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# Dance for Health: Improving Fitness in African American and Hispanic Adolescents

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## Synopsis .....

*Cardiovascular disease begins early in life but might be prevented or delayed by primary prevention programs designed for children and adolescents. Regular physical activity is an important part of primary prevention programs, and school physical education programs have potential for the promotion of regular physical activity.*

*Cardiovascular disease is the major cause of death among Hispanics and African Americans in the United States. Low levels of fitness and increased body mass index are common in African American and Hispanic adolescents. Increased physical activity and the adoption of healthy eating habits would*

*increase fitness and reduce body mass index among these adolescents.*

*The purpose of the study was to undertake a small-scale controlled trial to determine if Dance for Health, an intervention program designed to provide an enjoyable aerobic program for African American and Hispanic adolescents, has a significant effect on improving aerobic capacity, helping students maintain or decrease weight, and on improving attitudes toward physical activity and physical fitness.*

*In the first year of the program (1990-91), approximately 110 boys and girls ages 10-13 years participated in an aerobic dance pilot program three times per week for 12 weeks. Dance for Health was revised and continued in the 1992-93 school year with seventh grade students and an added culturally sensitive health curriculum. Forty-three students were randomized to Dance for Health and 38 to usual physical activity. Those in the intervention class received a health education curriculum twice a week and a dance oriented physical education class three times a week. The usual physical activity consisted mostly of playground activities.*

*Students in the intervention had a significantly greater lowering in body mass index and resting heart rate than students in regular physical activity.*

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**C**ARDIOVASCULAR DISEASE (CVD) begins early in life but might be prevented or delayed by primary prevention programs designed for children and adolescents (1). Regular physical activity is an important part of primary prevention programs, and school physical education programs have potential for the promotion of regular physical activity (2,3). Yet regular physical education classes do not provide significant aerobic exercise.

## Literature Summary

Epidemiologic research demonstrates that lifestyle factors, such as sedentary habits, a diet rich in saturated fat and cholesterol, and cigarette smoking, contribute to the development of most cases of

cardiovascular disease (4). Behaviors associated with increased risk of CVD are acquired early in life and may accelerate development of the disease (1,4). Obesity is becoming more prevalent in adolescents (5). About half of obese school age children remain obese as adults (6).

Although preventive efforts are important for the entire U.S. population, such efforts may be particularly critical for African Americans and Hispanics, a relatively neglected and greatly expanding sector of the population. Black men and women appear to have equal or even higher death rates from cardiovascular disease than their white counterparts, even after adjustment for income (7,8,9). Black women are nearly twice as likely as white women to become overweight. Adolescence appears to be a

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critical period for the development of obesity in black girls. Black and white females have similar rates of obesity in infancy and childhood, but the prevalence increases in blacks relative to their white peers during adolescence (10). Obesity in teenagers is associated with an increased risk of hypertension and hypercholesterolemia. (1,11–14). These increased rates of obesity are related presumably to increased caloric intake versus less expenditure of energy in physical activity (15).

Cardiovascular mortality among Hispanics appears to be lower than among whites (16), but cardiovascular disease is the leading cause of death among Hispanics. Compared with non-Hispanic whites, Hispanics have similar levels of hypertension and cholesterol but a substantially higher prevalence of diabetes (8,17). Compared with non-Hispanic whites, Mexican Americans are characterized by increased overall adiposity (18) and unfavorable body fat distribution (19).

Increased physical activity has been related to a decreased cardiovascular disease mortality and other cardiovascular benefits, including weight maintenance (20–22). Efforts to promote increased physical activity and the adoption of healthy eating habits would presumably increase fitness and minimize weight gain in young African American and Hispanic adolescents.

Despite the potential for physical activity to help reduce or maintain weight, physical education classes provide only minimal activity, and they are becoming less common in schools (23). Children engage in about 20–40 percent of their physical activity at school, and many children are physically active only during physical education classes (24). Yet, according to several surveys, children spend less than 10 percent of their physical education time in moderate to vigorous activity, amounting on average to less than 10 minutes per week (25).

A number of interventions have been developed to reduce cardiovascular risk factors in young people, such as Project CATCH, (26), Heart Smart (27), the Know Your Body Program (28,29), and others (30,31). Of these, the Know Your Body Program has been the most extensively studied and implemented.

