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Caregiver Asthma in Urban Families: Implications for School Absenteeism

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Abstract

Asthma is a significant contributor to missed school days, especially for children living in urban settings. This preliminary study examined the impact of caregiver asthma on school absenteeism in a sample of 102 urban children with asthma from African American, Latino, and non-Latino White backgrounds. Caregivers and children participated in a single research session; 32 caregivers had asthma. Children of caregivers with asthma missed more days of school than children whose caregivers did not have asthma (3.97 vs. 2.43 days, $p < .05$, Cohen's $d = .40$). Other indicators of child asthma morbidity (e.g., hospitalizations) did not differ across caregiver asthma status. Findings highlight that caregiver asthma may be an added risk factor for school absenteeism among children with asthma. For children with a high frequency of asthma-related school absenteeism, school nurses may find it useful to provide educational resources and referrals for caregivers with asthma.

Keywords

asthma; parent/family; academic achievement/attendance; school nurse education; screening/risk identification

Asthma is the most common cause of respiratory disability in children and a leading cause of missed school days, contributing to a yearly loss of more than 13.8 million school days (Centers for Disease Control and Prevention [CDC], 2013). Asthma symptoms include wheezing, chest tightness, shortness of breath, and lack of energy. Although this chronic disease has no cure, burdensome symptoms can be managed with proper diagnosis and treatment (National Asthma Education and Prevention Program, 2007).

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Compared to their nonurban counterparts with asthma, urban children with asthma experience substantial health disparities in both asthma prevalence and morbidity. Families living in urban settings may experience stressors related to poverty and urban living, including exposure to environmental allergens, indoor pollutants such as particulate matter and nitrogen dioxide, lack of health-care access, and barriers to medication access (Akinbami et al., 2012). These challenges may further complicate asthma management (Koinis Mitchell et al., 2007) and increase child asthma morbidity (Kopel et al., 2015).

Children with asthma miss more school than children without asthma (CDC, 2013); these rates are higher among children living in urban settings, which has direct implications for student learning and academic achievement. Asthma absenteeism among urban children has been found to have a negative impact on standardized test-level achievement (Moonie, Sterling, Figgs, & Castro, 2008). In addition to the deleterious effects on learning and academic achievement, there is an association between asthma-related school absenteeism and poor health outcomes. Missed school days have been linked to asthma exacerbations, poor asthma control, and urgent and emergent health-care utilization (Akinbami, Moorman, & Liu, 2011; Hsu, Qin, Beavers, & Miarebelli, 2016).

School nurses have a unique opportunity to assist families to efficiently access health care and promote better disease management, but further research is needed to examine and minimize barriers to asthma management (Quaranta & Spencer, 2016). For instance, the recent research has highlighted the role of the school nurse in identification of modifiable risk factors, including poor nutritional status, obesity, and dietary deficiencies (Brackney & Cutshall, 2015; Lineberry & Ickes, 2015). Improvements in the student–nurse relationship have been suggested to address determinants of school absenteeism, including lack of knowledge and insufficient asthma care (McClelland, Wenz, Sood, & Yono, 2013).

Caregivers

Caregivers of children with asthma are often viewed as first-line medical responders, putting health care and school attendance decision-making in their hands. In a sample of children with asthma from the National Health Interview Survey (NHIS), children whose caregivers had a chronic illness missed more days of school and had worse health status than children whose caregivers did not have a chronic illness (Lipstein, Perrin, & Kuhlthau, 2009). As caregivers in the NHIS sample had a range of chronic conditions, it is unclear whether a shared chronic condition between care-giver and child, such as asthma, may lead to more missed school days. Family history of asthma is a strong predictor of asthma diagnosis and earlier onset in children (Dietert, 2011; Klinnert et al., 2001). Although it is well documented that presence of parental asthma increases the risk for future offspring to have asthma, the family impact of caregiver asthma on specific child asthma outcomes, such as missed school days, has not been examined in previous work. As adults with asthma in urban settings experience increased risk factors leading to complex symptomology and burden, it is likely that this disease may in turn affect the management of their child's disease. However, caregiver asthma has not been considered as a risk factor for school absenteeism.

