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## New Moves—Preventing Weight-Related Problems in Adolescent Girls:

### A Group-Randomized Study

Dianne R. Neumark-Sztainer, PhD, MPH, RD, Sarah E. Friend, MPH, RD, Colleen F. Flattum, MS, RD, Peter J. Hannan, MStat, Mary T. Story, PhD, RD, Katherine W. Bauer, MS, Shira B. Feldman, MPH, RD, and Christine A. Petrich, MEd

Division of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota

### Abstract

**Background**—Weight-related problems are prevalent in adolescent girls.

**Purpose**—To evaluate New Moves, a school-based program aimed at preventing weight-related problems in adolescent girls.

**Design**—School-based group-randomized controlled design.

**Setting/participants**—356 girls (mean age=15.8±1.2 years) from six intervention and six control high schools. Over 75% of the girls were racial/ethnic minorities and 46% were overweight or obese. Data were collected in 2007–2009 and analyzed in 2009–2010.

**Intervention**—An all-girls physical education class, supplemented with nutrition and self-empowerment components, individual sessions using motivational interviewing, lunch meetings, and parent outreach.

**Main outcome measures**—Percent body fat, BMI, physical activity, sedentary activity, dietary intake, eating patterns, unhealthy weight control behaviors, and body/self-image.

**Results**—New Moves did not lead to significant changes in the girls' percent body fat or BMI but improvements were seen for sedentary activity, eating patterns, unhealthy weight control behaviors, and body/self-image. For example, in comparison to control girls, at 9-month follow-up, intervention girls decreased their sedentary behaviors by approximately one 30-minute block a day ( $p=.050$ ); girls increased their portion control behaviors ( $p=.014$ ); the percentage of girls using unhealthy weight control behaviors decreased by 13.7% ( $p=.021$ ), and improvements were seen in body image ( $p=.045$ ) and self-worth ( $p=.031$ ). Additionally, intervention girls reported more support by friends, teachers, and families for healthy eating and physical activity.

**Conclusions**—New Moves provides a model for addressing the broad spectrum of weight-related problems among adolescent girls. Further work is needed to enhance the effectiveness of interventions to improve weight status of youth.

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Address correspondence to: Dianne Neumark-Sztainer, PhD, MPH, RD, Division of Epidemiology & Community Health, School of Public Health, University of Minnesota 1300 South Second Street, Suite 300, Minneapolis MN 55454. Neumark@epi.umn.edu.

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Weight-related problems, including obesity, inadequate physical activity, poor eating behaviors, unhealthy weight control practices, and body dissatisfaction, are prevalent among adolescent girls.<sup>1, 2</sup> The prevalence of obesity, while high among all subgroups of adolescents, tends to be somewhat higher among ethnic and racial minorities. Among African American adolescent girls, 45% are overweight or obese, compared to 37% of white girls.<sup>3</sup> Further, girls from low-SES backgrounds tend to have higher levels of obesity than girls from higher SES backgrounds.<sup>4</sup> Research shows that weight-related problems are inter-related. For example, 76% of obese adolescent girls engage in unhealthy weight control behaviors, (e.g., skipping meals, fasting, taking diet pills or smoking cigarettes for weight control) as compared to 51% of normal weight girls. Similarly, 66% of obese girls have low levels of body satisfaction, compared to 38% of normal weight girls.<sup>2</sup> Unhealthy weight control behaviors and body dissatisfaction have been found to longitudinally predict excessive weight gain in adolescent girls, even after adjusting for differences in baseline weight status.<sup>5, 6</sup> The high prevalence and co-occurrence of weight-related problems among adolescent girls points to a need for interventions aimed at preventing a spectrum of weight-related problems, particularly among underserved adolescents from racial/ethnic minority and low-SES backgrounds.

This paper describes the main findings from a group-RCT designed to evaluate the impact of a school-based intervention aimed at preventing weight-related problems in adolescent girls: New Moves. It was hypothesized that girls in the intervention condition would decrease their percent body fat and BMI, increase physical activity, decrease sedentary behavior, improve eating behaviors, and decrease body dissatisfaction and the use of unhealthy weight control behaviors, as compared to girls in the comparison condition.<sup>7–10</sup> In addition to examining these outcomes, perceived changes in the social environments of the participating girls were assessed, given the importance placed on providing a supportive environment within New Moves. Finally, program satisfaction among participating girls and their parents were examined.

## METHODS

### Overview of New Moves

New Moves aims to meet the needs of adolescent girls who are overweight or at risk for becoming overweight due to sedentary lifestyles<sup>7–10</sup>. New Moves is novel in its approach, in that it incorporates principles from both the eating disorders and obesity fields.<sup>11–13</sup> Thus, weight loss goals are not discussed and the program focuses on behavioral change. New Moves is implemented within schools, as an all-girls physical education class, with supplementary group and individual activities. The program strives to provide a supportive environment in which all girls feel comfortable being physically active and discussing weight-related issues, regardless of their size, shape, or level of physical activity. The underlying program philosophy is that if girls feel good about themselves, they will want to take care of their bodies<sup>6, 14</sup>.

