

The Family Fitness Program

ABSTRACT

Childhood obesity is rising, and with it health complications for children now and in the future. The *Family Fitness* program offers the help all children ages 8-12 and their families need for improving healthier food and fitness behaviors and child obesity prevention. The program is based on the Transtheoretical (Stages of Change) and Motivational Interviewing educational theories. This National Extension Association of Family and Consumer Sciences 2007 award winning, research-based program developed by Penn State Extension engages diverse families (rural, urban, income, race) and significantly improves family communication, healthy eating and physical activity. Children attend 9 weekly or 5 twice weekly sessions to practice making healthy food choices and increase physical activity via guided discussions and activities. Parents participate in five meetings (three with their child) to receive information, skills, and motivational guidance leading to improved food choices, physical activity, and family support. Parent/family learn-at-home lessons, family discussions and goal setting are included. Trained Extension educators and community collaborators have provided over 27 programs in this research study to document the program's effectiveness.

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Program of Distinction Category

Healthy Lifestyles: youth obesity, nutrition education, health & fitness, healthy relationships, good decisions

Sources of Funding that Support this Program

Funding has been provided by Penn State College of Agriculture Seed grant for \$12,000, Penn State Outreach Health Thematic Initiative grant for \$68,000 over 3 years, and Pennsylvania Department of Health grants for \$24,000 over the past 2 years.

Program Content

Knowledge and Research Base

The growing problem of childhood obesity in the United States has received substantial documentation (Strauss & Pollack, 2001; Austin, Field, Wiecha, Peterson, & Gortmaker, (2005); O'Dea, 2003; Fisher & Mitchell, 2002; Vereecken, Van Damme, & Maes, 2005; Sandeno, Wolf, Drake, & Reicks, 2000; Howerton, Bell, Dodd, Berrigan, Stolzenberg-Solmon, & Nebling, 2007; American Dietetic Association,

2006). Heart disease is the nation's leading killer for adults, but it will be reaching even younger ages sooner than in previous generations. Research is now finding that 61% of overweight children, aged 5-10 have one cardiac risk factor, and 27% have 2 or more (Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007). Obesity, overweight, and physical inactivity are major, modifiable risk factors that must be addressed with prevention education by the major institutions that affect children the most: schools and families. Many programs target children for overweight prevention and reduction, but most have not actively included the parent and the child together (Austin, et al., 2005; O'Dea, 2003; Fisher & Mitchell, 2002; Vereecken, et al., 2005; Sandeno, et al., 2000; Howerton, et al., 2007), leading to little lasting change in the child's diet and fitness levels. Accomplishing lasting change in a child's diet and fitness levels presents many challenges, including family time constraints, child self esteem issues, poor parenting practices, modeling for meals and healthy food practices, and defensiveness about these practices (O'Dea, 2003; Fisher & Mitchell, 2002; Vereecken, et al., 2005; Sandeno, et al., 2000; Howerton, et al., 2007). However, a growing body of studies recommends that parents or other care-giving adults need to be directly involved with their children in the intervention to effect positive change in healthy diets and physical activity behaviors (Howerton, et al., 2007; American Dietetic Association, 2006; American Academy of Pediatrics, 2003; Borra, Kelly, Shirreffs, Neville, & Geiger, 2003; Kirk, Scott & Daniels, 2005). Studies have shown direct parental involvement helps the child improve weight regulation (Muller, Asbeck, Mast, Langnase, & Grund, 2001; Ammerman, Linquist, Lohr, & Hersey, 2002). Strategies calling for improved parent- child cooperation, setting goals, and motivating for these healthy behavior changes have been requested and recommended (Muller, et al., 2001; Ammerman, et al., 2002), but the process to effect these changes, as well as other important strategies of parental involvement in a program, have not been well documented (American Dietetic Association, 2006). One new study has revealed parents, care-giving grandparents, and children requested nutrition educators offer hands-on, practical ways to improve family cooperation and communication, and suggests programs empower children to act as partners with their parents to improve these healthy behaviors (Kaplan, Kiernan, & James, 2006).