Theoretical Framework

This study was based upon the individual and family self-management theory (IFSMT; Ryan & Sawin, 2009), a theoretical framework for understanding the complexities of self-management behaviors within the dynamic concept of individual and family self-management. With purposeful incorporation of health-related behaviors into the family's daily functioning, individual and family self-management may attenuate illness or facilitate management of complex health regimens. The individual or the family as a whole is responsible for the transactional process of self-management behaviors, which may occur with the collaboration of health-care professionals, to improve outcomes for the individual, family, health-care practitioners, and systems. In particular, and most relevant to this study of urban families, IFSMT recognizes the impact of context, including the physical and social environments as well as family factors, that may enhance or diminish self-management. We suggest in this preliminary study, the increased demands of managing their own asthma *and* their children's asthma, within the context of an urban setting, may place children at unique risk for worse proximal and distal outcomes, including school absenteeism.

Purpose

In this preliminary study, we initiated an extension of the existing evidence in pediatric asthma by introducing the consideration of caregiver asthma as a risk factor for school absenteeism. We hypothesized that children with a caregiver who has asthma would have more reported missed days of school. We also considered whether other markers of child asthma morbidity (including hospitalized due to asthma, course of oral corticosteroids, intubation, asthma control) differed across caregiver asthma status.

Method

Design and Institutional Review Board (IRB)

Participants—The IRB at Rhode Island Hospital approved the study protocol. Participants in the current study included 102 children (58.8% male) between the ages of 6 and 15 years ($M = 10.03$, standard deviation [SD] = 2.31) and their primary caregivers. Families lived in the greater Providence, Rhode Island area, an urban center. Eighty-nine percent of families ($n = 91$) identified the primary caregiver as the child's mother. Thirty-two primary caregivers (31.4%) reported having an asthma diagnosis. Among enrolled families, 44.1% of caregivers ($n = 45$) self-identified as non-Latino White, 27.5% ($n = 28$) as African American, 28.4% ($n = 29$) as Latino. Fifty percent of caregivers reported a mean monthly income of less than US \$2,000.

Families were recruited via flyers and forms at community primary care and institution-affiliated ambulatory pediatric clinics, hospital-based asthma education programs, community-based events, and regional schools. Study flyers and "consent-to-contact" forms were distributed at all sites (Koinis-Mitchell et al., 2015); if interested, caregivers completed the form, which gave permission for study personnel to contact them via telephone for initial eligibility screening. Recruitment efforts identified 190 potentially eligible families, of which 102 were ultimately enrolled (54%). Of the 88 families not enrolled, 12 were not

interested, 28 screened ineligible, 7 families could not be reached to finish the screening procedure, and 41 screened eligible but missed multiple, scheduled visits or were no longer interested after the initial screening process. Inclusion criteria included (1) children ages 6–15 years; (2) caregiver-reported physician diagnosis of child asthma; (3) caregiver-reported child breathing problems in last 12 months; (4) English-speaking caregivers; and (5) caregivers that self-identified as Latino, African American, or non-Latino White. Exclusion criteria included (1) additional pulmonary disease, (2) asthma symptoms occurring only during exercise, (3) significant developmental delay, or (4) severe psychiatric/mental illness.

Procedures

Research assistants contacted families who indicated they would be interested in participating and screened them for eligibility by phone. Eligible families were invited to complete interview-based questionnaires either in a laboratory setting or in the family's home. Informed consent and child assent were received before questionnaires were administered. Families received US\$25 for their time.

Measures

Background questionnaire—Primary caregivers provided basic demographic information including child age and gender, monthly household income, caregiver and child race/ethnicity, and whether their child was prescribed a daily controller medication. Daily controller medication was used as a proxy for persistent asthma status. Primary caregivers were asked to self-report whether they had ever been diagnosed with asthma (e.g., a doctor told them they had asthma).

Asthma control—For children between the ages 6 and 11 years, the level of asthma control was assessed with the validated, 7-item childhood asthma control test (cACT; Liu et al., 2007), which assesses frequency of daytime and nighttime asthma symptoms, activity limitation, and patient perception of disease control. On the cACT, children completed the first 4 items, and caregivers completed the remaining 3 items. Children between 12 and 15 years completed the well-validated, 5-item ACT (Nathan et al., 2004). Higher scores indicated better asthma control.