### Study design and study population

New Moves was evaluated using a group-randomized controlled design, with six intervention and six control high schools in the Minneapolis/St. Paul metropolitan area of Minnesota. Three intervention and three control schools participated in the study during the 2007–2008 school year and another three intervention and three control schools participated in 2008–2009. High schools were recruited into the study on the condition that they would participate as either control or intervention sites and were randomized into these conditions. The study was approved by the University of Minnesota's IRB and by participating school districts. Participants provided written assent and parent consent.

Girls in both intervention and control schools participated in an all-girls physical education class during the first semester of the school year. Additionally, intervention girls received the New Moves curriculum during their physical education class and participated in New Moves activities throughout the rest of the school year. Teachers within control schools did not receive training on New Moves until after the study period and were free to conduct their physical education classes as they desired during the study period. Thus, the study design allows for an evaluation of the New Moves program above and beyond any effects of participating in an all-girls physical education class.

Participating schools were in urban and first-ring suburban areas and were selected because of their diverse student bodies. The percentage of students eligible for free or reduced school breakfast and lunch was 58% in the intervention schools (range: 25%–87%) and 56% in the control schools (range: 22%–92%). Table 1 describes the baseline characteristics of the 356 girls who participated in the study. Over 75% of the girls were racial/ethnic minorities and nearly half were overweight or obese.

Girls participated in evaluation assessments at three points: baseline (prior to the fall physical education class), post-class (immediately after the fall class), and follow-up (end of school year, approximately 9 months from the beginning of the intervention). Additionally, parents of intervention girls were mailed process surveys at follow-up. Baseline and follow-up assessments were conducted at the University of Minnesota General Clinical Research Center and post-class assessments were done at school. As shown in Figure 1, the overall response at follow-up was 94% (intervention: 97%; control: 91%).

## Recruitment

Girls in intervention and control schools were invited to register for an all-girls physical education class as an alternative to the regular coeducational class. In participating schools, students were required to take either one or two physical education classes to graduate from high school; participation in this class counted toward that requirement. Recruitment materials were designed to appeal to inactive girls interested in healthy weight management. Care was used to avoid stigmatizing the class in any way. A class description was included in the school catalogue used for class registration. Additionally, posters and flyers about the program were displayed at schools. Girls were screened for physical activity and eating disorder behaviors. Four girls were excluded because of high levels of physical activity ( $\geq 1$  hour/day). No girls were excluded because of eating disorder behaviors (vomiting or laxative use weekly or more).

## Description of New Moves intervention

The development of New Moves was guided by extensive formative research<sup>15–21</sup> and pilot-testing.<sup>9</sup> In accordance with Social Cognitive Theory, which provided the primary theoretic framework for New Moves,<sup>22, 23</sup> the program targets socio-environmental factors (e.g., peer support), personal factors (e.g., body image), and behavioral factors (e.g., goal-setting), to bring about changes in physical activity, eating, and weight control behaviors. In addition, the Transtheoretical Model<sup>24–26</sup> informed program content and structure. New Moves targeted girls in the precontemplation, contemplation, and preparation stages for physical activity and aimed to move girls forward in their stages of change for physical activity and other behaviors. Motivational interviewing was used as it takes into account readiness for change<sup>27</sup>. Eight behavioral objectives, targeted throughout the program, include: (1) be more physically active; (2) limit sedentary time; (3) increase fruit and vegetable intake; (4) limit sugar-sweetened beverages; (5) eat breakfast every day; (6) pay attention to portion sizes and your body's signs of hunger and satiety; (7) avoid unhealthy weight control behaviors; and (8) focus on your positive traits.

New Moves program components included: (1) the New Moves physical education class, which incorporated nutrition and social support/self-empowerment sessions; (2) individual counseling sessions using motivation interviewing techniques; (3) lunch get-togethers (lunch bunches) once a week during the maintenance period; and (4) minimal parent outreach activities.<sup>7</sup> 10 Program components are described in Figure 2. Additionally, intervention materials are available at [www.newmovesonline.com](http://www.newmovesonline.com).

The New Moves physical education class was approximately 16 weeks long. Girls participated in physical activity (Be Fit) 4 days/week and nutrition (Be Fueled) or social support/self-empowerment (Be Fab) classes 1 day/week. Most girls (91%) attended at least 80% of the classes. Be Fit sessions were taught 3 days/week by school physical education teachers and 1 day/week by different community guest instructors who exposed the girls to fun activities (e.g., dance, hip hop, kickboxing) available in the community. New Moves intervention staff ran all other program components. Physical education teachers participated in a full-day training prior to the start of the intervention and a half-day training in the middle of the program. Additionally, teachers received regular, ongoing support from New Moves staff throughout the program.

Girls also participated in individual counseling sessions with their New Moves coach in which they personal goals for behavioral change based on eight New Moves behavioral objectives.<sup>8</sup> The girls explored how to best achieve their goals and, if ready, made a plan for change. Motivational interviewing strategies were used to assist the girls in moving toward change.<sup>27–29</sup> The majority of the girls (80.8%) participated in 5–7 sessions (range: 0–7). New Moves coaches were intervention staff who received training and ongoing support in motivational interviewing techniques.