The time to make a difference in childhood overweight prevention is clearly in the elementary years, not later. Compared to their leaner peers, overweight children and adolescents are at high risk for adult obesity, other morbidities such as Type 2 diabetes, hypertension, and early mortality. According to the American Heart Association Committee on Atherosclerosis, Hypertension, and Obesity in the Young, successful pediatric overweight interventions should include: initiation of treatment prior to adolescence, willing participation by child and family, emphasis on long-term behavior change, establishment of gradual goals, monitoring of eating and physical activity, empathy and encouragement (American Heart Association, 2006). Research tells us that normal weight people eat a wider variety of fruits, vegetables, cooked grains, and legumes than obese people. Also, an increased variety of vegetables in the diet is associated with lower body weight (Rolls & Barnett, 2000). Five or more servings of fruits & vegetables are associated with less chronic disease, including cardiac disease, Type 2 diabetes, many cancers, and hypertension. Research also shows many children need repeated exposures to new foods, like vegetables, before they will readily accept them (Galloway, Lee & Birch, 2003). The program is informed by and applies elements of the Transtheoretical Model (Prochaska & Velicer, 1997)

and Motivational Interviewing (Resnicow, Dilorio, Soet, Ernst, Borrelli, & Hecht, 2002; Resnicow , Davis, & Rollnick, 2006).

Needs Assessment

Pennsylvania is afflicted with many of the chronic disease and life style trends that impact the health of the rest of the nation. However, according to the National Center for Chronic Disease Prevention, Pennsylvania has higher rates of adults with Type 2 diabetes, higher rates of obese adults, lower rates of fruit and vegetable consumption, and higher rates of adults who engage in no leisure-time physical activity than the desired goal. These rates are higher in certain segments of the population, such as those with lower incomes, lower educational status, and in those within certain racial categories such as Black non-Hispanic and Hispanic adults. These individuals in particular are in need of basic nutrition, shopping, and food preparation techniques to aid them in using their food resources wisely and making healthful choices for their families.

Pennsylvania's Department of Health's vital statistics (2007) reflect that the causes of death in Pennsylvania mirror those of the nation as a whole. This is particularly true for the causes of death that are directly related to nutrition and physical activity life style choices. (Heart Disease- # 1, Cancers- # 2, Diabetes - # 7, Atherosclerosis- # 8). Management of these chronic diseases cost state and national health care systems billions of dollars a year, directly and indirectly. Diabetes, for example, is estimated to cost the nation nearly \$100 billion annually. The alarming increase in the rate of diabetes during the past decade has led the Healthy People 2010 report to list diabetes prevention and education as a top objective. In 1998 United States aggregate adult medical expenditures (out-of pocket, Medicare and Medicaid) attributable to overweight and obesity was estimated to be \$51.5 billion (Centers for Disease Control and Prevention, 2007).

In 1998-2000 in Pennsylvania, \$138 million health care expenditures were related to obesity alone, and only reflect direct medical costs. Absenteeism and decreased productivity costs were not included, but they are also attributed to poorer health and disease related to overweight and obesity.

The rates of obesity and overweight in Pennsylvania adults and children are also increasing dramatically. The percentage of child overweight has tripled in the past 30 years, and the need for research-based successful interventions has increased as well. In Pennsylvania, 35% of eighth graders were found to be at risk or overweight from 1999-2001 (Pennsylvania Department of Health, 2002). National surveys show between the ages of 6-11 the rate of overweight and at-risk for overweight jumps to 30.5%, with African-Americans at 35% (Centers for Disease control and Prevention, 2007).

Childhood overweight has been documented to increase risk for cardiac disease and its risk factors, hypertension, Type 2 diabetes, and high cholesterol for children, adolescents, and adults. Since many studies show 50-80% of overweight children will become overweight adults, early intervention is key. (See Appendix 1 for references).

In 2003, Pennsylvania elementary schools also began reporting BMI measurements to parents, as mandated by the state Department of Health. Most

schools, especially low income and rural, had little to no programs or interventions in their area to refer these families to after this information was sent home.

