INCREASING AWARENESS OF TYPE 2 DIABETES IN ADOLESCENTS THROUGH THEATRE

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ABSTRACT

INCREASING AWARENESS OF TYPE 2 DIABETES IN ADOLESCENTS THROUGH THEATRE

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Education and prevention of type 2 diabetes in the adolescent population should be a high priority among school officials and healthcare providers. The purpose of this research study was to educate adolescents on type 2 diabetes and to increase awareness of this disease. The Health Promotion Model developed by Nola Pender was the theoretical framework used in this study. This model applies behavioral science’s understanding of learning to the area of health promotion.

A time series design was an appropriate choice for this study and specifically, a one-group before-after design was used. The students were in seventh and eighth grade and enrolled in physical education classes at a local elementary school. There were 57 students recruited and 47 participants completed the study. The researcher used a diabetes educational program geared towards kindergarten through eighth grade. The
students received a pre-test, watched an informational session and play on type 2 diabetes, and completed a post-test. The researcher graded each test according to a standardized answer sheet. All possible answers for the test were addressed during the lecture portion of the performance. The graded test scores were collected and placed on an Excel spreadsheet for data analysis.

The main goal of this study was to address the research question “will educating seventh and eighth graders on type 2 diabetes increase their awareness of the disease?” This awareness can be demonstrated through an increase in the students’ test scores. An average pre-test score among the 47 subjects was 78%. After the informational session and play, the average post-test scores were 82%. This was a 6% increase from baseline testing. Although an encouraging statistic, this data was further explored.

The type 2 diabetes educational program used in this study was instrumental in its design and execution. The strength of peer education in this program cannot be understated. In this setting, students can make a difference in the lives of others. It is the hope of the researcher that further study into the effectiveness of this program can be pursued. The importance of this educational tool is far reaching and could be adopted into other school districts. It is through knowledge and understanding that we might influence our youth.
CHAPTER I

INTRODUCTION

Type 2 diabetes continues to be a health challenge in the United States. According to the Centers for Disease Control and Prevention (CDC, 2007), over 23 million people have diagnosed and undiagnosed diabetes. The CDC reported that diabetes was the seventh leading cause of death in 2006. The estimated total cost for this disease in 2007 was $174 billion dollars. Diabetes and its complications are seen in all patient populations. The American Diabetes Association (ADA, 2007) noted that 2 million adolescents between the ages of 12-19 have pre-diabetes (or 1 in 6 overweight adolescents). The prevalence of type 2 diabetes in adolescents needs more attention. Although rare, there has been an increase in this diagnosis in children and adolescents. There is a particular concern in the American Indian, African American, and Hispanic/Latino American populations that diabetes is “being diagnosed more frequently in children and adolescents” (ADA, n.d., para. 2). In addition, the CDC (2008) reported that children and adolescents are at risk if they are obese, insulin resistant and have a family history of this disease. These individuals may also present with acanthosis nigricans, a sign of insulin resistance. This physical finding consists of light brown to black hyperpigmented skin noted at the neck, axillae, and areas that flex (Hagarty, Schmidt, Bernaix, & Clement, 2004). Stender, Burghen, and Mallare (2005) suggested “the power of health care professionals to impact the lives of their patients cannot be
overstated” (p. 246). These high risk or newly diagnosed adolescents will require comprehensive nursing care and education.

The increased incidence of type 2 diabetes in adolescents requires aggressive education with a focus on prevention. Adolescents need to be instructed on this disease and their risk for developing diabetes. Daniels et al. (2005) noted that efforts to prevent obesity at school sites are prevalent and include classroom education. In addition, there have been positive changes to meals and vending machines offered to include healthier options. Education on type 2 diabetes in the adolescent population may lead to understanding of risk factors and ultimately changes in behaviors.

Nurses can have an enormous impact on adolescents and their families. This is achieved through patient education in the inpatient and outpatient settings. Stender et al. (2005) noted “health care professionals should also become involved in setting up new community programs to promote healthier lifestyles” (p. 245). Nurses should be encouraged to educate adolescents on type 2 diabetes. This knowledge could impact adolescents’ health in the future. The purpose of this current study was to increase awareness of type 2 diabetes in the adolescent population through theatre. This program, *Don’t monkey around with diabetes: A kit for helping kids prevent type 2 diabetes* (Fenn, Rosales & Logue, 2003), has been used extensively in schools over the past 4 years. The program reviewed five categories of information with the adolescents: definition of diabetes, prevalence, risk factors, signs and symptoms, and prevention.

There has been a growing effort in communities to increase awareness of obesity and type 2 diabetes in adolescents. Stender et al. argue that “the fight against obesity must involve people from all walks of life, settings, and disciplines joining
together in creative ways” (p. 244). One example of a creative educational intervention is Healthy Shasta. This is a local campaign created to challenge families to be active and to develop healthy lifestyle choices. Their innovative website (www.healthyshasta.org) was created to encourage physical activity in families by offering walking events within their city. There are monetary incentives such as a trip to Disneyland and memberships to a local YMCA for families that complete their challenge to make healthy choices. This is an example of a local community promoting healthy lifestyle changes within families. This innovative approach gets families involved and working towards positive lifestyle changes.

The American Diabetes Association (2006) implemented the “School Walk for Diabetes” (SWFD). This program was created to raise funds for this foundation and is targeted towards kindergarten through twelfth grade (K-12) to encourage healthy living and pride in their schools. A school’s participation in this event would raise money for the American Diabetes Association (ADA), earn up to 15% return on physical education (PE) supplies, educate students on diabetes, and align with physical education standards. This program targets community involvement in schools and encourages education on diabetes. Both the Healthy Shasta and SWFD are important examples of using both local and national resources to increase awareness of type 2 diabetes.

Theoretical Framework

The Health Promotion Model (HPM) developed by Nola Pender was the theoretical framework used in this study. Pender, Murdaugh and Parsons (2006) noted “the HPM proposed a framework for integrating nursing and behavioral science
perspectives on factors influencing health behaviors” (p. 47). In other words, the model applies behavioral science’s understanding of learning to the area of health promotion. This model is separated into three categories: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Ronis, Hong and Lusk (2006) reported that the revised HPM encompassed a greater focus on behavioral factors. This revised model describes the various influences an individual may experience in order to adopt a health promoting behavior. The first phase involves experiences related to behavior and personal factors. The second phase deals with cognition, encompassing an individual’s perceptions of the behavior change, potential barriers, and interpersonal and situational influences. The last phase is the commitment to action and change. Professionals may have an opportunity to intervene in the revised HPM, specifically in the second phase, because of situational influences. This current study also encompasses interpersonal factors through the use of peer education. The students might be influenced more positively because diabetes education is given in a non-threatening manner from other students. The ultimate goal is a health promoting behavior.

The cognitive portion is the core of the Health Promotion Model. Pender et al. (2006) emphasized that “measuring change in these variables is essential to determine if such changes actually result from the intervention and, in turn, influence changes in commitment or in the occurrence of health promoting behaviors” (p. 52). Type 2 diabetes instruction in adolescents may encourage healthy lifestyle choices. The goal is to have students understand that changing behaviors now will have a lasting impact on their health.
Pender et al. discussed the perceived self-efficacy portion of the model. This is a “judgment of personal capability to organize and carry out a particular course of action” (p. 53). This study taught information about type 2 diabetes to adolescents to increase their awareness of this disease. For example, this knowledge may lead to an increase in physical activity. Some school sites offer alternatives to the traditional gym classes such as dance classes. This venue would allow students to change sedentary behaviors for the health promoting behavior of physical activity. Educating adolescents on type 2 diabetes is the key to success in the prevention of this disease. The goal of this study was to increase awareness through knowledge of type 2 diabetes in the adolescent population. This knowledge could influence change and promote healthier behaviors.