During the maintenance period (second semester), lunch get-togethers (lunch bunches) were held at school 1 day/week; 56% of the girls attended at least half of the lunch bunches. At lunch bunches, girls were served healthy food and engaged in informal discussions on New Moves topics with New Moves staff.

Finally, New Moves included a minimal parent outreach component. Six postcards were sent home to reinforce New Moves messages. On process surveys, which were mailed home and completed by 116 parents (of 182 intervention girls), 84% of the responding parents indicated that they read the postcards. Additionally, during the maintenance period, there was a parent-daughter retreat day at a local community center that focused on New Moves messages; 21% of the girls had a parent attend.

## Measures

Variables included in the current analysis related directly to the eight behavioral objectives targeted in New Moves: physical activity, sedentary behaviors, dietary intake, eating patterns, unhealthy weight control behaviors, and body/self image. Self-efficacy for physical activity and goal-setting for physical activity and eating behaviors were also included given their centrality within Social Cognitive Theory.<sup>22, 23</sup> Stages of change were assessed for key behaviors in order to detect progression toward behavioral change (e.g., from precontemplation to contemplation).<sup>24–26</sup> Given the importance of a supportive environment to facilitate changes in weight-related attitudes and behaviors, changes in perceived social support were also assessed. All variables are described in Appendix A, available online at [www.ajpm-online.net](http://www.ajpm-online.net).

Percent body fat was assessed with dual-energy x-ray absorptiometry (DXA) (Lunar Model, Madison, WI). Trained research staff measured participants' height and weight using standard procedures.<sup>52</sup> BMI was calculated and participants were classified as non-overweight (BMI < 85<sup>th</sup> percentile), overweight (85<sup>th</sup> percentile ≤ BMI < 95<sup>th</sup> percentile) or obese (BMI ≥ 95<sup>th</sup> percentile).

percentile) based on their BMI percentile for age and gender using the CDC Growth Charts. 30-31 Physical activity was assessed with the 3-Day Physical Activity Recall (3-DPAR) survey.<sup>32-36</sup> Dietary intake was assessed with one 24-hour dietary recall conducted by trained research staff (Nutrition Data System for Research software version 2006 developed by the Nutrition Coordinating Center (NCC), University of Minnesota, Minneapolis, MN.) Other measures were assessed with the New Moves survey (available at [www.newmovesonline.com](http://www.newmovesonline.com)). Most survey items were from previous studies and had high reliability and/or validity. Additionally, the New Moves survey was pilot-tested with 48 adolescents for overall comprehension and item/scale psychometrics, including 2-week test-retest of variables. Cronbach's alpha values shown in Appendix A (available online at [www.ajpm-online.net](http://www.ajpm-online.net)) are from the final sample of 356 girls, whereas the test-retest values are from the pilot sample. All variables were assessed at the three time-points, with the exception of the DXA measures of body fat and the 24-hour recalls of dietary intake, which were assessed only at baseline and at follow-up.

### Statistical analysis

The experimental design was a group-randomized trial in 12 schools involving measurement of a cohort of girls at baseline, post-class, and follow-up. For descriptive purposes the baseline means and individual SDs adjusted for age and ethnicity/race were generated. The post-class and follow-up means (and the differences by experimental condition) were obtained from a two time-point repeated measures analysis of post-class and follow-up, adjusted for the baseline measure, age and ethnicity/race, and with school nested in the experimental condition as a random effect.<sup>53</sup> Each p-value is derived from the associated t-statistic, having 10 df as required by the group-randomized design. P-values have not been adjusted for multiple testing. Some outcomes are assessed by categorical scales; however because ultimately it is the means per school that drive the analysis of a group-randomized trial, the assumption of normality in the mixed model is appropriate.<sup>54</sup> Data for this paper were analyzed in 2009–2010.

## RESULTS

### Program impact on body composition and key areas targeted for change

Table 2 shows the intervention effect on body composition and key areas targeted for change within the domains of physical activity, sedentary activity, dietary intake, eating patterns, unhealthy weight control practices and body and self-image. Changes were all in the hypothesized and desired direction; although not all reached significance. Changes in percent body fat and BMI were not significant and, in general, changes for determinants of behaviors (e.g., goal-setting) were seen more often than for actual behaviors. Changes that were significant are discussed below.

At follow-up, intervention girls increased their stage of change for physical activity ( $p=.039$ ), physical activity goal-setting behaviors ( $p=.021$ ) and their self-efficacy to overcome barriers to physical activity ( $p=.003$ ), as compared to control girls. Based on the 3-DPAR, which assesses activity in 30-minute blocks throughout the day (e.g., main activity done between 5:00 and 5:30), total sedentary activity decreased by 1.26 blocks a day among the intervention girls as compared to the control girls at follow-up ( $p=.050$ ).

Improvements were seen for dietary goal-setting ( $p=.002$ ) and for stage of change for fruit and vegetable intake ( $p=.002$ ) among intervention girls as compared to control girls. Additionally, at follow-up, intervention girls advanced in their stage of change toward regular breakfast eating ( $p=.028$ ). Intervention girls also showed increases in portion control behaviors ( $p=.014$ ) and for stage of change for portion control ( $p=.006$ ).

