

THE CHILDHOOD OBESITY CHALLENGE TAP INTO FITNESS: PROGRAM OVERVIEW AND RESULTS ANALYSIS

Louis Heuser, MD; Shawn Herbig

Obesity is and will continue to be a pressing issue in the United States, especially in the younger populations. In 2002, studies revealed that the number of overweight children doubled in the last two decades and also that one child in five was overweight. What makes this matter even more pressing is that the trends continue to point toward a worsening in physical fitness.

This prominent health issue is so urgent because of the many and dangerous health consequences of childhood obesity. The following is a list of serious consequences of child obesity:

- Type 2 diabetes (used to only occur in adults)
- High cholesterol and blood pressure
- High incidence of orthopedic problems, liver disease, and asthma
- 70% chance of becoming overweight or obese adults
- Social discrimination through teasing and ostracizing

The statistics demonstrate that obesity is a very real, growing, and serious threat, especially in the Jefferson County Public Schools. We have seen that an alarming 45% of the local 4th grade population began the school year obese or at risk for obesity. It is clear that intervention is necessary and action should be undertaken to solve the issue of childhood obesity, and the Tap into Fitness (TIF) program aims to defeat that threat one child at a time.

The Tap into Fitness program aims to curb and reverse that trend through its multi-pronged approach, which delivers nutritional

education and physical fitness training. Utilizing this comprehensive approach, the TIF program helps students become exposed to and take part in a healthy lifestyle.

This past school year was the third full year of the program in the Jefferson County Schools, and it was implemented upon a population of 4th graders from six Jefferson County elementary schools.

This study examines if and to what degree the program accomplished the general goal of improving physical fitness. To clearly investigate the achievement of that objective, we will first decompose the general goal into the following specific objectives:

- Objective 1: Improve the fitness of *those at obese levels of body fat*
- Objective 2: Prevent a movement toward obesity for *those at risk for obesity* and also improve their fitness
- Objective 3: Maintain and improve the fitness of *those already at healthy levels* of physical fitness
- Objective 4: Improve the nutritional knowledge of the students

ANALYSIS PROCESS

Generally speaking, a significantly healthier population at the year's end indicates that Tap into Fitness is demonstrating success in accomplishing its objective. Physical fitness was measured by a variety of indicators, including body fat percentage, pushups, sit-ups, and half-mile run/walk time. The most important indicator, however, is body fat percentage.

Tap into Fitness! is a community partnership working in Jefferson County, Kentucky elementary schools. The Heuser Clinic/Louisville Youth Training Center, Louisville Water Company, Jefferson County Public Schools, and Schneider DeMuth Advertising created the program in 2004. Tap into Fitness! provides community resources to teach nutrition, fitness, and consumerism. A research component for 4th grade examines the impact of increased physical activity and nutrition instruction on a child's overall health.

For medical questions, contact Louis Heuser, MD, Louisville Youth Training Center, 2040 Metal Ln, Louisville, KY 40206; 502/893-7833; louisheuser@aol.com. For statistical questions, contact Shawn Herbig, IQS Research, 308 N Evergreen Rd Ste 140, Louisville, KY 40243; 502/244-6600; sherbig@qgsresearch.com

To examine the extent to which Tap into Fitness accomplished the smaller, more specific objectives listed in the previous section, we must first stratify the individuals of the population according to the following criteria:

- Obese: Body fat of 30% or more (both genders)
- At Risk for Obesity: Body fat 20.1%-29.9% (males), 24.1%-29.9% (females)
- Average (healthy): Body fat 12%-20% (males), 18%-24% (females)

Of the original 505 students, 288 students had completed the necessary examinations in both the fall and spring testing sessions and were included in this study.

IMPROVEMENT IN AGGREGATE POPULATION

Prior to delving into the specific objectives we must first examine the changes in the population as a whole. There were clear improvements across all measured factors. Every single indicator of physical fitness improved by a

clear amount, and body fat percentage improved by 2.5 percentage points (Table 1).

More importantly, there were improvements in the body fat categories; the unhealthy categories (at risk for obesity and obese) lost students and the healthy category (average) gained students (Figure 1).

It is clear that the population underwent a significant and consistent improvement as a whole. This general improvement manifests itself in the accomplishment of the smaller objectives examined next.