Piaget’s cognitive development stages can be applied to this research. The adolescent groups targeted were seventh and eighth grade students enrolled in a rural elementary school in northern California. Piaget’s fourth developmental stage or Formal Operations Stage (Boeree, 2006) encompasses ages 12 and over. In this stage, the individual can discuss concepts, solve abstract problems and begin to think as an adult. By receiving education on type 2 diabetes, students in this stage may understand the importance of prevention as well as being able to understand concepts such as risk factors and signs and symptoms.

Research Question and Purpose

The purpose of this research study was to educate adolescents on type 2 diabetes and to increase awareness of the disease. The students were in seventh and eighth grade and enrolled in physical education classes at a local elementary school.
(kindergarten through 8th grade). The total student population in the school is approximately 300 students (Public Schools Report, 2007). This school is located in a rural area in northern California. The total population for the entire county is 60,000 people (U.S. Census Bureau, 2008) and the main industry is ranching and farming. The median income in 2005 was $32,100 per household. There are primarily White non-Hispanic (72.9%) and Hispanic (19.7%) people in the area (Onboard Informatics, 2008).

The research question is “will educating seventh and eighth graders on type 2 diabetes increase their awareness of this disease?” A review of the literature has shown an increased incidence of type 2 diabetes in the adolescent population. Studies have encouraged early detection and assessment for this disease (Brosnan et al., 2005; Whitaker, Davis, & Lauer, 2004). Education on diet has been shown to be a successful intervention with high risk adolescents (Brosnan, et al., 2005). It is important to instruct students who may be at high risk for developing this disease equally with lower risk students. An article in the Brown University Child and Adolescent Behavior letter (“Chronic Obesity Linked,” 2003) regarding chronic obesity in youth encouraged intervention, in this case education, be provided to a population. It was encouraged that overweight individuals not be removed from other (lower risk) students so that no one would be separated from the group. An informational session and a play were conducted for all seventh and eighth grade students in a rural elementary school in northern California.
Operational Definitions

This study evaluated type 2 diabetes education in an adolescent population. The students received an informational session and a play performed on this disease (for a total of 30 minutes). The students were instructed in the following areas: definition of diabetes, prevalence, risk factors, signs/symptoms, and prevention. A pre-test and a post-test were administered to document their knowledge of type 2 diabetes. The following is a list of frequently used terms in this study and their definitions.

- **Adolescent** is referred to as a state of being immature in emotion or intellect (Webster, 1987). The World Health Organization (WHO, 2006) defined adolescents as being between 10-19 years.

- **Awareness** (Dictionary.com, 2007a) is being informed or knowledgeable. This was measured by evaluating for a change on the post-test results.

- **Commitment to action** (Pender et al.) enables a person to enter into a behavior.

- **Education** (Dictionary.com, 2007b) is the process of giving or receiving knowledge.

- **Health promoting behavior** (Pender et al.) is the end point of the revised HPM. It occurs when a person has adopted a behavior that leads to a healthier lifestyle.

- **Pre-test** is a gathering of data before an intervention (Polit, Beck, & Hungler, 2001).

- **Post-test** is a gathering of data after an intervention (Polit et al., 2001).

- **Potential barriers** (Pender et al.) are possible barriers that may exist and prevent behavioral change.
Type 2 diabetes encompasses insulin resistance with a poor insulin response and an increased amount of insulin required to control glucose. The pancreas responds by increasing insulin production but over time insulin may decrease, which leads to diabetes (CDC, 2007).

Qualifications of the Researcher

The researcher is currently enrolled in the Masters in Science of Nursing (MSN) program at California State University in Chico, California. The MSN student has been a Registered Nurse (RN) for eighteen years. Her nursing experience has been diverse to include both active duty service in the United States Air Force (USAF) and civilian nursing. She has worked with adult and pediatric populations. These experiences include the Intensive Care Unit (ICU) and successful completion of the Critical Care Certification (CCRN) exam. Her passion is patient education to improve outcomes of the individual. In addition, she is interested in educating individuals on preventative behaviors.

Summary

In conclusion, type 2 diabetes is prevalent in the adult and adolescent population. The incidence of this disease in the United States is on the rise and includes adolescents with pre-diabetes. Education is an important step in the prevention of type 2 diabetes. This study attempted to educate adolescents on type 2 diabetes and demonstrate their understanding of this disease. A literature review of type 2 diabetes, education and the adolescent population was addressed in the next chapter of this study.
CHAPTER II

LITERATURE REVIEW

The CDC (2008) reported that as more children and adolescents become overweight and less active, type 2 diabetes is occurring more often in this population. The purpose of this literature review was to focus on educational programs on type 2 diabetes specifically provided to adolescents. This review included diabetes education in the following areas: assessment of education in schools, the use of peer support and a review of national educational standards required in public schools.

Nurses should be encouraged to get involved in diabetes education and prevention. Diabetes education by nurses could involve an informational session at a local school or within a religious community. Early education and prevention may be the key to successful intervention with adolescents. McKnight-Menci, Sababu, and Kelly (2005) noted “with this disease now occurring at a younger age, the long-term medical ramifications on our health system could be staggering” (p. 104). Primary care providers, nurses, teachers, and school administrators must rise to the challenge and support adolescents with diabetes education, assessment and early intervention. Education on healthy lifestyle choices that include increased physical activity and portion control are important steps towards prevention.
Type 2 Diabetes Education in Schools

There have been numerous studies published on type 2 diabetes in the adolescent population. Research has occurred in the following areas: screening of students for type 2 diabetes (Brosnan et al., 2005), screening of seventh grade students (Whitaker et al., 2004), nutritional and educational interventions for high risk students (Grey et al., 2004), self-efficacy and dietary choices (Parcel et al., 1995) and lastly, Web based education (Long et al., 2006). The use of education and assessment for students can be a powerful tool to encourage healthy lifestyle changes.

Brosnan et al. (2005) used nursing students in their community health rotation to screen students in middle and high school. This study used a Community Partnership Model designed by the University of Texas Health Science Center in Houston. Brosnan et al. noted this model’s focus was the “detection, prevention, and reduction of obesity and its complications in youth” (p. 261). There were 4 groups of 10 nursing students that completed screenings of 1100 adolescents over a 6 week period. A school gymnasium was used and students rotated through four separate stations that included: measurements of height and weight, body measurements, assessment of the presence of acanthosis nigricans, and gathering blood pressure and pulse readings. The nursing students were able to reflect on their roles in a post-conference. This study was successful in the following ways: as an assessment of students for type 2 diabetes and as a means to educate the nursing students and the school nurses. “School officials noted that the project increased awareness of acanthosis nigricans as a risk factor for insulin resistance and familiarized school nurses with a method for screening” (Brosnan et al., 2005, p. 261).
264). This study is ongoing and the use of nursing students for screening purposes has been shown to be “feasible and effective” (p. 264).

