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Feasibility Study of a Combined Lifestyle Behaviors and Asthma Self-Management Intervention for School-aged Children

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Abstract

Purpose—The purpose of this study was to test the feasibility of delivering an intervention that combined healthy lifestyle behaviors related to weight management with asthma self-management, the Living Healthy with Asthma intervention, to children who have asthma.

Methods and Design—Using a mixed design, the feasibility study of the 12-week Living Healthy with Asthma intervention was conducted with a single group of children diagnosed with asthma. Pre-test and post-test data were collected on asthma-related (self-management, metered dose inhaler [MDI] skill, asthma severity, quality of life [QOL]), and healthy lifestyle variables (body mass index [BMI]; dietary quality). A matched comparison sample was drawn from a separate study that tested the same asthma self-management component (single intervention) used in the feasibility study to determine if the Living Healthy with Asthma intervention worked as well as the single intervention for improving children's asthma self-management.

Results—Thirteen school-aged children were enrolled in the feasibility study. There were significant reductions in BMI z-scores ($p = .007$), and improvements in vegetable servings ($p = .03$), MDI skill ($p = .005$), children's QOL ($p < .001$), and parents' QOL ($p = .03$). When comparing the feasibility group with the matched comparison group ($n = 13$), there were no significant differences in asthma self-management, MDI skill, or asthma severity after the interventions.

Practice Implications—Findings supported the feasibility of implementing the combined intervention, and it was not inferior to the single intervention – which supports nurses' efforts to help families manage multiple health problems.

Keywords

childhood asthma; childhood obesity; motivational interviewing; goal setting; lifestyle behavior

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Asthma is one of the most common chronic conditions of childhood with 14% of children diagnosed with asthma (Bloom, Jones, & Freeman, 2013). There is growing awareness that people who have one chronic condition are at risk for developing additional chronic health problems. Data from the National Health Interview Survey found that 5% of children with asthma have a comorbid condition such as hypertension, allergies, or obesity that increase the likelihood of asthma exacerbations and absenteeism (Chen, Kim, Houtrow, & Newacheck, 2010; Patel, Leo, Baptist, Cao, & Brown, 2015).

In fact, children with asthma have a higher prevalence obesity (e.g. 16.6% vs 13.7%) than their non-asthmatic peers (Black, Smith, Porter, Jacobsen, & Koebnick, 2012). Asthma symptoms in obese children tend to be more severe, less well controlled, and less responsive to standard medications (Carr & Kraft, 2015). Theories proposed to explain the co-occurrence of asthma and obesity include: a) lifestyle factors where children are less physically active due asthma symptoms; b) consumption of a higher fat and fast-food diet; c) mechanical factors due to increasing abdominal girth restricting pulmonary expansion; and d) elevated systemic adipokines present in obesity contributing to increased airway resistance in asthma (Farah & Salome, 2012; Holquin et al., 2011; Jay et al., 2012). Asthma control is difficult for obese individuals to achieve, thus making weight loss a priority for improving asthma self-management (Juel, Ali, Nilas, & Ulrik, 2012).

Individual interventions have been designed to address either weight management or asthma self-management in children. Given the negative impact of obesity in children who have asthma, it is imperative that effective interventions that address both problems be developed and tested. The purpose of this study was to test the feasibility of delivering a combined asthma self-management and lifestyle intervention with a weight management focus to children who have asthma.

Literature Review

Asthma Self-Management

Asthma self-management interventions are designed to help families reduce and prevent asthma episodes through environmental management of asthma triggers, proper use of controller and preventive asthma medications, and early recognition and treatment of asthma symptoms (Bruzze et al., 2011; Campbell et al., 2015). These interventions have good intermediate outcomes including increased asthma knowledge, self-efficacy and self-management behaviors; however, the effect on health outcomes (e.g., asthma control, acute health care visits, quality of life [QOL]) is more variable across studies (Coffman, Cabana, & Yelin, 2009; Mosnaim et al., 2016). In a meta-synthesis of school-aged child asthma self-management studies, those interventions that were comprehensive in scope, and actively engaged children in problem-solving and developing skills were the most effective at improving health outcomes including days with asthma symptoms and QOL (Coffman et al., 2009). Mosnaim et al.'s (2016) meta-analysis of behavioral interventions found that a focus on decision-making, preventive strategies, and medication skill and adherence led to significant reductions in days with asthma symptoms and improved QOL in adolescents with asthma.