The program has been shown to reduce some cardiovascular risk factors, although it has had relatively little impact on weight or physical fitness (28).

I have developed and evaluated the following program designed to increase fitness in African American and Hispanic adolescents.

### **Project Objectives**

Dance for Health is a program designed to provide an enjoyable school-based aerobic exercise program for low-income African American and Hispanic adolescents. To determine if the intervention, Dance for Health, had a significant effect on students' aerobic capacity, maintained or decreased their weight, or improved their attitudes toward physical activity and physical fitness I conducted a study. I hypothesized that, compared with students participating in regular physical education, students who took part in Dance for Health would demonstrate significantly greater increase in aerobic fitness, reduced body weight, and a more positive attitude toward physical activity.

### **Methodology**

Dance For Health was developed in cooperation with the Ravenswood City School District in east Palo Alto, CA, based on my prior experience in teaching 5th grade students in east Los Angeles and south central Los Angeles. Through those experiences, I determined that students preferred dancing to regular physical education. In the first year of the program (1990–91), approximately 110 boys and girls ages 10–13 participated in an aerobic-dance pilot program three times per week for 12 weeks. The students liked the program, and because of the initial success, Dance for Health was revised and continued in the 1992–93 school year with a somewhat older group of students and an added culturally sensitive health education curriculum.

A small-scale efficacy trial was designed to investigate the impact of the Dance for Health Program in increasing aerobic capacity, helping students maintain or decrease weight, and improve attitudes toward physical activity and physical fitness in low-income African American and Hispanic boys and girls in the seventh grade.

**School and subjects.** Four seventh grade physical education classes at Ronald McNair Middle School in east Palo Alto participated in the 12-week school-based intervention program, Dance for Health. The ethnic breakdown for the school is approximately 51

percent African American and 40 percent Hispanic. The study was randomized by classrooms, using a class-by-class pattern to achieve two groups—43 for a dance-oriented physical activity-health education class and 38 for a usual physical activity class. The 43-member class had health education twice a week and a dance-oriented physical education class three times a week. The usual physical activity consisted mostly of playground activities.

## Intervention

**Aerobic dance.** The dance-oriented physical activity curriculum replaced the intervention group's regular physical education program. The class was taught three times a week for 50 minutes. Attendance was mandatory as it was in the usual physical education class, except for students who normally would be exempt.

Each 50-minute period was divided into 10 minutes for warmup and cool-down and 40 minutes for moderate- to high-intensity aerobic dance. The latest popular hip-hop music was selected for dance routines developed by the instructors. To ensure that the music appealed to both African Americans and Hispanics, students from each ethnic group were invited to make recommendations of popular music. To keep the students from getting bored, different music was used for warmup and cool-down and routines were developed for 5-10 different popular songs.

**Health education.** A health education component was also added to the Dance for Health program. Students met twice a week for the health education class. The curriculum was revised from the 9th grade CVD curriculum developed and evaluated through other federally funded research projects (32). Because English is a second language for many students, and they have some difficulty with reading, the health education material was made very simple, with each session consisting of 10 minutes of didactic activity and 20 minutes of other types of activities. The curriculum covered 25 lessons, 6 devoted to nutrition, 5 to exercise, 3 to obesity and unhealthy weight regulation practices, 5 to smoking prevention, 2 to substance abuse, 2 to stress management, and 2 to peer pressure.

## Significance of the Project

CVD is the major cause of death among Hispanics and African Americans in the United States. Low levels of fitness and increased body mass index

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(BMI), both contributors to later CVD, are common in African American and Hispanic adolescents. There have been minimal preventive efforts directed at African American and Hispanic adolescents. Increased physical activity and the adoption of healthy eating habits would increase fitness and reduce increases in BMI. Middle schools are logical places for such programs. Unfortunately, the time spent in physical activity is decreasing in these schools. Models of enjoyable physical fitness programs that can be implemented in schools need to be developed and evaluated.

