

*Project Title*

**A Pilot Diabetes Prevention Program for Burleson County Youth**

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## **Abstract**

The purpose the Pilot Diabetes Prevention Program for Burleson County Youth (DPP) is to teach the knowledge and skills necessary for children in grades four and five (age nine and ten) in Burleson County, TX, to make informed choices in the selection of healthy foods and the development of health oriented exercise behaviors. This program is of great significance because America's children are being diagnosed with an illness that once only affected older populations, type 2 diabetes. As these rates increase, so does the risk of these children developing the long-term complications of diabetes before they reach the age of 30. The program will be developed in conjunction with school administrators, health care providers, and parents. The program consists of an eight-week classroom and community/family based educational intervention that focuses on two key areas in relation to the prevention of type 2 diabetes: nutrition and exercise. A pre/post test method, pre/post BMI and body fat testing, parent surveys, and personal nutrition diaries to be used will provide the necessary information to assess the effect of the program. The outcomes of the implementation of this program will not only benefit the individuals and their families involved in this program, but also the future in which they will reside as healthy productive adults.

## **Program Goals and Objectives**

### ***Goals***

The goals of the Pilot Diabetes Prevention Program for Burleson County Youth are as follows:

1. Improve the knowledge and skills of proper nutrition and exercise in 4<sup>th</sup> and 5<sup>th</sup> Grade students who participate in the program.
2. Provide 4<sup>th</sup> and 5<sup>th</sup> Grade students with skills that will enhance both themselves and their families' decision-making skill regarding the prevention of type 2 diabetes.

### ***Objectives***

Upon completion of the Pilot Diabetes Program for Burleson County Youth (an eight-week program) the following objectives will be attained:

#### **Learning Objectives**

1. Students will be able to identify at least five healthy foods from each of the five food groups of the United States Department of Agriculture food guide pyramid.
2. Students will be able to list at least three different exercise methods and describe the benefits of each method.
3. Students will be able to identify the risk factors associated with type 2 diabetes.

#### **Intervention Objectives**

1. 90% of Burleson County 4<sup>th</sup> and 5<sup>th</sup> grade students will have taken part in the program.
2. 75% of the students will complete the entire program.
3. Student's knowledge of diabetes and its prevention will increase by 25% based on pre and posttest scores.

4. BMI and body fat composition will rates in obese children will decrease 10% by the end of the pilot program.
5. Students will demonstrate skills of healthy food selection and proper exercise.

## **Background & Significance**

### ***Background***

Diabetes mellitus is a serious disease and major public health problem in the United States. There are two types of diabetes, with over 90 % of diabetes affected with type 2 diabetes. In Texas, it is estimated that greater than 12.1% of the population has type 2 diabetes (CDC, 2002; Texas Diabetes Council, 2002). Diabetes is also ranked as the 6th leading cause of mortality in the Texas according the Centers for Disease Control and Prevention (CDC, 2002). The prevalence of type 2 diabetes in Burleson County is not known, however in 2000 there were 7 deaths attributed to diabetes. Current statistics for juveniles with diabetes mellitus are currently incomplete due to lack of adequate data; however it is estimated that 40% of new cases of diabetes in children are type 2 diabetes.

The current trend in the identification of type 2 diabetes in children is troublesome because little is known about the epidemiology of the illness in children. It is believed that genetics may play a role in the development of the illness, which may also be influenced by the child's current behavioral, social, and environmental factors (Amschler, 2002).

In addition to a family history of diabetes and other pre-determined genetic factors, behavior-related factors, such as obesity and poor nutrition that are associated with diabetes are receiving more attention. After a child is diagnosed as having type 2 diabetes or pre-diabetes, lifestyle changes are first implemented either in conjunction with medications or alone. Lifestyle

change represents one of the most critical elements not only for the treatment of type 2 diabetes, but the prevention of or delay in the onset of the disease (Amschler, 2002).

