Evaluating the Effectiveness of the Kids Living Fit™ Program: A Comparative Study

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ABSTRACT: After-school programs can be implemented by school nurses to facilitate healthy lifestyle choices in children with the goal of decreasing obesity. Kids Living Fit™ (KLF), an after-school program designed by community hospital nurses, was implemented in elementary schools and focused on best lifestyle choices regarding foods consumed and activities chosen for children in grades 2 through 5. Study measures included comparison of body mass index (BMI) percentiles for age and gender and waist circumference between two self-selected groups composing a total sample size of 185 participants: the KLF intervention group (n = 80) and the no-intervention/contrast group (n = 105). The 12-week intervention included a weekly fitness program and monthly dietitian presentations. Participants completed food and activity diaries and wore pedometers. In pairwise comparisons, the KLF group had a significant decrease in BMI percentile between baseline and follow-up (−2.3%) compared with the contrast group. The KLF group also demonstrated a smaller increase in waist circumference than the contrast group.

KEY WORDS: after-school program, body mass index, childhood obesity, child nutrition, health promotion, nutrition education, physical activity

INTRODUCTION

From 1999 to 2000 through 2003 to 2004, the prevalence of overweight status among children aged 2 to 19 years increased from 14.0% to 18.2% among boys and from 13.8% to 16.0% among girls (Ogden et al., 2006). The cause of childhood obesity is multifactorial, with complex interactions among cultural, behavioral, genetic, environmental, and socioeconomic factors (Dehghan, Akhtar-Danesh, & Merchant, 2005; Sheehan & Yin, 2006). Societal shifts in healthy foods consumed and decreased activity levels presumably have influenced these factors in recent decades. Less is known about the effectiveness of interventions designed to decrease the body mass index (BMI) for age and gender among this group. However, any intervention must address energy imbalance, with considerations of both energy consumption and physical activity (Institute of Medicine of the National Academies, 2007). Various studies have targeted the amount of time spent viewing television and/or playing video games, levels of exercise, dietary choices, and nutritional counseling (Dietz & Gortmaker, 2001; Maffiuletti et al., 2004; Wang et al., 2006). Some recent evaluations of school-based interventions to address adolescent overweight status have shown mixed results. Most of these interventions are based on the social-cognitive theories that knowledge and behavior are related to observing others in social contexts and experiences.

Schools provide an ideal environment in which health knowledge can be presented and healthy behaviors can be modeled and observed by children. In one school-based, random control study program designed to improve nutrition knowledge and physical activity in 5- to 7-year-old children, some significant improvements were observed in the selection of fruits and vegetables as well as activity patterns, but no differences were observed with respect to BMI among participants at baseline and follow-up (Warren, Henry, Lightowler, Bradshaw, & Perwaiz, 2003).

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The GEMS pilot study found significant improvements among 8- to 10-year-old African American girls in BMI scores, in activities resulting in fewer hours of viewing television/playing video games, and in the number of meals eaten while watching television (Robinson et al., 2003). This intervention sought to integrate the family into the child's activity and dietary patterns, which may explain some of the improvements observed.

Originators of the Pathways program implemented and evaluated a comprehensive school-based program consisting of four components, including classroom curriculum, food service, physical activity, and family involvement (Caballero et al., 2003). The Pathways program components were: a classroom curricula designed to teach healthy eating and increased physical activity, a food service component designed to reduce the fat content of school lunch menus, a physical exercise component intended to increase physical exercise through three 30-minute-per-week exercise programs, and a family component designed to add family support for healthy food and exercise behaviors. There were no significant differences observed between the intervention and control group in this program targeting 3rd-, 4th-, and 5th-grade American Indian children. The authors acknowledged that a longer period of time is needed to observe changes in BMI scores following an intervention of this type. A complete review of school-based interventions that address adolescent obesity was completed by Sharma (2006).