Weight Management

The prevalence of obesity has increased over the last 3 decades for all Americans, and currently 33% of children and adolescents are overweight or obese (Pate et al., 2013). The number of weight management studies has consequently increased, but fewer studies have focused on childhood overweight and obesity. Ho et al. (2012), completed a meta-analysis of 38 studies of lifestyle interventions with a dietary component for weight loss in overweight and obese children and adolescents. Most studies reported positive effects on weight or body mass index (BMI) in the lifestyle intervention treatment groups in comparison to usual care or minimal education. The most effective studies were those that combined dietary intervention with exercise and involved families throughout the intervention.

Chen, Kao, Hsu, Wang, and Hsu (2015) tested a family-based weight loss intervention for 9- to 11-year old children with 107 parent-child dyads. The intervention was delivered in four 2-hour biweekly education sessions that focused on nutrition and behavior modification. The control group received a nutrition education pamphlet. The treatment group significantly decreased BMI z-scores and consumption of high calorie foods in comparison to the control group by the 12-week follow-up. Furthermore, the treatment group parents significantly reduced the quantity of high calorie foods in their homes and also consumed significantly fewer high calorie foods. This latter finding highlights the role of parents in managing the food environment in the home and role modeling healthy eating behaviors to their children.

Yusop, Shariff, Hwu, Talib, and Spurrier (2018) tested a lifestyle modification intervention with 50 obese children who were 7–11 years old. Children were randomized to a treatment group that met weekly for 24 weeks or to a usual care control group. The intervention focused on kilocalorie (Kcal) reductions between 500–1000 Kcal daily, increasing fruit and vegetable intake, and increasing physical activity intensity and frequency. Forty children completed the study for an 80% retention. The treatment group significantly increased their physical activity minutes and intensity and decreased their BMI at 6 months in comparison to the control group.

Studies of Weight Management in Persons with Asthma

There is strong evidence that asthma and obesity are co-morbid conditions. In a meta-analysis of 16 case-controlled studies of BMI and asthma in children, Azizpour, Delpisheh, Montazeri, Sayehmin, and Darabi (2018) found the odds ratio of being overweight or obese and having asthma were 1.62 and 1.92, respectively. Children who have asthma and are overweight or obese are less likely to meet the requirements for getting 60 minutes of daily physical activity, have greater activity limitations, and poorer asthma control (Holderness et al., 2017). Despite this evidence, there are few studies that have examined weight loss interventions for people with asthma.

In a Cochrane review of weight loss randomized controlled trials (RCT) for persons with chronic asthma published through March 2012, Adeniyi and Young (2012) found only four studies with adults and no studies with children. The weight loss interventions included low-calorie diets, physical activity, and anti-obesity medications. There was greater weight loss

among the treatment groups than among the control groups, and weight loss led to better asthma control in the treatment groups.

Three recent weight loss intervention studies conducted with children who have asthma were reported in the literature. Jensen, Gibson, Collins, Hilton, and Wood (2013), conducted an RCT with 28 children, 8- to 17-years old, who were obese and had chronic asthma. The 10-week weight loss intervention provided a commercial calorie counter and individualized meal plans to the treatment group to reduce kilocalorie (Kcal) intake by 500 Kcal per day. The treatment group significantly reduced their BMI z-scores and improved asthma control in comparison to the control group.

Willeboordse et al. (2016), conducted an RCT with 87 children in the Netherlands who were 6- to 16-years old, obese, and had chronic asthma. The intervention consisted of 18 counseling sessions of 75–90 minutes duration provided to small groups of children in the first 6 months followed by monthly meetings for the 12-month maintenance phase. At the end of 18-months, both the treatment and control groups had significant weight loss but there was no significant difference between the groups. The weight loss was associated with clinical improvements in lung function (i.e., FEV₁, FVC), asthma control, and QOL.