School days missed—Caregivers were asked to report on the number of school days their children had missed due to child asthma in the last 12 months.

Previous child asthma experiences—Caregivers were asked to report (“yes” or “no”) if their children had been hospitalized due to asthma or prescribed a course of oral corticosteroids in the last 12 months, or if they had ever been intubated due to asthma.

Statistical Analyses

Analyses were performed using IBM SPSS Version 21.0 (IBM Corp., Armonk, NY). Analysis of variance (ANOVA), *t*-test analyses, and Pearson correlational analyses were used to test whether family race/ethnicity, monthly household income, child controller use, child age, and child sex were associated with number of school days missed. In subsequent analyses, we controlled for any confounding variables that emerged as significant in

associations with school days missed. *T*-test analyses were used to assess for differences in school days missed across caregiver asthma status (e.g., *no asthma* = 0, *asthma* = 1). χ^2 analyses were used to determine the association between caregiver asthma status and other markers of asthma morbidity (e.g., hospitalized due to asthma, prescribed oral corticosteroids, intubated); a *t*-test was used to determine whether asthma control scores differed across caregiver asthma status.

Results

The number of asthma-related school days missed was unrelated to family income, family race/ethnicity, controller use, child sex, or child age. School days missed in the last 12 months differed significantly across caregiver asthma status, $t(100) = -2.02$, $p = .046$, Cohen's $d = .40$, children with a caregiver with asthma ($n = 32$) had more reported missed days of school ($M = 3.97$, $SD = 4.52$) than children whose caregivers did not have asthma ($M = 2.43$, $SD = 3.05$).

We next considered whether there were differences in other markers of child asthma morbidity in families with a caregiver with asthma versus families without a caregiver with asthma (see Table 1). Analyses did not reveal significant differences in child asthma morbidity across caregiver asthma group.

Discussion

This preliminary study expanded our understanding of pediatric asthma among urban families by introducing an examination of caregiver asthma on markers of child asthma morbidity. In our sample, children who had a care-giver with asthma missed an average of 4 days of school a year due to asthma, as compared to 2.5 days of school for children whose caregivers did not have asthma. This finding is consistent with previous research, suggesting that children with asthma whose caregivers have a chronic condition are at increased risk for missed days of school (Lipstein et al., 2009).

To our knowledge, this is the first study that has examined school absenteeism with asthma as a shared illness between caregiver and child. Our results suggest that even when the illness between caregiver and child is shared, children are still at risk for missing school days and are more likely to miss a greater number of days because of their asthma than children who do not have caregivers with asthma. Further, we did not find differences in other indicators of asthma morbidity, including level of asthma control, across caregiver asthma status. These findings may suggest that, despite differences in missed school days, there were few differences in asthma severity between families with a caregiver with asthma and families without such a caregiver. Future research is needed to elucidate discrepancies in school absenteeism across caregiver asthma status, particularly in the absence of differences on other indicators of asthma morbidity.

Given that our sample was comprised of families living in an urban area, it is important to note that caregivers with asthma in our sample may have been managing their asthma and their child's asthma in the context of urban stressors (e.g., community violence, neighborhood stress). Although we did not measure such variables in our preliminary study,

it may be that urban caregivers encounter unique challenges while managing their child's illness and concurrently ensuring the safety of their family as well (Bellin et al., 2014).

Limitations

Given that the original study did not specifically target enrollment of caregivers with asthma, our study is limited by the number of caregivers who reported an asthma diagnosis. Further, we did not have a study clinician confirm asthma diagnosis in either the parent or child, instead relying on self-reported asthma. We also did not collect data related to the caregiver's history with asthma or previous experiences with their own disease, which may have potentially affected the decision to keep their child home from school. Although asthma-related school days missed was not associated with controller use, future research should consider whether associations with school days missed is confounded by other indicators of asthma severity in the child. The measure of school days missed in the last 12 months required a long recall period, which may have introduced bias in care-giver recall. Further, the 12 months included both summer and school across 1 calendar year (not school year); there may have been a higher number of asthma-related school absences for those students that attended summer school versus those that did not. It is our recommendation that future, longitudinal studies include analysis across 1 school year, including distinguishing any summer school missed days if applicable. Limitations also include the use of a convenience sample. Our findings should be replicated in larger urban samples of African American, Latino, and non-Latino White families. Caregivers reported on the majority of measures, which may have introduced method bias. Finally, our data are cross sectional and do not allow for conclusions regarding causality.

