Published in final edited form as:

J Adolesc Health. 2016 November ; 59(5): 543–548. doi:10.1016/j.jadohealth.2016.06.010.

Psychological Factors Influencing the Decision of Urban Adolescents with Undiagnosed Asthma to Obtain Medical Care

Jean-Marie Bruzzese, Ph.D.,

Office of Scholarship and Research, Columbia University School of Nursing, 630 West 168th Street, Mail Code 6, New York, NY 10021

Sharon Kingston, Ph.D.,

Department of Psychology, Dickinson College, P.O. Box 1773, Carlisle, PA 17013, kingstos@dickinson.edu

Yihong Zhao, Ph.D.,

Department of Child and Adolescent Psychiatry, NYU School of Medicine, One Park Avenue, 7 FL, New York, NY 10016, Yihong.Zhao@nyumc.org

John S. DiMeglio, B.A.,

Department of Child and Adolescent Psychiatry, NYU School of Medicine, One Park Avenue, 7 FL, New York, NY 10016, johndimeglio7@gmail.com

Amarilis Cespedes, M.P.H., and

Department of Child and Adolescent Psychiatry, NYU School of Medicine, One Park Avenue, 7 FL, New York, NY 10016, acespedes81@yahoo.com

Maureen George, Ph.D., R.N., A.E.-C, F.A.A.N.

Columbia University School of Nursing, Office of Scholarship and Research, 630 West 168th Street, New York, NY 10032, mg3656@cumc.columbia.edu

Abstract

Purpose—Adolescents are low users of medical care. Psychological factors and perceived reasons to not seek routine medical care may increase the risk of non-use by adolescents with undiagnosed asthma. This study tests if psychological factors were associated with seeing a medical provider for asthma-like symptoms; identifies adolescents' perceived reasons for not obtaining care; explores if psychological factors are associated with these perceptions; and explores if asthma severity moderates the relationships with psychological factors.

Methods—We analyzed cross-sectional data from a baseline assessment of 349 urban, primarily ethnic minority adolescents with moderate to severe asthma-like symptoms but no asthma diagnosis who were enrolled in a controlled trial.

Corresponding Author: jb3958@cumc.columbia.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Conflict of Interest: The authors have no actual or potential conflicts of interest, either personal or financial.

Results—The odds of seeing a provider for their asthma-like symptoms were significantly higher for those with asthma-related anxiety (OR: 1.644; 95% CI: 1.242–2.176) and depressive symptoms (OR: 1.031; 95% CI: 1.004–1.059). The most commonly endorsed reason for non-care included a characterization of symptoms as not serious, past medical visits not diagnosed as asthma, fear of diagnosis, busy lifestyles, and not wanting medication. Psychological factors were not related to the number of reasons or to most of the commonly endorsed reasons. Adolescents with more asthma-related anxiety were less likely to characterize their breathing problems as serious (OR=0.0583; 95% CI: 0.424–0.802), and were more likely to report busy lifestyles (OR=1.593; 95% CI: 1.122–2.261).

Conclusions—Adolescent-perceived reasons for non-care were not pragmatic, but instead highlighted denial. Asthma-related anxiety was the most robust psychological factor associated the decision to seek medical care.

Keywords

Barriers to medical care; asthma; adolescents; urban; routine health care utilization

Childhood asthma affects almost 9% of individuals under age 18 in the US [1]. Adolescents are a particularly vulnerable group because compared to younger children, adolescents have a higher disease prevalence [1], suffer asthma attacks more frequently [2], and have higher asthma mortality rates [2, 3]. Up to 49% of symptomatic children, ages 1 – 17, are undiagnosed [4]. Disease severity is similar, if not worse among undiagnosed youth, relative to their diagnosed counterparts [5, 6]. Undiagnosed youth have appreciable morbidity and activity limitations due to their asthma-like symptoms [6, 7].

These findings are alarming given that adolescents utilize routine health care less frequently than children [1-3]. Given the potential seriousness of asthma, understanding reasons for not obtaining routine health care among symptomatic yet undiagnosed adolescents is an important step in helping them obtain a diagnosis and treatment, and potentially begin to develop a long-term relationship with a medical provider.