Whitaker et al. reviewed the need for type 2 diabetes screening in a seventh-grade population. The study assessed this population for risk of developing diabetes. The parents completed a questionnaire that reviewed family history and physical activity. The participants were also assessed for age, ethnicity, gender, and acanthosis nigricans. Additionally, they received a blood pressure screening. There was a 60% response rate to the questionnaires and a total of 173 students participated in the research. The researchers noted that a limitation to the study was their inability to draw blood and get laboratory testing completed. In addition, it was concluded that screening for type 2 diabetes in seventh grade students is indicated. This study is an example of a successful screening of students and had a favorable response rate at 60%. The students and their families were able to receive important assessment and education needed to combat type 2 diabetes.

Grey et al. (2004) studied adolescents at high risk for type 2 diabetes. The students were selected from two middle schools with a 40% obesity rate. The students were screened by a school nurse practitioner. According to the CDC (2008), the body mass index or BMI is a number calculated from a person’s height and weight. Between the percentiles of 85-95%, a child would be considered overweight. Families were contacted if the students had a 95% BMI and family history of diabetes. If the family agreed to the study, they were contacted by the coordinator. A total of 46 youths were chosen and 41 participated. The student could choose one family member to be included in the study and the inclusion criteria were the ability to read and speak English.
Unfortunately, this could eliminate Spanish speaking Latino and Hispanic individuals that are a higher risk for type 2 diabetes.

All participants received nutritional education and physical activity training. This training consisted of a program 2 days a week, 45 minutes per day, over a 16 week period. A licensed personal trainer and a research assistant encouraged the adolescent and the parent to design an exercise plan, such as dancing or playing basketball. The participants were encouraged to exercise 3 days a week at home. The experimental group received coping skills training. This specific training was culturally sensitive and reviewed strategies to improve binge eating related to stress. The families of the participants mentioned change in their lives. Grey et al. (2004) noted that parents reported subjectively that their children motivated them to improve their eating and physical activity. The success of the children was dependent upon the support of their parents.

Parcel et al. (1995) developed a Child Dietary Self-Efficacy Scale (CDSS). The sample size was 1,127 students enrolled in four sites across the country including California, Louisiana, Minnesota, and Texas. The students were in third grade (44%) or fourth grade (56%). A Likert-type format was used to assess food choices and the potential for lower fat and sodium intake. The researchers focused on self-efficacy “the belief in one’s ability to perform a certain task, as a pivotal construct in understanding and modifying human behavior” (Parcel et al., 1995, p. 23). Self-efficacy occurs when an individual approaches a task and is willing to accomplish it. In addition, the person handles the challenges and follows through to the goal. The researchers noted that self-efficacy measures existed and were reliable and valid predictors of adolescent smoking,
but no tool existed for dietary habits in youth. Parcel et al. reported the tool to be “appropriate for use in research and evaluation that address behaviors of elementary school children to lower the fat and sodium content in their usual diet” (p. 27). This study provided a child self-efficacy measurement and also educated students on proper food choices.

The National Institute of Health (NIH) is conducting a HEALTHY study of middle schools around the country (Diabetes Dateline, 2007). This study was focused on assessing if changes in the food and activity offered in schools, in conjunction with activities that increase healthier behaviors, will decrease the risk of type 2 diabetes in this population. Those in the program will be exposed to healthier food choices, learning activities, and more intense gym classes. The results of this study will be published in 2009 and the knowledge gained could bring about changes at school sites that focus on the prevention of type 2 diabetes.

Long et al. (2006) studied the effectiveness of education on type 2 diabetes in the adolescent population. This study “tested the effects of an interactive nutrition education Web site on fruit, vegetable, and fat consumption in minority adolescents genetically at risk for Type 2 diabetes” (p. 67). There was a random sample of 60 students from an eligible group of 118. A total of 21 participants between the ages of 12 and 16 were included in this study. The racial breakdown was Hispanic (57.1%), African American (33.3%) and mixed (9.5%). Long et al. noted that students were satisfied with Web based education but further research is needed on the success of this program. “This observation was consistent with the recommendations of the CDC suggesting that an interactive, computer-based method of nutrition education is a relevant and socially
appropriate method of learning for adolescents” (p. 76). This interactive education could potentially change behaviors and encourage healthy lifestyle choices.

Frenn and Malin (2003) used two theoretical frameworks; Pender’s Health Promotion Model (HPM) and the Transtheoretical Model (TM) to study diet and exercise in middle school students. The authors used the HPM to help explain conditions that may lead to healthy behaviors. The participants were low income and culturally diverse students from public and private schools. A total of 127 boys and 94 girls were involved in the study. The researchers used two tools that measured access to healthy foods and food habits. The use of the TM and HPM allowed for multiple variables to be analyzed. The researchers concluded that interventions and policies be developed to encourage healthier lifestyles in this population at school sites.

Increase Awareness of Type 2 Diabetes with Peer Support

The use of peer groups to educate individuals on type 2 diabetes was found in the literature review. Peer groups were used to educate K-8 students through theatre and through an adolescent peer support group to encourage weight loss. Fenn, Rosales and Logue (2007) reported on a method used to teach diabetes awareness that was appropriate for age and culturally sensitive. The program was called, Don’t monkey around with diabetes: A program for helping kids learn how to prevent type 2 diabetes. It was developed by a Tucson-based, five member Girl Scout troop that needed to provide community service to achieve a Silver Award. This award is the highest achievement available to girls aged 11-14 years. The young girls choose the topic of diabetes after recognizing that some of their family members had this disease. The girls, with the
assistance of their troop leader, discussed the need to increase awareness of diabetes, engage students in their peer group and to be aware of the cultural needs of Mexican American youth. Ideally, the girls desired to teach diabetes awareness to students that were not currently at risk and have them share information with their families at home.

Fenn et al. (2007) noted that from this innovation was the development of a play by two members of the troop. It “incorporated diabetes facts, risk factors, and prevention tips in a lively, creative, and humorous fashion” (p. 458). The play was 30 minutes in length and included information on diabetes given in five informational sessions. As part of the performance, the student audience was encouraged by the cast to answer questions. The students were given a verbal pre-test before the performance and a verbal post-test after the play. It has been performed for the past 4 years in schools, conferences, and tribal reservations. The troop designed the diabetic tool kits so that it could be used to train groups to educate students in the future. Unfortunately, there was no reliability or validity information available on the pre-test and post-tests used. This was an innovative approach to educating youth on type 2 diabetes to involve students, the community and their peers.

Zang (2006) started a peer support group for adolescents in a community in Brooklyn, New York. The participants were between the ages of 11 and 16. A total of 8 young girls participated in this pilot study. Some questions that were addressed to the group were related to why the girls wanted to get healthy and ways to keep motivated in the program. It was an 8 week program that covered information on subjects such as goal setting and food choices. The participants were also weighed on a weekly basis. The study showed the peer support group was a beneficial way to introduce healthy lifestyle
changes. There was weight loss noted by participants from 3-5 pounds up to 12 pounds. The author noted that the girls enjoyed their participation in the study and had a desire to continue on the weight loss program. The participants were familiar with each other and attended the same church. There needs to be further study into this program but the pilot study results are encouraging.