The *Family Fitness/Childhood Overweight Prevention* team documented the intense struggles between parents (grandparents or other caregivers) and elementary-age (grades 3–5) children in selecting, preparing, consuming and scheduling time for healthy meals, snacks, and regular physical activity in two different focus groups studies. We developed the *Family Fitness Program* to address those struggles and to offer attainable solutions. The *Family Fitness Program* provides parents, adult caregivers and children with the information, skills, and motivational guidance necessary to achieve diet quality and a healthy level of physical activity. These focus groups included parents, youth, care-giving grandparents, and school nurses from six diverse (racial, economic, geographic) sites in Pennsylvania. In all groups, we documented they desired new ways to better communicate as a family to achieve better diet quality and physical activity, and ways to then meet these goals together. Our pilot program focus groups informed the program by reinforcing approaches and activities that worked well and areas to improve, such as: marketing, recruiting, surveys, program food and physical activities.

Program Goals and Objectives

This research-based program teaches participants how to:

Program Goals:

- Increase fruit, vegetable, whole grain, and low-fat dairy consumption
- Increase positive communication and collaboration on planning and preparing healthy meals and snacks
- Increase minutes of physical activity for children and together as a family
- Increase goal setting and tracking of healthy diet and physical activity behaviors
- Longer-term- have youth at risk for overweight or overweight not increase their *body mass index* (BMI, which is weight in kilograms/height in centimeters x height in centimeters) six months post-program

After participation in the Family Fitness program:

Specific Youth Lesson Objectives:

- Children will identify that Nutrition Facts Labels exist on food packages.
- Children will apply their knowledge of Nutrition Facts Labels and identify the healthiest food choice based on the sugar content from a comparison of Nutrition Fact Labels for three foods. Children will be able to do the same for fat, calcium, fiber and calorie content.
- Children will increase number of days they eat fruits, vegetables, low fat foods from the milk group, whole grains and water, and reduce the number of days they eat sugary foods and drinks and fried and high fat foods.
- Children will increase the array of fruits, vegetables, low fat foods from the milk group, and whole grains they eat.
- Children will increase the number of days they eat breakfast within a week.
- Children will increase their willingness to try new vegetables, fruit, whole grain foods, and low fat food from the milk food group.
- Children will identify two or more high-calcium foods.

- Children will ask their parents (or caregivers) to purchase and prepare the recipe with the healthy food that the children tried during the lesson and report to the instructor in class before the new snack is served the following week.
- Children will set one-three goals for healthy eating and physical activity each week and work with their family to attain these goals. Children will attain these goals as indicated by parent's or caretaker's initials on their goal sheets.
- Children will identify how many minutes of physical activity are recommended each day for youth.
- Children will identify one or more bone-building physical activities.
- Children will increase minutes of physical activity towards recommendation of 60 minutes daily.
- Children with BMI >85% will not increase waist circumference and blood pressure 6 months post program.
- Children will not increase their body mass index six months post program.

Specific Parent Lesson Objectives- after the program, parents will:

- Identify three or more healthy eating competency skills.
- Identify three or more Family Fitness values shared by their family.
- Plan two family meals and two snacks to meet the requirements of USDA's MyPyramid with their families.
- Taste-test new snack recipes with their child from each lesson and agree to make it at home.
- Try a physical activity together with their child they can do at home, including one bone-building activity.
- Identify and set two new family fitness goals for the next meeting, including 60 minutes of daily physical activity.
- Describe one pro and one con effect of eating out on the family's diet and health.
- Plan two or more new ways to make healthful, quick family meals.
- Plan two or more new developmentally appropriate ways children can help with food selection, preparation, and meal time management for healthier meals.
- Identify two or more higher and lower energy-density foods by reviewing food labels.
- Use the Nutrition Facts Panel to select foods for family meal menus based on energy density, calcium, fat, sugar, and fiber content.
- Identify two or more Family Fitness goals they have set and accomplished, and what they will continue to work on in the future.
- Recommend one new family communication strategy that has worked for improving children's acceptance of healthy foods/meals.

Target Audience

All children ages 8-12 and their families, care-giving parents, grandparents or other adults, are invited to participate. We have collaborated with elementary school principals, school nurses, area health educators, teachers, 4-H and Young Men's Christian Associations (YMCAs) to train and offer the programs. Since its inception four years ago, this program has been conducted as a research study, as well as a non-research program. Over two-thirds of our participants have been rural or in areas

less than 50,000 in population. Our urban areas include Philadelphia, Pittsburgh, and Harrisburg. Our participants include: 45% eligible for free or reduced-price lunch, 80% white, 18% African American, 2% other.