Few studies examine psychological factors associated with health care utilization among adolescents. Anxiety and depressive symptoms have been associated with an increase in pediatric healthcare [8, 9]. Among adolescents with asthma, those with a comorbid anxiety and/or depressive disorder reported more primary care visits than those without a mental health diagnosis [10]. Anxiety regarding asthma has been linked to health care in adults, with increased utilization associated with low and high asthma-related anxiety [11, 12]. This relationship has yet to be studied in adolescents. Further, the relationship of psychological factors and health care utilization has not been studied among adolescents who present with asthma-like symptoms, but who have yet to be diagnosed, representing an important limitation in pediatric research.

Disease severity has been found to be associated with an increase in primary care consultations in adolescents and adults diagnosed with asthma [13]. Relative to youth with controlled asthma, those with uncontrolled asthma have more asthma-related medical visits

[14]. Despite the role of asthma severity in health care utilization, its potential interaction with psychological factors has yet to be examined in this context.

To address these gaps, in a sample of predominately African American and Latino urban adolescents with undiagnosed asthma, this study sought: (1) to test for differences in psychological factors (i.e., anxiety, depression, and stress) among those who see and do not see a medical provider for routine care of their asthma-like symptoms; and among those who did not see a provider (2) to characterize their perceived reasons for not obtaining routine health care for their asthma-like symptoms; (3) to explore whether psychological factors were associated with the number and type of reported reasons; and (4) to explore if asthma severity moderates the relationships with psychological factors. It was hypothesized that adolescents with poorer psychological functioning would be more likely to report seeing a medical provider and that asthma severity would weaken this relationship.

Methods

Participants

Data were part of the baseline assessment of adolescents who participated in a randomized controlled trial (RCT) testing the efficacy of a school-based intervention to help adolescents who report symptoms consistent with moderate to severe persistent asthma, but no diagnosis, obtain a clinical evaluation, diagnosis, and medication, if appropriate [15]. The institutional review boards of the New York University School of Medicine, Columbia University, and the New York City Department of Education approved study procedures.

Participants were 349 adolescents enrolled in grades 9 through 11 in New York City public high schools with probable undiagnosed moderate to severe persistent asthma. Asthma status was determined using a case detection survey administered in class to students.

Adolescents eligible for the RCT indicated that they were never diagnosed with asthma, reactive airway disease, or wheezy bronchitis, and on two validated screening instruments [16, 17], had to endorse at least three out of seven markers of uncontrolled asthma [16], and report symptoms of moderate to severe persistent asthma in the prior year [17]. Participants were enrolled between 2009 and 2012 from 20 high school campuses. Following parental consent and student assent, trained study staff interviewed the adolescents, who were compensated \$20 for their baseline assessments. Caregivers provided their demographic characteristics via telephone; the New York City Department of Education provided the percent of students in each school eligible for free or reduced lunch.

Outcome Measures

Seeing a Medical Provider—Adolescents reported the number of times in the past two months they saw a provider for routine, scheduled or unscheduled treatment for wheezing, coughing, chest tightness, or other breathing problems. Because this study set out to understand reasons for not obtaining routine care, acute care visits (i.e., emergency room visits and hospitalizations) were excluded as these types of visits differ from routine care, including patients potentially being seen for more severe symptoms, lack of follow-up, and absence of being able to develop a long-term relationship with a medical provider. We

collapsed responses into yes/no. Self-reported health care utilization has been found to be a valid proxy in the absence of medical claims and administrative data, especially when the recall period is relatively short [18].

Perceived Reasons for Not Seeing a Medical Provider—An investigator-developed list of reasons for not seeing a medical provider was created from a literature review of relevant adolescent studies and the investigators' collective clinical experiences. Ten adolescents with asthma and five experts in pulmonary medicine and/or adolescence reviewed this list for relevance and completeness; no additions/deletions or revisions were made. Adolescents who did not report seeing a medical provider in the prior two months indicated how much they agreed with each of 12 reasons (1=Strongly Disagree; 4=Strongly Agree). For each reason, we collapsed the Likert scale into "Yes, a Reason to Not Seek Care" and "Not a Reason", and summed the number of positively endorsed responses to calculate the aggregate number of reasons.

Potential Predictors of Seeing a Medical Provider and Reasons to Not Obtain Care

Generalized Anxiety—Adolescents indicated the extent to which 9-items of the generalized anxiety subscale of the *Screen for Child Anxiety Related Disorders* (SCARED) [19] are true of them (0=Not True/Hardly Ever True to 2=True/Often True). Items were summed, with higher scores indicating greater levels of general anxiety.

