

# PARTNERS FOR HEALTHY ACTIVE CHILDREN

The YMCA of Metropolitan Tucson was awarded a Carol White Physical Education Program (PEP) grant from the Department of Education to implement the:

## **Partners for Healthy Active Children, Compañeros Para Niños Sanos y Activos program.**

### **Partners:**

- YMCA of Metropolitan Tucson
- University of Arizona, Department of Nutrition Sciences
- United States Department of Education, Safe and Drug Free Schools
- Center for Physical Activity and Nutrition (CPAN)
- Sunnyside Unified School District.



### **Federal Grant Period:**

October 1, 2004 End Date: September 30, 2007

### **Need**

Nationally, the percentage of **children ages 6 to 11 who are overweight has more than doubled since 1980** from 7 to 15%. There is a higher prevalence of obesity among Hispanic children. According to a recent report by the Centers for Disease Control and Prevention (CDC) in 2001, Mexican American boys have the highest prevalence of obesity, surpassing the rate of both black and white (non-Hispanic) boys, and Mexican American girls have the second highest prevalence of obesity, second only to black girls. While child obesity effects one in every six American children between the ages of 6 and 19, one in every three children is likely to be obese in urban Hispanic areas (Columbia News Service, "Obesity Affects Hispanic Children Disproportionately", March 14, 2003). According to the National Diabetes Education Program, Native Americans are nearly three times more likely to have diabetes than non-Hispanic whites of similar age, and Pima Indians (also known as the Tohono O'odham) have rates of diabetes that are the highest in the world.

The high prevalence of obesity among Hispanic and Native American children presents numerous issues for them. They are disproportionately at risk for diabetes, increased risk of coronary heart disease, and increased stress on weight-bearing joints. There is also a higher risk for obesity among low-income children, with 24% of low-income children between the ages of two and five years of age overweight or at risk for being overweight in Arizona. Obese children receive less acceptance from their peers and discrimination from adults; they exhibit a greater sense of rejection and failure, have poorer interpersonal relationships and have limited social interests. (Spencer, Priscilla, Obesity in Children - A Prevention Guide for Parents, National Association of School Psychologists, 1998).

### **The Partners program is providing all of the following:**

1. Fitness education and assessment to help students understand, improve, or maintain their physical well-being.
2. Instruction in a variety of motor skills and physical activities designed to enhance the physical, mental, or social or emotional development of every student.
3. Development of, and instruction in, cognitive concepts about motor skill and physical fitness that support a lifelong healthy lifestyle.
4. Opportunities to develop positive social and cooperative skills through physical activity participation.
5. Instruction in healthy eating habits and good nutrition.
6. Opportunities for professional development for teachers of physical education to stay abreast of the latest research, issues, and trends in the field of physical education.

### **YMCA Programs**

The staff from YMCA after school and summer camp programs have been trained in two standards based curricula designed for after school programs, Sport For All and Physical Best. These curricula will be added to the programming to increase physical activity of youth in YMCA programs. In addition, the University of Arizona is developing extensive nutrition curricula that will also become a part of the YMCA programming.

**Sport For All** Certified Instructors will provide Program Leader Training for individuals who are in charge of children in out-of-school settings such as the Tucson YMCA's. The goal of this program is to teach Program

Leaders how to lead age-appropriate, fun, and safe physical activity and is a key component of the Sport For All Program. There are two K-5 modules: Sport Play and Sport Skill Basics

**SportPlay** is a program of fun games and physical activities designed to help 5 to 7 year-old children develop basic movement skills that serve as precursors to the development of sport specific skills. The purpose of the Sport for All Program is to provide practice of sport-related skills for young people in developmentally appropriate ways, resulting in positive experiences that help children develop lifelong patterns of health-enhancing physical activity.

Children do not automatically develop the motor and physical skills they need to successfully participate in physical activities. Basic motor skills such as running, jumping, throwing, and catching are all play skills that prepare children for sport, but children must have the opportunity to practice this skills in appropriate ways. Improved motor skills increase the opportunity to enjoy sport and physical activity for a lifetime.