Objective 1: Improving the fitness of those at obese levels of body fat

The first objective was to improve the physical fitness of those at obese levels of body fat. This objective is perhaps the most challenging because obese children are in a physical condition

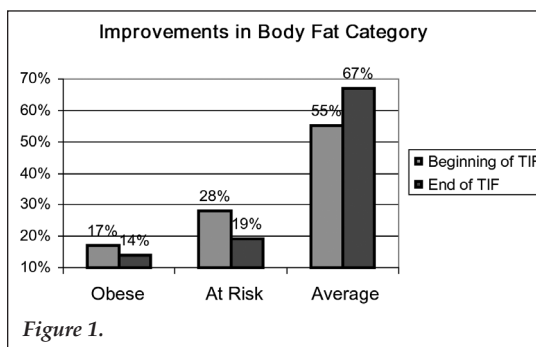


Table 1. Changes in TIF Population

	Beginning of TIF – Fall 2006	End of TIF – Spring 2007	Improvement
Number of Students	288	288	NA
Number and % Obese	49 (17% of population)	40 (14% of population)	9 (3%)
Number and % At Risk	81 (28%)	54 (19%)	27 (9%)
Number and % Average	158 (55%)	194 (67%)	36 (12%)
Average Body Fat Percentage	21.58%	19.07%	2.51%
Average Nutritional Test Score	58.6%	71.5%	12.9%
Average Number of Push-ups	14.4	19.6	5.2
Average Number of Sit-ups	25.7	26.8	1.1

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Table 2. End of Program Statistics for Those at Obese Levels

	End of Program Classification			Total
	At Risk	Average	Obese	
# of students in category (spring)	11	1	37	49
% of 49 students	22.4%	2.1%	75.5%	100%
Average Body Fat Improvement	0.79%			
Average pushup Improvement	5.7 pushups			
Average half-mile time improvement	13.1 seconds			

Table 3. End of Program Statistics for Those At Risk

	End of Program Classification			Total
	At Risk	Average	Obese	
# of students in category (spring)	40	39	2	81
% of 81 students	49.4%	48.1%	2.5%	100%
Average Body Fat Improvement	2.9%			
Average Pushup Improvement	5.0 pushups			
Average sit-up improvement	1.6 sit-ups			

generally requiring serious, personal medical counseling. Despite this difficulty, the program accomplished its goal of improving the general fitness of these students. End-of-program statistics speak to the demonstrated improvements (Table 2).

The most considerable improvements observed occurred among the 12 students who moved out of the Obese category, meaning nearly a quarter of all students improved from the Obese category. One student even improved to the Average category, a remarkable improvement that perhaps requires further investigation.

Although not all initially obese students left the Obese category, the group as a whole still experienced improvement in physical fitness, as demonstrated by the .79% body fat improvement and the improvements in pushups and half-mile time.

Objective 2: Prevent a movement toward obesity for those at risk for obesity and also improve their fitness

The second objective was to arrest the trend of students who were on the path toward obesity.

This is a considerably more difficult task as many of these students are beginning to develop the behavioral patterns that lead them into an unhealthy lifestyle. Thus, the students who began the year at risk for obesity are perhaps the most critical population; they stand at a pivotal juncture where they can either improve their fitness or fall into childhood obesity that often translates into long-term obesity.

The TIF program not only accomplished the goal of stopping the unhealthy trends, but also far exceeded expectations (Table 3).

Only two of the 81 students who were originally at risk for obesity ended the year in the Obese category, whereas nearly half (39) of the originally At Risk students ended the year in the Average fat category. Even those who stayed in the At Risk category experienced improvement, as the group's average body fat percentage improved by 2.9%.

The importance of the improvement in this category cannot be overstated. Nearly half of the children (39) who began the year at risk for obesity made a significant improvement to return to healthy levels of body fat. These children experienced a major and potentially life-changing improvement in their physical fitness.