Asthma-related anxiety—Adolescents completed an adapted version of the *Youth Asthma-related Anxiety Scale* (YAAS) [20], a 10-item validated measure assessing how nervous or worried they were about their breathing problems in the prior two weeks using a 6-point scale (0=Never to 5=Always). Because the adolescents in this study did not have diagnosed asthma, the word "asthma" from the original scale was replaced with "breathing problems" for each item. Higher mean scores indicate greater levels of asthma-related anxiety.

Depression—To assess depression, adolescents completed the *Center for Epidemiologic Studies Depression Scale* (CES-D) [21] to indicate how often in the past week they experienced each of 20 items that assess depressive symptoms over the past week (0=Rarely or None of the Time [Less than 1 Day] to 3=Most or All of the Time [5-7 Days]). Higher total scores indicate higher levels of depressive symptoms.

Stress—We assessed psychological stress using the 4-item *Perceived Stress Scale* (PSS4) [22], which measures the degree to which adolescents felt their lives were unpredictable, uncontrollable, and overwhelming in the preceding month (0=Never to 4=Very Often). Higher total scores indicate greater perceived stress.

Asthma Severity—Adolescents' asthma severity was determined by their responses on the case detection form to determine study eligibility, where they indicated how frequently they had each of six asthma symptoms in the last 12 months (5=Every Day and All the Time; 0=Never or Rarely (0-4 Days/Year)) [17]. The National Heart Lung & Blood Institute criteria [23] was applied to determine their severity classification, where moderate persistent

asthma was defined as having daytime symptoms every day, but not all the time, or night wakening 3 – 6 days a week, and severe persistent as having daytime symptoms every day and all the time, or night wakening every day.

Statistical Analyses

We used descriptive statistics to characterize the sample with respect to demographic and clinical characteristics, rates of seeing a medical provider, and perceived reasons to not seek care. Next, we tested the relationship between psychological factors, and obtaining medical care and perceived reasons to not seek care. Primary outcomes were (1) self-reported medical care (yes/no), (2) the total number of perceived reasons, and (3) the six most frequently endorsed reasons (yes/no). We chose to model the six most frequently endorsed reasons because at least 40% of the adolescents endorsed them, whereas the least endorsed reasons were endorsed by only 10 – 26% of the participants. We used generalized linear models to test whether psychological characteristics were associated with each of the outcome measures. Logit link function was used for the binary outcomes and log link function when the outcome was the total number of reasons endorsed. Each outcome was modeled as a function of the scores on the general anxiety subscale of the SCARED, the YAAS, the CES-D, and the PSS4. Cohort (i.e., students enrolled at a given campus during a study year) was entered as random effect in all models to control for potential cohort effects. We controlled for age, gender, ethnicity, and asthma severity as these have been found to be associated with health care utilization [24-26]. Of the 349 adolescents, 58 were excluded from the analyses involving reasons for not seeking care because they reported seeing a medical provider in the prior two months for breathing problems resulting in a sample of 291 for these analyses. Data were analyzed using SPSS Statistics, version 20.0, and SAS, version 9.3. Statistical significance was set at $\alpha=0.05$.

Results

Table 1 provides adolescent demographic and clinical characteristics. Briefly, their mean age was 15.8, the vast majority were female (82.8%) and ethnic minorities (45.8% Hispanic/Latino; 37.2% African American/Black). Slightly more reported symptoms consistent with moderate persistent asthma than severe persistent asthma (53.3% and 46.7%, respectively). Access to care was relatively high with 84.5% reporting they had health insurance, and 90.3% reporting they had a provider or clinic. Among those who knew the type of insurance they had, Medicaid (66.8%) was the most common. Among those who reported having a provider or clinic, 94.9% reported usually or always seeing the same provider. Approximately 2/3 of the adolescents' caregivers (n=240) provided demographic information: 64% were currently employed at least part-time; 36.7% had a less than high school level education, 25.0% had a high school diploma, 24.6% had some college or specialized training, and 13.8% had a college or graduate degree. Nearly half (44.7%) were married or living with someone. On average 76.3% of the students at each campus were eligible for free or reduced lunch.