The goal of the Sport for All Program is the provide children the appropriate practice to develop these skills, resulting in increased confidence in their ability to participate as well as developing an appreciation for participating in physical activity. The emphasis of the SportPlay activities is to get young children playing fun games while also learning basic skills. If young children do not have fun, they will not be motivated to continue to be active in appropriate ways. The SportPlay activities are not sport-specific, but rather focus on basic locomotor, non-locomotor, and manipulative skills that younger children need to be successful in physical activity. The activities are presented in fun, game-like activities to enhance enjoyment.

**SportSkill Basic** is a program of fun games and physical activities designed to help 8 to 10 year-old children develop and refine basic movement skills that serve as precursors to the development of sport specific skills. The emphasis of the SportSkill Basic activities is to get young children to practice and refine basic sport skills while playing fun games. The SportSkill Basic activities have been carefully designed so they: are appropriate for children aged 8-10, offer a variety of linked activities, can be set up easily and quickly, are safe and fun, progress from simple to more complex. The SportSkill Basic activities are not sport-specific, but rather focus on basic locomotor, non-locomotor and manipulative skills that younger children need to be successful in physical activity

An evaluation is being conducted on select youth participating in YMCA after school programs before and after participating in the Carol White funded activities to determine which changes have occurred as a result of program participation. The assessment will include measuring height, weight, Body Mass Index (BMI), and aerobic capacity. A total of 250 youth will be given pre and post tests during the 3 years.

#### **University of Arizona**

Faculty, staff, and student teams are working with the YMCA and Sunnyside schools to conduct needs assessments, develop and select nutrition and physical education curricula, and implement the curricula. Professional trainers will provide additional training to YMCA staff and Sunnyside teachers as necessary.

#### **Sunnyside School District**

All -13 Sunnyside elementary schools are conducting a needs assessment utilizing the School Health Index and developing action plans for their schools. The physical education teachers are receiving training in a number of research-based curricula, which are described below.

#### **CATCH™**

A Coordinated Approach to Child Health, offers a successful blend of PE, classroom curriculum, nutrition awareness, student-directed activities, and PE equipment designed to promote and maintain cardiovascular health in children, grades K-5. With more than 600 school programs tested and implemented to date, CATCH continues to impact students long after they complete the coursework. Published in the Journal of the American Medical Association, results indicate that student intake of total fat and saturated fat was reduced while the intensity of physical activity performed both inside and outside school increased. (Aligned with all 7 AZ PA Standards)

#### **Physical Best**

Physical Best is a youth fitness education program, and is complemented by FITNESSGRAM, the AZ youth fitness assessment program, both with the goal of promoting lifelong physical activity habits. Physical Best strongly correlates with the overall language and six program elements outlined in the 2004 PEP grant proposals. Physical Best aligns with the AZ PA standards (3 & 4 are most strongly correlated) as well as the national health education and dance education standards).

#### **Dynamic Physical Education for Elementary Students (DPE)**

DPE provides teachers with the tools necessary to ensure success in today's educational environment. DPE is a valuable in-service tool. The fourteenth edition integrates the National Standards for Physical Education and addresses new recommendations designed to increase the activity levels of children and improve their overall

fitness levels. (Aligned with all 7 AZ PA Standards)

**Project Adventure's Adventure Curriculum for Physical Education**

The curriculum format and outcomes are aligned with National and State Physical Education Standards. Implementation is made simple with clearly explained lesson plans comprised of activities designed to develop conflict resolution skills, leadership ability and problem solving skills. Lessons include specific outcomes, briefing suggestions, rules and reflection questions. Assessment tools are also incorporated. This curriculum is designed as a supplement to a PE Program and is specifically designed to meet AZ PA Standards 5,6, and 7.

A baseline assessment of K-5 youth in Sunnyside elementary schools is being conducted during year one to measure the height, weight, Body Mass Index (BMI), and fitness level of students. This will be repeated in Year Three to determine progress.