Jensen et al.'s (2013) and Willeboordse et al.'s (2016), interventions focused on weight management in children who have asthma but did not address asthma self-management. In the third study, Martin and colleagues (2016) tested a community health worker delivered intervention provided to families of 5- to 12-year old children ($n = 46$) who have asthma and were overweight (BMI ≥ 85%). The intervention addressed both asthma (e.g., asthma triggers, symptom recognition, medications) and weight management (e.g., healthy foods and beverages, portions, labels, physical activity, screen time) topics. The community health workers provided the intervention in 12 monthly home visits. At the end of 12 months, the children had significantly decreased their BMI z-scores and days of limited activities, while their asthma control improved.

The improvements in asthma control, lung function, and QOL when weight is lost is an important finding. These results demonstrate that obesity is a modifiable risk factor for persons with asthma (Juel et al., 2012). However, there are few intervention studies of weight management in children with asthma reported in the literature. Of the three studies reported here, two focused on weight management alone while the third tested a combined asthma and weight management intervention. As more children develop multiple chronic conditions, it is important for researchers and clinicians to design and test interventions to address these co-morbidities.

Methods

The aims for this study were to: (1) Test the feasibility (acceptability, retention) of implementing a 12-week family-based intervention that combined lifestyle health promotion with a focus on weight management and asthma self-management (*Living Healthy with Asthma*). (2) Examine changes in children's asthma self-management, metered dose inhaler (MDI) skill, asthma severity, QOL, physical activity self-efficacy, dietary quality (total

calories, calories from sugar, daily fruit servings, daily vegetable servings), and BMI from pre-test to post-test at 13-weeks. The sample for these two aims included both normal weight and obese children who had asthma to allow us to explore differences in these measures based on the child's weight status.

After the feasibility study was completed, the researchers questioned whether changes in asthma self-management for the combined intervention were equivalent to those obtained in a solo-intervention. A third aim was added to compare changes in asthma self-management and asthma severity between the feasibility sample that completed the *Living Healthy with Asthma* intervention and a matched comparison group drawn from a separate study that received the asthma self-management intervention only (Author, 2016).

Ethics and Sampling

The study was reviewed and approved by the university IRB. After IRB approval was obtained, participants were recruited from elementary schools. Sample inclusion criteria were: (a) a child between 9 and 14 years of age, (b) with a physician diagnosis of asthma, (c) experiencing current asthma (i.e., asthma symptoms in the past 12-months), and (d) able to read and speak English or Spanish. Sample exclusion criteria were children who could not participate in usual activities of walking (e.g., a child who is bedridden). Children who met the inclusion criteria were identified by staff in school nurses' offices. Letters were sent to these children's families requesting permission to contact the parents to discuss the study. Permission was granted either through returned post-card response or a telephone call to the research office. The study coordinator contacted the families to explain the purpose of the study and to schedule a home visit to obtain consent, assent, and baseline data. All participating families provided parental consent and child assent.

The comparison group was drawn from an RCT that tested the same asthma self-management intervention used in the feasibility study (author, 2016). The de-identified comparison group participants were identified from the RCT data file by choosing those participants who were the same gender, race, ethnicity, weight status (i.e., normal weight, overweight/obese), and were within 1 year in age as the feasibility group participants.

Data Collection

Data were collected from the feasibility sample at baseline (week 0) and after the intervention (week 13) using self-report, observational, and biological measures during a home visit by trained research assistants (RA). Self-report data were collected first from parents and children. All measures, in both English and Spanish versions, had been tested in previous studies with school-aged children and found to have acceptable reliability and validity before use in the present feasibility study.

Feasibility data—Data were collected to assess the acceptability of the intervention through exit interviews conducted with parents and children. Retention in the study was determined with the (interventionist's) logs used to record visits with participants and completion of pre-test and post-test data collection.

Self-report data—Parents provided demographic data (i.e., child's age, gender, race, ethnicity), the child's asthma severity, and asthma history (i.e., asthma triggers, asthma onset), and the parents' QOL. Children completed measures of asthma self-management, physical activity self-efficacy, and QOL. Dietary intake for the child was completed in collaboration with both the child and parent.

