ARTICLE

Effects of a Peer-Led Asthma Self-management Program for Adolescents

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Objective: To evaluate the effectiveness of a peer-led asthma self-management program for adolescents.

Design: Randomized controlled trial comparing a peer-led asthma program (intervention group) and a conventional adult-led asthma program (control group). Each program was implemented at a full-day camp.

Setting: A city and adjacent suburbs in upstate New York.

Participants: A total of 112 adolescents aged 13 to 17 years with persistent asthma.

Intervention: A peer-led asthma self-management program implemented at a day camp.

Main Outcome Measures: The Child Attitude Toward Illness Scale and the Paediatric Asthma Quality of Life Questionnaire were administered at baseline and immediately and 3, 6, and 9 months after the intervention. Spirometry was conducted twice: before and 9 months after the intervention.

Results: The intervention group reported more positive attitudes at 6 months (mean difference, 4.11; 95% confidence interval [CI], 0.65-7.56) and higher quality of life at 6 months (difference, 11.38; 95% CI, 0.96-21.79) and 9 months (difference, 12.97; 95% CI, 3.46-22.48) than the control group. The intervention was found to be more beneficial to adolescents of male gender or low family income, as shown by greater improvement in positive attitudes toward asthma and quality of life than their counterparts.

Conclusion: An asthma self-management program led by peer leaders is a developmentally appropriate approach that can be effective in assisting adolescents with asthma in improving their attitudes and quality of life, particularly for males and those of low socioeconomic status.

Trial Registration: clinicaltrials.gov Identifier: NCT01161225

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Asthma is a leading chronic condition affecting an estimated 7 million children younger than 18 years in 2008.[1] Childhood asthma remains a serious problem for many adolescents into adulthood.[2] Asthma attacks are as common for adolescents as for children.[3] There is a general consensus that the asthma morbidity in adolescents can be largely prevented by effective self-management programs.[4-6] Nevertheless, insufficient effort has been directed toward developing and evaluating an asthma self-management intervention exclusively targeting adolescents.

Peers constitute an essential component of adolescent life. Peers also have important roles as adolescents with chronic illness deal with challenges associated with development and disease.[7-9] Peer support can buffer the impact of stressors, such as adjusting to chronic illness and coping with medical treatment,[10] and increase the likelihood of adherence to self-managing behaviors.[11-13] Particularly, positive peer interactions can have a positive effect on asthma self-management in adolescents.[14,15]

According to Bandura,[16] adolescents are more likely to develop a positive attitude and enact modeled behaviors when they perceive the models as similar to themselves. Adolescents tend to seek guidance from those perceived to be similar to them in characteristics and situations, and the opinions of similar others are more influential than are those of dissimilar others.[17] Adolescents with asthma highly value support from peers with asthma.[18,19] Interactions with peers with asthma can promote a sense of support and normalcy[13,20] and can ameliorate feelings of isolation and compromised peer identification.[21] Therefore, providing a context in which adolescents with asthma can interact with other adolescents with asthma seems to be a developmentally sensitive approach to enhancing asthma self-management in adolescence.