Future Steps

Future research is needed to consider the dynamic interaction between family factors, condition complexity, urban stressors, and school absenteeism in children with asthma. Further clarification of sources of disparities and subsequent discrepancies in health status will help to guide early screening guidelines and provide knowledge for the development of focused interventions for this vulnerable population. It is also our recommendation that future studies highlight the unique role of the school nurse, in particular in regard to collaboration with the family and child, in efforts to facilitate self-management and develop comprehensive education plans. There are many potential implications for the role of the school nurse in developing a family-focused intervention to improve outcomes for asthma-related school absenteeism, including a school nurse-led intervention (Gellar et al., 2012).

Next steps for inquiry may also include mixed-methods and qualitative approaches to better understand the complex phenomenology of how caregivers use their own experiences with asthma in managing their child's asthma, particularly as it relates to decisions regarding child school attendance. For instance, based on their own history with asthma, caregivers with asthma may choose to keep their child at home to prevent a more serious asthma episode. As comprehensive school-based asthma programs involving parents have been shown to impact reports of school absenteeism from asthma (Clark et al., 2004), future inquiry may incorporate effects of caregiver asthma experiences in school attendance decision-making. These programs, such as the American Lung Association (ALA) Open

Airways for Schools (2016), may be further evaluated in the context of families with a caregiver with asthma and individualized for those caregivers with prior asthma experiences.

Implications for School Nurses

Identification of risk factors for urban childhood morbidity creates an opportunity for intervention (Lineberry & Ickes, 2015). Findings from our preliminary study have significant implications for school nurses, in particular, school nurses in urban school districts where children are at the highest risk for experiencing asthma morbidity. As this study suggests that children who also have a caregiver with asthma may be at increased risk for school absenteeism, school nurses may consider familial asthma in their initial assessment and risk classification of the student with asthma. Although more in-depth investigative studies are needed to clarify this risk, an initial suggestion is that school nurses consider a short screening to determine whether the child's primary care-giver also has asthma.

Further, caregivers who have asthma may benefit from receiving educational materials and a referral from school nurses for a family-based asthma educational program, along with encouragement to see their health-care provider. As school nurses already take an active role in supporting students with asthma, additional identification and inclusion of families with both a child and caregiver with asthma may optimize outcomes and decrease school absenteeism. Finally, school nurses may wish to develop a collaboration with the family and the child's primary care provider for excessive school absenteeism due to asthma.

Conclusion

Although replication is needed, findings from our study suggest that the presence of a caregiver with asthma within urban families may place a child at risk for increased rates of asthma absenteeism. Given that we did not find differences in other indicators of asthma morbidity based on whether the caregiver had asthma, future work is needed to identify sources of school absenteeism discrepancy and consider processes that may place children at greater risk for school absenteeism in families that also have a caregiver with asthma. Implications for school nurses include identifying students with asthma who also have a caregiver with asthma and increasing asthma self-management behaviors and education for such families.

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Table 1

Child Markers of Asthma Morbidity by Caregiver Asthma Status.

Child Asthma Variables	Families of Caregivers Without Asthma (<i>n</i> = 70)	Families of Caregivers With Asthma (<i>n</i> = 32)	<i>P</i>
Prescribed controller medication, <i>n</i> (%)	60 (86)	27 (84)	1.00
Asthma control score, <i>M</i> (<i>SD</i>)	21.97 (3.25)	21.06 (3.23)	0.20
Number of school days missed due to asthma in last 12 months, <i>M</i> (<i>SD</i>)	2.43 (3.05)	3.97 (4.52)	0.04 *
Hospitalized due to asthma in last 12 months, <i>n</i> (%)	6 (9)	3 (9)	0.89
Oral corticosteroids in last 12 months, <i>n</i> (%)	33 (47)	13 (41)	0.54
Intubated due to asthma, <i>n</i> (%)	2 (3)	1 (3)	0.95

Note. *n* (%) indicates the number (percentage) of “yes” responses.

*
p < .05.