Asthma severity was measured with 3-item *Severity of Chronic Asthma* scale that was designed to correspond to national asthma guidelines for categorizing asthma severity. Validity and reliability were established in a psychometric study (Horner, Kieckhefer, & Fouladi, 2006). Possible scores range from 3 to 12.

Asthma self-management was measured with the 13-item *Asthma Inventory for Children* (Kieckhefer, 1987). The items were rated on a 5-point scale with 1 for "never" to 5 for "always." Cronbach's alpha was .76 for the English version and .74 for the Spanish version of the scale. The children's skill in using an MDI was assessed by the trained RA using the standardized 8-item MDI skill tool where the child is given 1 point for each correct behavior (Kelly et al., 1998).

Self-efficacy for physical activity was measured with the 9-item *Child Physical Activity Self Efficacy Scale* (Leary et al., 2012). The items were rated on a 5-point scale with 1 for "not at all sure" to 5 for "completely sure." Cronbach's alpha was .76 for the English version and .72 for the Spanish version of the scale.

The child's QOL was measured with the 23-item *Pediatric Asthma Quality of Life* scale that is composed of 3 subscales including a 10-item symptom subscale, 8-item emotional function subscale, and 5-item activity subscale (Juniper et al., 1996a). The items are rated on a 5-point scale with 1 for "never" to 5 for "always". Lower scores indicate better QOL. The English version has good internal consistency with Cronbach's alpha of .92 for the total scale, .85 for the symptom subscale, .83 for the emotional function subscale, and .72 for the activity limitations subscale. The Spanish version Cronbach's alpha were .91 for the total scale, .89 for the symptom subscale, .83 for the emotional functioning subscale, and .58 for the activity limitation subscale. Subscale items are summed and then averaged for subscales and total mean scores.

The parent's QOL was measured with the 13-item *Pediatric Asthma Caregiver's Quality of Life* scale that was composed of two subscales including a 4-item family activity subscale and a 9-item emotional functioning subscale (Juniper et al., 1996b). Items are scored on 7-point response scales that assessed either frequency or degree of worry. For example, 1 represented "all the time" or "very, very worried" while 7 represented "none of the time," or "not worried." Higher scores indicate better QOL. The total scale and subscale items are summed and then averaged for subscales and total mean scores. Cronbach's alpha for the English version was .89 for the total scale, .84 for the emotional function subscale, and .85 for the family activity subscale. The Cronbach's alpha for the Spanish version was .88 for the total scale, .80 for the emotional function subscale, and .84 for the family activity subscale.

Dietary quality was represented by caloric, sugar, daily vegetables and fruits intake, all of which are important contributors to weight management. The data were collected through a 24-Hour dietary recall by a trained interviewer from the child and parent together (Conway et al., 2003). To improve the recall of portion sizes, participants used the *Food Amount Booklet for Participants* with actual sized pictures of food models representing various amounts (e.g., bowls, glasses) to determine amounts consumed. The child was instructed to “think about yesterday and tell us what you had for breakfast,” and then the parent was asked if they remembered anything else eaten at breakfast by the child. This process was repeated for all meals and snacks throughout the day. Data were entered and analyzed using the Nutrition Data System for Research software (Nutrition Coordinating Center, University of Minnesota, 2014).

Anthropometric data—The child’s height was measured with a portable stadiometer with the child in stocking feet, standing erect, looking straight ahead, with heels, buttocks, and shoulders against the wall and recorded to the nearest 0.5 cm. Weight was measured with a calibrated digital scale to the nearest 0.2 kilogram with the child wearing light-weight indoor clothing. The BMI was calculated as (weight in Kg/height in m²), and the resultant score was interpreted as BMI% using the CDC growth tables for children (Kuczmarski et al., 2002).