Summary of the Literature Review

The public school system must adhere to educational standards at the state and federal level. The American Diabetes Association (n.d.) has published lessons to be used by teachers for students that correlate with the National Health and Physical Education Standards. The lessons for 7-9 graders could involve taking action in the community. This can be accomplished through a health project or addressing the health needs of the community. Throughout the literature review, there have been examples of community involvement to educate about type 2 diabetes. This required standard can be used to bring education to students and encourage them to teach diabetes in their communities.

Type 2 diabetes in the adolescent population has been reviewed in the literature. Each study addressed an important aspect of the assessment, detection, education, or prevention of this disease. The purpose of this research study was to educate adolescents on type 2 diabetes and to increase awareness of the disease. The third chapter of this study will review research methodology, description of sample size, ethical considerations, data collection methods and procedures, data analysis, and reliability and validity.
CHAPTER III

RESEARCH METHODOLOGY

The purpose of this study was to increase awareness of type 2 diabetes in adolescents. The researcher used a program called, Don’t monkey around with diabetes: A program for helping kids learn how to prevent type 2 diabetes (Fenn et al., 2003). In this program, a play was created by Girl Scouts from Troop 509 in Tucson, Arizona. It was their desire to educate young people on this disease. It has been performed in towns along the Arizona-Mexico border and at other venues. The girl scouts received a Silver Award for this achievement and it is the highest award given to girls 11-14 years of age (Girl Scouts, 2009). They decided to make it available to others and they created the Diabetes Tool Kit. These kits were funded through the Arizona Department of Health Services and the U.S. Mexico Border Health Commission (Fenn et al., 2007). The kit was sent to the researcher after a written request. It contained the play, an activity book, and information packet that included a DVD. This presentation has not been offered in this county and the researcher was honored to bring this invaluable information to northern California.

This program was used to teach seventh and eighth grade students enrolled in physical education classes. The curriculum involved peer education in the form of an informational session (lecture) and play. The researcher utilized the services of “Friday Night Live” (FNL), a Red Bluff community based prevention group (see Appendix A).
This group consists of a director and high school students that educate their peers on subjects such as smoking cessation and drug awareness. Prior to this performance, the researcher taught a class on type 2 diabetes for the FNL group. A PowerPoint presentation included in the toolkit was used to instruct the team. It was important that the students had an accurate understanding of this disease to help facilitate the lecture and play. This group performed at a rural elementary school.

The pre-test, supplied by the Diabetes Tool Kit; was revised to a written format with the assistance of an educator (see Appendix B). A Flesch Reading Ease Readability Score (2009) was used by the researcher as part of Microsoft Office software. The numerical scale is from 0-100. A higher score denotes an easier reading experience and the lower score is more difficult. This test received a score of 73, which indicates an easier readability. In addition, the Flesch-Kincaid Readability Score (2009) was a grade level of 4.7 and it correlates to school grades. In other words, this test was written to a fourth grade level. All the answers for this multiple choice test were retrieved from the lecture material given to the students before the play. The educator that assisted in its development has over eight years experience as a teacher and as a school administrator. His background also includes curriculum development and evaluation.

This test was administered to the students within one week of the performance. In addition, the researcher visited the students again and administered the same test within a week following the performance. The reason for the second visit was to investigate increased awareness of type 2 diabetes. The researcher felt that testing within one week met the logistical challenges of assessing all the enrolled students and even those that might have been absent. This time frame gave a definitive end to the
testing phase. It was also a concern of the researcher to complete the study in a timely manner so that disruption to the teachers and students would be minimal.

A time series design was an appropriate choice for this study and specifically, a one-group before-after design was used. Polit, Beck, and Hungler (2001) noted that a time series does not utilize a control group or a randomization. This study administered the test before and after the play (including the informational session) to the participants. Although there are inherent flaws in this design, the goal of this research was to ascertain whether or not the students increased their knowledge of type 2 diabetes after watching the play. It is the desire of the researcher to use this educational venue to teach students about this disease throughout this rural community.

Population and Sample Size

This study was conducted with one local elementary school population (seventh and eighth grade students) in northern California. All students received their pre-tests and post-tests at the school site. On the day of the play, this group and the entire school assembled to watch the performance. Students’ age and gender were noted by the researcher (see Appendix C). The sample size was 57 seventh and eighth grade students. During their physical education classes, the students received the pre-test one week prior to the performance. The students watched the play and they had the post-test administered within one week. This time frame allowed the researcher to meet with all enrolled students in this study. The students had time to ask the researcher questions about diabetes after the post-test, and they were encouraged to offer feedback on the program.
Ethical Considerations

The researcher received approval from the Human Subjects in Research Committee (HSRC) at California State University, Chico prior to starting the research (see Appendix G). The protection of human rights was a vital step in this research proposal. An additional concern was the readability of the consent forms. With both the parental and student consent forms, the Flesch Reading Ease Readability Score (2009) was approximately 56. As noted earlier, the closer the score is to 100, the easier to read. The researcher was aware of this score and she reviewed the consent forms in class. This occurred to relieve any concerns about students’ understanding. In the case of the parental consent form, the researcher was available to the school office to answer any questions from parents.

The parental consent forms were sent home with students one month prior to the performance. If the parents wanted their children to be involved in this study, they signed the parental consent form (see Appendix D) and returned it to the teacher. The teacher returned the completed forms to the researcher. The students had the right to refuse involvement in this study (see Appendix E). An alternative classroom activity was not available to students on that day of the performance. During HSRC proceedings, the researcher was guided to include all participants in the play but to limit study participation to the written tests only. The consents reflect these changes. The identities of all students were protected and random numbers were generated for each student. The researcher was available during the pretest, performance, and post-test.

The researcher met the requirements of the Human Subjects in Research Committee (HSRC) policies through the Institutional Review Board (IRB) at California
State University, Chico (Wilson, 1999). The researcher completed all appropriate forms in the fall semester of 2008. After completing the IRB process, the researcher began the type 2 diabetes educational program for seventh and eighth grade students in February of 2009. The researcher received written permission from the principal prior to the performance (see Appendix F). The informational session and play on type 2 diabetes was offered to the entire school which included these students. The consents allowed the parents or guardians to decide whether or not they wished to have their children’s knowledge assessed through testing. If they opted not to have their child involved, this student was not given a test.

Data Collection

This study was a one-group before-after design and consisted of a pre-test and post-test. The questions for both tests were (see Appendix B):

1) True or False: there are over 18 million people in the U.S. with diabetes. (prevalence)

2) What is diabetes? (definition)

3) What makes you more at risk of getting diabetes? (risk factors)

4) What are 2 signs or symptoms of diabetes? (signs and symptoms)

5) How do you prevent diabetes? (prevention) (Fenn et al., 2003)

The students were given these questions in a revised written format by the researcher (see Appendix B) that received approval from the IRB in November 2008. The students received these questions on two different occasions. First, the students were given the pre-test prior to the performance (within one week). Secondly, during the play,
the students received an informational session and a play on type 2 diabetes from their peers in the following areas: prevalence, definition, risk factors, signs and symptoms, and prevention. The performance was called, “Sir Insulin Monk vs. the Evil Diana Betes” (Logue & Toci, 2003) performed by high school students from FNL. Lastly, they received the same questions in the form of a post-test after the performance (within one week).