This study evaluated the effectiveness of a peer-led asthma program compared

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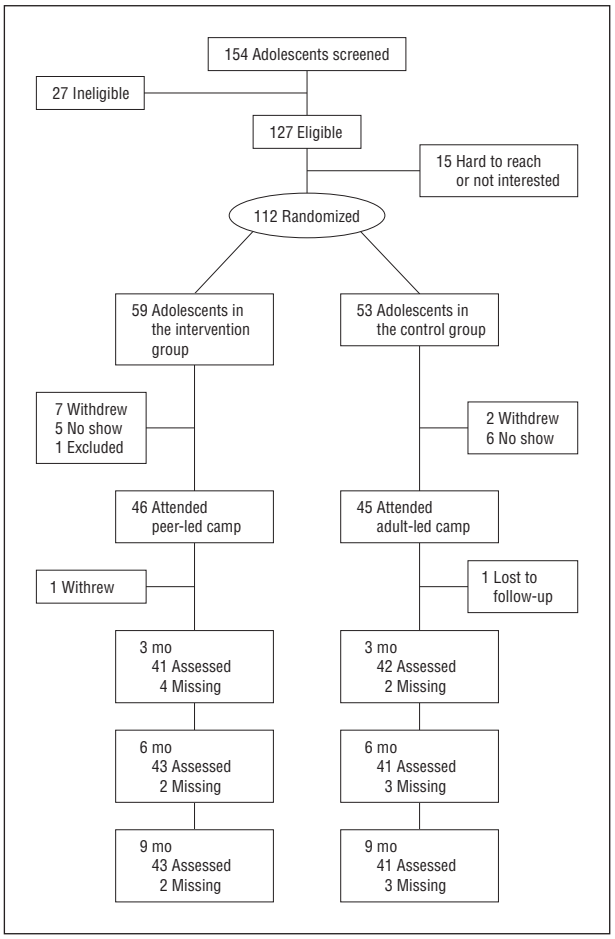

Figure 1. Flow diagram of participant progress through the study phases.

with a program led by adults. The following hypotheses were tested: (1) adolescents who received the peer-led program reported greater improvements in positive attitudes toward asthma and quality of life over time than did those who received the adult-led asthma program and (2) the effects of the peer-led program were moderated by gender, socioeconomic status (SES), and race of the participants.

METHODS

STUDY DESIGN

This randomized controlled trial evaluated the effectiveness of a peer-led program implemented in a camp setting in improving asthma outcomes in adolescents with asthma. A total of 112 adolescents were randomly assigned using a computer-generated random table to either the intervention (peer-led camp) or control (adult-led camp) group. Participants were blinded to their group assignment. Data were collected before randomization (baseline), immediately after the camp, and 3, 6, and 9 months after the camp.

SETTING AND SAMPLE

Participants were recruited from a variety of settings, including clinical practices and schools, in a northeastern section of the United States. The intervention programs were implemented at a camp facility. Eligibility criteria included (1) age 13 to 17 years; (2) mild, moderate, or severe persistent asthma specified by the National Heart, Lung, and Blood Institute guidelines; (3) asthma diagnosis for at least 1 year; (4) no other chronic or emotional health conditions (eg, diabetes, cystic fibrosis, and major depression); and (5) the ability to understand spoken and written English. Adolescents with learning disabilities based on reports from parents, teachers, or physicians were excluded because these disabilities could affect the implementation and outcomes of the intervention program.

A priori power analysis estimated 104 (52 in each group) to be an adequate sample size. The sample size was based on a function of power (0.80) with a large effect size ($\mu 1 - \mu 2/\sigma = 0.75$) and $\alpha = .05$ for comparing the intervention and control groups on the outcome variables. The sample size also accommodated a 10% predicted attrition rate. Of 112 campers (59 in the intervention group and 53 controls) enrolled in the study, 91 attended the day camp (46 in the intervention group and 45 controls). **Figure 1** shows the flow of participants through the study. Twenty-one recruited adolescents did not participate in the camp for multiple reasons, including acute illness or hospitalization, school events, and sports competitions.

INTERVENTION

The intervention group attended a day camp in which group activities were facilitated by 12 peer leaders (9 females and 3 males). Peer leaders, aged 16 to 20 years, who met the previously mentioned eligibility criteria (disregarding age) were nominated by adults (eg, teachers, nurses, and physicians). Before the camp, peer leaders attended 3-week training sessions (5 hours per week) that used an intensive and structured training protocol based on the Power Breathing program.[22]