Type of Program

Family Fitness has been run as an after-school youth program, with evening or weekend family meetings and parental learn-at-home materials that includes family activities to further apply lesson concepts and reinforce new behaviors. We are now training elementary teachers to offer as an in-school program, since we have matched the nine youth lessons with Pennsylvania educational standards for grades 3-5 in reading, math, science, language, health and physical activity. This year we have also had programs run outside the research study as summer 4-H day camps and after school programs.

Delivery Methods

Children attend 9 weekly or twice weekly 1.5 hour sessions to practice making healthy food choices and increase physical activity via guided discussions using Motivational Interviewing techniques and hands-on nutrition education activities. Parents participate in five separate 1.5 hour weekly meetings (three with their child) to receive information, develop hands-on skills, and motivational guidance leading to improved food choices, physical activity, and family support. Parent/family learn-at-home lessons include more family activities, family discussions and goal setting for healthier behaviors. All child and family sessions include 30 minutes of physical activity, nutrition education in game and hands-on formats, taste-testing and some food preparation of program recipes, and guided goal setting.

Curricula and Educational Materials

The Family Fitness team, which includes nutrition, physical activity, intergenerational, and family strengths educators and specialists, developed the curriculum and program materials. Sample lesson topics include family fitness values, using the food pyramid to make healthy food choices and meals, breakfast for all, eating out and fast foods, healthy snacking, healthy beverages, setting limits and sweets and fats, finding time for physical activity, family communication, overcoming resistance to change, family time management. In addition to the nine youth lessons, five family meeting lessons, handouts, four parent learn-at-home lessons, we partnered with Penn State Outreach to develop all marketing materials, including the logo, registration brochure, marketing flyers and two exhibits, recruitment video, and educator instructional video. Our website, www.extension.psu.edu/familyfitness, has the entire program materials posted under the Family Fitness Educator link. We also have links for families, health professionals, and schools.

Teamwork and Collaboration

Our collaborating organizations include 34 elementary school principals (see Appendix 2, Table 1), school nurses, teachers, Bloomsburg University Exercise Science professor and graduate students, community health educators, YMCA's from eight different locations, Penn State Outreach marketing and designers, public broadcasting, Penn State Extension intergenerational, family living, 4-H, nutrition and evaluation specialists and educators, Penn State Center for Child Obesity Research co-director, statistician and staff. Principals and school nurses gave us the time, space, and helped us market the program by recommending in letters sent home with

the brochures, and advertising in school. School nurses also provided BMI and other physical measurements (blood pressure, waist circumference), recruited controls. Community health educators, teachers and school nurses helped administer program surveys and sometimes assisted at or ran programs. Bloomsburg University professor and graduate students helped with physical measurements at many sites. The professor also trained educators to run the program, reviewed and suggested improvements to the physical activities. Extension educators and specialists developed the program curriculum and ran the research sites. Penn State Extension partnered with Penn State Outreach and Penn State public broadcasting to develop the marketing materials. The Penn State Center for Child Obesity is our research co-Project Investigator and oversees the fiscal and statistical analysis aspects of the research for this program.

Program Evaluation

Methods

We assessed children's and parents' knowledge, attitude and behavioral changes for healthy eating, nutrition knowledge, family communication, and physical activity, using pre, post and 5-6 month follow-up evaluations and physical measurements.

Process Evaluation

Immediately after the first four pilot sites (N=44) of our initial program year, we ran 4 focus groups with the children (n=13), parents (n=12), and collaborating school nurses (n=5) to determine participant attitudes and beliefs on what they liked best about the program and how they benefited, what should be improved or changed, with in-depth questions on program components and marketing. Extensive and substantial evidence from participants' viewpoints indicated there were many program hurdles to overcome in running a joint child/parent program for child overweight prevention, but fruitful marketing, program components, and positive program impacts were delineated. We improved our program marketing recruitment, evaluation, and affirmed the benefits of the program after this process evaluation. We met our benchmarks of running four program pilot sites, but the greatest hurdle was to overcome parental and child biases on registering for the program, as it was perceived for only overweight children, and this stigma was hard to overcome. After the focus groups, we changed our recruitment and marketing to include all children and deleted overweight references in the marketing. Other program process measures were the child and family goal setting sheets they returned at each session documenting their food, physical activity, family communication, and for parents, time management accomplishments.