To facilitate improved lifestyle choices for children related to foods consumed and activities chosen, the authors of this article designed and implemented three studies to determine if the program Kids Living Fit™ (KLF) could effect change in participants' BMI for age and gender. KLF, which includes dietary education and exercise components, is described in the Methods section.

The first study was a pilot evaluating the outcomes of 14 3rd- through 5th-graders who participated in an 8-week after-school program at a public elementary school in the community the hospital serves. Results of this pilot study demonstrated an overall BMI decrease of 0.07% percentile and a 14% increase in healthy weight percentiles (Speroni, 2006). Because improvement in BMI was seen in this study, the research series was continued.

The second study was also a pilot; however, this 12-week study was a hospital-based intervention and was held on weekends at the hospital instead of after school. Study procedures were similar to the other two KLF studies. A total of 32 children were enrolled at two hospital sites. Results demonstrated small decreases in both BMI percentile and waist circumference among participants (Speroni, Tea, Earley, & Niehoff, 2007).

The current study we conducted took place after school at four public elementary schools in the community the hospital serves. This study was designed to teach healthy lifestyle choices related to foods consumed and activities chosen. The KLF intervention follows the social learning model which holds that individuals adopt and modify behavior based on experiences in social settings (Bandura, 1986). Consistent with this social learning theory, the dietary and exercise components were based on the expectation that children will make healthier choices, herein referred to as best choices, with respect to foods consumed and activities chosen when introduced to best choices in a social setting including family and peers.

The purpose of this study was to determine if a voluntary after-school program could be effective in decreasing BMI for age and gender for children at risk of becoming overweight (85th–94th percentiles) or overweight (≥95th percentile) and also to maintain normal weight (5th–84th percentiles). Secondary objectives were to determine if the KLF program led to a reduction in the obesity-related outcome measure of waist circumference (Lee, Bacha, & Arslanian, 2006; Maffeis, Grezzani, Pietrobelli, Provera, & Tato, 2001; Morimoto et al., 2007) and in the program-related outcome measures per the satisfaction questionnaires completed by study participants.

METHODS

This was a prospective comparative study of two populations: the KLF intervention group and a contrast group. Because randomization was not considered practical, a quasi-experimental design was adopted. Four public elementary schools in the community served by the hospital were selected based on the school principals' willingness to accommodate an after-school program offering the KLF intervention. This study was approved by the Institutional Review Board (IRB) of record for the hospital prior to implementation. As required by the IRB, parental informed consent and child assent were obtained for all study participants. To recruit study participants, letters describing the study were sent home with students in the weekly packet of written communications between schools and parents. These letters were distributed to the approximately 1,700 parents of students in grades 2 through 5 at the four schools. A total of 194 children enrolled in the study.

There were 86 participants enrolled in the KLF group and 108 participants in the contrast group. A total of 6 participants withdrew from the KLF group, and 3 were lost to follow-up in the contrast group, resulting in participant totals at Week 12 of 187 (80 = intervention, 107 = contrast) and at Week 24 of 185 (80 = intervention, 105 = contrast). Procedures for both the KLF and contrast group are listed in Table 1.

KLF Intervention Group Methods

Study eligibility criteria excluded children who were unable or unwilling to perform physical fitness

Table 1. Study Procedures for the Kids Living Fit™ (KLF) Intervention Group and Contrast Group

Study Procedure	Group	Baseline	Week 1	Weeks 2–3	Week 4	Weeks 5–7	Week 8	Weeks 9–11	Week 12	Week 24
Body mass index for age and gender/height and weight	KLF	X							X	X
	Contrast	X							X	X
Waist circumference	KLF	X							X	X
	Contrast	X							X	X
Weekly exercise: 1 hour	KLF			X		X		X		
	Contrast									
Weekly exercise: 30 minutes	KLF		X		X		X		X	
	Contrast									
Dietary presentation: 30 minutes	KLF		X		X		X		X	
	Contrast									
Food and activity questionnaires	KLF	X							X	X
	Contrast									
Satisfaction questionnaires	KLF	X							X	X
	Contrast	X							X	X
Daily diaries	KLF		X		X		X		X	X
	Contrast									
Overall satisfaction with KLF intervention	KLF									X
	Contrast									
Parental attendance recorded	KLF		X		X		X		X	
	Contrast									