At the camp, paired peer leaders facilitated learning activities in small groups of 6 to 10 campers. Younger leaders (aged 16-17 years) led younger groups (aged 13-14 years); older leaders (aged 18-20 years) led older groups (aged 15-17 years). Younger teens were divided into 2 gender-matched groups and a coed group, and older teens were divided into 3 gender-mixed groups. Adult volunteers oversaw the group activities and were available to provide assistance to peer leaders and campers as needed. The day camp program took place at a local camp facility for a full day. The adapted Power Breathing program was used for the campers' self-management training, consisting of the 3 sessions addressing basic asthma education, psychosocial issues, and asthma self-management skills. Each session lasted approximately 45 to 60 minutes; group activities involved discussion, strategic thinking, knowledge testing games, and role-playing. After the camp, peer leaders conducted monthly telephone follow-ups to provide continuous peer support and encouragement using a checklist. Approximately 49% of participants were successfully reached each month, and the mean length of the interaction was 2 to 5 minutes for each contact.

The control group attended an adult-led day camp that was conducted at the same camp site on a different day. Two nurse practitioners and a physician offered the campers didactic asthma education. The length of the day camp and the content of the asthma program were comparable with those of the intervention group.

MEASUREMENTS

Child Attitude Toward Illness Scale

Adolescents' attitudes toward their health condition were measured using the 13-item Child Attitude Toward Illness Scale.[23]

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This 5-point scale includes questions such as, "How fair is it that you have asthma?" A total score reflected respondents' overall attitudes toward asthma, with higher scores indicating more positive attitudes. The Cronbach α in the current adolescent sample was .85.

Paediatric Asthma Quality of Life Questionnaire

The 23-item Paediatric Asthma Quality of Life Questionnaire measures asthma-specific quality of life in children aged 7 to 17 years.[24] This scale has been effective in evaluating and discriminating within and between individuals with varying severity of asthma because of its high sensitivity to changes in asthma status.[24-26] The scale consists of 3 subdomains: symptoms (10 items), emotional function (8 items), and activity limitation (5 items). Each item is measured on a 7-point scale. Higher total scores indicate better levels of functioning. In this study, the Cronbach α of the total questionnaire was .96, and the reliability of the 3 subscales was 0.95 (symptoms), 0.93 (emotional function), and 0.84 (activity limitation).

Forced Expiratory Volume in 1 Second and Forced Expiratory Volume in 1 Second/Forced Vital Capacity

A portable spirometer (KoKo; Pulmonary Data Services, Louisville, Colorado) was used to measure forced expiratory volume in 1 second (FEV_1) and FEV_1/forced vital capacity. Predicted values were based on the equations of Polgar. Spirometry was performed twice (at the camp and at the 9-month contact). Three consecutive efforts were recorded, and reproducibility was determined per American Thoracic Society criteria. Respiratory therapists administered all the tests. A demographic questionnaire was completed by the parents, who indicated the race, age, and gender of the adolescents and the annual family income.

Procedure

Participants were recruited through flyers and referrals from physicians and school nurses. For physician referral, clinical practices in a major university medical center that predominantly served minority children and adolescents of low-income inner-city families were used. School nurses in 5 local schools also made referrals. Thirty-six percent of the sample was recruited through referrals from health care providers, 39% from school systems, and the remaining from flyers and personal referral. The study nurse (J.B.) screened for eligibility via telephone. Eligible adolescents and parents met with the study nurse at the University of Rochester Medical Center for informed consent acquisition and data collection. Adolescents completed the study measures independent of parents. Self-report measures were administered at baseline, immediately after the camp, and 3, 6, and 9 months after the camp. Spirometry tests were conducted twice: at the camp and at 9 months. The 9-month spirometry tests were conducted at the university medical center. Participants spent 10 to 20 minutes completing the scales (the reading levels of which ranged from fourth to seventh grade). A trained study nurse collected baseline data by paper and pencil at enrollment before random assignment, and postintervention data were collected online or by paper and pencil. Throughout 9 months, 59% of the sample completed study questionnaires online at least once. The study protocol and questionnaires were approved by the Research Subjects Review Board. Informed parental consent and adolescent assent were obtained before baseline data collection.