As noted above, progression forward in stage of change (e.g., from precontemplation to contemplation) was found for a number of physical activity and dietary behaviors. Baseline-adjusted mean stage of change scores at follow-up averaged about 0.3 higher in the intervention girls than in the control girls. This corresponds to about 13% more intervention girls progressing in stage of change and about 3% fewer intervention girls regressing in their stage of change, as compared to control girls.

At follow-up, the percentage of intervention girls engaging in unhealthy weight control behaviors decreased by 13.7% ( $p=.021$ ) as compared to control girls. Additionally, intervention girls showed significant improvements in body satisfaction ( $p=.045$ ), perceived athletic competence ( $p=.044$ ), and self-worth (.031) as compared to control girls.

### Support from friends, teachers, and parents

Differences in perceived support for physical activity and healthy eating from friends, teachers, and parents were explored, given the strong emphasis placed on providing a supportive environment for the girls. At follow-up, intervention reported significantly more support for physical activity from friends, teachers, and family members than control girls (Table 3). For healthy eating, significant increases were found for friend and teacher support, but not for parent support.

### Program satisfaction

Among intervention girls who completed process evaluation surveys at follow-up ( $n=175$  of 182), 98% indicated that they were satisfied (24%) or very satisfied (74%) with the program and 100% said they would recommend New Moves to a friend. Among parents completing process evaluation surveys ( $n=116$ ), 91% were satisfied (38%) or very satisfied (53%) with the program and 100% said they would recommend New Moves for other girls.

## DISCUSSION

New Moves was designed to prevent a broad range of weight-related problems in adolescent girls. The intervention did not lead to significant changes in the girls' percent body fat or BMI, but improvements were seen within the domains of sedentary activity, physical activity (stage of change, goal-setting, and self-efficacy), dietary intake (stage of change and goal-setting), eating patterns (portion control behaviors and stage of change for breakfast eating), unhealthy weight control behaviors, and body/self image. Additionally, intervention girls reported that they felt more support for being physically active from friends, teachers, and family members and more support for healthy eating by friends and teachers. Finally, the vast majority of the girls and their parents indicated high levels of satisfaction with New Moves and 100% said they would recommend the program to others.

School-based obesity prevention programs have had limited success in changing weight status, with greater success in changing weight-related knowledge, attitudes, and behaviors.<sup>55–61</sup> Similarly, in the current study, no change was seen in weight status, but changes were seen in attitudes and behaviors. A large focus of New Moves was on goal-setting, and notable increases were found in goal-setting for both physical activity and eating behaviors. The decrease in sedentary behaviors of approximately 30 minutes/day among intervention girls was a positive change. Additionally, while control girls tended to decrease their physical activity, levels remained fairly constant in the intervention girls. Intervention girls advanced in their stage of change for breakfast eating, which is important given that breakfast has been found to be protective for excessive weight gain.<sup>62, 63</sup> Given the large portion sizes of food to which young people are exposed<sup>64, 65</sup>; the changes found in portion control behaviors among intervention girls were positive.

Girls participating in New Moves decreased their use of unhealthy weight control behaviors and had improved body image and self-worth. Given that unhealthy weight control behaviors predict excessive weight gain, extreme weight control behaviors, and binge eating among adolescents<sup>66</sup>; the decrease in unhealthy weight control behaviors may help in preventing future weight gain and risk for eating disorders. Similar to findings described in the obesity prevention literature, interventions aimed at preventing risk factors for eating disorders have shown mixed results. In a meta-analytic review of eating disorder prevention programs, 51% of the programs reduced risk factors for eating disorders, such as dieting and body dissatisfaction.<sup>67</sup> Thus, although New Moves addressed a broader range of weight-related outcomes than most eating disorder prevention programs, it compared favorably in terms of its impact on risk factors for eating disorders. Of note, binge eating was not targeted as one of the key objectives in New Moves and differences were not found between the two conditions. Given its relevance for both obesity and eating disorders<sup>5, 68, 69</sup> and the girls' discussions of emotional eating, it is suggested that future interventions target binge eating.

Study strengths and limitations need to be taken into account in interpreting the findings. The diverse nature of the participants, drawn from schools serving high percentages of low-income youth, with over 75% of the girls from racial/ethnic minorities, is a study strength, as it is crucial to find ways to meet the needs of these girls. The implementation of New Moves within a school setting makes the program accessible to all students; however, there are difficulties inherent to involving parents and helping youth make changes in their eating and activity behaviors within a school setting. For example, only one fifth of parents attended the parent-daughter retreat day. The high level of response (94% at follow-up) and the strong evaluation tools are study strengths, although 26% of the girls were missing DXA assessments of body composition at either baseline or follow-up assessments, primarily due to concerns about doing a required urine test and logistic difficulties in getting to the clinic (e.g., moved, did not want to miss class).