Seeing a Medical Provider for Asthma-like Symptoms: Rates and Predictors

Among the sample 16.6% (n=58) reported seeing a medical provider in the prior two months for their asthma-like symptoms. Controlling for demographic characteristics and asthma severity, neither general anxiety symptoms nor perceived stress were significantly related to seeing a provider for their asthma-like symptoms. However, the odds of reporting seeing a provider for their asthma-like symptoms was significantly higher for asthma-related anxiety (for one unit increase in asthma-related anxiety, odds ratio (OR): 1.644; 95% confidence interval (CI): 1.242–2.176; $P < .01$) and for depressive symptoms (for one unit increase in depressive symptoms, OR: 1.031; 95% CI: 1.004–1.059; $P = 0.02$).

Perceived Reasons for Not Seeing a Medical Provider

On average, adolescents reported a total of 4.0 reasons for not seeing a provider for their asthma-like symptoms ($SD=2.0$), with 48.6% reporting two to four reasons, and 38.7% reporting five to seven reasons. The six most commonly endorsed reasons (Table 2) were: (1) My breathing problems are not serious; (2) I saw a provider for my breathing problems and he/she did not tell me I have asthma; (3) I do not want to be told by a provider that I have asthma; (4) My parent/caregiver does not think I need to see a provider for my breathing problems; (5) I am busy with other things in my life right now; and (6) I do not want to take medication for breathing problems. Only 10.3% of the adolescents reported not having a medical provider as a reason for not seeking care, and only 12.4% reported not having health insurance as a reason.

Predictors of Perceived Reasons for Not Seeing a Medical Provider

Controlling for cohort and asthma severity, none of the psychological factors were significantly related to the total number of perceived reasons. When we considered individual reasons, general anxiety symptoms, depressive symptoms, and perceived stress were not related to any of the six most commonly endorsed reasons. Asthma-related anxiety was associated with two individual reasons: adolescents with more asthma-related anxiety were less likely to endorse that their breathing problems were not serious (OR = 0.0583; 95% CI: 0.424 – 0.802; $P < .001$), and were more likely to report that they were busy with other things in their lives (OR = 1.593; 95% CI: 1.122 – 2.261; $P < .01$). Asthma severity did not significantly interact with the psychological factors.

Discussion

This study expands the existing knowledge base regarding urban adolescent health care utilization by characterizing the rates of routine medical visits, perceived reasons for not obtaining such care, and the role of psychological functioning on healthcare utilization and reasons for not seeking care. Little evidence exists regarding health care utilization among adolescents who present with asthma-like symptoms but who are yet to be diagnosed.

Despite the frequency with which the adolescents reported experiencing asthma-like symptoms, the vast majority reported they did not seek routine medical care. The adolescent-perceived reasons for not seeking care were not pragmatic – a relatively small proportion in this low-income sample indicated that they did not seek care because of a lack

of medical insurance or medical provider. This somewhat surprising finding may be due to the location in which the data were collected. It is possible that a lack of health insurance is less of a reason in New York City, the location of this study, which may have better Medicaid coverage and a larger network of publically funded clinics than other localities.

Several of the most commonly endorsed reasons – the youth believe their symptoms are not serious, they are resistant to obtaining a diagnosis or to taking medications, and they believe their caregiver does not think the adolescent needs to see a provider – highlight denial on the part of the adolescent and/or their caregiver. These findings complement other studies with adolescents with diagnosed asthma that document symptom denial [27, 28] due to inaccurate perceptions or underestimation of the consequences of untreated asthma; studies have linked denial to increased emergency room visits and hospitalizations in adolescents [27, 28]. It appears that the use of denial extends to adolescents with undiagnosed asthma. It may also reflect fear or stigma; both have been associated with failure to access medical care [29].

The fact that the second most frequently endorsed reason for not seeking care was that adolescents had seen a provider for their asthma-like symptoms and had been informed that they did not have asthma is of concern. This reluctance to go back to a provider for a clinical evaluation of their symptoms may be due to disappointment with the outcomes of previous visits, mistrust of the provider [30], or the belief (real or not) that their symptoms was due to some condition other than asthma. However, preliminary results from the larger trial from which this data was drawn revealed that the majority of adolescents who obtained a medical evaluation were in fact diagnosed with asthma [31]. Alternatively, the adolescents may have been diagnosed with asthma in the past and do not recall the diagnosis or were not informed of the diagnosis by their caregivers. Another potential explanation for this reason is clinical inertia by the providers. Some providers are not aware of the asthma guidelines [32], and others fail to adhere the guidelines [32-35].