# Summary of Results

We have measured 7,140 children in grades K-5 at SUSD schools. They were not all necessarily measured on all items, but all schools and grades are well represented. An additional 2,224 children were measured since the last report on the same variables. Total sample sizes, by grade and gender, are reported in table 1.

**Table 1: Children Tested by Grade and Gender**

Grade	Girls	Boys	Total
K	669	647	1,316
1	652	644	1,296
2	615	611	1,226
3	572	580	1,152
4	549	568	1,117
5	503	530	1,033
Total	3,560	3,580	7,140

**Performance Measure 1.a** Physical activity was assessed in boys and girls in K-3 from pedometer steps accumulated during the school day. Pedometers were put on children at the beginning of the school day and removed at the end of the school day. Total sample for pedometer is 2,656. Descriptive statistics are given in Table 2. Steps per day declined in both boys and girls across grades K-3 showing that even at these young ages physical activity declines with increasing age. Boys were more active than girls. The data suggest that, on average, boys and girls achieved about 40% of the recommended daily steps during the school day.

**Table 2. Pedometer Steps in Grades K-3**

Grade	Girls		Boys		Total	
	N	Steps/Sch. Day	N.	Steps/Sch. Day		Steps/Sch. Day
K	342	5,342	374	5,955	716	5,662
1	325	5,151	323	6,389	648	5,768
2	312	4,451	324	5,584	636	5,028
3	316	4,349	340	5,571	656	3,272
Total	1,295	4,837	1,361	5,874	2,656	4,949

**Table 2a. Steps during school day on days with & without PE**

Grade	Girls			Boys		
	PE	No PE	% Difference	PE	No PE	% Difference
K	5,365	3,716	44.4%	5,088	4,321	17.8%
1	4,498	3,388	32.8%	4,894	4,286	14.2%
2	3,233	3,355	26.2%	4,167	4,151	0.38%
3	3,156	2,921	8.0%	4,490	3,659	22.8%
Total	4,165	3,347	24.4%	4,645	4,100	13.3%

The number of steps taken during a school day on days when PE is held versus days without PE are shown in the table. Percent differences (PE versus no PE) ranged from 8-44% in girls and 0.4 to 23%. Overall, boys are more active than girls, which may explain the smaller differences (PE vs. no PE) in boys, except for girls in the 3rd grade (8%) and boys in the 2nd grade (0.4%), all differences were statistically significant ( $p < .05$ ). Overall, in girls, steps on PE days exceeded steps on no PE days by 24%; in boys, steps on PE days exceed no PE days by 13%. In the total sample (boys and girls combined) steps on PE days exceeded steps on no PE days by 18.6%. The results clearly demonstrate the importance of physical education for adding to activity levels during the school day.

**Table 2b. Number of children wearing pedometer on PE days and no PE Days**

Grade	Girls		Boys	
	PE	No PE	PE	No PE
K	30	181	43	173
1	46	169	48	171
2	46	172	47	167
3	54	176	55	179
Total	176	698	193	690

**Table 2c. Percent active time (during pedometer wearing) at school on days with & without PE**

Grade	Girls			Boys		
	PE	No PE	Combined	PE	No PE	Combined
K	22.7%	18.0%	18.8%	21.4%	20.0%	20.3%
1	18.9%	17.4%	17.4%	19.4%	20.3%	20.0%
2	18.1%	15.1%	14.9%	18.6%	17.9%	17.6%
3	13.1%	14.3%	14.0%	16.7%	16.7%	16.7%
Total	17.6%	16.2%	16.4%	18.8%	18.7%	18.7%

**Table 2d. Percent active time (during pedometer wearing) at school**

Grade	Girls	Boys	Combined
K	18.8%	20.3%	19.5%
1	17.4%	20.0%	18.7%
2	14.9%	17.6%	16.2%
3	14.9%	17.6%	16.2%
Total	14.0%	16.7%	15.4%

Percent active time averaged 17.5% in boys and girls in grades K-3. Percent active time was higher in boys than girls in each grade, although the differences (~1.5-3.0%) were not large. In both girls and boys, percent active time declined across grades K-3 as children got older. Percent active time tended to be higher on PE days (18.2%) than no PE days (17.4%), especially in girls (17.6% vs 16.2%) although the differences were small.