The use of a control group that received an all-girls physical education class allowed for the recruitment of similar girls into both conditions and an examination of the effect of New Moves activities above and beyond the all-girls physical education class. However, in examining the findings it is important to note that the control group also received an intervention (i.e., an all-girls class composed of girls with sedentary lifestyles). Some studies have found that all-girls physical education classes provide a more positive learning experience than coeducational classes and lead to more active participation of girls.<sup>70, 71</sup> The control girls' participation in a physical education class during the intervention period may explain the larger differences found at follow-up than at post-class, particularly with regard to physical activity outcomes and measures of a supportive environment. The intervention effect may have been larger had it also been possible to evaluate the impact of an all-girls physical activity environment. Additionally, given the program's focus on long-term behavioral change, and trends toward improvements in outcomes from post-class to follow-up assessments in intervention girls as compared to control girls, a longer follow-up period may have revealed further differences between the groups.

## CONCLUSION

Findings indicate very high levels of satisfaction with the program among girls and their parents. New Moves appears to fill a niche within schools by meeting the needs of girls who are not comfortable in regular physical education classes, have sedentary lifestyles, and are at risk for weight-related problems.<sup>9</sup> New Moves was effective in improving key weight-related attitudes and behaviors. However, in order to lead to changes in weight status, it may be necessary to integrate New Moves into more comprehensive school-based interventions<sup>72-</sup>

