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Diabetes awareness among children: A comparison study of diabetes knowledge in school-age children between U.S. and Kuwait

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This research is a product of the graduate program in [Family and Consumer Sciences](#) at Eastern Illinois University. [Find out more](#) about the program.

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DIABETES AWARENESS AMONG CHILDREN:
A COMPARISON STUDY OF DIABETES KNOWLEDGE IN
SCHOOL-AGE CHILDREN BETWEEN U.S. AND KUWAIT

BU-MARYOUM

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Diabetes Awareness Among Children: A Comparison Study of Diabetes Knowledge in School-Age Children Between U.S. and Kuwait

(TITLE)

BY

Nayef Y. Bu-Maryoum

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Master of Science


IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY CHARLESTON, ILLINOIS

2006

YEAR

I HEARBY RECOMMEND THAT THIS THESIS BE ACCEPTED AS FULFILLING THIS PART OF THE DEGREE CITED ABOVE

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Abstract

The literature shows that people of all ages, in all socio-economic groups and in many countries, are not well educated about nutrition. Teachers in public elementary schools both the United States and Kuwait administered an eight-item questionnaire developed by the researcher. The questionnaire was delivered orally to insure comprehension by non-readers. Results indicated that young children in both the United States and Kuwait have an awareness of and a desire to learn more about diabetes. Generally speaking, Kuwaiti children are more knowledgeable about diabetes than their American counterparts as seen in questions four, five, six, and eleven. On the other hand, American children are also more knowledgeable about the healthy food that may help prevent diabetes according to their affirmative response to question number seven. Future research and nutrition education is needed.

Dedication

All the Greatness and Dignity for Allah *Allah Subh'ana Hu Wa'Ta-A'la* (God to whom be ascribed all perfection and majesty) who is The Creator of whole world.

I would like to show my thankfulness towards Prophet MOHAMMAD and His family

Ahl Al-Bait (prayers and peace be upon THEM).

Acknowledgments

Many people helped me with the work I achieved in many ways and I really thank them all.

A very special "Thank you" to my beloved advisor, Prof. Jim E. Painter, Chairman of School of Family and Consumer Sciences for his exclusive supervision, expertise, and encouragement on this thesis. I would like to extend my deepest gratitude to the other two wonderful people with whom I've worked to produce, design, and arrange this thesis, Dr. Karla Kennedy-Hagan and Dr. Mikki Meadows, my thesis committee members, for their dedicated guidance and support on my thesis.

Where I am and what I have achieved (Little bit) so far, I dedicated to:

My MOTHER, who's prayer always save me from all sort of troubles. She supported me for my positive purpose, and her willpower definitely inherited in me. May Allah Keep Her Healthy and Save from all harm.

My FATHER, who's Honesty and goodwill Nature, I always aim to find in my self. He provided for my every need and gave me Trust relationship. May Allah Keep Him Healthy and Save from all harm.

My LITTLE FAMILY in the USA including my lovely wife Hanan and three little awesome sons Ali, Mohammad Mahdi, and Salman for their patience, time, encouragement and support in completing this work.

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Chapter 1

INTRODUCTION

Diabetes is a disease known all over the world. The disease is caused by defective carbohydrate metabolism. Persons with this disease carry an unusually high amount of glucose in the blood and urine because of a defect in the amount of insulin utilization or secreted by the pancreas.

In healthy individuals, glucose is sent into all the body tissues to provide energy for bodily activities. In a diabetic, the glucose entry is impaired. Because the amount of insulin produced is deficient, or because insulin utilization is impaired, sugar builds up in the blood.

Diabetes is not an acutely fatal disease, as is cancer, but it is a chronic disease. This means that once one has it, one will always have it. If not kept under control, its complications can be deadly. It is estimated that diabetes complications cause 200,000 deaths per year in America (American Diabetes Association, March, 2002). One of the greatest risks posed by diabetes is that many people do not know that they have it. For example, nearly half of the 16 million diabetics in the United States, over 18 percent of people over age 65, do not know that they have the disease (American Diabetes Association, 2005). It is not unusual for someone to have a routine physical, with healthy readings of cholesterol, weight, and blood pressure, only to be shocked when the doctor reports that "blood sugar" is high.

The culprit may be nothing more than age, at least for one of two types of diabetes. But not knowing that one has diabetes puts him or her at great risk for developing complications of the disease. In some cases diabetes is not difficult to control.

In many instances, it can be controlled by diet and weight loss. In more serious cases, insulin is prescribed so that the body receives artificially what it is unable to produce on its own. It is crucial to control diabetes as it can damage the eyes, kidneys, heart and limbs, and endanger a pregnancy (American Diabetes Association, 2006).

Add to these health complications the issue of health care costs of diabetes, and the need to teach people about diabetes becomes very clear. For example, statistics show that about \$100 billion in health care costs can be attributed to treating diabetics (American Diabetes Association, 2002).