Taken together, the perceived reasons for not seeking care suggest that urban adolescents and their caregivers would benefit from interventions to help them accurately estimate the symptom severity, understand the consequences of untreated asthma-like symptoms, and employ active, direct coping strategies to address fear of diagnosis or stigma, as well as a disinclination towards treatment. These interventions may also focus on ways the adolescents can establish a trusting relationship with their providers. Such interventions could take place in schools, community health centers, school-based health centers, and potentially all primary care clinical settings; additionally, social marketing campaigns could be utilized. Further, medical providers who treat urban adolescents would also benefit from education regarding the use of the current guidelines in order to obtain an accurate diagnosis. Local departments of health and/or professional organizations might be best situated to deliver such interventions in order to maximize the reach to medical providers. Delivering the family and provider interventions, as well as offering the public health campaigns, concurrently may increase the likelihood that youth will receive the appropriate diagnosis and care, above and beyond that if either intervention was delivered in isolation.

Psychological functioning, particularly asthma-related anxiety, was associated with the likelihood that youth would seek a routine medical evaluation for their asthma-like

symptoms and was associated with two reasons for not obtaining care: (1) breathing problems not perceived as serious; and (2) busy lifestyles. Adolescents who reported more anxiety related to their asthma-like symptoms and a greater number of depressive symptoms were more likely to seek a medical evaluation for their asthma-like symptoms. These results are consistent with studies that have established a relationship between depressive and anxiety symptoms and more frequent medical care visits in general [9, 10]. Similarly, individuals with asthma and more depressive symptoms have been found to report more frequent urgent care visits and a lower asthma-related quality of life [36]. Perhaps a willingness to seek routine medical care reflects a need for relief from both the physical symptoms of asthma and the co-existing psychological encumbrances.

The link between greater asthma-related anxiety and being more likely to seek a medical evaluation suggests that a certain amount of concern regarding the symptoms is needed to motivate adolescents into action. Consistent with studies with adults, lower levels of anxiety may be associated with denying the importance of symptoms [37], which may lead to a delay in seeking care. Anxiety regarding their symptoms, therefore, may serve as a warning sign of danger, and coupled with the potentially urgent nature of their asthma-like symptoms, may prompt the adolescent to see a medical provider [38].

This argument is further supported by our findings that adolescents with increased asthma-related anxiety were less likely to endorse the reason that their breathing problems were not serious. Also, with increased anxiety the adolescents were more likely to endorse that being busy was a reason for not seeking medical care. It may be that this group of adolescents acknowledges the severity of their symptoms, but busyness typical of adolescent lifestyles may preclude them from seeing a provider for their asthma-like symptoms, which in turn, increases their anxiety about their symptoms.

Adolescents in our study with more anxiety regarding their symptoms and more depressive symptoms were equally likely to seek a medical evaluation regardless of whether they are experiencing moderate persistent or severe persistent asthma symptoms. This supports a previous study in adolescents that found asthma severity, and anxiety and depression disorders exerted independent effects on social functioning and asthma functional status [39]. This finding should be interpreted cautiously, given the relatively minimal variation in severity among those enrolled in our study. It is plausible that these findings would not generalize to adolescents experiencing less severe symptoms.

Limitations

Several study limitations warrant caution in interpreting our findings. The cross-sectional study design precludes causal interpretations. Inclusion of only adolescents who report never being diagnosed with asthma, but who have moderate to severe asthma-like symptoms limits generalizability to those diagnosed asthma and to those with less severe asthma. Also, we only asked the reasons for not seeking care to those who failed to seek medical care recently (i.e., in the prior two months); those who saw a medical provider recently may have different reasons for not seeing a provider in the past that they overcame. Future studies might benefit by comparing reasons for not seeing a provider among adolescents with and without a diagnosis, among those with varying levels of severity, and among those who seek care and

those who do not. We also made use of self-reported data, which introduces potential recall bias for frequency of health care utilization and for inaccuracies in identifying real versus perceived reasons. We recruited study participants from over 20 school campuses throughout New York City, which impeded our ability to confirm the validity of self-reported health care use against chart audits. However, we had a relatively brief period of recall (i.e., 2 months), and the optimal recall period for self-report of routine medical care is believed to be approximately six months or fewer for adolescents [40], which helped to minimize recall errors. Because participants did not have an asthma diagnosis, we modified the *Youth Asthma-related Anxiety Scale*, which may have changed the psychometrics for this validated measure.