activities or to complete food and activity study questionnaires and diaries. When participants were originally screened, no children were excluded based on these criteria. Participants were charged a $100 fee to participate in the KLF program. School principals identified three children whose families could not pay the fee but wanted their child in the KLF group. The hospital provided scholarships for these three children.

Heights, weights, BMI for age and gender, and waist circumference were measured by one of the two nurse investigators or by the study coordinator, all of whom were registered nurses and who performed all measurements using standardized practices. School scales were used to measure height and weight. The BMI calculations were determined by the Centers for Disease Control and Prevention's (CDC's) online BMI child and teen percentile calculator adjusted for age and gender (CDC, 2006).

Beginning in January 2006, participants in the KLF group met once weekly for 12 consecutive weeks. The KLF program sessions were held immediately after school at the elementary school. Each of the four schools held the program at their school on different days of the week.

Exercise Component. A physical fitness trainer led the participants in performing various types of physical fitness activities, such as aerobic dance, light strength training, stretching, balancing techniques, heart rate monitoring, yoga, and relaxation techniques. Best lifestyle choices were reinforced, encouraging participants to make best choices in selecting active behaviors such as running or cycling compared with being sedentary by viewing television or playing video games. The purpose of the exercise component was to help participants identify a variety of active behaviors they enjoyed and could conduct independently following the conclusion of the program.

Dietary Component. The objective of the four 30-minute dietary education presentations given by registered dietitians was to encourage children to select foods best for them when making meal and snack selections. Week 1 addressed best choice lunch selections. The nutrient analysis for the lunches to be served at the four schools was obtained. The dieticians then conducted a nutrient analysis to identify the best option for participants to select from the school menu, and they labeled this option the *best choice option*. The best choice–labeled menus were given to students in the KLF group. The nutrient analysis was based on total calories and grams of saturated fats and trans-saturated fats as well as a balanced distribution of protein, carbohydrates, and fats. The purpose of identifying a best choice lunch was to expose the participants to thinking in terms of best lifestyle choices and making choices that are based on what is nutritiously best for them instead of momentary food desires. The dieticians also created best choice lunch menus for children who brought their lunch from home rather than buying the school lunch.

The second dietary presentation introduced the U.S. Department of Agriculture (n.d.) food pyramid and serving sizes. The food pyramid given to students also included recommended serving sizes. Each food

group was discussed as well as age-appropriate serving sizes. Using food models, participants were taught the serving size each represented, the group to which it belonged, and whether the item represented a best choice, OK choice, or limited choice food item. Students worked together in groups to identify healthy meal and snack options.

The third dietary education component was an age-appropriate interactive portion distortion presentation (U.S. Department of Health and Human Services & National Heart, Lung, and Blood Institute, n.d.). Calories were described in simple terms, showing side-by-side comparisons of serving sizes 20 years ago versus serving sizes today. Students then guessed how long it would take to walk or ride a bike to burn the extra energy found in today's larger serving sizes. The healthy choices discussion focused on asking participants to identify the better options for meals and snacks based on alternatives presented.

The final dietary presentation focused on making best choices at fast-food restaurants and summarized information from the previous three presentations. Participants were encouraged to eat fast food in moderation (fewer than one time per week) and to make the best choices possible when dining at fast-food restaurants. The concept of healthy versus not-healthy choices was taught by providing menus from fast-food restaurants and having groups of students review the menus and present their best choice findings. Parents were encouraged to attend each of the four dietary presentations.

