	104.90 (28.00)	
BS/MS/ or Higher	23 (17.3)	112.48 (40.09)	
I don't know	34 (25.6)	117.79 (30.57)	
Any day family went hungry			.143
Yes	3(2.3)	81.00 (32.51)	
No	130 (97.8)	111.55 (35.51)	
Money your family has for living			.525
Family does not have enough	18 (13.5)	102.06 (41.40)	
Family has just enough	95 (71.4)	112.51 (34.13)	
Family has more money than we need	20 (15.0)	111.00 (37.88)	
Background Characteristics	M (SD)	Pearson's r	p
Age	15.48 (.80043)	.005	.958
Years Since Diagnosed	10.83 (4.679)	.002	.983

ASCPI = Asthma Self-Care Practice Instrument

**Table 2**

Descriptive Statistics for Illness Representations and Pearson Correlations between Asthma Self-management and Illness Representations

Illness Representations	Mean (SD)	ASCPI Total	
		r	p
Cognitive			
Identity	5.55 (2.32)	.143	0.10
Acute/Chronic Timeline	19.11 (4.62)	.033	0.70
Cyclical Timeline	12.92 (3.29)	-.039	0.65
<b>Consequences</b>	16.57 (4.65)	<b>.190</b>	<b>0.03</b>
Personal Control	22.49 (3.61)	.088	0.31
<b>Treatment Control</b>	18.75 (3.03)	<b>.223</b>	<b>0.01</b>
<b>Illness Coherence</b>	18.05 (4.66)	<b>.269</b>	<b>0.00</b>
Causes			
Psych Attributes	13.98 (4.58)	-.033	0.71
Risks	7.89 (3.18)	.055	0.53
Behavioral	6.34 (2.53)	-.058	0.51
Emotional Representations	13.18 (4.67)	.039	0.65

ASCPI = Asthma Self-care Practice Instrument

**Table 3**

Factors Associated with Asthma Self-management in African-American Adolescents (N=133)

<b>Regression Model</b>	<b><math>\beta</math></b>
Demographics	
Formal Asthma Education	.327***
Cognitive Illness Representations	
Consequences	.187*
Treatment Control	.133
Illness Coherence	.230**
R <sup>2</sup>	.251
F	10.719***

\*  
p<.05.\*\*  
p<.01.\*\*\*  
p<.001 $\beta$  = standardized regression coefficient

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