Despite these limitations, the study provides important insights into perceived reasons low-income urban adolescents do not obtain appropriate health care even when they are experiencing frequent and noticeable symptoms of a potentially fatal disease. Asthma education for adolescents, their caregivers, and medical providers needs to address these important issues. Adolescents and their caregivers need to be aware of the consequences of untreated asthma and how to discuss their symptoms with medical providers; educational interventions for families delivered in a broad range of settings and public health campaigns are recommended to achieve this. Medical providers need to be aware that lack of awareness of the seriousness of the disease and the resistance to obtaining a diagnosis and treatment for asthma may preclude adolescents from seeking treatment. Given the potential seriousness of asthma, such interventions may help adolescents obtain a diagnosis and treatment, and potentially begin to develop a long-term relationship with a medical provider. Offering all three types of interventions simultaneously may reinforce change in families and in providers, and have a synergistic effect on youth seeking care and obtaining an appropriate diagnosis and treatment.

Acknowledgments

Funding Source: This study were supported by an NIH grant, R01HL089493, to the first author. The sponsor had no role in the study design; in the collection, analysis and interpretation of data; in the writing of this manuscript; and in the decision to submit the manuscript for publication.

References

- [1]. Bloom B, Jones LI, Freeman G. Summary health statistics for U.S. children: National Health Interview Survey, 2012. *Vital Health Stat.* 2013; 10:1–81.
- [2]. Akinbami LJ, Schoendorf KC. Trends in childhood asthma: prevalence, health care utilization, and mortality. *Pediatrics.* 2002; 110:315–322. [PubMed: 12165584]
- [3]. Akinbami LJ, Moorman JE, Garbe PL, et al. Status of childhood asthma in the United States, 1980-2007. *Pediatrics.* 2009; 123(Suppl 3):S131–S145. [PubMed: 19221156]
- [4]. Coker TR, Kaplan RM, Chung PJ. The association of health insurance and disease impairment with reported asthma prevalence in U.S. children. *Health Serv Res.* 2012; 47:431–445. [PubMed: 22091849]
- [5]. Gerald JK, Sun Y, Grad R, et al. Asthma morbidity among children evaluated by asthma case detection. *Asthma morbidity among children evaluated by asthma case detection.* 2009; 124:e927–933.