Table 1. Sociodemographic Characteristics of 112 Adolescents by Group

Characteristic	Intervention Group (n = 59)	Control Group (n = 53)
Age, mean (SD), y	14.86 (1.35)	14.53 (1.3)
Gender, No. (%)		
Male	26 (44)	22 (42)
Female	33 (56)	31 (58)
Race/ethnicity, No. (%)		
White	27 (46)	25 (47)
Black	20 (34)	18 (34)
Hispanic	8 (14)	5 (9)
Asian	1 (2)	0
Biracial/multiracial	3 (5)	5 (9)
Annual family income, No. (%), $		
≤29 000	28 (47)	19 (36)
30 000-69 000	13 (22)	15 (28)
≥70 000	18 (31)	19 (36)

DATA ANALYSIS

χ^2 and t Tests were performed to compare the groups by demographic characteristics and baseline outcome measures, depending on the levels of measurement. Using linear mixed models, repeated-measures analyses of variance were conducted for attitudes and quality of life as a function of time, treatment group, and time × treatment interaction effects. Planned contrasts were constructed to test treatment effects at each time point. To test for moderator effects, the moderator and the interaction of the moderator with the treatment were added to each model. When the moderator × treatment group interaction was statistically significant, additional contrasts were constructed to compare camp and 3-, 6-, and 9-month differences in the treatment and control groups at Cohen and Cohen's[27] suggested values of 1 SD above and below the mean. Analyses were performed using all available data (ie, intent-to-treat analyses), including participants who subsequently dropped out. Statistical analyses were performed using PROC Mixed in SAS, version 9.1.3 (SAS Institute Inc, Chicago, Illinois).

RESULTS

SAMPLE CHARACTERISTICS/GROUP COMPARISONS ON BASELINE DATA

A total of 112 adolescents completed the baseline data. **Table 1** summarizes the sociodemographic characteristics for each group. The mean number of years with an asthma diagnosis was 10 years, and 71% of the sample was taking at least 1 controller medication. Of those who completed baseline, 91 (81%) attended either peer-assisted (intervention) or adult-led (control) asthma camp. In comparing camp attendees (n=91) and nonattendees (n=21), attendees reported a higher family income (t_{110}=2.32, P=.03) and more positive attitudes (t_{110}=2.12, P=.04). No statistically significant differences were found in other variables. Baseline comparisons between the intervention and control groups showed no significant initial differences between the groups.

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Table 2. Outcome Measures by Group and Time Point

Outcome Measure	Baseline (n=112)		Time After Camp: Immediately (n=91)		Time After Camp: 3 mo (n=83)	
	Intervention Group	Control Group	Intervention Group	Control Group	Intervention Group	Control Group
Attitude scores, mean (SD)	43.92 (8.70)	43.04 (8.13)	47.54 (8.00)	46.38 (7.74)	49.02 (6.80)	46.69 (8.76)
Quality of life scores, mean (SD) total	128.36 (28.12)	120.00 (30.63)	131.22 (22.08)	120.40 (33.13)	132.90 (20.18)	124.33 (26.20)
Symptoms	54.20 (13.89)	49.25 (15.64)	55.45 (10.46)	51.71 (15.78)	54.66 (11.29)	52.48 (12.12)
Emotional function	46.92 (10.51)	44.42 (11.60)	48.18 (8.89)	43.24 (12.54)	49.51 (7.37)	45.17 (10.73)
Activity limitation	27.24 (6.15)	26.34 (6.08)	27.59 (5.58)	25.45 (6.78)	28.73 (4.78)	26.69 (6.25)