Intervention

The *Living Healthy with Asthma* intervention was delivered over 12 weeks in 6 home visits (weeks 1, 2, 4, 6, 9, and 12) and three support phone calls (weeks 3, 5, and 7). The intervention addressed both asthma self-management and healthy lifestyle behaviors for weight management at each visit. Every home visit started with a motivational interviewing (MI) approach (Rollick & Miller, 1995). The MI approach actively engages the child and parent in the behavior change process. The MI visit began by focusing on the parent’s and child’s concerns. This served as the starting point for having them identify behaviors related to nutrition, physical activity, and asthma self-management that they would like to change. Potential challenges to making behavior change and solutions were discussed. The last step was to ask the child to set goals that were feasible, flexible, and achievable in the next week. Flexible goals that allows for days when the behavior can be met (e.g., 4 of 7 days) increases the child’s success in meeting goals and reinforces their efforts in making the behavior change. The interventionist also provided both standard and individualized educational information to assist the child and parent in meeting the selected goals.

During the first home visit the child’s 24-hour dietary recall data were presented to the child and parent to help them with selecting a nutrition goal. As the family reviewed the types of foods (i.e., fruits, vegetables, fats, proteins, total calories), the interventionist assisted them in identifying sources of excess calorie intake in the child’s diet. Many of the children consumed sugar-sweetened beverages which contributed to excess calorie intake. The diet recall summary data were used by the interventionist to tailor the relevant dietary information provided to each family.

Each week the child set one goal each for nutrition, physical activity, and asthma self-management for the coming week. The interventionist emphasized incremental changes are more successful in the long run – that a “diet” is NOT advocated but rather lifestyle changes are the desired goal. To support the child’s efforts in meeting physical activity goals, the family was given pedometers to self-monitor their daily steps (LifeSource Tri-Axial Activity Monitor XL-18). The child was also encouraged to gradually increase daily steps over the coming weeks (Leatherdale, 2013). The child was given a peak flow meter to support the asthma self-management work. The child and parent were taught how to use the peak flow meter and interpret scores.

In addition, at each home visit standard information pertaining to dietary quality, physical activity, and asthma self-management was provided to every family. This information was individualized to the family’s situation, resource availability, stated concerns, and the child’s behaviors and symptoms. For example, everyone received standard dietary information on weight management and energy balance, but they also received nutrition information specific to the child’s dietary pattern identified in the 24-hour dietary recalls. All families received asthma self-management information on lung pathophysiology, recognizing asthma symptoms, reducing contact with asthma triggers, interpreting peak flow meter scores, medication action and use, using inhalers correctly, and creating an asthma action plan for home use. Similarly, everyone received information on sedentary behavior, screen time, physical activity, and exercise (Leatherdale, 2013). The sequence of the standard information was varied based on the family’s stated concerns so that those were addressed first. However, all standard information was covered over the 12-weeks and completed by the last home visit.

Comparison group intervention—The matched comparison group received the same asthma self-management education and materials that were used in the *Living Healthy with Asthma* intervention. Content included information on lung pathophysiology, recognizing asthma symptoms, reducing contact with asthma triggers, interpreting peak flow meter scores, medication action and use, using inhalers correctly, and creating a home asthma action plan.

Data Analysis

Quantitative data were entered into a password protected computer data file by one RA. Validity checks were completed by a second RA for all entries. Using SPSS-PC version 19, the scales were summed, then measures of central tendency and dispersion were run and checked for outliers, non-normal distributions, and non-random missing items. The BMI data were transformed into BMI z-scores. Paired t-tests were run to examine changes from pre-test to post-test.

The qualitative data collected at the exit interviews were analyzed with simple descriptive analysis. Two RA independently coded the data and listed the areas of satisfaction and improvement. Differences between the coded results were discussed by the research team to determine consensus.

Results

The primary aim of this study was to test the feasibility of delivering a combined healthy lifestyle intervention focused on weight management with an asthma self-management intervention to children who have asthma. The secondary aim was to examine changes in asthma-related self-management behaviors and healthy lifestyle behaviors from baseline (week 0) until after the intervention was completed at week 13.

Intervention Feasibility—Thirteen children enrolled in the study over 6-weeks (see Table 1 for demographics). Three families, all with normal weight children, withdrew after week 7 due to difficulties in scheduling the intervention visits around extra-curricular activities. Thus, the retention rate was 77% for the total sample, although 100% of the overweight children completed the study.