**Performance Measure 1.b.** Aerobic fitness was measured in fourth and fifth grade boys and girls (total sample at present, N=1,281 boys and girls) using the Fitnessgram Pacer Field test which reflects aerobic endurance. Pacer laps and percent of children meeting the minimum standard are given below.

**Table 3. Pacer laps and percent meeting standard**

	Girls		Boys		Total
Grade	#Laps*	%Pass**	#Laps*	%Pass**	%Pass**
4	16.9 ± 9.5	49.1%	20.3 ± 12.6	33.6%	41.1%
5	17.9 ± 11.1	52.0%	21.1 ± 12.3	37.5%	44.6%
Combined	17.4 ± 10.5	50.5%	20.7 ± 12.5	35.6	42.8

\* Mean ± standard deviation

\*\* Minimum standards for pass: girls = 15 laps; boys = 23 laps.

It is encouraging that 50% of girls exceeded the minimum standard for laps set by the Fitnessgram. Fewer boys met the minimum standard, with only 36% of boys exceeding the minimum number of laps to pass. The high prevalence of at-risk for overweight and overweight presumably contributed to these findings, since the PACER test is a "weight-bearing" activity that is influenced by body composition, and more boys than girls had higher than desirable weight for height.

**Performance Measure 1.c.** Descriptive statistics for height, weight and BMI, by grade and gender, are given in table 4.

**Table 4. Height, Weight & BMI by Grade and Gender**

Kindergarten			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	114.6 ± 5.8	22.7 ± 6.0	17.18 ± 3.80
Boys	115.3 ± 5.9	23.2 ± 6.3	17.33 ± 3.65
Grade 1			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	120.6 ± 6.1	26.2 ± 7.9	17.91 ± 4.73
Boys	121.9 ± 6.4	27.3 ± 8.3	18.24 ± 4.78
Grade 2			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	127.1 ± 6.6	30.4 ± 9.0	18.65 ± 4.60
Boys	128.0 ± 6.4	31.4 ± 9.5	18.94 ± 4.63
Grade 3			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	133.2 ± 6.7	35.4 ± 10.9	19.75 ± 4.94
Boys	133.4 ± 6.4	35.4 ± 10.5	19.68 ± 4.84
Grade 4			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	139.4 ± 7.3	38.9 ± 10.7	19.81 ± 4.29
Boys	139.4 ± 6.7	40.7 ± 11.9	20.7 ± 4.79

Grade 5			
	Height (cm)*	Weight (kg)*	BMI (kg m <sup>-2</sup> )*
Girls	145.8 ± 7.8	45.2 ± 13.9	21.01 ± 5.12
Boys	145.0 ± 7.6	46.1 ± 13.6	21.70 ± 5.17

\* Mean ± standard deviation

Note: sample sizes are equivalent to sample sizes shown in Table 1.

**Table 5. Prevalence of "at-risk and "overweight" boys and girls**

Grade	Girls				Boys			
	At-risk*		Overweight**		At-Risk*		Overweight**	
	N	%	N	%	N	%	N	%
K	253	37.8	159	23.8	253	39.1	130	20.1
1	250	38.3	171	26.2	265	41.1	159	24.7
2	289	47.0	185	30.1	261	42.7	174	28.5
3	298	52.1	198	34.6	276	47.6	164	28.3
4	277	50.5	158	28.8	287	50.5	184	32.4
5	256	50.9	161	32.0	269	50.8	168	21.7
Total	1,623	45.6	1,032	29.0	1,611	45.0	979	27.3

\* At-risk of overweight, ≥85<sup>th</sup> percentile of age- and gender-specific BMI.

\*\* Overweight, ≥95<sup>th</sup> percentile of age- and gender-specific BMI.