Outcome Measure	Time After Camp: 6 mo (n=84)		Time After Camp: 9 mo (n=84)	
	Intervention Group	Control Group	Intervention Group	Control Group
Attitude scores, mean (SD)	49.67 (8.57)	46.22 (8.78)	50.05 (7.30)	47.12 (7.94)
Quality of life scores, mean (SD) total	134.72 (21.53)	123.59 (29.62)	140.30 (21.04)	125.12 (25.95)
Symptoms	57.51 (10.01)	52.20 (12.88)	60.09 (10.12)	52.63 (12.63)
Emotional function	49.56 (7.32)	45.07 (11.72)	51.00 (7.29)	46.80 (9.11)
Activity limitation	27.65 (6.62)	26.32 (7.11)	29.21 (5.30)	25.68 (6.24)

Table 3. Pulmonary Function Test Results at the Camp and 9 Months After the Camp by Group

Variable	Camp (n=91)		9 mo After Camp (n=75)	
	Intervention Group	Control Group	Intervention Group	Control Group
FEV_1, mean (SD), % of predicted	102.1 (15.9)	102.3 (13.1)	100.8 (13.7)	97.7 (11.0)
FEV_1/FVC, mean (SD), %	83.3 (8.2)	82.1 (7.8)	83.1 (9.0)	83.2 (9.2)

Abbreviations: FEV_1, forced expiratory volume in 1 second; FVC, forced vital capacity.

EFFECTIVENESS OF THE INTERVENTION

Hypothesis 1: The Intervention Group Showed Greater Improvement in Asthma Outcomes Than Did the Control Group

The mean values for outcome measures at 5 time points for each group are displayed in **Table 2**. Mixed-model analyses of variance revealed a significant improvement over time in overall attitudes in both groups (F=11.94, P=.001), and the improvement was greater in the intervention group than in the control group at 6 months (mean difference, 4.11; 95% confidence interval [CI], 0.65-7.56; P=.02). Both groups reported significantly increased quality of life over time (F=4.31, P=.002), with the intervention group having significantly higher quality of life at 6 months (difference, 11.38; 95% CI, 0.96-21.79; P=.03) and 9 months (12.97; 3.46-22.48; P=.008). When each subscale was considered separately, the intervention group scored significantly higher on the symptom subscale at 6 months (difference, 5.35; 95% CI, 0.69-10.01; P=.03) and 9 months (6.25; 1.62-10.89; P=.009); on the emotional function subscale at 3 months (4.19; 0.38-8.01; P=.03), 6 months (4.49, 0.58-8.40; P=.02), and 9 months (3.67; 0.31-7.03; P=.03); and on the activity subscale at 9 months (3.05; 0.71-5.40; P=.01). No statistically significant changes in percentage of predicted FEV_1 and percentage of FEV_1/forced vital capacity were found as a result of the intervention for either group (**Table 3**). However, there was borderline significance in percentage of predicted FEV_1 (F=3.62, P=.06), for which both groups showed a decreasing trend between baseline and 9-month follow-up, with the control group showing a greater decline than the intervention group.

Hypothesis 2: Intervention Outcomes Were Moderated by Gender, SES, and Race

Gender moderated the impact of the intervention on quality of life where males in the intervention group had significantly higher scores at 9 months than did male controls (difference, 16.32; 95% CI, 1.82-30.82; P=.03) (**Figure 2**). A similar result was found for the subscales of symptoms (difference, 7.33; 95% CI, 0.26-

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14.41; $P=.04$) and activity limitation (4.68; 1.13-8.23; $P=.01$).

Participants were classified into either lower SES (1 SD below the mean of family income) or higher SES (1 SD above the mean). **Table 4** provides mean differences between the intervention and control groups for outcome measures in each SES subgroup. The intervention effect on attitudes was significantly moderated by SES, with lower-SES intervention participants scoring higher in positive attitudes at 3 months ($P=.001$), 6 months ($P=.001$), and 9 months ($P=.02$) than controls. The SES also moderated the relationship between the intervention and quality of life. Low-SES intervention participants had significantly higher quality of life at 3 months (difference, 16.28; 95% CI, 2.80-29.76; $P=.02$), 6 months (22.52; 7.96-37.09; $P=.003$), and 9 months (17.71; 4.33-31.08; $P=.01$) than did low-SES controls. Compared with low-SES controls, low-SES intervention participants had significantly higher symptom scores at 6 months ($P=.008$) and 9 months ($P=.02$); emotional function scores after the camp ($P=.01$) and at 3 months ($P=.001$), 6 months ($P=.001$), and 9 months ($P=.01$); and activity limitation subscale scores at 3 and 9 months ($P=.02$ for both).