- [6]. van Gent R, van der Ent CK, van Essen-Zandvliet LE, et al. No differences in physical activity in (un)diagnosed asthma and healthy controls. *Pediatr Pulmonol*. 2007; 42:1018–1023. [PubMed: 17902143]
- [7]. Nichols B, Scott L, Jones S, et al. Detection of undiagnosed and poorly controlled asthma in a hospital-based outpatient pediatric primary care clinic using a health risk assessment system. *J Asthma*. 2009; 46:498–505. [PubMed: 19544172]
- [8]. Bernal P, Estroff DB, Abouadarham JF, et al. Psychosocial morbidity: the economic burden in a pediatric health maintenance organization sample. *Arch Pediatr Adolesc Med*. 2000; 154:261–266. [PubMed: 10710024]
- [9]. Ferrin M, Gledhill J, Kramer T, et al. Factors influencing primary care attendance in adolescents with high levels of depressive symptoms. *Soc Psychiatry Psychiatr Epidemiol*. 2009; 44:825–833. [PubMed: 19247561]
- [10]. Richardson LP, Russo JE, Lozano P, et al. The effect of comorbid anxiety and depressive disorders on health care utilization and costs among adolescents with asthma. *Gen Hosp Psychiatry*. 2008; 30:398–406. [PubMed: 18774422]
- [11]. Dirks JF, Kinsman RA, Horton DJ, et al. Panic-fear in asthma: rehospitalization following intensive long-term treatment. *Psychosom Med*. 1978; 40:5–13. [PubMed: 637908]
- [12]. Feldman JM, Siddique MI, Thompson NS, et al. The role of panic-fear in comorbid asthma and panic disorder. *J Anxiety Disord*. 2009; 23:178–184. [PubMed: 18667290]
- [13]. Godard P, Chanez P, Siraudin L, et al. Costs of asthma are correlated with severity: a 1-yr prospective study. *Eur Respir J*. 2002; 19:61–67. [PubMed: 11843329]
- [14]. Diette GB, Sajjan SG, Skinner EA, et al. Using the Pediatric Asthma Therapy Assessment Questionnaire to measure asthma control and healthcare utilization in children. *Patient*. 2009; 2:233–241. [PubMed: 22273244]
- [15]. Bruzzese J-M, Kingston S, Sheares BJ, et al. Feasibility and preliminary outcomes of a school-based intervention to help inner-city, ethnic minority adolescents with undiagnosed asthma. *Patient Educ Couns*. 2011; 85:290–294. [PubMed: 20970946]
- [16]. Redline S, Gruchalla RS, Wolf RL, et al. Development and validation of school-based asthma and allergy screening questionnaires in a 4-city study. *Ann Allergy Asthma Immunol*. 2004; 93:36–48. [PubMed: 15281470]
- [17]. Clark NM, Brown R, Joseph CL, et al. Issues in identifying asthma and estimating prevalence in an urban school population. *J Clin Epidemiol*. 2002; 55:870–881. [PubMed: 12393074]
- [18]. Short ME, Goetzel RZ, Pei X, et al. How accurate are self-reports? Analysis of self-reported health care utilization and absence when compared with administrative data. *J Occup Environ Med*. 2009; 51:786–796. [PubMed: 19528832]
- [19]. Birmaher B, Khetarpal S, Brent D, et al. The Screen for Child Anxiety Related Emotional Disorders (SCARED): scale construction and psychometric characteristics. *J Am Acad Child Adolesc Psychiatry*. 1997; 36:545–553. [PubMed: 9100430]
- [20]. Bruzzese J-M, Unikel LH, Shrout PE, et al. Youth and parent versions of the Asthma-related Anxiety Scale: development and initial testing. *Pediatr Allergy Immunol Pulm*. 2011; 24:95–105.
- [21]. Radloff LS. The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *J Youth Adolesc*. 1991; 20:149–166. [PubMed: 24265004]
- [22]. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983; 24:385–396. [PubMed: 6668417]
- [23]. N.H.L.B.I.. Guidelines for the Diagnosis and Management of Asthma. NIH; Bethesda: 2002. Update on Selected Topics: NIH Publication No. 02-5075
- [24]. Nordin JD, Solberg LI, Parker ED. Adolescent primary care visit patterns. *Ann Fam Med*. 2010; 8:511–516. [PubMed: 21060121]
- [25]. Ford CA, Bearman PS, Moody J. Foregone health care among adolescents. *JAMA*. 1999; 282:2227–2234. [PubMed: 10605974]
- [26]. Lau M, Lin H, Flores G. Racial/ethnic disparities in health and health care among U.S. adolescents. *Health Serv Res*. 2012; 47:2031–2059. [PubMed: 22417169]
- [27]. Rhee H, Belyea MJ, Halterman JS. Adolescents' perception of asthma symptoms and health care utilization. *J Pediatr Health Care*. 2011; 25:105–113. [PubMed: 21320682]