Outcome Evaluation

Children and parents completed pre, post, and five-six month follow-up evaluations. School nurses and the exercise science professor and his graduate students also provided the study with the children's body mass index measurements, percent body fat, waist circumference, blood pressures, and accelerometer measures (to demonstrate objective pre and post program changes in physical activity time and intensity). See Appendix 3, graphs one and two for some outcome results.

Pre versus post program (N=315 students, 175 parents intervention, over 2000 contacts and 82 student, 48 parent controls the past two years) **short term outcomes:**

We saw significant improvement (p<.05) for children in:

- Healthy eating behaviors: increased whole grains, fruit, breakfast, willingness to try new fruits and vegetables, less higher fat and sugar foods and drinks
- Increased minutes of physical activity and ease of physical activity
- Less sedentary screen time

We saw significant improvement (p<.05) for parents and child (p<.05) in:

- Improved communication/agreement and goal setting for healthy eating
- Increased physical activity
- Planning and preparing meals together
- Increased knowledge of Nutrition Facts labels

Compared to control groups we saw significant improvement (p<.05) in:

- Children increasing whole grains, trying new fruits and vegetables, consuming three or more vegetables daily, consuming lower fat foods
- Children decreasing sedentary screen time
- Families were setting healthier eating and physical activity goals, planning meals together, preparing meals together, increased knowledge of Nutrition Facts labels, child and family enjoyment of physical activity
- Families increased walking by 63% and jump rope by 56

In five-six month follow-up outcomes:

- 6 month post average BMI measures-68% met our goal of not increasing in 05-06, and 48% in 06-07 (other physical measures currently being analyzed).

In 2006-07, follow-up parent surveys show continued improvement compared to pre-surveys in children (N=32 intervention, 23 control):

- Consuming three or more daily vegetables by 60%
- Whole grains by 58%
- Decreased high sugar foods and drinks 88%
- Decreased high fat foods by 90%
- Families agreeing about eating more healthfully by 55%
- Families being more physically active by 53%

We also have open ended questions on the post evaluations as to how participants have benefited from the program. Here is a sample of their responses: "We got closer as a family, she likes to make things herself and help now with cooking." (parent) "Our whole family is eating healthier, smaller portions, walking in neighborhood." (parent) "I eat more breakfast and exercise more. I know about the healthy things in life. I feel better. Much, much better." (child)

Communication to Stakeholders

The results of the Family Fitness program have been communicated in Penn State state-wide publications: *Penn State Outreach* magazine, *Penn State Rural Health* magazine, in marketing and federal and state stakeholder reports, in participating county Penn State Extension annual reports, and local newspaper articles. We have had increased grant funding, collaboration from within and outside

the university and more educators contact us for training in this program from these reports.

Evidence of Sustainability

The program has been successfully run over the past 4 years in Pennsylvania, and could easily be applicable to other states; for example our 27 research sites were evenly distributed over rural, suburban, and urban schools, as well as all income levels. We have had 412 children, 229 parents or care-giving adult or grandparents as participants and over 6,000 educational contacts since we began. We have also trained 163 educators to run their own programs this past year. The program has been accepted by the Penn State Hershey Center for Nutrition and Activity Promotion in the College of Medicine as a best practice, which has expanded the program's availability to school districts across the state by providing advertising and grant dollars from corporate and health care insurance and alliances. The Pennsylvania Department of Health has also recognized its importance by providing grants to extension educators to implement the program in elementary schools over the past 3 years and next year.

Replicability

The program is now in its fifth year, and has been replicated at over 30 sites, including the non-research sites. One 4-H summer day-camp outreaches to families of children with mental and emotional disabilities, and is now advertising for its third summer. We are also partnering with asthma programs in Philadelphia, and YMCA's in Pennsylvania. Several new rural county sites are partnering with us by writing their own local grants for funding, and many have already been funded. See Appendix 4 for sample program photos, and the website for more www.extension.psu.edu/familyfitness.