The children and their parents were noted to actively participate in the home visits. Children set personal goals to improve their dietary quality, physical activity, and the asthma self-management. Children's goal attainment (meaning they met the goal they set) increased from 51% of goals met in week 2 to 86% of goals met in week 12.

Two pedometers were provided to each family, ostensibly one for the child and one for the parent. Pedometer usage varied across the group with 45% of the children using their pedometers more than 60% of the time, 35% using their pedometers about 30% of the time, and 30% using their pedometers for one or two weeks before misplacing or losing them. At exit interviews held at the post-intervention data collection visit, parents noted on how helpful the lifestyle information was and suggested more home visits would help them continue making the lifestyle changes part of their everyday routines.

Intervention results—By week 13, the children's BMI z-scores decreased significantly ($p = .007$). Dietary quality improved significantly with more daily servings of vegetables consumed ($p = .03$), and a non-significant reduction in daily calories from sugar intake. Children significantly improved their MDI skill and QOL (see Table 2). Parents' QOL improved significantly from pre-test to post-test. There were no significant differences after the intervention in children's asthma self-management or physical activity self-efficacy.

Matched Comparison Group—To assess whether the combined *Living Healthy with Asthma* intervention was as effective at improving asthma self-management as an intervention that focused solely on asthma self-management, data on asthma severity, asthma-self management, and MDI skill, were compared between the feasibility sample and the matched comparison group. The feasibility group had significantly higher MDI skill at baseline than did the comparison group. There were no differences between groups on asthma severity or asthma self-management at pre-test or at post-test. Both groups significantly improved their MDI skill from pre-test to post-test (see Table 3).

Discussion

The first aim focused on the important issue of whether it was feasible to provide an intervention that focused on different health behaviors (i.e., asthma self-management and healthy lifestyle behaviors). The pretest to posttest data show that both can be addressed in one comprehensive intervention. The exit interviews revealed that families found the discussion topics and focus on goal setting and healthy behaviors to be acceptable and that they indicated that the intervention needed to have a longer follow-up period with feedback provided on the child's progress. Further, the families liked the process of discussing goals and challenges and noted that goal-setting exercise helped the child stay focused on meeting the goals.

The data on participant retention has mixed interpretations. The 23% sample attrition was based on the families reporting they were having difficulty fitting the home visits into their busy schedules. This points to issues about the frequency of visits over the first half of the 12-week intervention (i.e., biweekly in weeks 2, 4, 6). This may indicate a need to space out the visits to address the scheduling issue. On the other hand, the attrition occurred only among the normal weight children which may indicate a lower need for an intervention designed to increase activity and less perceived need to change dietary habits. Future studies on the *Living Healthy with Asthma* intervention should focus on overweight and obese children for a better fit of intervention to participants' health problems.

The improvements in weight status, asthma self-management, physical activity self-efficacy, and QOL from pretest to posttest provides preliminary evidence of the benefits of the intervention for the participants. The additional analysis with the matched comparison group showed that the *Living Healthy with Asthma* intervention was equivalent to the intervention that focused solely on asthma self-management that the comparison group received.

The small sample size in the feasibility study is a limitation for interpreting findings. Nevertheless, the improved self-management scores and BMI z-scores will enable us to conduct a power analysis to determine the needed sample size for a full-scale test of the *Living Healthy with Asthma* intervention.

The inclusion of normal weight children in the feasibility study was not a limitation per se, because their participation revealed differential retention. Future studies should focus on overweight and obese children. We learned that pedometers had variable use. The pedometers were a good incentive and for those families who used them regularly, they were a useful tool for self-monitoring their daily steps.

Conclusion

The feasibility study reported here helps to fill a gap in knowledge about using combined interventions to improve the health of children who have asthma and who are also overweight or obese. The findings supported the feasibility of implementing a family-based intervention that combined lifestyle health promotion with asthma self-management using MI and goal setting with home visits and telephone monitoring. While attrition was high among the normal weight families, all the families with obese children completed the study.

Our experience indicates it would be better to focus on overweight and obese children with asthma in future studies. Further, the intervention needs to be lengthened with additional visits and longer follow-up to continue monitoring and encouraging families as they make lifestyle and asthma self-management behavioral changes.