- [28]. Tiggelman D, van de Ven MO, van Schayck OC, et al. The Common Sense Model in early adolescents with asthma: longitudinal relations between illness perceptions, asthma control and emotional problems mediated by coping. *J Psychosom Res.* 2014; 77:309–315. [PubMed: 25280828]
- [29]. Earnshaw VA, Quinn DM. The impact of stigma in healthcare on people living with chronic illnesses. *J Health Psychol.* 2012; 17:157–168. [PubMed: 21799078]
- [30]. Rhee HBM, Brasch J. Family support and asthma outcomes in adolescents: barriers to adherence as a mediator. *J Adolesc Health.* 2010; 47:472–478. [PubMed: 20970082]
- [31]. Bruzzeze JM, Cespedes A, Kingston S, et al. Immediate efficacy of a school-based intervention for urban adolescents with undiagnosed asthma: a randomized control trial. *Am J Respir Crit Care Med.* 2014; 189:A4022.
- [32]. Cabana MD, Ebel BE, Cooper-Patrick L, et al. Barriers pediatricians face when using asthma practice guidelines. *Arch Pediatr Adolesc Med.* 2000; 154:685–693. [PubMed: 10891020]
- [33]. Cabana MD, Rand CS, Becher OJ, et al. Reasons for pediatrician nonadherence to asthma guidelines. *Arch Pediatr Adolesc Med.* 2001; 155:1057–1062. [PubMed: 11529809]
- [34]. Wisnivesky JP, Lorenzo J, Lyn-Cook R, et al. Barriers to adherence to asthma management guidelines among inner-city primary care providers. *Ann Allergy Asthma Immunol.* 2008; 101:264–270. [PubMed: 18814449]
- [35]. Rastogi D, Shetty A, Neugebauer R, et al. National Heart, Lung, and Blood Institute guidelines and asthma management practices among inner-city pediatric primary care providers. *Chest.* 2006; 129:619–623. [PubMed: 16537859]
- [36]. Mancuso CA, Rincon M, McCulloch CE, et al. Self-efficacy, depressive symptoms, and patients' expectations predict outcomes in asthma. *Med Care.* 2001; 39:1326–1338. [PubMed: 11717574]
- [37]. Vamos M, Kolbe J. Psychological factors in severe chronic asthma. *Aust N Z J Psychiatry.* 1999; 33:538–544. [PubMed: 10483849]
- [38]. Kolbe J, Vamos M, Fergusson W, et al. Determinants of management errors in acute severe asthma. *Thorax.* 1998; 53:14–20. [PubMed: 9577516]
- [39]. McCauley E, Katon W, Russo J, et al. Impact of anxiety and depression on functional impairment in adolescents with asthma. *Gen Hosp Psychiatry.* 2007; 29:214–222. [PubMed: 17484938]
- [40]. Klein JD, Graff CA, Santelli JS, et al. Developing quality measures for adolescent care: validity of adolescents' self-reported receipt of preventive services. *Health Serv Res.* 1999; 34:391–404. [PubMed: 10199683]

Implications and Contribution: Adolescents, low users of medical care, report numerous reasons for not seeing a medical provider for moderate to severe asthma-like symptoms; several reasons are associated with asthma-related anxiety. Educational interventions and public-health campaigns may aid in addressing adolescents' fears of diagnosis and treatment of asthma.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1
Demographic and Clinical Characteristics of the Adolescents (N = 349)

	% (n)
Age (mean $\pm$ SD, years)	15.8 $\pm$ 1.1
Female	82.8 (289)
Ethnicity	
Hispanic	45.8 (160)
African American/Black, not of Hispanic origin	37.2 (130)
Other	11.0 (38)
2 or more races	6.0 (21)
Has health insurance	
Yes	84.5 (295)
No	8.0 (28)
Does not know	7.5 (26)
Of those insured, type of insurance (N=295)	
Private	12.2 (36)
Medicaid	66.8 (197)
Does not know	21.0 (62)
Has a provider or clinic	
Yes	90.3 (315)
No	9.2 (32)
Does not know	0.5 (2)
Of those with a provider or clinic, sees the same provider (N=315)	
Always	58.1 (183)
Usually	37.8 (119)
Never	4.1 (13)
Asthma Severity	
Moderate Persistent	53.3 (186)
Severe Persistent	46.7 (163)

Table 2
Adolescent Endorsed Reasons for Not Seeing a Provider (%(n))

	Yes	No
My breathing problems are not serious.	63.1 (178)	36.9 (104)
I saw a medical provider for my breathing problems and he/she did not tell me I have asthma.	49.6 (140)	50.4 (142)
I do not want to be told by a medical provider that I have asthma.	46.1 (130)	53.9 (152)
My parent/caregiver does not think I need to see a doctor for my breathing problems.	42.9 (121)	57.1 (161)
I am busy with other things in my life right now.	42.2 (119)	57.8 (163)
I do not want to take medication for breathing problems.	41.3 (116)	58.7 (165)
My parent/caregiver will not allow me to make an appointment or see the doctor by myself.	26.2 (74)	73.8 (208)
My parent/caregiver is unable to make an appointment or take me to the doctor right now.	25.5 (72)	74.5 (210)
My medical provider or clinic will not allow me to make an appointment by myself.	22.7 (64)	77.3 (218)
I have other medical problems that are more important than my breathing problems.	17.7 (50)	82.3 (232)
I do not have health insurance.	12.4 (35)	87.6 (247)
I don't have a medical provider or clinic.	10.3 (29)	89.7 (253)