Recommended guidelines that can be applied to a diabetes prevention program for youth come from the Centers for Disease Control and Prevention (CDC). The CDC Guidelines for School and Community Health Programs Promoting Lifelong Healthy Eating is document that inspired the creators of the Pilot Diabetes Prevention Program for Burleson County Youth. In the opening statement of the CDC document its authors summarize their view of the problem:

“Most young people in the United States make poor eating choices that put them at risk for health problems. Establishing healthy eating habits at a young age is critical because changing poor eating patterns in adulthood can be difficult. Schools can help young people improve their eating habits by implementing effective policies and educational programs (1999).”

The benefits of healthy eating include:

- Helping young people grow, develop, and do well in school.
- Preventing childhood and adolescent health problems such as obesity, eating disorders, dental caries, and iron deficiency anemia.
- May help prevent health problems later in life, including heart disease, cancer, and stroke—the three leading causes of death (CDC, 1999).

These guidelines served as a map to follow for schools to implement a broad-based nutrition program that would positively affect the lives of their students. Successful implementation of a diabetes prevention program of this nature will have a significant impact on future of 4<sup>th</sup> and 5<sup>th</sup> grade students in Burleson County. Prevention or delay of the development of type 2 diabetes is ideal in this younger population.

## *Significance*

An intervention is needed due to the increased number of American youth who are obese. Obesity is related to the onset of type 2 diabetes in adolescents. The rate of obesity in children has doubled in the last twenty years and unless drastic action is taken will continue to rise according to the CDC (2002). On the other side of this spectrum is the decrease in the numbers of Americans who are at a healthy weight, dropping from 50.1% in 1960–62 to 41.7% in 1988–94 (CDC, 2002). This trend is mirrored in both the adult and youth populations of Burleson County, Texas.

In order to combat these phenomena, an intervention program needs to be implemented that will improve the skills associated with proper nutrition and exercise in our youth. Currently there no programs that target the children in Burleson County in relation to diabetes prevention. The DPP will successfully meet the challenges of educating the youth of the Burleson County by providing them with the skills needed make healthy choices in that will have a positive impact on their future lives. Once they have the knowledge and skills and have applied them to their lives, not only will there be a positive change in their individual behavior, but also the overall health of the communities in which these children will reside.

## **Program Design & Intervention Methods**

The DPP will be a theoretically based program using components of the following health behavior models: the Health Belief Model (HBM), the Social Cognitive Theory (SCT) and the Transtheoretical Model (TTM). These were chosen because of their applicability as individual based behavior change theories. The HBM's constructs of perceived susceptibility and severity will be useful in educating the students on the benefits of diabetes prevention. The SCT constructs of self-efficacy, behavioral capability and self-control as well as the stages of change

will be useful in the maintenance of behavior change. While only certain parts of each theory will be used the use of a wide variety of models allows for a more focused prevention program. The program administrator throughout the implementation of the program will use the stages of change as a guide for evaluation. These theories will work the best because the constructs describe specific processes and steps to be taken in behavior change process.

### **PRECEDE/PROCEED Model**

#### Social Assessment

Burleson County has a population of 16,470 (2000 Census). The per capita personal income is \$ 18,112, compared to the state figure of \$ 27,752. Poverty level is 17.2 %, as compared to a state level of 15.4%. Unemployment rate is 3.8%, compared to 4.2% statewide. Three Burleson County communities will be involved in the DPP – Caldwell (population 3450), Somerville (population 1810) and Snook (population 568). These are the only communities that have school districts with the population of 4<sup>th</sup> and 5<sup>th</sup> graders in each community as follows: Caldwell: 250; Somerville: 85; Snook: 63. Each school district has a nurse or health leader available to the campus. Public facilities for exercise are limited in the smaller communities. Jogging and walking is permitted on the high school tracks during non-school, daylight hours. Streets are in poor repair and many are dirt and gravel. There is not professional gym available in Somerville or Snook.

Further social assessment will include the identification of community stakeholders (community, school, health and parental representatives). This will help to both inform and engage the stakeholders in the planning process.