Study Questionnaires and Diaries

Participants were asked to complete food, activity, and satisfaction questionnaires three times during the study, recording their 10 favorite foods and 10 family-favorite foods categorized by choice category (best choice, OK choice, or choice that should be limited) and by food groups. On the activity questionnaire, participants specified their 10 favorite activities by choice category and whether they were inactive or active.

On the satisfaction questionnaire, participants categorized their level of satisfaction (very satisfied, satisfied, or not satisfied) with their food choices, activity choices, family food choices, and family activity choices. Participants were also asked to describe their body size as too thin, just right, or too heavy. One additional satisfaction question was measured only at Week 24, at which time participants were asked to categorize how much the KLF program helped them make improved lifestyle choices, such as for food and activity choices, by selecting one of the following choices: helped a lot, helped a little, or did not help.

Participants were to complete daily diaries at Weeks 1, 4, 8, 12, and 24, recording the following: the total time of the 10 activities they spent the most time doing that day, not including school or sleeping; pedometer totals; food intake specifying servings per day by food group and number of fast-food meals; and number of best choice lunches. Participants were reminded during the KLF exercise programs to complete the diaries themselves in the upcoming week. Participants returned these at the weekly exercise sessions. The intent of study diaries was to build awareness about healthy food choices and activity patterns. The diaries were not incorporated for purposes of analysis and reporting because of expected compliance issues inherent with diaries in long-term studies and in studies with children.

Contrast/Nonintervention Group Methods

BMI and waist circumference measurements were made at baseline and at Weeks 12 and 24, and they followed the same methodologies as described above for the KLF group. Participants in this group also completed satisfaction questionnaires. These procedures were conducted during the school day and required approximately 5 minutes to complete. No other study procedures were performed, and no study materials were provided to this group. There was no fee to participate in the contrast group.

RESULTS

Data analysis for this study was completed by a biostatistician using SAS version 9.1 statistical software. Measures of central tendency (mean, median, and variance) were performed to describe the participant groups. There were 185 participants, 80 in the KLF group and 105 in the contrast group, who were followed to Week 24. A higher percentage of girls were enrolled in the KLF group than the contrast group (57% vs. 44%, $p < .05$). The majority of students (29%) enrolled in the KLF group were in Grade 4, whereas the majority (33%) of the contrast group were in Grade 2. The mean age was 9.4 years for the KLF group and 9.2 years for the contrast group (Table 2). Approximately three fourths of the participants in both groups were White, non-Hispanic.

All KLF intervention groups in the four schools experienced a decrease in BMI percentile from the baseline measure to remeasure recorded at Weeks 12 and 24. The two single largest decreases in BMI percentile occurred in the contrast groups in Schools 1 and 4, with an 8.5 and 7.9 ($p < .1$) percentile point decrease, respectively. By comparison, participants in the KLF group in School 1 had a 4.0 ($p < .1$) percentile point decrease in BMI.

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Table 2. Demographic Characteristics and Body Mass Index (BMI) by Group and School (n = 185)

Characteristic	Elementary Schools				Total
	School 1 (n = 47)	School 2 (n = 40)	School 3 (n = 60)	School 4 (n = 38)	
Age (mean years)					
KLF group	9.7	9.1	9.2	9.8	9.4
Contrast group	9.2	9.4	9.3	8.9	9.2
Gender					
KLF group					
Female	8	11	19	10	48
Male	6	8	11	7	32
Contrast group					
Female	16	6	11	12	45
Male	17	15	19	9	60
Race					
KLF group					
White	12	15	25	10	62
Non-White, Hispanic	2	4	5	7	18
Contrast group					
White	32	18	22	11	83
Non-White, Hispanic	1	3	8	10	22
Mean baseline BMI for age percentile					
KLF group	84.6	78.8	64.5	86.5	76.1
Contrast group	42.8	49.6	64.3	71.5	56.0
Mean Week 12 BMI for age percentile					
KLF group	77.9	76.4	64.0	85.0	73.8
Contrast group	32.8	43.3	61.2	64.7	49.4
Mean Week 24 BMI for age percentile					
KLF group	80.6	76.0	62.4	85.6	73.8
Contrast group	34.1	47.4	63.3	63.6	51.0
Total enrollment					
KLF group	14	19	30	17	80
Contrast group	33	21	30	21	105

Note. KLF = Kids Living Fit™.