<sup>74</sup> that involve ongoing educational efforts, changes in the school food and physical activity environments, and more intensive parent and community outreach activities.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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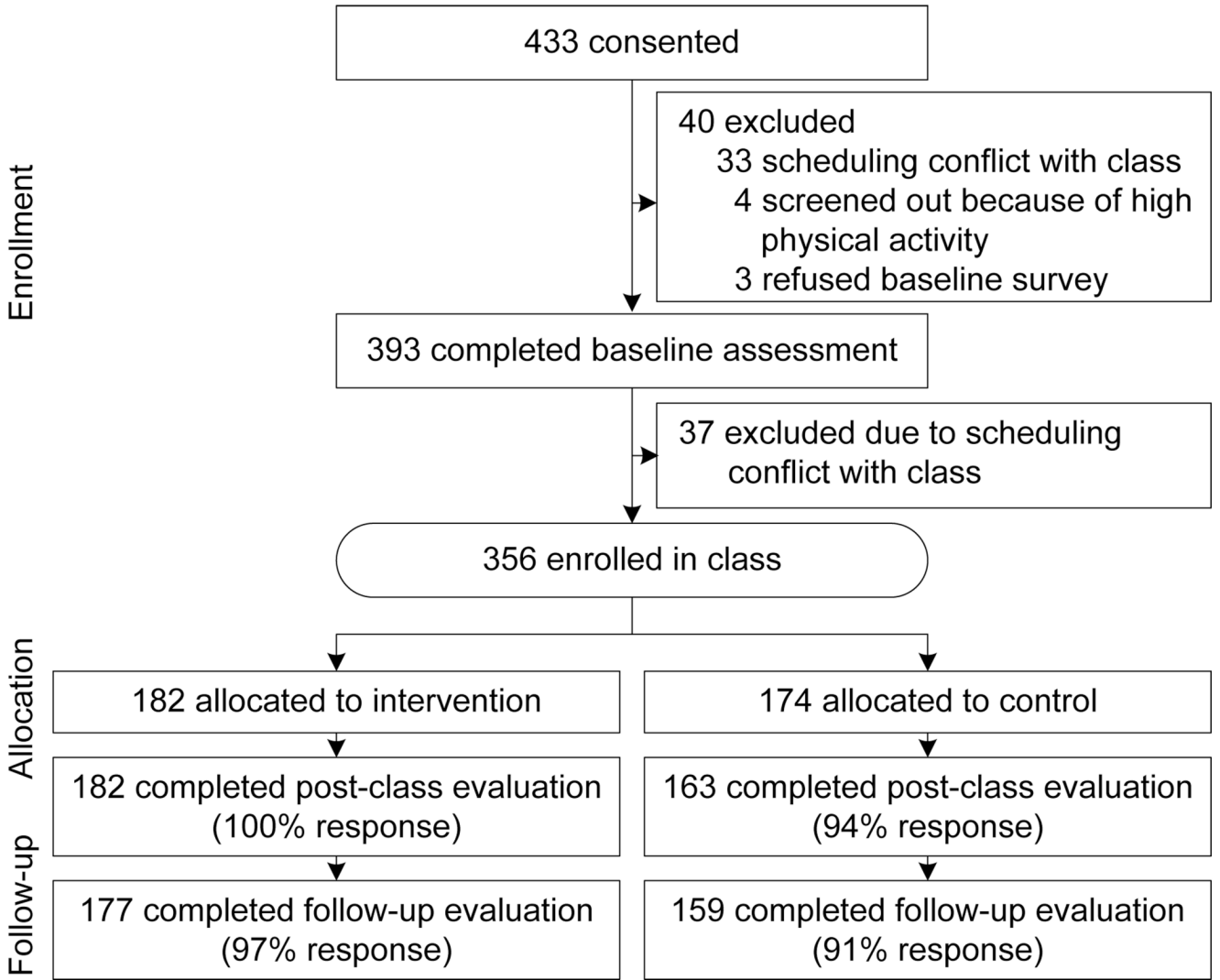
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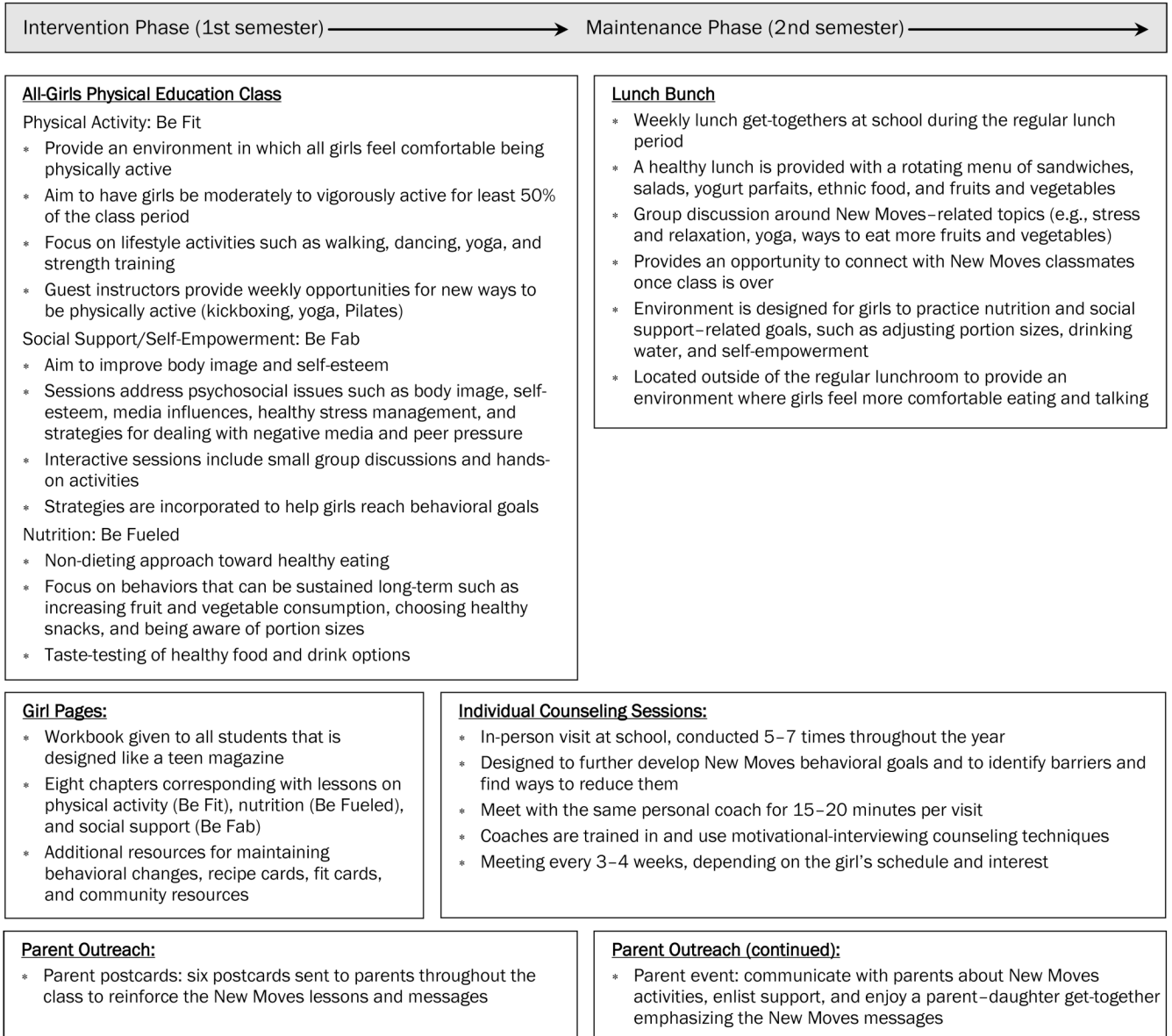
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**Figure 1.** Flow chart showing response patterns in intervention and control conditions



**Figure 2.** Key components of the New Moves intervention during a 9-month school year

**Table 1**

Baseline description of New Moves study population by intervention condition

	<b>Total N=356 M (SD)</b>	<b>Intervention n=182 M (SD)</b>	<b>Control n=174 M (SD)</b>	<b>p<sup>a</sup></b>
<b>Age</b>	15.8 (1.17)	15.7 (1.13)	15.8 (1.22)	0.296
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
<b>Weight Status</b>				0.572
< 85 <sup>th</sup> percentile	191 (53.8)	96 (53.0)	95 (54.6)	
85 <sup>th</sup> – 95 <sup>th</sup> percentile	64 (18.0)	30 (16.6)	34 (19.5)	
≥95 <sup>th</sup> percentile	100 (28.2)	55 (30.4)	45 (25.9)	
<b>Race/ethnicity</b>				<b>0.046</b>
African-American/ Black	101 (28.4)	59 (32.4)	42 (24.1)	
White	87 (24.4)	49 (26.9)	38 (21.8)	
Asian <sup>b</sup>	82 (23.0)	30 (16.5)	52 (29.9)	
Hispanic	51 (14.3)	24 (13.2)	27 (15.5)	
Mixed/Other	26 (7.3)	14 (7.7)	12 (6.9)	
American Indian	9 (2.5)	6 (3.3)	3 (1.7)	