### Epidemiological Assessment

Risk factors for the development of diabetes may be behavioral, environmental, genetic or biological. The most powerful and widely accepted risk factors for diabetes include: obesity, physical inactivity and improper diet. Nation wide approximately 11% of the population age 6-17 were seriously overweight (Texas Diabetes Council, 2000). Because accurate rates for diabetes type 2 are not available for the adult population, let alone the child population, an examination of secondary data in the form of BMI and other health indicators will be used to estimate the number of persons afflicted with or at risk of the development of diabetes.

### Behavioral and Environmental Assessment

Diabetes is related to a sedentary lifestyle. Changes in lifestyle have impacted the youth as well as older persons in Burleson County. The public schools have recognized that decreased emphasis in physical education and activity has negatively affected the school aged child. Schools have since focused on serving healthier, nutritious meals in conjunction with the removal of snack and soda vending machines. Data related to exercise behavior of youth and their families is not available due in part to the problems associated with quantifying the data in a rural setting. In the school setting, an evaluation of the number of hours of physical activity that children are engaged can be quantified and will be used in the development of the DPP. Because the DPP will have a strong national emphasis, data on the dietary habits of the children, which may reflect the typical American diet, will also be gathered as part of the DPP.

Environmental considerations include instructional resources as well as facilities for physical activity. Additional behavioral and environmental factors associated with diabetes include: healthcare monitoring, self-care skills, and compliance with health recommendations.

### Educational and Ecological Assessment

Factors under this phase can be broken down in predisposing, reinforcing and enabling factors. The predisposing: social, religious and cultural food beliefs and preferences, body image issues, peer pressure, beliefs concerning exercise and diabetes. Reinforcing factors include: school and family support, peer issues, availability of healthy foods, availability and access to exercise equipment / facilities, community support of the program, health providers as advisors, and parental involvement and supporters. Enabling factors include: adequate funding, school district support, school teachers and health personnel as educators, and parental understanding of the need for behavioral and environmental changes.

### Administrative and Policy Assessment

This phase will include an examination of school policies on nutrition and exercise; community regulations regarding bikes, skates, tennis courts, basketball courts; educators' policy and support of diabetes awareness, nutrition classes, exercise programs; and health care providers support and involvement in diabetes class, nutrition classes, and exercise programs.

### Program Implementation

The DPP will target roughly 400 participants in fourth and fifth grade over a two-year period using a macro intervention. The intervention will consist of an eight-week class room based educational program that focuses on two key areas in relation to the prevention of type 2 diabetes: nutrition and exercise. The program will be taught in two phases: Phase 1 – 4<sup>th</sup> grade students will receive the training in the fall of each year of the program and Phase 2 – 5<sup>th</sup> grade students will receive the second part of the training in the fall of year two of the program. Over the course of the program students will be introduced to Diabetes - what is diabetes, who has the disease, how it affects our bodies and how we can prevent the onset of the disease? Then,

building off the prevention aspect the remainder of the classes will focus on the two key areas, exercise and nutrition. It is with in these areas that some of the complications of diabetes will be taught. A sample time line can be found in Appendix A; it is very broad and will become more specific based on the implementation of the intervention within the Burleson County Schools.

## Diabetes Prevention Program Budget

<u>Personnel Expenses</u>		1 <sup>st</sup> Year	2 <sup>nd</sup> Year
Education Specialist/Administrator	FTE=1.00	\$40,000.00	\$40,000.00
Certified Diabetes Educator/Registered Nurse	FTE=0.50	\$20,000.00	\$20,000.00
Graduate Level Health Educator (1)	FTE=0.50	\$18,500.00	\$18,500.00
Administrative Assistant	FTE=1.00	\$28,000.00	\$28,000.00
<b>Student Intern</b>	FTE=0.50	\$14,000.00	\$14,000.00
<i>Subtotal</i>		<i>\$120,500.00</i>	<i>\$120,500.00</i>
Fringe Benefits 30%		\$36,150.00	\$36,150.00
(FICA, Medicare, Health Insurance, Workman's Comp.)			
<b>Total Personnel Expenses</b>		<b>\$156,650.00</b>	<b>\$156,650.00</b>
<b>Program Expenses</b>			
Operational			
Office Space (Including: Computers, Phone, and Utilities)		Provided By Local Schools	
Office Supplies		\$600.00	\$500.00
Printing/Reproduction		\$12,000.00	\$12,000.00
Computer Analysis Software		\$3,000.00	\$0.00
<i>Subtotal</i>		<i>\$15,600.00</i>	<i>\$12,500.00</i>
<b>Other Expenses</b>			
Program Incentives		\$2,500.00	\$2,500.00
Guest Speakers		\$2,500.00	\$2,500.00
Travel		\$6,000.00	\$6,000.00
<i>Subtotal</i>		<i>\$11,000.00</i>	<i>\$11,000.00</i>
<b>Total Operational Expenses</b>		<b>\$26,600.00</b>	<b>\$23,500.00</b>
<b>Total Expenses</b>		<b>\$183,250.00</b>	<b>\$183,250.00</b>
<b>Two Year Total Expenses</b>			<b>\$366,500.00</b>
			(Over two years)