To differentiate the two groups using a statistical comparison, pairwise t tests were performed comparing individual participant performance and outcomes at baseline and at 24 weeks out from baseline. These t tests were performed for both the KLF and contrast group. With respect to the KLF group, all participants across all schools experienced a drop in mean BMI percentile scores of 2.3 points, from 76.1 to 73.8 ($p < .01$); among the contrast group participants, paired BMI percentile scores increased by 1.5 points ($p < .01$).

Regarding maintenance of healthy weight, the KLF group experienced a 5% increase in the number of children with a BMI in the normal weight percentile category, with a corresponding decrease in the at-risk and overweight categories during the time period from screening to Week 12 (Table 3). The contrast group did not show a similar shift during the same time period. This improvement for the intervention group was maintained when measured at Week 24.

Waist circumference of the KLF and the contrast groups was done at baseline, Week 12, and Week 24. Participants in the KLF group showed an increase in mean waist circumference from baseline to Week 12 (0.29 inches), from Week 12 to Week 24 (0.13 inches), and from baseline to Week 24 (0.42 inches). The contrast group experienced an increase in waist circumference from baseline to Week 12 (1.03 inches) ($p < .001$), a modest decrease in waist circumference from

Table 3. Change in Body Mass Index (BMI) From Baseline to Weeks 12 and 24 (KLF = 80; Contrast = 105)

KLF BMI Percentile	Baseline		Week 12		Week 24	
	KLF n (%)	Control n (%)	KLF n (%)	Control n (%)	KLF n (%)	Control n (%)
0–4	0	3 (3)	1 (1)	4 (4)	0	2 (2)
5–84	32 (40)	85 (81)	36 (45)	84 (80)	36 (45)	88 (84)
85–94	22 (27.5)	9 (8)	19 (24)	9 (8)	23 (29)	8 (7)
≥95	26 (33.5)	8 (8)	24 (30)	8 (8)	21 (26)	7 (7)

Note. KLF = Kids Living Fit™.

Table 4. Self-Perception at Baseline, Week 12, and Week 24 by Body Mass Index (BMI) Percentile (KLF = 80; Contrast = 105)

	Baseline			Week 12			Week 24		
Group	**Too Thin**	**Just Right**	**Too Heavy**	**Too Thin**	**Just Right**	**Too Heavy**	**Too Thin**	**Just Right**	**Too Heavy**
KLF BMI Percentile									
0–4	0	0	0	1	0	0	0	0	0
5–84	5	26	1	5	27	4	2	31	3
85–94	0	14	8	0	15	4	0	17	6
≥95	0	8	18	0	10	14	1	7	13
Contrast BMI Percentile									
0–4	0	3	0	1	2	0	1	2	0
5–84	8	74	3	8	71	6	7	73	5
85–94	0	9	0	0	7	2	0	7	2
≥95	0	6	2	0	5	3	0	5	3

Note. KLF = Kids Living Fit™.

Week 12 to Week 24 (−0.05 inches), and an increase from baseline to Week 24 (0.98 inches) ($p < .02$).

Table 4 shows the analysis of the participant's body self-perception by BMI percentile category. At baseline, 22 (46%) of the study participants in the KLF group who described themselves as just right had BMI percentiles ≥85% at baseline. These percentages were 48% and 44% at Weeks 12 and 24, respectively. In the contrast group, these percentages were 18% at baseline and 14% for both Weeks 12 and 24. For both groups, none of the participants in the at-risk-for-overweight category considered themselves too thin. The participants' perceptions and BMI status were not discussed, as this study was not designed to advise children of overweight status. At Week 24, participants' height and weight measures and a link to obtain BMI information were provided for their parents.