Likewise, intervention effects were also moderated by race, where nonwhites tended to benefit the most from the intervention. Nonwhite intervention group participants reported greater improvement in attitudes and on all 3 subdomains of quality of life than did their white counterparts (data not shown). As an example, **Figure 3** illustrates the race difference in the effect of the intervention on overall quality of life. The similar patterns of results for SES and race were due to the high correlation between the 2 variables ($r=0.72$, $P<.01$).

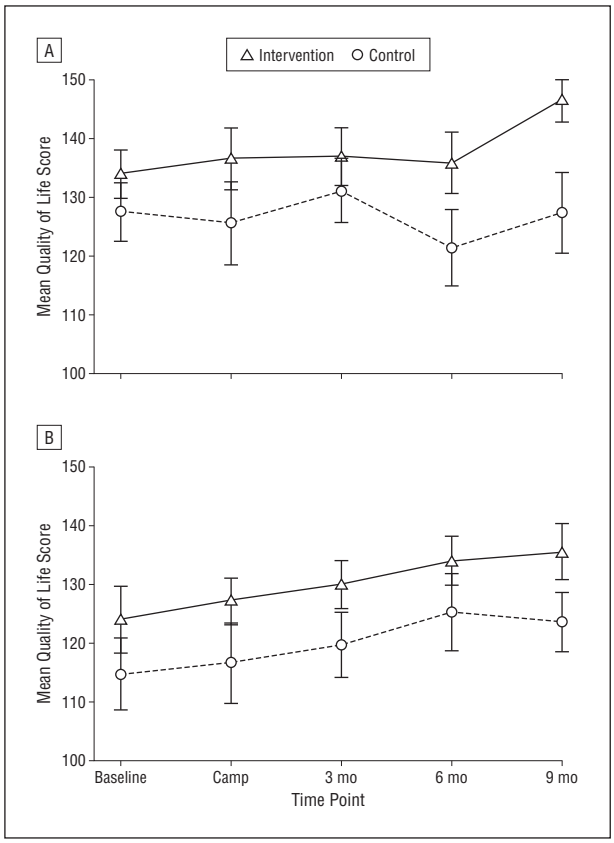

Figure 2. Effect of the intervention on quality of life in male (A) and female adolescents (B). Error bars represent SD.

COMMENT

This study provides compelling empirical evidence that an asthma self-management program assisted by peer leaders is a viable and developmentally appropriate option for adolescents with asthma as an alternative to paternalistic models of asthma programs for adolescents. The peer-led asthma program yielded greater improvements in positive attitudes and quality of life compared with the adult-led program. These findings corroborate the literature demonstrating the superiority of peer-led health education programs to other programs led by adults in promoting positive health outcomes.[28,29] A peer-led asthma program ("Triple A Program") for adolescents has been evaluated using school settings in Australia.[30,31] Gibson et al[31] provided the program to and collected data from all participating students regardless of their asthma status, whereas Shah et al[30] offered the program to all students in the intervention schools but collected asthma-related data from those with recent wheeze only. Each study reported the effectiveness of the intervention in affecting asthma knowledge[31] and quality of life.[30] However, because of the untreated control groups, a question remained whether the positive effects were simply due to the provided information or the specific learning format using peer leaders. The present study effectively addressed the question by using controls who received comparable information as the intervention group; thus the only difference was the facilitators who delivered the information: adults vs peers, respectively. As a result, this study espouses the superiority of a peer leader approach to the traditional adult-led format. Another noteworthy difference from the earlier studies is that these peer leaders experienced similar burdens of asthma as did participants. The participants' perceptions of the shared experiences with the peer leaders in their disease-related and developmental challenges may have fostered the sense of camaraderie between them. As Bandura[16] hypothesized, the perceived similarities may have enhanced the learners' increased receptivity of the imparted information and the peer leaders as role models, resulting in the improvement in study outcomes.