Table 4. End of Program Statistics for Those at Healthy Levels

	End of Program Classification			Total
	At Risk	Average	Obese	
# of students in category (spring)	3	154	1	158
% of 158 students	1.9%	97.5%	0.6%	100%
Average Body Fat Improvement	2.9%			
Average Pushup Improvement	5.3 pushups			
Average Half-mile time improvement	5.3 seconds			

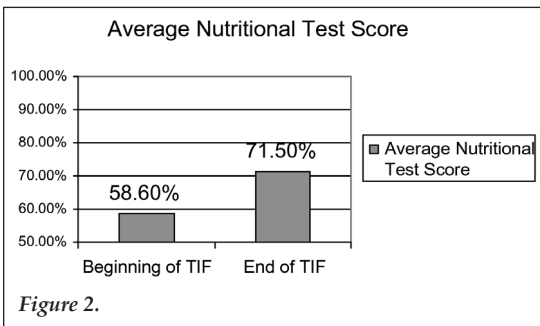


Figure 2.

Objective 3: Maintaining and improving the fitness of those already at healthy levels

The Tap into Fitness program also aims to maintain the fitness of currently healthy students. TIF accomplished its goal of maintaining the fitness of already healthy children and even exceeded expectations by improving their fitness (Table 4).

Out of the 158 initially average students, 154 ended the year in the Average body fat category. The group as a whole experienced considerable improvement, as demonstrated by the average body fat improvement of 2.9% and

the improvement of 5.3 pushups and 5.3 seconds on the half-mile time.

Objective 4: Improve the nutritional knowledge of the students

The Tap into Fitness program utilizes a multi-pronged approach to improving physical fitness incorporating both meaningful physical activity and also an educational program that teaches the science and importance of a healthy diet.

The improvement in nutritional knowledge due to Tap into Fitness was measured by comparing the improvement in scores for a nutrition test, which was administered at the beginning and end of the year (Figure 2).

The students exhibited a 12.9 point increase in their nutritional knowledge, which may translate into healthier diets and lifestyles.

COMPARISON TO A CONTROL POPULATION

To place the population's improvement due to TIF in perspective, it is necessary to compare the population that underwent the TIF pro-

Table 5. Population Comparison with and without TIF

	Control Population	Population After a School Year of TIF	Change (1 year with TIF vs. 1 year without TIF)
Percent of population Obese	26% of population	14% of population	-12%
Percent of population At Risk	29%	19%	-10%
Percent of population Average	45%	67%	+22%
Average Body Fat Percentage	23.9%	19.07%	-4.83%
Average Nutritional Test Score	66.9	71.5	+4.6
Average Number of Push-ups	15.3	19.6	+4.3
Average Number of Sit-ups	23.2	26.8	+3.6

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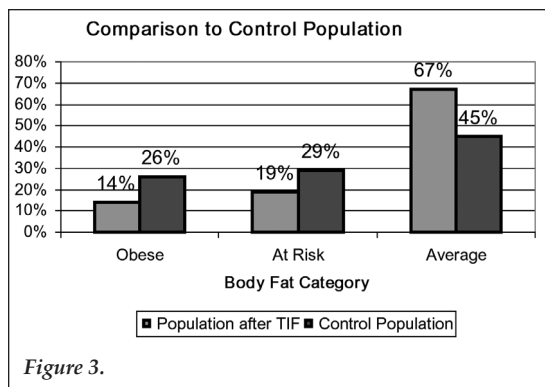


Figure 3.

gram to a similar population without a school year of TIF, or a control population. This is important because the data illustrates that without the intervention of TIF, the population would have actually undergone a *negative trend* toward obesity.

This year's 4th grade population with a year of TIF was contrasted with a population without a year of TIF (Table 5, Figure 3). The

control population (without a year of TIF) was derived from results of the previous year, when we measured the data of students who were beginning 5th grade and had not undergone the TIF program.

The data presents a clear message that the impact of TIF extends far beyond the improvement from the beginning to the end of the year. For the children without TIF, 55% of the population was obese or at risk for obesity; with TIF, however, that figure is remarkably less: 33%.

The body fat percentage difference is also extraordinary. The average student after a year of TIF had 4.83% less body fat than the average student without TIF. All the other indicators of physical fitness, as well, demonstrate a significant improvement in physical fitness.

Simply put, if untouched, the student population grows unhealthier as the children grow older. The TIF program effectively prevents and even reverses this negative trend to move the population to a significantly healthier level.