Additional satisfaction questionnaire comparisons between the two groups are provided in Table 5. There were varied improvements in satisfaction categorizations for both participant and family food and activity choices for both groups. Of note, in the KLF group, there was a consistent decrease in the percentage of participants who were not satisfied between baseline and Weeks 12 and 24.

Analyses described below are intervention specific and thus are reported for the KLF group. The average attendance rate of participants was 82%, ranging from 73% to 99% over the 12 weeks. The overall average parental attendance rate, measured at the four dietary lectures, was 17%. Participant satisfaction with the KLF intervention was 94% at Week 24. A total of 49 (61%) participants reported that the KLF intervention helped a lot, 26 (33%) stated that it helped a little, and 5 (6%) specified that the intervention did not help.

DISCUSSION

The KLF intervention was an after-school program for 2nd- through 5th-graders whose parents agreed to their participation. Similar programs have been implemented as curriculum modifications to instruction during school hours. Most of these school-based studies focused on programs that included physical education, healthy eating choices, and family support to modify measures of adolescent obesity such as BMI and waist circumference. Two early studies (Gortmaker et al., 1999; Robinson et al., 2003) observed decreases in BMI among children given a school-based curriculum designed to promote healthier food choices and/or increased exercise. Later obesity intervention programs targeting at-risk children focused only on the promotion of physical education, specifically adding 1 hour of physical recreation as a component of a school-based curriculum.

> KLF program emphasized a multipronged strategy of healthier diet, promotion of exercise, and family involvement in the process of changing lifestyle patterns among young children.

Results of the current study suggested that when compared with the contrast group, participants in the KLF group experienced a decrease in BMI percentile scores from baseline to Week 24. These findings seem to fit into an emerging body of evaluation research on programs designed to implement social-cognitive learning-based programs to address adolescent obesity. As with earlier study programs, the KLF program emphasized a multipronged strategy of healthier diet, promotion of exercise, and family involvement in the process of changing lifestyle patterns among young children.

Limitations

Limitations exist in any nonrandomized test of a behavioral intervention. For example, parents might differentially urge their children at risk for overweight to participate in the KLF intervention after-school–based group compared with the contrast group with no intervention. KLF participants might be more mo-

tivated to succeed with parental encouragement. Another limitation is regression to the mean, which is a typical reason for observing change among a group of self-selected participants whose BMI percentile scores were statistically higher in comparison to the contrast group.

IMPLICATIONS FOR SCHOOL NURSING PRACTICE

The KLF intervention was designed, implemented, and evaluated as an after-school program by hospital nurses; school nurses were not directly involved. However, it was designed with the expectation that if reductions in BMI for age and gender were observed, school nurses could implement a program such as KLF in their schools. School nurses and/or school staff alone cannot solve the childhood obesity epidemic, particularly in a country where only 8% of the states meet the national recommendation of 150 or more minutes of physical education per week (Burgeson, Wechsler, Brener, Young, & Spain, 2001). Obesity is a challenge that the community as a whole needs to address through education. However, school nurses can use their position as role models and spokespersons to foster increased activity and improved nutrition education in their schools and communities.

School nurses and/or school staff alone cannot solve the childhood obesity epidemic, particularly in a country where only 8% of the states meet the national recommendation of 150 or more minutes of physical education per week.

The fact that nearly half of the KLF group at risk of becoming overweight or overweight perceived their body image as just right supports the need for educating children and their parents about BMI results and the associated ramifications of being overweight. School nurses can facilitate the identification of those who are overweight or at risk of becoming overweight (Sheehan & Yin, 2006). This crucial information could empower parents to seek help through programs provided by the school, county, or community health care providers. Resources for psychological support should be made available.

Parental acknowledgment, responsibility, and involvement are the first steps to building family support of healthy behaviors in children.