Findings about pulmonary function are less conclusive, although there was a trend toward the percentage of predicted FEV_1 declining over time at a greater rate in the control group than in the intervention group. Similarly, Shah et al[30] also reported no effect of the peer-led program on pulmonary function after 3 months despite the notable improvement in quality of life.

We found overall improvement in outcome measures regardless of group membership, suggesting that the asthma program of either format can be beneficial to some degree. Nevertheless, the intervention group reported consistently greater improvement in all measures than did the control group, particularly at the latter time points, when the peer-led group continued to show improvement while

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Table 4. Differences Between the Intervention and Control Groups for Outcome Measures by SES Subgroup

Variable	Time After Camp, Difference, Mean (95% CI)			
	Immediately	3 mo	6 mo	9 mo
Attitude scores				
Low SES	2.56 (–1.70 to 6.83)	7.13 (2.90 to 11.37)	8.59 (3.71 to 13.46)	5.48 (1.02 to 9.94)
High SES	0.23 (–3.84 to 4.30)	–0.31 (–4.19 to 3.56)	0.77 (–3.71 to 5.25)	1.11 (–2.98 to 5.19)
Quality of life scores				
Symptoms				
Low SES	4.33 (–3.03 to 11.69)	3.28 (–3.59 to 10.16)	9.01 (2.39 to 15.63)	7.86 (1.29 to 14.43)
High SES	2.86 (–4.04 to 9.77)	1.00 (–5.12 to 7.12)	3.35 (–2.64 to 9.34)	5.83 (–0.13 to 11.80)
Emotional function				
Low SES	7.45 (1.52 to 13.38)	9.37 (4.08 to 14.66)	10.34 (4.97 to 15.72)	5.55 (0.76 to 10.34)
High SES	2.42 (–3.15 to 7.99)	0.78 (–3.98 to 5.54)	0.51 (–4.37 to 5.39)	2.64 (–1.69 to 6.97)
Activity limitation				
Low SES	2.28 (–1.21 to 5.78)	3.92 (0.58 to 7.26)	3.22 (–0.80 to 7.24)	4.21 (0.93 to 7.48)
High SES	1.33 (–1.98 to 4.64)	0.39 (–2.59 to 3.39)	0.78 (–2.88 to 4.45)	2.65 (–0.33 to 5.63)

Abbreviations: CI, confidence interval; SES, socioeconomic status.