<sup>a</sup>P-values are for comparisons between intervention and control groups at baseline<sup>b</sup>The majority (86%) of the Asians self-identified as Hmong

**Table 2**

Body composition and behavioral outcomes: Means and intervention effect estimates<sup>a</sup>

	M		Test of intervention effect			
	Baseline <sup>b</sup>	Post Class <sup>c</sup>	Follow-up <sup>c</sup>	Post-class <sup>d</sup>	Follow-up <sup>d</sup>	p-value
	M (SD)	M	M	Intervention Effect	Intervention Effect	p-value
<b>BODY COMPOSITION</b>						
<b>% Body fat (DXA)<sup>e</sup></b>						
Intervention	37.3 (9.55)	—	37.2	—	-0.46	0.216
Control	36.6 (8.84)	—	37.7			
<b>BMI</b>						
Intervention	25.9 (7.11)	25.8	26.0	-0.08	-0.10	0.446
Control	25.5 (6.49)	25.9	26.1			
<b>PHYSICAL ACTIVITY (PA)</b>						
<b>Total physical activity (30-minute blocks/day)</b>						
Intervention	4.80 (3.52)	3.83	4.92	0.08	1.20	0.068
Control	4.23 (3.65)	3.75	3.72			
<b>Moderate and vigorous PA (30-minute blocks/day)</b>						
Intervention	3.04 (2.84)	2.62	2.80	0.22	0.53	0.186
Control	2.92 (2.98)	2.40	2.27			
<b>Stage of change: PA (range: 1-5)</b>						
Intervention	3.19 (1.11)	3.27	3.56	0.04	0.32	<b>0.039</b>
Control	3.01 (0.97)	3.23	3.24			
<b>Goal-setting for PA (range: 5-25)</b>						
Intervention	12.9 (4.38)	13.8	14.4	0.86	1.15	<b>0.021</b>
Control	12.7 (4.20)	13.0	13.3			
<b>Self-efficacy: PA (range: 6-30)</b>						
Intervention	18.1 (5.76)	19.0	19.4	0.67	2.02	<b>0.003</b>
Control	18.0 (5.64)	18.4	17.4			
<b>SEDENTARY ACTIVITY</b>						
<b>Sedentary activity</b>						

	M	Test of intervention effect					
		Baseline <sup>b</sup>	Follow-up <sup>c</sup>	Post-class <sup>d</sup>	Follow-up <sup>d</sup>		
<b>(30-minute blocks/day)</b>							
Intervention	32.1	31.0 (3.82)	31.0	-0.12	0.834	-1.26	<b>0.050</b>
Control	32.2	31.4 (3.89)	32.3				
<b>TV (30-minute blocks/day)</b>							
Intervention	2.90	2.78 (2.80)	2.29	0.51	0.158	-0.05	0.883
Control	2.39	2.44 (2.66)	2.34				
<b>Stage of change: TV (range: 1-5)</b>							
Intervention	2.72	2.74 (1.35)	2.95	-0.18	0.226	-0.02	0.905
Control	2.90	2.61 (1.30)	2.97				
<b>DIETARY INTAKE</b>							
<b>Fruits/vegetables (servings/day)</b>							
Intervention	—	1.96 (2.18)	2.06	—	—	0.24	0.365
Control	—	1.60 (1.76)	1.82				
<b>Sugar-sweetened beverages (servings/day)</b>							
Intervention	—	1.33 (1.65)	1.25	—	—	-0.05	0.751
Control	—	1.04 (1.31)	1.30				
<b>Stage of Change:</b>							
<b>Fruits/vegetables (range: 1-5)</b>							
Intervention	3.14	2.96 (1.08)	3.34	0.13	0.276	0.28	<b>0.033</b>
Control	3.01	2.91 (1.11)	3.06				
<b>Goal-setting for healthy eating (range: 4-20)</b>							
Intervention	11.8	10.5 (3.54)	12.5	0.91	<b>0.028</b>	1.57	<b>0.002</b>
Control	10.9	10.7 (3.79)	10.9				
<b>EATING PATTERNS</b>							
<b>Breakfast (days/week)</b>							
Intervention	4.13	3.29 (2.65)	4.69	0.26	0.401	0.61	0.067
Control	3.88	3.55 (2.55)	4.08				
<b>Portion control (range: 4-16)</b>							