## Ways in Which Project is Innovative

A creative physical activity intervention program with a culturally appropriate-sensitive health curriculum was implemented and designed for an important and underrepresented study population, minority adolescents. Physical activity has unique characteristics that make its adoption and maintenance different from other types of health behaviors (33). Dance for Health attempted to incorporate many of the factors that seem to be associated with better participation in physical activity. The aerobic activity for minority adolescents has these multiple advantages:

1. All students can be successful in the activity (the routines are non-competitive);
2. Minimal skills are necessary, (although dancing skills will improve with practice);
3. Students will perceive physical benefit from the program (for example, improved fitness, weight maintenance or loss);
4. Overweight students can participate;
5. The routines are fun (reinforcing) without being overly repetitive (boring);
6. Equipment requirements are minimal; and
7. The activity occurs in a safe environment with adult supervision. Also, the use of music popular with the students, and dance itself, is appealing to this age group.

## Summary of Evaluation Methods

The primary outcome measures are the timed mile run, resting heart rate, BMI adjusted for sexual

Table 1. Baseline characteristics of the Dance for Health sample of 81 boys and girls in control and intervention groups

Characteristic	Percent
Mean age (years).....	12.6
Sex (percent female).....	54
Ethnicity:	
Hispanic.....	43
African American.....	44
Other.....	13
Spanish spoken at home.....	41
Born in the United States.....	74

Table 2. Effects of the Dance for Health project on 26 girls in the intervention group and 23 girls in the control group

Effect	Intervention		Control	
	Number	SD	Number	SD
Body mass index:				
Preintervention.....	22.9	6.1	22.2	4.4
Post intervention.....	22.1	6.0	22.5	4.4
Difference.....	-0.8		10.3	
Heart rate (beats per minute):				
Preintervention.....	83.7	12.8	79.0	12.3
Post intervention.....	72.7	7.7	78.9	8.4
Difference.....	-10.9		<sup>2</sup> -0.2	
Timed mile run (minutes):				
Preintervention.....	14.8	3.5	14.6	3.5
Post intervention.....	13.9	5.0	14.1	4.5
Difference.....	-0.9		-0.5	
Feelings about physical education <sup>3</sup> :				
Preintervention.....	2.9	1.2	3.0	1.1
Post intervention.....	2.7	1.3	2.9	0.9
Difference.....	-0.2		-0.1	
Feelings about sweating <sup>3</sup> :				
Preintervention.....	4.0	1.4	4.0	1.2
Post intervention.....	3.7	1.4	3.5	1.4
Difference.....	-0.2		-0.5	

<sup>1</sup>P < .05, intervention versus control.

<sup>2</sup>P < .01.

<sup>3</sup>Scored on a scale of 6 to 1, ranging from unhappy to happy.

NOTE: SD = Standard deviation.

maturation stage and age (34), and attitudes toward physical activity. The analyses examined change scores from pre- and post-treatment using ANOVA between the intervention and control group.

### Preliminary studies—dance for health 1992–93.

Pre- and post-test, students were assessed for the timed mile run, baseline heart-rate, and weight and height. Students also completed a questionnaire designed to measure attitudes about physical activity. The baseline characteristics of the sample can be seen in table 1.

Table 2 presents the results for girls. Dance for Health was associated with a significant decrease in BMI and heart rate. It was also associated with

favorable changes in the timed mile run and with attitudes about physical activity.

The results for boys also favored the intervention group, but the differences were not significantly different between treatment and control groups. The treatment boys reduced the time of the mile run by 1.1 minutes compared with .06 minutes for the control group. BMI was -.20 in the treatment group boys compared with -.06 among the control boys. Heart rate decreased by 0.7 beats per minute in the treatment group but by 3.6 in the control group. There was also a somewhat worse attitude toward physical activity in the treatment group compared with those in the control group. Although the boys seemed to enjoy the dance, they might need more unstructured free play time for the class to work very well for them.

In summary, Dance for Health has proved to be an effective program to improve fitness and reduce weight in minority adolescents. The program appears to be more effective with girls than with boys. It is likely that a program extending over the entire school year would have even greater effects. If so, the program might prove to an effective way to increase physical activity in Hispanic and African American girls and, with some revision, boys.

### Budget Estimate and Justification

Printing pre- and post-test questionnaires and student handouts costs \$500. Music selection and portable cassette player was \$200. Rewards for student participation—juice, stickers, t-shirts, \$500. Student supplies for health intervention paper, markers, glue, crayons, scissors, etc. was \$300, for a total of \$1,500.

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