**Table 6. Prevalence of "at-risk" and "overweight" total**

Grade	Total			
	At-risk*		Overweight**	
	N	%	N	%
K	506	38.4	289	22.0
1	515	39.7	330	25.5
2	550	44.9	359	29.3
3	574	49.8	362	31.4
4	564	50.5	342	30.6
5	525	50.8	329	31.8
Total	3,234	45.3	2,011	28.2

\* At-risk of overweight, ≥85<sup>th</sup> percentile of age- and gender-specific BMI.

\*\* Overweight, ≥95<sup>th</sup> percentile of age- and gender-specific BMI.

Prevalence estimates of at-risk of overweight (BMI >85<sup>th</sup> percentile) and overweight (BMI >95<sup>th</sup> percentile) were derived using current U.S. growth charts (ref).

Prevalence of both at-risk for overweight and overweight are higher than expected in boys and girls in each grade. Estimates of at-risk and overweight were similar between genders.

National prevalence data is presented below based on the NHANES (National Health and Nutrition Examination Survey) survey, from the years 2003-2004. NHANES is a national, population-based survey, in which height and weight is measured rather than self-reported; this data was published in April 2006. Reference: Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A., Tabak, C.J., and Flegal, K.M. Prevalence of overweight and obesity in the United States, 1999-2004. JAMA, 295(13), 1549-1555, 2006.

For Mexican-American boys and girls aged 6-11		
	At-risk ( $\geq 85^{\text{th}}$ percentile)	Overweight ( $\geq 95^{\text{th}}$ percentile)
Girls	37.4%	19.4%
Boys	47.9%	25.3%

In SUSD schools, with predominately Mexican American student bodies, the prevalence of at-risk for overweight ( $>85^{\text{th}}$  percentile) and overweight ( $>95^{\text{th}}$  percentile) were 45% and 28% as a whole. When broken down by gender 45.6 % of girls were at-risk and overweight and 29 % were overweight, while 45% of boys were at-risk and overweight and 27.3 were overweight.

**Performance Measure 1.d. Nutrition**

Dietary recalls were collected from 121 children 3rd (N=46) and 5th (N=75) grade attending SUSD Elementary schools.

At both the YMCA and SUSD we captured if the children could identify recommended amount of milk and milk products to eat daily, recommended amount of fruits and vegetables to eat daily, a reason for eating breakfast. Tables 6 and 7 report this data.

The baseline YMCA questionnaire was missing the question regarding eating breakfast. The information presented for the YMCA was collected in April 2005. A revised questionnaire will be given to the YMCA children again in April 2007.

**Table 7. SUSD Baseline Intake Questionnaire**

Question	Average 3 <sup>rd</sup> Grade (N=46)	Average 5 <sup>th</sup> Grade (N=75)
How many fruits and vegetables do you eat each day?	3	3.4
How many milk and milk products do you eat each day?	2.4	2.7
How many fruits and vegetables should a person have each day?	4.3	5.3
How many milk and milk products should a person have each day?	2.8	3.5
Should a person eat breakfast?	Yes	Yes
Why should a person eat breakfast?	46 Responses	75 responses

**Table 8. (Liberty and Mulcahy) Baseline Intake Questionnaire**

Question	Average Grade (K-5)
How many fruits and vegetables do you eat each day?	1.75
How many milk and milk products do you eat each day?	1.40

Project Objective 1 Targets for Year 3:

Baseline data was collected at 10 schools during year 1, and at 4 additional schools in the first quarter of year 2. Data will be collected again during year 3. We expect to see the following:

- A 5% increase in the average # of steps taken by K-5 SUSD students during school,

- A 5% increase in the % of time that students are physically active, and
- A 5% increase in the number of kids who meet the PACER standards for aerobic fitness, and
- No increase in the % that are at-risk and overweight as measured by BMI.