There was no validity or reliability measurements available for the pre-test and post-test used in this program. The researcher had a panel of experts review the test questions and answers. This panel included a nurse practitioner with diabetes educator experience, a registered dietician affiliated with the department of education, and a teacher. The researcher received input from this panel and made all the recommended changes. Their suggestions and changes included the following:

1) True or False: there are over 23 million people in the U.S. with diabetes. The original question stated that there were 18 million people affected by this disease. A panel member believed a more recent statistic would be appropriate.

2) What is diabetes? There were no changes recommended by the panel.

3) What makes you more at risk of getting diabetes? There were no changes recommended.

4) What are 2 signs or symptoms of diabetes? When creating the answer portion of the test, the researcher did not state that a student should “circle 2” answers. The answers were changed accordingly to support the need for an additional answer.

5) How do you prevent diabetes? (Fenn et al., 2003) In one of the potential answers (item d), one word was changed from “avoid” to “don’t” to further clarify.
The researcher sent a copy of the changes as a courtesy to the expert panel. No further input was offered to the researcher. This revised written test received IRB approval (see Appendix B).

Data Collection Procedure

All students participating in this study received a random identification number supplied by the researcher. This number was assigned to the student after the administration of the pre-test. The student’s identification number was used throughout the testing phase to include the post-test. All the identification numbers and student information was available to the researcher and her mentors. She was certain that this information was in a secure location to protect student confidentiality. If a student was unable to complete all the testing, this result was removed from the study. The researcher graded each test according to a standardized answer sheet. All possible answers for the test were addressed during the lecture portion of the performance. The graded test scores were collected and placed on an Excel spreadsheet. This data was used by the researcher to document increased awareness of type 2 diabetes. This was demonstrated by an increase in the number of correct answers between the pre-test and post-test.

Data Analysis

The data were organized on a table (see Appendix C). This information was entered into Excel that allowed for the creation of graphs to describe the results. Polit et al. (2001) noted that this type of information is referred to as descriptive statistics and included test averages and percentages. The data were organized into categories so that the information could be fully understood and described. Burns and Grove (2005)
asserted that the researcher must be able to follow the mathematical logic of the data. Through the Excel software, the researcher was able to follow the data without difficulty.

Reliability and Validity

The program being utilized by the researcher has been in existence since 2003. According to Jeanne Fenn, MEd, RN, BC, CDE, at the University of Arizona, there have been at least 130 diabetes tool kits given to companies and individuals over the past few years. Ms. Fenn anecdotally noted that no follow-up has been completed on the validity and reliability of the pre/post-tests administered to students. According to her, this play has been utilized through a telemedicine project on a Navajo Reservation and she commented that it was successful. She indicated to the researcher that verbal feedback on the program from the participants and their families should be documented. The researcher appreciated Ms. Fenn’s support during the development of this study. In addition, the use of the tool kit and play was instrumental in the study’s design.

Summary

In conclusion, educating adolescents on type 2 diabetes may increase awareness of the disease. The researcher used a pre-test and post-test design and peer education in the form of an informational session and a play. Education is the key to increasing awareness of this disease and potentially leading to preventative behaviors. The next chapter introduces implementation of this study and data analysis.
CHAPTER IV

RESULTS

This study was designed in a pre-test and post-test format. The written test was created to answer the research question: “will educating seventh and eighth graders on type 2 diabetes increase their awareness of the disease?” The students received a pre-test, watched an informational session and play on type 2 diabetes, and completed a post-test. This research received Institutional Review Board (IRB) approval in November 2008 (see Appendix G). Consents and data collection began in January of 2009.

Instruments

The test consisted of five questions with multiple-choice answers. The researcher utilized the talents of an educator with curriculum design experience to create this test. The core questions were used from the toolkit received by the researcher. The program is called, *Don’t monkey around with diabetes: A program for helping kids learn how to prevent type 2 diabetes* (Fenn et al., 2003). The test and answers were evaluated by an expert panel for content validity. The pre/post test and study were given IRB approval in November 2008 (see Appendix B).

Theoretical Constructs

The Health Promotion Model (HPM) developed by Nola Pender was the theoretical framework used in this study. This model applies behavioral science and
learning to the area of health promotion (Pender et al.). The three phases of this model are: experiences related to behavior and personal factors, dealing with cognition and encompassing perceptions of change, and lastly, a commitment to action and a health promoting behavior. The use of peer education to teach students about type 2 diabetes was implemented and can be applied to this second phase of the HPM. The students may be influenced by their peers through an interactive and humorous presentation. Therefore, it may cause students to understand the benefits of diabetes education and prevention. The cognition can be evaluated through testing and a possible increase in the scores after the performance. This educational program could lead a student to the last phase; a health promoting behavior such as an increase in activity or healthier food choices. The researcher did not assess for these changes because it was beyond the scope of this study.

Consents

The participants used in this study were seventh and eighth graders enrolled in a rural elementary school. The parental and student consent forms received approval from the IRB in November 2008 (see Appendices D and E). The researcher met with the teachers and explained the program and consent forms. In addition, the researcher explained the parental consent forms to the students. There were a total of 57 students recruited in January of 2009. The students were rewarded with a fruit snack after returning the form. Of the 57 parental consents sent home with students, 55 of them were returned. Due to the dedication of teachers and students, a 96% response rate was achieved. Of the 55 returned, 3 parents did not want their children enrolled in this study. The remaining 52 students received their personal consent form; all signed and were
enrolled in the study. The researcher opted to complete the student consents on a separate occasion than the pre-testing. This decision was based on the amount of time available and the necessity that all consents be completed prior to testing. The researcher was available to the school and staff to answer any questions via telephone and frequent campus visits.

Sample

There were 52 students enrolled in this study. Each received a randomized number generated by the researcher in order to protect their confidentiality. The pre-tests were distributed to the students during their physical education classes one week prior to the performance. Pencils and paper were provided and the researcher was available to answer any questions and encourage a quiet atmosphere for test taking. Of the 52 enrolled students, 4 missed both the pre-test and the performance due to extensive absenteeism. All 4 students had traveled out of state for one week to attend a conference. The researcher was unaware of this event prior to recruitment. One student also moved out of the school district during this time frame. This left a total of 47 students enrolled; 82% of the originally recruited group. All these students watched the performance and completed the post-tests.

Results

There were a total of 47 students enrolled in this study that included seventh and eighth graders. There were 24 male students (51%) and 23 females (49%). The ages ranged from 12 to 15 years (see Figure 1).
The average pre-test score was 78% with a post-test score of 84%. This was a 6% difference in the results. Table 1 shows each student with assigned number, pre-test score, post-test score, and difference.

The participants and their test results were further organized into separate categories by age. The 12 year old group (23% of the participants) received an average pre-test score of 83% and a post-test score of 90%. The 13 year olds (47% of the participants) scored an average of 76% on the pre-test and 78% on the post-test. The 14 year olds (28% of the participants) had an average pre-test score of 82% and a post-test of 89%. All experienced an increase in test scores between the two tests 7%, 2%, and 7%
Table 1

*Pre-test and Post-test Scores*

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<th>Difference</th>
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<td>Average</td>
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<td>84%</td>
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</table>

respectively. There was one 15 year old enrolled in the study and this student also had an increase in the test score from 40% in the pre-test to 80% in the post-test.

The students were categorized into male and female groups. The girls scored an average of 82% on the pre-test and an 86% on the post-test. This was a 4% increase from baseline. The boys had an average of 75% on the pre-test and an 82% on the post-test, an 8% increase in scores.