How might this information affect nursing practice?—While the focus of patient care is often limited to addressing the presenting chief complaint, nurses are educated to assess patients and their families from a more holistic perspective. With the growing number of people who have multiple chronic conditions, it is imperative that nurses maintain this holistic perspective and bring attention to the patient's other health problems and not focus solely on the presenting complaint. Once the presenting problem is addressed, there is remains a great need to help parents and children learn how to manage the complex care of comorbidities. Comprehensive, multi-focused interventions, like the one introduced here, have the potential to help nurses meet the complex needs of their patients who are dealing with comorbid conditions.

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What is currently known?

Children with chronic conditions are predisposed to obesity. More children with asthma are obese when compared to the non-asthmatic peers. Studies conducted with overweight or obese persons with asthma that focus on weight loss have been found to improve asthma control.

What does this article add?

While there are successful interventions to improve asthma self-management and successful weight loss interventions, there are no combined interventions that address both asthma self-management and weight management. This article is the report of a feasibility test of a combined healthy lifestyle behavior and asthma self-management intervention for school-aged children.

Table 1

Demographics of Feasibility Sample

Variable	N	%	M	SD
Age			11.8	1.2
<u>Gender</u>				
Boy	5	38.5%		
Girl	8	61.5%		
<u>Race/Ethnicity</u>				
Non-Hispanic white	2	15.4%		
Hispanic	5	38.5%		
African American	6	46.2%		
<u>Weight Status</u>				
Normal Weight	7	53.8%		
Obese	6	46.2%		

Table 2

Baseline to Post-intervention Data for Feasibility Sample

Variable	Week 0		Week 13		t	p	95% CI	
	M	SD	M	SD			LL	UL
Child's Data								
Asthma Severity	3.80	1.03	3.50	.71	1.96	.08	-.05	.65
Asthma Self-management	44.40	9.24	50.00	10.81	-1.42	.19	-14.53	3.34
Physical Activity Self-efficacy	33.10	7.62	36.70	9.12	-1.55	.16	-8.85	1.65
MDI Skill	5.35	1.84	6.26	1.29	-3.10	.005	-1.52	-.30
Fruit servings, daily	.57	.88	.62	.92	-.11	.92	-1.04	.94
Vegetable servings, daily	1.00	1.06	2.5	2.37	-2.56	.031	-2.83	-.18
BMI z-score	.16	1.11	.00	1.00	3.38	.007	.06	.27
Quality of Life (QOL)								
Total Score	96.80	11.35	44.30	22.41	6.33	<.001	33.73	71.27
Asthma Symptoms	41.40	6.29	21.00	12.14	4.40	.002	9.91	30.88
Emotional Functioning	35.00	4.55	13.30	5.50	7.76	<.001	15.37	28.03
Activity Limitations	20.40	4.55	10.00	5.74	5.32	<.001	5.98	14.83
Parent's Data								
Total Score	72.64	16.87	86.11	5.40	-3.27	.013	-9.22	-1.45
Family Activity	23.89	3.82	27.00	2.0	-2.55	.05	-6.19	-.03
Emotional Functioning	57.00	5.34	59.50	5.34	-2.55	.031	-4.72	-.28

Table 3

Comparing Feasibility and Matched Comparison Group

Variable	Pre-test			Post-test		
	M	SD	p ¹	M	SD	p ² p ³
<u>Asthma Severity</u>						
Feasibility	3.85	.98	.39	3.50	.70	.92 .08
Comparison	3.54	.78		3.46	.97	.78
<u>Asthma Self-management</u>						
Feasibility	46.31	9.01	.74	50.00	10.81	.84 .19
Comparison	47.42	7.63		50.92	9.87	.13
<u>MDI Skill</u>						
Feasibility	5.35	1.84	.008	6.26	1.29	.86 .005
Comparison	4.77	1.48		6.31	1.44	.001

Legend: p¹ = Differences between feasibility and matched comparison groups at baseline; p² = Differences between feasibility and matched comparison groups post-intervention; p³ = Differences between baseline and post-intervention within each group.