#### Description of Data Collection Measurement and Analysis Procedures for SUSD Data

Height in centimeters and weight in kilograms were measured in children in grades K-5. Height was measured with a portable stadiometer (Shorr Board) with the children standing erect, in stocking feet, after a full inspiration, with the head in the Frankfurt plane. Weight was measured in stocking feet with the children standing on a digital electronic weighing scale (Seca scale). Height and weight were both measured twice. The average of two trials was used as the criterion score. The Body Mass Index (BMI; kg per squared meters) was calculated from height in meters and weight in kilograms. CDC growth charts of BMI-for-age percentiles by gender were used to determine weight status (2000, National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion). Using the CDC criteria, children in the 85-94th percentile of BMI were at risk for overweight and children in the 95th or higher percentile of BMI were overweight.

Pacer laps were measured in children in grades 4 and 5 following the Fitnessgram standard protocol. Children ran 20 meter laps keeping pace with a standardized pacing audiotape until they can no longer keep pace with the audiotape for 2 consecutive laps. The score is the number of completed laps. The percent exceeding the minimum standard was determined by comparing measured laps against the national Health-Related Fitnessgram standards.

Steps taken during the school day were measured in children in grades K-3. A pedometer was placed on children at the beginning of the school day ("time-on" was recorded) and removed at the end of the school day ("time-off" was recorded). The duration the pedometer was worn ("wearing time") was calculated from pedometer "time-on" and "time-off." The pedometers were two function and measured both number of steps taken and the minutes of physical activity. These measures were used to determine the % of school time that involved physical activity. The # of steps taken by youth during school was compared with the recommended daily number of steps, and it was determined what % of recommended steps were taken during school. Means (averages) and standard deviations were calculated for basic variables and comparisons were made to norms when they existed, i.e. BMI and Pacer.

### Performance Measure 1.e. Evaluation Findings for YMCA After-School Sites

Design: In 2005-2006, the evaluation plan was a paired comparison (time1 to time 2) of youth at four YMCA after-school sites. The comparison included data on 1) height; 2) weight; 3) BMI; 4) CDC weight status based on BMI-for-age by gender percentiles; 5) percent of time spent in physical activity during an after-school session; and, 6) number of steps taken during an after-school session. Time 1 data were collected in October 2005. Time 2 was approximately six months later in April 2006.

The two evaluation questions were:

1. Does the CDC weight status of youth change from Time 1 to Time 2 during the school year?
2. Does the physical activity of youth at the after-school sites increase from Time 1 to Time 2 during the school year?

Data Collection: Four YMCA after-school sites were selected. The Mulcahy and Liberty sites served youth in the Sunnyside School District. The Erickson and Marshall sites served youth in the Tucson Unified School District.

A standardized scale (kilograms) and a height board (centimeters) were used. Two function pedometers, counting minutes of activity and number of steps, measured physical activity.

Most physical activity at the after-school sites occurred outdoors. To assure comparability of Time 1 and Time 2, physical activity data were collected under similar outside temperature and weather conditions. The same pedometer was placed on a child at Time 1 and Time 2. Data were collected on the same days of the week at both times.

Parent/guardian permission was obtained. At Erickson and Marshall, the YMCA evaluator spoke with parents/guardians to obtain consent. A parental consent was signed for all youth at Erickson (n=52) allowing height, weight and pedometer measurements. At Marshall, 39 of 44 youth (89%) were given permission for height, weight and pedometers. YMCA staff decided to seek parental permission at the Mulcahy and Liberty

sites. At Mulcahy, 68 of 98 youth (69%) had signed consent forms with most allowing the three measurements. At Liberty, 17 of 34 youth (50%) had permission for only height and weight.

Multiple days of data collection were needed to assure that each child was measured and activity documented. At both Time 1 and 2, height and weight were measured on two days in one week at each site. Physical activity measured using the pedometer occurred on two to three days during the following week. A pedometer was placed on a child when he or she entered the room used for the after-school program and removed when the child was signed out by his/her parent/guardian. The time that the pedometer was placed and the time the pedometer was removed were recorded for each child. When the pedometer was removed, the number of minutes of activity and the number of steps were recorded.