Each question used in the testing was further analyzed for trends. Figure 2 describes pre-test and post-test scores for each item. This was calculated as the average number of correct answers for the 47 students.

Summary

Reporting and compiling the results of this study began the process of investigating the findings. This led to a deeper understanding of the research question. In
the next chapter, the results will be fully discussed to include a reflection on the findings and limitations of the study. The implications for research, education and practice were discussed along with conclusions and recommendations.
CHAPTER V

DISCUSSION

The growing problem of type 2 diabetes in the adolescent population is a worrisome health issue. According to the CDC (2008), youth diagnosed with type 2 diabetes are typically between 10-19 years of age, obese, have a family history of the disease, and are insulin resistant. The importance of diabetes education and prevention should be addressed with all age categories but specifically in the adolescent population. The informational session and play offered in the program, *Don’t monkey around with diabetes: A program for helping kids learn how to prevent type 2 diabetes* (Fenn et al., 2003) had a pivotal role in the implementation and design of this study. Through the generosity of this grant funded program, the researcher was able to secure a copy of the Train-the-Trainer toolkit and subsequently initiated this program in her rural community.

**Intervention**

This program was designed for students to deliver scripted material to their peers on type 2 diabetes (Fenn et al., 2003). The cast consisted of five high school students that were involved in the informational session and play. In the beginning, the cast encouraged the audience to stand up and participate in a song that required physical movements. This exercise or “ice breaker” allowed the students to interact with the troop in a positive and entertaining manner. The researcher observed participation throughout
the song by the students and their teachers. After the song, the audience settled into their seats and the informational session began. The areas covered were the definition of type 2 diabetes, prevalence, risk factors, signs and symptoms, and prevention. The cast used a lecture format and visual cues to review the topic of type 2 diabetes. For example, one cast member discussed signs and symptoms of diabetes such as being thirsty and tired. Another student demonstrated these symptoms by drinking water quickly from a bottle and placing her head on a pillow. These teaching strategies addressed multiple learning modalities.

The play followed the informational session and it involved all members of the troop. A narrator described the fictional battle between Sir Insulin Monk and Diana Betes. In addition, the audience was encouraged to participate, by the cast, through signs that read “Boo” for Diana Betes character and “Yeah!” for the Sir Insulin Monk character. The researcher observed participation by the audience when the signs were used. The plot was to rescue Princess Low-n-Sweet from her tower. Other knights failed to help her because “they came armed with fatty foods and no veggies and no exercise at all” (Logue & Toci, 2003, p. 4). Ultimately, Sir Insulin Monk succeeded in rescuing the Princess because he used his tennis racket to battle Diana Betes and threw fresh fruit (props) at her. These actions led to her defeat. The researcher observed that the audience was engaged in the play and cheered loudly when it concluded.

This program used a non-traditional approach to health education through the use of theatre. In addition, the performance was an entertaining medium and had a non-threatening approach. Other researchers have used similar approaches to increase awareness of diabetes in students. Long et al. (2006) used Web based education to
increase nutritional awareness in adolescents. These researchers embraced an unconventional approach to health education and used technology as a successful medium. In both studies, the teaching approach had a generational appeal and embraced dynamic mediums.

The program implemented for this study utilized peers to educate students about type 2 diabetes. The use of peers in supportive and educational roles was investigated by Zang (2006). Zang developed a program called Go Girl Go for adolescents that combined diabetes education and a peer support environment. The focus was to increase awareness of unhealthy choices in an adolescent population. Zang’s research was similar to this current study because of the use of peers and the focus on health education. In the adolescent population, peers have a pivotal role in their lives; therefore, a focus on including this support system was important.

This current study was designed with a health education focus and sought to assess for increased awareness of type 2 diabetes. It was implemented in a rural elementary school and was shown to the entire student population that included teachers and school administrators. Brosnan et al. (2005) conducted evaluations on adolescents to assess for type 2 diabetes risk factors. Through their findings, the researchers noted that school officials had an “increased awareness of acanthosis nigricans as a risk factor for insulin resistance” (p. 264). This study supports the importance of including school officials and teachers into this program. The researcher met with school administration to discuss her study and this performance. The administrator was interested in bringing the topic of type 2 diabetes to the entire school population. The teaching staff was also supportive and was enthusiastic about participating. This school could incorporate
designated type 2 diabetes awareness days into the academic calendar that would encourage lesson plans that are geared towards risk factor assessment and prevention. This knowledge could be imparted to their students and families in creative ways. The school faculty is dedicated to caring for children both academically and physically and this purpose can be guided towards diabetes awareness and prevention.

The health educational approach of this program could have further influence within the community. The students that saw this performance may have shared diabetes information with their families. The school families were made aware of the performance through an announcement in the weekly newsletter. In addition, the parents of the students involved in the study were aware because of the consent process. Grey et al. (2004) and Whitaker et al. focused on the importance of parental involvement in type 2 diabetes screenings and intervention within the adolescent population. These studies stressed the need for a familial approach. This current study did not assess if diabetes was discussed within families. The informational session and play were an innovative approach to health education through theatre and peer involvement and could have led to discussion in the home. This discussion of the play might have included families talking about healthy food choices and exercise. Family involvement and health education are key elements in helping individuals make healthier lifestyle choices.

Health Promotion Model

The revised HPM by Nola Pender was the theoretical framework used in this study. The model applied behavioral science’s understanding of learning to the area of health promotion (Pender et al.). The revised HPM has three major phases: individual
characteristics and experiences; behavior-specific cognitions and affect; and behavioral outcomes. The first phase includes individual characteristics that influence health behaviors: these are prior related behavior and personal factors. The students in this study were not surveyed on their prior related behaviors such as their experiences with diabetes. Through application of this model, questioning students on past experiences would have led the researcher to understand if beneficial habits were formed within a family. The second influence of personal factors encompasses the biological and sociocultural elements of an individual. The biological influences of age and gender were assessed by the researcher. The data collected allowed the researcher to search for test score trends within age and gender categories. One additional personal factor was ethnicity as a sociocultural element. In this rural area, 19.7% of the general population was Hispanic (Onboard Informatics, 2008). Due to the risk factors related to this minority group, it was an ideal location for this performance. This school was chosen because it was typical for this region in terms of size and demographics. In addition, the researcher was geographically close to the school and she had existing relationships with faculty. The informational session and play used was not gender specific or particular to a cultural group. It was written to appeal to a wide audience of students. Within the first phase of the HPM, the researcher concentrated on the personal factors of the students enrolled in the study. Prior related behaviors were not assessed but would be recommendations for future studies.

The second phase within the revised HPM was the behavior-specific cognitions and affect. This was the category that the performance targeted and there were six areas of influence. First, there were the perceived benefits of action that encompassed
the influence of social connections. In other words, the benefits of developing a healthier lifestyle could be reinforced within a group. According to the model, the use of the FNL troop to deliver the information on diabetes from a peer perspective had more impact than traditional modes such as diabetes information given by a non-peer. The second influence was a perceived barrier to change. A student might decide to eat healthier but struggle with the difficulty of this decision.

Thirdly, the perceived self-efficacy portion of the revised HPM is an important factor. Pender et al. asserted this is a judgment of an ability one may have to carry out a particular action. This ability is not based on skill but rather the judgments of an individual regarding the skills one has to use. A student needed to believe and judge he/she was capable of a health promoting behavior.