Parental acknowledgment, responsibility, and involvement are the first steps to building family support of healthy behaviors in children. By encouraging parental or caregiver participation in a program such as KLF, schools and families can work together to achieve the goal of healthy weights obtained through healthy lifestyle choices. The KLF program illustrates strategies that school nurses can use to plan and implement after-school programs. Local professionals, such as exercise trainers and dietitians, can participate by planning and presenting various program components. In addition, school nurses can work with Parent-Teacher Associations or other parent groups to request program funding and assistance in implementing programs.

Table 5. Satisfaction at Baseline, Week 12, and Week 24 by Group (KLF = 80; Contrast = 105)

Satisfaction Questionnaire Type	Baseline		Week 12		Change From Baseline to Week 12		Week 24		Change From Baseline to Week 24	
	KLF *n* (%)	Control *n* (%)	KLF *n* (%)	Control *n* (%)	KLF	Control	KLF *n* (%)	Control *n* (%)	KLF	Control
Participant food choices										
Very satisfied	19 (24)	31 (30)	25 (31)	46 (44)	+7%*	+14%**	25 (31)	52 (49)	+7%	+19%***
Satisfied	50 (63)	67 (64)	52 (65)	55 (52)	+2%*	−12%**	48 (60)	50 (48)	−3%	−16%***
Not satisfied	11 (14)	7 (7)	3 (4)	4 (4)	−10%*	−3%**	7 (9)	3 (3)	−5%	−4%***
Participant activity choices										
Very satisfied	53 (66)	66 (63)	55 (69)	71 (68)	+3%	+5%	49 (61)	73 (70)	−5%	+7%
Satisfied	23 (29)	35 (33)	22 (28)	27 (26)	−1%	−7%	28 (35)	26 (25)	+6%	−8%
Not satisfied	4 (5)	4 (4)	3 (3)	7 (7)	−2%	+3%	3 (4)	6 (6)	−1%	+2%
Family food choices										
Very satisfied	15 (19)	57 (54)	29 (36)	52 (50)	+17%**	−4%	29 (36)	49 (47)	+17%**	−7%
Satisfied	51 (63)	39 (37)	46 (58)	43 (41)	−5%**	+4%	41 (51)	42 (40)	−12%**	+3%
Not satisfied	14 (18)	9 (9)	5 (5)	10 (10)	−13%**	+1%	10 (13)	14 (13)	−5%**	+4%
Family activity choices										
Very satisfied	27 (34)	56 (53)	45 (56)	62 (59)	+22%**	+6%	33 (41)	55 (52)	+7%	−1%
Satisfied	41 (51)	38 (36)	25 (31)	30 (29)	−20%**	−7%	39 (49)	38 (36)	−2%	0%
Not satisfied	12 (15)	11 (10)	10 (13)	13 (12)	−2%**	+2%	8 (9)	12 (11)	−6%	+1%

Note. KLF = Kids Living Fit™.
* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.

For school nurses who may not have the time or resources to present such a program, individual components of the program could be implemented either during or after school. School nurses could also provide education programs for parents related to healthy eating, making healthy choices when eating at fast-food establishments, and ideas to increase physical activity that would involve the whole family. Provision of a listing of resources for nutrition education and opportunities for physical activity in the community would be beneficial. School nurses must continually encourage children to make healthy lifestyle choices with respect to foods consumed and activities chosen to increase the potential for a lifetime of normal weight.

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CONCLUSION

After-school programs such as KLF can be implemented by school nurses to facilitate healthy lifestyle choices in elementary school children with the goal of decreasing obesity. Results for the after-school KLF program designed by community hospital nurses, which focused on healthy/best lifestyle choices regarding foods consumed and activities chosen, demonstrated a significant decrease in BMI percentile as compared with the contrast group. School nurses can initiate after-school programs with the objective of increasing activity in elementary school children and improving nutrition education.

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