Data Analysis: Data were entered into an SPSS database. BMI was calculated using height and weight. CDC growth charts of BMI-for-age percentiles by gender were used to determine weight status (2000, National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion). Using the CDC criteria, youth in the 0-5th percentile were underweight, 6-84th percentile were normal weight, 85-94th percentile were at risk for overweight and 95th or larger were overweight.

To measure physical activity, two variables were created. The first labeled 'percent activity' was calculated by dividing the number of minutes of activity reported by the pedometer by the total number of minutes the pedometer was worn by the child then multiplied by 100%. This variable gave the percent of time that a child was physically active during an after-school session.

The second variable, 'steps per 15 minutes of activity time', was calculated by determining the number of 15-minute segments of activity the child was involved in (minutes of activity/15 minutes) then dividing the number of steps by the number of 15-minute segments. This second variable gave a proxy measure of how intense the activity was during a specified period of time. This second calculation was necessary because each child spent different amounts of time in the after-school program at time 1 and time 2.

Paired comparisons were used. Data were analyzed for all youth in the four YMCA sites and for youth at each of the four sites. Crosstabs looked at change in weight category from Time 1 to Time 2. Percent activity was normally distributed (Kolmogorov-Smirnov with Lilliefors Significance Correction,  $p=.092$ ) so paired t-tests were used. Steps in 15 minutes were non-normally distributed (KS with Lilliefors,  $p=.000$ ) so Wilcoxon Signed-Rank Matched Pairs tests were used.

Findings for weight status: There were 203 youth across the four sites that were measured at Time 1 for height and weight. Only 146 of these youth had height and weight data at both Time 1 and Time 2. Thus, the research retention rate was 72%. Most missing youth had dropped out of the after-school program and a few were absent on all days of data collection at Time 2.

For the 146 youth, 54% were boys and 46% were girls. Ages ranged from 5-11 years with a mean of 7.2 years ( $sd=1.7$  years).

For the 146 youth, crosstabs show that 85% ( $n= 123$ ) were in the same weight category at Time 1 and Time 2 (see Table 1). Approximately 3% were underweight, 51% were normal weight, 10% were at risk for overweight and 21% were overweight at both times.

**Table 9: Crosstabs for Weight Status at Time 1 and Time 2 reported by Percents (n=146 youth)**

Underweight = 0-5th percentile  
 Normal Weight = 6-84th percentile  
 At risk for Overweight = 85-94th percentile  
 Overweight = Greater than or equal to the 95th percentile

Weight Status	Under - Time 2	Normal - Time 2	At Risk - Time 2	Over - Time 2
Underweight - T1	2.7%	1.4%		
Normal weight - T1	0.7%	51.4%	4.1%	
At risk for over - T1		2.1%	9.6%	2.7%
Overweight - T1		0.7%	4.1%	20.5%

Total % at Time 2	3.4%	55.5%	17.8%	23.2%
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Using normal weight as the standard, positive changes in weight status were seen in six youth (4.1%) with two moving from underweight to normal, three from at risk to normal and one from overweight to normal. Four youth (2.7%) were overweight at Time 1 then at risk for being overweight at Time 2.

Negative weight changes were seen in seven youth (4.8%) with one (0.7%) moving from normal weight to underweight and six (4.1%) moving from normal to being at risk for overweight. In addition, six youth (4.1%) moved from at risk for overweight at Time 1 to being overweight at Time 2. From the Time 2 data, it is clear that 41% of YMCA after-school youth were either at risk for or were actually overweight.

Weight status was also examined for each of the four YMCA sites. The following summarizes those findings.

- Erickson: Among 37 youth, 19 (51%) were normal weight at Time 1 and Time 2. Two children moved from underweight to normal weight. Two increased from normal weight to at risk for overweight. Two decreased from overweight to at risk for overweight. Only five youth (14%) were overweight at both times.
- Marshall: Among 31 youth, 18 (58%) were normal weight at Time 1 and Time 2. Two children decreased from at risk for overweight to normal while one decreased from overweight to normal weight. One increased from at risk to overweight at Time 2. Only three youth (10%) were overweight at both times.
- Liberty: Among 15 youth, 10 (67%) were normal weight at Time 1 and Time 2. One child increased from at risk to overweight at Time 2. Only one child (7%) was overweight at both times.
- Mulcahy: Among 63 youth, 28 (44%) were normal weight at Time 1 and Time 2. One child decreased from at risk to normal weight. Four decreased from overweight to at risk for overweight. One child increased from normal to at risk while two increased from at risk to overweight at Time 2. Twenty-one youth (33%) were overweight at both times.