The fourth area of influence was the activity related affect. This area involved how the students felt about the informational session and play. Although the performance was designed to be entertaining, the researcher did not assess this activity related affect by formally asking about students’ level of enjoyment or disapproval. The researcher observed that the students were receptive to the performance and were actively engaged. The students were engaged by activities such as “cheering and booing” for certain characters as guided by signs the FNL troop held. The last two influences of the second phase were the interpersonal and situational influences. The interpersonal influences were utilized through peer education and role modeling. McKeachie and Svinicki (2006) suggested that one of the best ways to instruct was to have “students teaching other students” (p. 214). In the case of this study, the play was an entertaining medium and had a peer educational approach. The students’ averaged post-tests increased and provided
evidence of increased awareness. The element of role modeling occurred between the FNL troop and the audience. The troop was high school students between the ages of 16-18 years and the audience were kindergarten through eighth graders. The situational influences in this behavior-specific cognitions and affect phase occurred through a non-threatening environment of the play and informational session. In addition, Pender et al. noted if these situations created were “fascinating and interesting” (p. 56), it would further encourage health behaviors. This performance was created by students for students.

The final phase of the revised HPM was a behavioral outcome. This phase included the commitment to a plan of action, competing demands, and a health promoting behavior. This outcome was beyond the scope of this study but it was an important phase to review. If an individual was committed to change this would lead to a health promoting behavior. There could be competing demands on an individual. For example, a demand might include experiences that students have with making food choices. The availability of fast food could create a competing demand that would impede an individual from making healthier choices.

In conclusion, the first two phases of the revised HPM outlined the multiple factors that may influence an individual. These factors must be understood by a health educator or nurse so that intervention may occur. The ultimate goal was that a student would take the information learned and make healthier choices in their lives. The revised HPM served as a guide and allowed the researcher to understand the influences that contribute to the development of a health promoting behavior.
Piaget

The students enrolled in this study could be placed in Piaget’s fourth stage of cognitive development (Phillips & Soltis, 2004). This stage encompassed the ages of 12-15 years which were the ages of the students enrolled in this study. In this stage, an individual is able to problem solve and understand abstract concepts. In the case of this study, the program explained diabetes risk factors and keys to prevention. The concepts of diabetes were presented to students through teaching modalities that appealed to different learning styles. According to Piaget, it is possible, in the fourth cognitive phase, to understand risk factors and preventive measures and to potentially make healthier choices from the knowledge gained. This can further be aligned with Pender’s self-efficacy influence in the behavior-specific cognitions and affect phase. Both theories have shown the initial elements required for an action are the capability and understanding to move towards change.

Limitations

The limitations of this study were the small number of participants, the test, and the use of the FNL troop. The small number of participants was unavoidable. The researcher used a rural elementary school and recruited the seventh and eighth graders only. A larger group of students or the addition of other schools might have been beneficial. The pre/post test used in this study was reviewed for content validity by an expert panel. The test could have received further refinement through a pilot study and input from a student population. There were two limitations regarding the FNL troop. First, there was a learning curve for the troop involved in mastering a performance. This
was the first time the performance was implemented in front of a live audience. Second, there was time and dedication required to accomplish this performance. The FNL group practiced weekly for three months.

Implications for Education

The informational session and play was the intervention in this study and the revised HPM served as the framework. This performance followed this model and could potentially lead the students to a health promoting behavior. Interestingly, this program was not created with reference to the revised HPM. The young girls and their leaders were able to create a program that involved some of the phases and addressed the influences that lead to a health promoting behavior. Pender et al. noted that schools should have “health-enhancing environments” (p. 324). These environments should enhance healthy behaviors that include proper nutrition and exercise. Teachers, school officials and school nurses should instruct students on diabetes and serve as role models that encourage healthier lifestyles.

The informational session and play have been performed for over 4 years at many different venues. As a pivotal part of this research study, access to this play and informational session allowed the researcher to focus on assessing increased awareness of type 2 diabetes. The play also utilized students to instruct their peers. The power and potential of peer education can not be overlooked. Students are able to share information on diabetes in a non-threatening and entertaining manner. It is the hope of the researcher that further study into the effectiveness of this play as an educational tool can be pursued. A suggestion for future research should span the ages targeted for this performance such
as younger primary students that could be assessed for their knowledge through interactive games and/or drawing. The importance of this educational tool requires further research.

Implications for Practice

According to the CDC (2007) diabetes is the seventh leading cause of death and the estimated total cost for this disease was $174 billion dollars. The CDC (2008) noted the prevalence of type 2 diabetes “already appears to be sizable and growing problem among U.S. children and adolescents” (para. 2). The early assessment and diagnosis of this population can lead to appropriate medical treatment. Most importantly, prevention needs to be the main focus. In this study, teaching adolescents about type 2 diabetes led to an increased awareness. Unfortunately, the participants were not followed to assess for short or long term lifestyle changes. Through healthier lifestyle choices, the risk factors for developing diabetes may be decreased. The goal of increasing awareness of type 2 diabetes and encouraging behavioral changes would have a defining impact on nursing practice. It could lead to fewer patients with type 2 diabetes, and especially those requiring comprehensive treatment and management. School nurses are on the frontline of education and assessment of diabetes. Nurses can advocate for students and school sites to make healthier choices and support families that may be affected by type 2 diabetes. In the researcher’s rural community, nurses are not located at individual school sites but at the district office. Unfortunately, these school nurses are geographically removed from the student populations that they serve.
Implications for Research

The knowledge one gains through the research process can have beneficial consequences on nursing practice. The purpose of this study was to increase awareness of type 2 diabetes in the adolescent population. The toolkit used allowed this knowledge to be given to a younger population. It is important that this program be studied more fully to encompass a larger population of seventh and eighth graders. In addition, a tool could be created to assess the knowledge of the younger students. This study would benefit from a longitudinal approach that would assess short and long term lifestyle changes in the future.

Recommendations

This study would benefit from a number of key factors: a pilot study, a longitudinal approach, a retrospective study, a limited qualitative assessment, and the addition of a comparison group. A pilot study would allow for refinement and assessment of the test. It would be beneficial to receive feedback on the exam from students. The longitudinal study approach could reveal possible behavior changes instituted after the performance. A retrospective study could be constructed to investigate the influences this play may have had on past audiences. For example, this study could reveal if behaviors changed after seeing the performance. This could involve a questionnaire to individuals or schools that implemented the program. Did it lead to health promoting changes within a school? Were there changes noted by individual students? The addition of a qualitative question to the testing portion could have focused on themes or lessons learned from the performance. Questions that could be asked are, did you talk to your family about type 2
diabetes? What did you discuss? Lastly, the use of a pre-test and post-test design with a comparison group would have strengthened the overall study. Burns and Grove (2005) noted this type of design would allow variances such as different tests and/or a change in the timing intervals. In future studies, students could receive testing after the performance and another group tested without attending the intervention. Although all these suggestions could have an impact on the findings, this study was able to measure increased awareness of type 2 diabetes in the students.

Summary

The theatrical troop recruited to perform this play was outstanding. They accomplished the task of educating their peers on type 2 diabetes in an entertaining manner. The program used was comprehensive and it helped to guide the troop through scripted material and a DVD of the play. The play was an ideal format within the rural community due to the availability of the FNL team and the troop will continue to perform in other schools within the community.