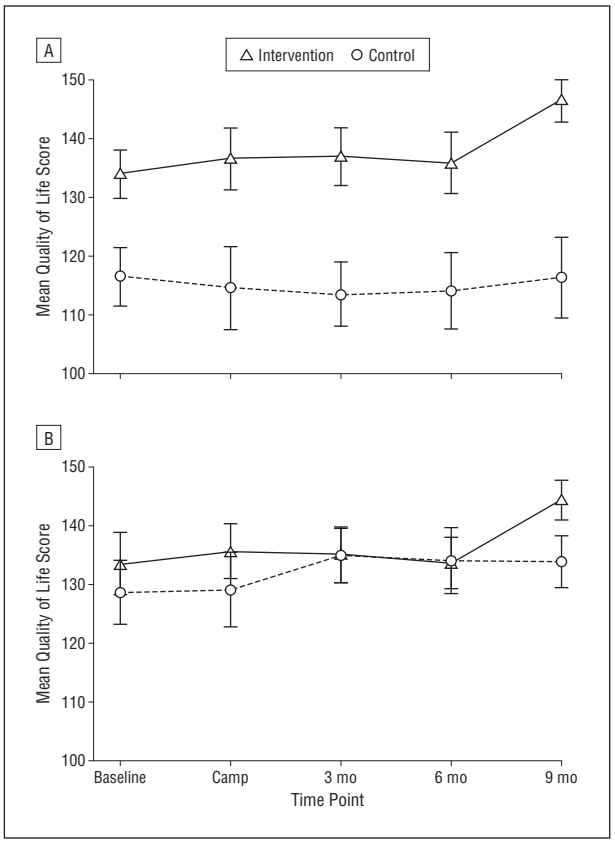

Figure 3. Effect of the intervention on quality of life in nonwhite (A) and white (B) adolescents. Error bars represent SD.

small changes were detected in the adult-led group. The continued or even further improved positive effects in the peer-led group at the latter time points may have been, in part, attributed to the brief monthly telephone contacts by the peer leaders. However, given the brevity of the contact and the low rates of the participants who were successfully reached each month, it may be unlikely that the follow-up telephone calls were solely responsible for the sustaining benefits. Rather, the long-term benefits may indicate the program's capacity to facilitate adolescents' internalizing process of the acquired information, enabling sustaining positive outcomes.

The results of this study also suggest that the peer-led program could be particularly beneficial to males. This finding is inconsistent with the study by Shah et al,[30] in which females showed greater improvement in quality of life after a peer-led asthma program. The mixed findings on gender difference warrant further investigation. In addition, we found that the peer-led program had a greater effect on adolescents from low-SES and nonwhite backgrounds. Nonwhite participants represented primarily those from low-income inner-city families. The underserved group often experiences limited access to informational and psychosocial resources, hampering optimum asthma self-management. The peer-led program can potentially narrow the gaps addressing disparity in asthma morbidity in underserved adolescents.

Several limitations of this study warrant caution. The convenience sampling method limits the generalizability of the sample. Particularly, differences between camp attendees and nonattendees in family income and attitudes raised further concerns regarding representativeness. We also encountered challenges in recruiting peer leaders of male gender and minority background. More creative strategies to recruit male and minority adolescents as peer leaders are warranted. In addition, this study was limited in ensuring comparability between the 2 groups because no monthly telephone calls were offered to the control group whereas monthly telephone contacts by peer leaders were implemented for the intervention group. Nevertheless, it seems unlikely that the difference in monthly contacts was accountable for these findings given that peer leaders' monthly contact attempts were largely unsuccessful. Last, the study is limited in predicting the long-term sustainability of the intervention beyond 9 months. A future study using a longer period of observation is needed, during which changes in medication adherence and health care utilization are systemically assessed along with other psychosocial measures.

This is one of very few intervention studies exclusively targeting adolescents with asthma. More impor-

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tant, this is the first non–school-based peer-led asthma program to use adolescents with asthma as peer leaders to maximize its impact. The present intervention capitalizes on adolescents' receptiveness to peer influence while addressing their desire for independence by offering a teen-governed program format. Implementing a peer-led asthma program may require systemic coordination among community health care professionals, who are well positioned to identify and train qualified peer leaders and organize and promote community events, such as a teen asthma camp, where the program can be provided. School nurses and health educators can also readily adopt the program in middle and high schools. Overall, this study demonstrates the possibility of the broader application of a peer-led approach to health education programs for adolescents. Further research is needed to investigate the long-term sustainability and cost benefit of the peer-led program.

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Author Contributions: Dr Rhee had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Rhee and Hunt. *Acquisition of data:* Rhee and Brasch. *Analysis and interpretation of data:* Rhee and Belyea. *Drafting of the manuscript:* Rhee. *Critical revision of the manuscript for important intellectual content:* Rhee, Belyea, Hunt, and Brasch. *Statistical analysis:* Rhee and Belyea. *Obtained funding:* Rhee. *Administrative, technical, and material support:* Brasch. *Study supervision:* Rhee.
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