## **Justification of Expenses**

### ***Personnel***

Education Specialist/Administrator – Masters Degree in Public Health, Health Education or related health education degree, and 2 years experience (management experience preferred).

Certified Diabetes Educator/Registered Nurse – Current RN licensure in Texas and CDE certificate.

Administrative Assistant – Associates degree in business or accounting with a background in office management, familiar with word processing, database management, spreadsheet, and desktop publishing software.

Student Intern – No experience necessary, health science students preferred.

### **Program**

#### **Operational**

Telephone – Provided by school system

Office Space – Provided by school system

Office Supplies – Initial operating supplies (Pens, paper, file folders, desk organizers, paper clips, stapler, staple, tape, tape dispensers, hole punches, file cabinet, pencil sharpener, and other supplies.)

Printing and Reproduction – Material for 400 students and families per year.

Computer System – Provided by school system.

Computer Analysis Software – The newest version of SPSS will be purchased with all accessories.

#### **Other**

Program Incentives – food and other give aways at programs

Guest Speakers – money from this line item will match donations from other organizations for events. All events will be co-sponsored by community stakeholders.

Travel – Burleson County is part of a large rural area; this will cover mileage reimbursement at \$0.345/mile.

### **Potential Funding Sources**

Primary funding for the DPP will be requested from the TDH with additional funding from the three represented school districts, the Texas A&M School of Rural Public Health, the Texas A&M Center for Health Disparities, the Centers for Disease Control and Prevention – Division of Adolescent and School Health, and the National Institutes of Health.

### **Use of Anticipated Results**

The DPP will produce a vast amount of information that will be evaluated using a combination of formative and summative evaluation techniques. The results of these evaluations, which will be conducted by the Education Specialist/Administrator, will dictate the effectiveness of how the program was implemented as well as identify the impact of the program at the end of each eight week program comparing the pre and post test scores of students as well as rating the degree of completion of the program objectives.

A diabetes prevention program that serves all populations is nearly impossible. However, when one focuses on diabetes prevention in youth the long-term benefits of such a program, ethically supersede any actual cost. As our society changes, so do the health needs and the implementation of DPP will not only improve the health of the students who take part in it program but also their communities.

In the child and young adult populations in the State of Texas, type 2 diabetes rates are increasing. This poses a problem for public health workers and health care providers, because children with type 2 diabetes are at risk for developing the long-term complications of the disease before they reach the age of 30 (ADA, 2002). At present, diabetes is the sixth ranked caused of mortality in Texas, affecting approximately 12.1% of the population (CDC, 2002; TDH, 2000). In an effort to deal with this problem, the DPP will be implemented as a diabetes

primary prevention program specifically for use in area schools.

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## Appendix A

### Diabetes Prevention Project Time line

Year 1												
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
<b>Planning</b>												
<b>4th Grade Implementation</b>												
<b>5th Grade Implementation</b>												
<b>Evaluation</b>												
Year 2												
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
<b>Planning</b>												
<b>4th Grade Implementation</b>												
<b>5th Grade Implementation</b>												
<b>Evaluation</b>												