In conclusion, this study sought to increase awareness of type 2 diabetes in adolescents. The program used to teach this subject was creative and it appealed to different learning styles. It encompassed auditory and visual elements through the play that could reach a greater number of students. The diabetes tool kit allowed a group of talented students and their director to deliver educational material through an entertaining medium. Although the toolkit is available upon request, it required many hours of preparation from the theatre troop. This study was able to accomplish the main objective
of increasing awareness of type 2 diabetes in adolescents. It is the hope that this performance will continue to educate other students throughout the community.
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REFERENCES


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Scout Council, Inc. Troop No. 509.


LETTER OF COMMITMENT FROM
FRIDAY NIGHT LIVE (FNL)

April 22, 2009

To Whom It May Concern:

Tehama Friday Night Live Partnership’s FNL Theatre Troupe is delighted to partner with Peggy Curry this fall to present the youth-led type 2 diabetes presentation “Sir Insulin Monk vs Evil Diana Betes” to Tehama County students. This partnership will provide an exciting opportunity for our youth leaders to educate their peers and younger students about this very serious health problem in a fun and interesting way.

The youth will begin rehearsal of the play and the informational presentation in September, 2008. We are excited to receive training from Ms. Curry about diabetes. The Friday Night Live will acquire our costumes, and create set pieces and visual aids with Ms. Curry’s help. We will begin performing the play/presentation in February of 2009.

We are excited to be a part of Ms. Curry’s thesis project, and look forward to this new opportunity. For questions or more information, please contact me at (530) 528-7391 or czastrow@tehamaed.org.

Sincerely,

Tina Zastrow

Tina Zastrow, MHB
Tehama Friday Night Live Partnership Coordinator
Tehama Co. Dept. of Education
APPENDIX B
Don’t Monkey Around with Diabetes


Name: ___________________________ School: ______________
Gender: (Circle one) Male / Female   Age: ____________
Please print clearly
Circle the best answer for each question.

1) There are over 23 million people in the U.S. with diabetes.
   a. True
   b. False

2) What is diabetes?
   a. Diabetes means that your blood sugar is too low
   b. Diabetes is a disease that impairs the body’s ability to use food
   c. Diabetes affects very few people
   d. Diabetes cannot be affected by diet and exercise

3) What makes you more at risk for getting diabetes?
   a. Gaining too much weight
   b. Not being active
   c. Family history of diabetes
   d. All of the above
4) What are two signs or symptoms of diabetes? (Circle 2)
   a. Going to the bathroom very often
   b. Having lots of energy
   c. Being very thirsty
   d. Healing quickly from cuts

5) How do you prevent diabetes?
   a. Stay active and exercise
   b. Eat meals that are high in fat
   c. Wear aluminum hats
   d. Don’t eat fruits and vegetables

Correct answers noted in red
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Hi! My name is Peggy Curry and I am a graduate student in the nursing program at CSU, Chico. I am asking your permission to assess your child’s knowledge of type 2 diabetes before and after they hear an informational session and see a play about this subject at Lassen View Elementary School.

Parent/Guardian Informed Consent

**Study Title:** Increase Awareness of Type 2 Diabetes in Adolescents through Theatre

**Investigator:** Margaret (Peggy) Curry is a registered nurse and lives in the Dairyville area. Her children attend Lassen View Elementary School.

**Purpose:** To teach your child about type 2 diabetes. The Center for Disease Control and Prevention (2007) states that diabetes is a disease that causes high blood sugar levels. All students will hear an information session and see a play on type 2 diabetes prevention performed by high school students. In addition, they will be given **non-graded** tests (before and after the play) to show their understanding of diabetes. Paper and pencils will be provided. The assessments and performance should take no more than one hour. The results will be kept strictly confidential and private. The names of the students will not be used.

**Benefits and Risks:** The **benefits** of this study are to have your child learn about type 2 diabetes and you will be assisting me with my research project. The **risks** are that your child
may be concerned about developing this disease. The researcher will be available to answer questions about diabetes.

**Alternatives:** You may decide not to have your child receive an evaluation of their knowledge of type 2 diabetes (before and after the play). Your child will still have the opportunity to experience this performance. Your child’s involvement in this research is strictly voluntary and it will not affect their grade.

**Questions:** This research has been approved by the Institutional Review Board (IRB) at California State University, Chico. It has also been approved by Mr. Mancill Tiss, Principal/Superintendent. If you have any further questions, please leave a message for the researcher at the front office or Professor Irene Morgan at 898-6207.

☐ Yes, my child may take the pre-test and post-test.

☐ No, my child may not take the pre-test and post-test.

**Student’s Name:** __________________________ (Please Print)

**Parent/Guardian Signature:** __________________________ Date: __________
Student Consent Form

Hi! My name is Peggy Curry and I am a nurse doing research for CSU, Chico. I want to test your understanding of type 2 diabetes before and after you hear about this subject and you see a play at school.

Study Title: Increase Awareness of Type 2 Diabetes in Adolescents through Theatre

Investigator: Mrs. Margaret (Peggy) Curry is a registered nurse.

Reason for the Study: To teach you about type 2 diabetes. You will hear a discussion and see a play on diabetes and answer written questions (it is not a test and no grades will be given). The entire research (tests and play) should take about one hour. Your names will not be used in the results of this research.

Reasons: The benefits of this study are learning about type 2 diabetes. The risks are that you may be concerned about getting this disease. The researcher will be available to answer your questions.

Other Activities: Answering the written questions is voluntary and you do not have to take the tests. There is no penalty if you don’t take the tests. You will still be able to hear the informational session and see the play.

Questions: This research has been approved by the Institutional Review Board (IRB) at California State University, Chico. It has also been approved by Mr. Tiss, your principal. If you have any questions, please ask me or your teacher.

Student Name: ______________________________ (Please Print)

Date: __________________
LETTER OF COMMITMENT
FROM SCHOOL

September 4, 2008

To Whom It May Concern:

Our district is pleased to support the research presentation of Margaret Curry for the California State University, Chico graduate program. Our seventh and eighth grade students will watch the type 2 diabetes instructional play during the 2008-2009 school year.

Sincerely,

Mancill Tiss
Superintendent/Principal
Lassen View Union Elementary School District
November 25, 2008

Margaret Curry
10401 85th Ave.
Los Angeles, CA 90045

Dear Margaret Curry,

As the Chair of the Campus Institutional Review Board, I have determined that following your Full Board review, no further modifications are needed in your research proposal entitled "INCREASING AWARENESS OF TYPE 2 DIABETES IN ADOLESCENTS THROUGH THEATRE." This clearance allows you to proceed with your study.

I do ask that you notify our office should there be any further modifications to, or complications arising from, this study. In addition, should this project continue longer than the authorized date, you will need to apply for an extension from our office. When your data collection is complete, you will need to turn in the attached Post Data Collection Report for final approval. Students should be aware that failure to comply with any IRB/C requirements will delay graduation. If you should have any questions regarding this clearance, please do not hesitate to contact me.

Sincerely,

[Signature]

John Mancini, M.D. Chair
Human Subjects Research Committee

Attachment: Post Data Collection Report

CC: Jennifer Lillibridge (2008)