	M		Test of intervention effect		
	Baseline <sup>b</sup>	Post Class <sup>c</sup>	Follow-up <sup>c</sup>	Post-class <sup>d</sup>	Follow-up <sup>d</sup>
Intervention	8.16 (2.83)	9.04	9.55	0.81	1.03
Control	8.34 (3.05)	8.23	8.52	0.041	0.014
<b>Stage of change: breakfast (range: 1–5)</b>					
Intervention	3.16 (1.21)	3.49	3.78	0.11	0.387
Control	3.24 (1.17)	3.37	3.46		0.028
<b>Stage of change: portion control (range: 1–5)</b>					
Intervention	2.77 (1.23)	3.02	3.31	0.23	0.56
Control	2.73 (1.11)	2.80	2.75	0.197	0.006
<b>UNHEALTHY WEIGHT CONTROL BEHAVIORS</b>					
<b>Unhealthy weight control behaviors (%)</b>					
Intervention	66.4 (0.48)	56.6	49.5	–9.57	0.083
Control	71.1 (0.45)	66.2	63.3		–13.7
<b>Binge eating (%)</b>					
Intervention	11.1 (0.31)	6.00	6.04	–5.41	0.120
Control	15.3 (0.37)	11.4	10.0		–3.93
<b>BODY AND SELF IMAGE</b>					
<b>Body satisfaction (range: 10–60)</b>					
Intervention	37.4 (12.8)	39.8	40.7	3.18	0.094
Control	34.9 (12.4)	36.6	36.7		3.95
<b>Harter athletic competence (range: 5–20)</b>					
Intervention	11.7 (3.02)	12.4	12.8	0.70	0.085
Control	11.7 (2.90)	11.7	11.9		0.86
<b>Harter appearance (range: 5–20)</b>					
Intervention	13.6 (4.06)	14.1	14.4	1.10	0.063
Control	12.6 (3.83)	13.0	13.4		1.06
<b>Harter self worth (range: 5–20)</b>					
Intervention	15.1 (3.51)	15.3	15.5	0.90	0.024
Control					0.85

	M			Test of intervention effect		
	Baseline <sup>b</sup>	Post Class <sup>c</sup>	Follow-up <sup>c</sup>	Post-class <sup>d</sup>	Follow-up <sup>d</sup>	
Control	14.6 (3.29)	14.4	14.7			

<sup>a</sup>  $n = 182$  girls in the intervention condition and 174 girls in the control condition, although numbers may vary for individual analyses due to missing values.

<sup>b</sup> Baseline means are adjusted for age, race, and school as a random effect.

<sup>c</sup> Post-class and follow-up means are adjusted for baseline value of the outcome in addition to age, race, and school as a random effect.

<sup>d</sup> Intervention effects are estimates that represent the difference in the outcome variable at post-class or follow-up in intervention condition compared to control condition, adjusted for age, race, and school as a random effect in addition to baseline value of the outcome. P-values are calculated from the associated t-statistic having 10 df.

<sup>e</sup> Percent body fat was measured with dual-energy x-ray absorptiometry (DXA).

**Table 3**

Support for physical activity and healthy eating: Means and intervention effect estimates<sup>b</sup>

	M		Test of intervention effect			
	Baseline <sup>b</sup> M (SD)	Post-Class <sup>c</sup> M	Follow-up <sup>c</sup> M	Post-Class <sup>d</sup> Intervention Effect	Follow-up <sup>d</sup> Intervention Effect	p-value
<b>SUPPORT FOR PHYSICAL ACTIVITY (PA)</b>						
<b>Friend support: PA (range: 1–4)</b>						
Intervention	2.37 (0.96)	2.38	2.55	0.10	0.25	<b>0.045</b>
Control	2.25 (0.98)	2.29	2.30			
<b>Teacher support: PA (range: 1–4)</b>						
Intervention	2.55 (0.76)	2.78	2.74	0.19	0.26	<b>0.034</b>
Control	2.47 (0.85)	2.59	2.48			
<b>Family support: PA (range: 5–25)</b>						
Intervention	13.2 (4.91)	13.2	14.1	0.54	1.38	<b>0.016</b>
Control	13.0 (4.74)	12.7	12.7			
<b>SUPPORT FOR HEALTHY EATING</b>						
<b>Friend support:</b>						
<b>healthy eating (range: 1–4)</b>						
Intervention	2.05 (0.95)	2.34	2.44	0.22	0.36	<b>0.018</b>
Control	2.08 (1.03)	2.12	2.09			
<b>Teacher support:</b>						
<b>healthy eating (range: 1–4)</b>						
Intervention	2.55 (0.80)	2.83	2.81	0.21	0.25	<b>0.044</b>
Control	2.52 (0.86)	2.62	2.55			
<b>Parent support:</b>						
<b>healthy eating (range: 2–8)</b>						
Intervention	2.64 (0.91)	2.83	2.84	0.06	0.13	0.198
Control	2.77 (0.94)	2.76	2.71			

<sup>a</sup> n = 182 girls in the intervention condition and 174 girls in the control condition, although numbers may vary for individual analyses due to missing values.

<sup>b</sup> Baseline means are adjusted for age, race, and school as a random effect.

<sup>c</sup> Post-class and follow-up means are adjusted for baseline value of the outcome in addition to age, race, and school as a random effect.

<sup>d</sup> Intervention effects are estimates that represent the difference in the outcome variable at post-class or follow-up in intervention condition compared to control condition, adjusted for age, race, and school as a random effect in addition to baseline value of the outcome. P-values are calculated from the associated t-statistic having 10 df.