Rationale and Importance of Program

Our innovative program and its research have shown successful ways to recruit, market, create and run a program in which parents and children actively work together in order to reduce childhood overweight. Most childhood overweight or prevention programs only target and reach the child, with little to no parent involvement. This approach does not promote enough or sustainable change in the child's and families' attitudes and health behaviors, as new research is demonstrating parents must work in a partnership with the child for lasting change. Our program promotes and develops these partnerships. We also are innovative in interweaving Motivational Interviewing into the program, perhaps for the first time with this audience to promote active behavioral change within the family. We reached diverse ethnic, economic, and educational levels of participants. We developed this program to reach more children, especially those at-risk for overweight or overweight, and in rural or lower income areas underserved by the current healthcare system. See Appendix 5 for three personal references.

Appendix 1-References

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Appendix 2

Table 1 School Partners

Starred counties are rural- less than 50, 000 for the towns.
Adams County* Gettysburg School District, Lincoln Elementary
Allegheny County Propel Charter School District, Propel East, Pittsburgh, PA Propel Charter School District, Propel Homestead, Homestead, PA Propel Charter School District, Propel McKeesport, McKeesport, PA Riverview School District, 10th Street Elementary School, Oakmont, PA Riverview School District, Verner Elementary School, Verona, PA Stow- Rox Elementary
Clearfield County* Clearfield Elementary School
Clinton County * Keystone Central School District, Robb Elementary, Lock Haven, PA Keystone Central School District, Renovo Elementary, Renovo, PA
Columbia County* Benton Elementary, Benton School District
Cumberland County West Shore Area School District, Washington Heights Elementary, Lemoyne, PA
Dauphin County Harrisburg School District, Downey Elementary
Luzerne County* Wyoming Valley West School District, State Street Elementary, Larksville, PA
McKean County* Shinglehouse School District, Oswayo Valley Elementary
Mifflin County* East Derry Elementary
Monroe County* Stroudsburg Area School District, Stroudsburg Intermediate Elementary School, Stroudsburg, PA
Montour County* Danville School District, Danville Elementary, CSIU Success Plus Program, Danville, PA
Northumberland County* Shamokin Area School District, Shamokin Elementary, CSIU Success Plus Program, Coal Township Mount Carmel School District, Mt. Carmel Elementary, CSIU Success Plus Program, Mt. Carmel, PA Line Mountain School District, Trevorton Elementary, Trevorton, PA Shikellamy School District, Oaklyn Elementary

Northampton County

Saucon Valley School District, Saucon Valley Elementary, Hellertown, PA
Easton Area School District, Paxinosa Elementary, Easton, PA

Philadelphia County

Philadelphia School District, TM Pierce Elementary
Philadelphia School District, Clymer Elementary
Philadelphia School District, Overbrook Elementary
Philadelphia School District, Levering Elementary

Snyder County *

Midd-West School District, Middleburg Elementary, Middleburg, PA
Selinsgrove School District, Selinsgrove Intermediate School, Selinsgrove, PA