Findings for Physical Activity as Percent Activity Time: Paired data on physical activity were available from 106 youth across three YMCA after-school sites. No pedometer data were collected at the Liberty site. Percent activity was compared using paired t-tests for all youth and youth at each of the three sites. Table 2 reports the findings.

**Table 10: Percent Activity [(activity minute/total minutes wearing the pedometer) x 100%]**

YMCA Site	Time 1 - % activity Mean (sd)	Time 2 - % activity Mean 9sd)	p-value for paired t-test
All sites (n=106)	32.4 (17.0)	33.7 (15.1)	.483
Erickson (n=36)	44.2 (13.7)	33.6 (12.9)	.000
Marshall (n=27)	38.4 (11.7)	41.4 16.9)	.403
Mulcahy (n=42)	18.7 (12.4)	28.9 (14.1)	.001

These data suggest that there was no increase in percent physical activity among all youth. Forty-nine youth (46%) had higher percent activity at Time 2 than Time 1 with a range of .4% to 53% more activity time (median = 13%). Fifty-seven children (54%) had lower percent activity at Time 2 than Time 1 with a range .2% to 43% less activity time (median = 9%).

However, there was a significant increase in percent activity among children at the Mulcahy site and a significant decrease among youth at the Erickson site. At Time 2, the percent activity time at Mulcahy averaged less than 30% while Erickson was at 34% and Marshall at 41%.

Findings for Physical Activity as Steps per 15 Minute Unit of Activity: Data from 106 youth were analyzed to estimate change in intensity of activity from Time 1 to Time 2. Data were also examined for three of the four individual Y sites.

As a proxy for intensity, the number of steps per 15 minutes of activity time was calculated for Time 1 and Time 2. Since these data were non-normally distributed, Wilcoxon Signed-Rank Matched Pairs were used for comparisons.

For all youth, there was no significant change ( $p=.323$ ) in the number of steps per 15 minutes of activity across time. The number of youth with more steps at Time 2 equaled the number of youth with more steps at Time 1.

**At Mulcahy**, there was a significant increase ( $p=.045$ ) in the number of steps taken in 15 minutes from Time 1 to Time 2. Twenty-five children increased their number of steps in 15 minutes from Time 1 to Time 2 while seventeen decreased their steps.

**At Erickson**, there was no change ( $p=.198$ ) in the number of steps taken in 15 minutes from Time 1 to Time 2. Twelve children increased their number of steps from Time 1 to Time 2 while twenty-four decreased their steps.

**At Marshall**, there was no change ( $p=.962$ ) in the number of steps taken in 15 minutes from Time 1 to Time 2. Fifteen children increased their number of steps from Time 1 to Time 2 while twelve decreased their steps.

Summary: Data from the YMCA after-school sites have answered the two evaluation questions.

1. Minimal changes were seen the weight status of youth. Approximately 52% of children were in the normal weight category at both Time 1 and Time 2. Positive changes were seen in 6.9% of youth including moving to a normal weight or changing from being overweight to being at risk for overweight. At Time 2, 41% of youth remained in the overweight or at risk for overweight category.
2. For all youth, neither indicator of physical activity increased from Time 1 to Time 2. There was no statistically significant increase in percent activity time or number of steps taken in a 15-minute increment of time. Forty-six percent of all youth increased their percent activity from Time 1 to Time 2. However, youth attending the Mulcahy YMCA after-school site significantly increased both their percent activity time and number of steps across time. It is important to note that the Mulcahy site had the highest percent of youth in the overweight category.

Year 3 target - 52% of youth will increase % time of physical activity