Union County *

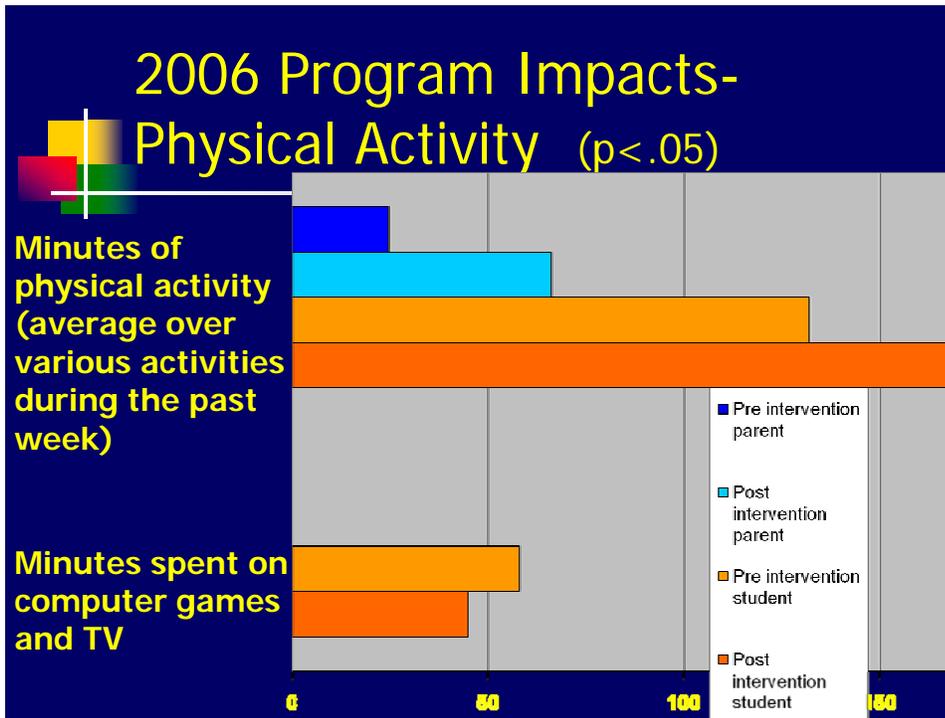
Lewisburg Area School District, Linntown Intermediate School, Lewisburg, PA

Westmoreland County

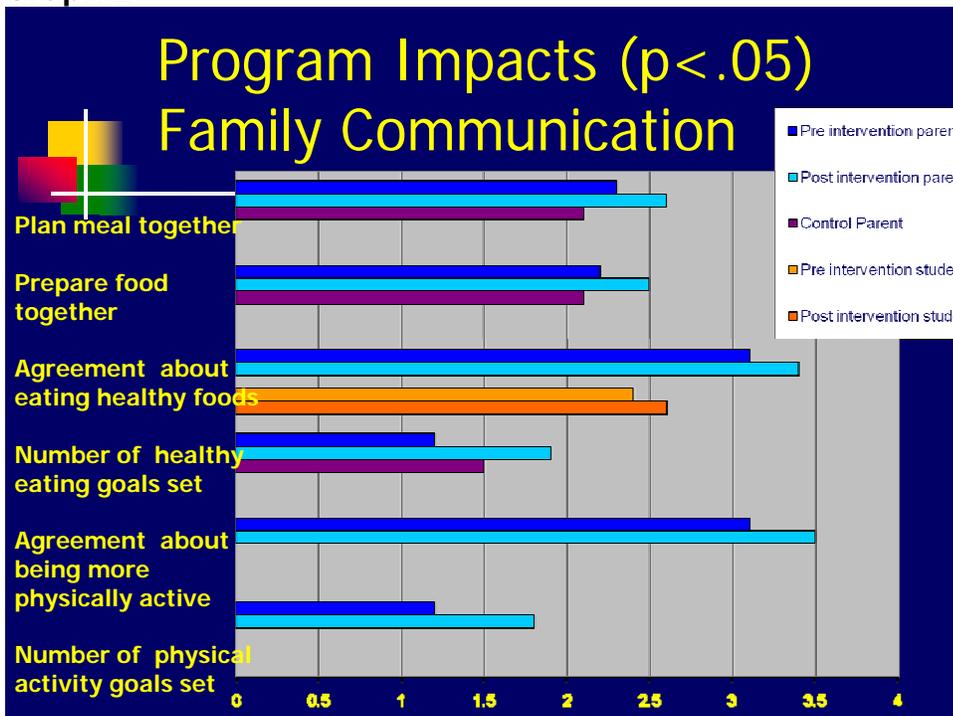
Yough School District, H.W. Good Elementary, Herminie, PA*
Norwin School District, Hillcrest Intermediate School, North Huntingdon, PA
Penn Trafford School District, McCullough Elementary, Claridge, PA

Appendix 3

Graph 1



Graph 2



Appendix 4: Program pictures

Mother and child showing program goal incentives

Mothers, fathers, and children doing a physical activity



Children in afterschool program



Appendix 5: Personal References

Cathi Crossgrove, R.N. School Nurse, & Terri Heinztleman, Principal
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