The major problems caused by the faulty blood chemistry that occurs with diabetes include arteriosclerosis, or hardening of the arteries, which leads to heart disease; disorders of the small blood vessels that service the kidneys and retina, which can lead to kidney failure (which can be fatal) and blindness; and poor circulation, leading to tingling in the extremities and nerve damage. If this damage is severe, it can lead to amputation of limbs when infections also set in.

In addition, diabetes may lead to the damage of the lining of blood vessels as well as the nerves. And, the longer one has diabetes, the more likely the complications will worsen or take a toll on someone who may otherwise be in good health. Diabetics are also at higher risk of dying from complications of flu and pneumonia.

There are two types of diabetes. Type I, "insulin-dependent diabetes," or "juvenile-onset diabetes," occurs primarily in children and young adults. Classified as an autoimmune disease that accounts for about 10 percent of diabetes; Type I diabetics lack insulin production. The disease can be fatal in that the body will break down stored fat because it lacks sufficient energy from tissue glucose. In this process, ketone bodies are

produced in the blood, making the blood acidic and interfering with respiration

(American Diabetes Association, 2006).

In Type II diabetes, which is more common, the pancreas makes a considerable quantity of insulin, but the insulin has a reduced ability to promote the entry of glucose into tissues. Type II is also known as “non-insulin dependent diabetes,” and it is a disease of slow progression commonly affecting persons over age 40 and more recently obese children too. It may not be accompanied by clinical illness. It is detected by high blood or urine glucose level which is commonly referred to by lay people as “sugar.” (American Diabetes Association, 2002).

It is this second type of diabetes, Type II, which poses the greatest health threat. The rate of diabetes has risen in recent decades so much that Type II diabetes is now considered a major health problem worldwide. Many type II diabetics are undiagnosed. Type II diabetes can be managed, but people must be made aware of it before they can take responsibility for it. People can learn to control their diabetes through diet and exercise and, as a last resort, medication. When foods with very high glycemic index (GI) are eaten, blood sugar rises very quickly and insulin levels soar. This hypersecretion of insulin may cause a rapid drop in blood sugar (*reactive hypoglycemia*), which can make patient feel dizzy, shaky, tired, lightheaded, and hungry for more sugar shortly after he or she has eaten. When foods with a low to moderate GI are eaten, blood sugar levels rise and fall more slowly and steadily, and insulin release is blunted. As a result, patients are likely to feel full longer after eating, enjoy longer lasting energy, maintain steady blood sugar levels, and prevent the negative effects of excessive insulin

in the blood. A diabetic should experience a slow rise in the blood sugar (American Diabetes Association, 2006).

An issue related to diabetes, and which is the focus of this study, is the increase in the number of people developing the disease and the age of onset. Whereas Type II diabetes, the type to be discussed in this research, is becoming more prevalent, the age at which people are first diagnosed is dropping. For example, from 1990 to 1998, diabetes among American adults increased by 33 % overall, but rose by 76 %, twice that number, among adults aged 30 to 39 (National Diabetes Fact Sheet, 2002). Among the countries of the world, the overall percentage of diabetes in the United States is 7 %, it ranks third in the number of overall diabetes cases. Kuwait, by contrast, has nearly 12.8 %, which is still considered as high range (Kuwait Information Office, 2005). Its population is less than one-hundredth that of the U.S. (293,027,571 for U.S. compared to 2,257,549 in Kuwait, according to 2004 figures). Yet in Kuwait the growth rate of diabetes is expected to increase by 206 % between 2000 and 2030, compared to 71 % in the U.S, mirroring the concern of health officials worldwide that Type II diabetes in particular is predicted to continue to increase dramatically over the next few decades (Study: Worldwide Diabetes Rate To Double By 2030, Diabetes Care 2004).

Most health care professionals see prevention as the only way to stop this rise, and education is the key to prevention. Professionals recommend (1) keeping healthy people at low risk for developing the disease; and (2) reducing risk for persons with multiple risk factors of developing Type II diabetes (Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications, 2002).

The first recommendation, "keeping healthy people at low risk," is a long-term goal of this research. A first step toward keeping healthy people at low risk is to begin to teach children about the disease, its risks and prevention. But in order to take this first step, it is necessary to determine children's knowledge about this disease. If all children were found to know about diabetes, education could be targeted to build on what they know. If, however, research shows that children know very little, then educators would develop programs on the most basic level.

Need for the Study

This information on the incidence and complications of diabetes makes it clear that it is prudent to educate people about the disease. Its complications make it a malady that must not be ignored.

Most Americans are aware of the need for dietary changes, but this need may be more pressing in Kuwait, a country that did not begin a diabetes registry until 1992, and where a substantial increase in the number of new cases of diabetes is predicted by the year 2030 (Moussa, Al-Saeid, Abdella, Refai, Al-Sheikh, & Gomez, 2005). That the country did not begin a diabetes registry until 1992 is not surprising in an area of the world where little information on Type I diabetes is available.

Type I diabetes is already considered a common chronic disease in Kuwait. A two-year study of school children from 2000 to 2002 revealed prevalence of the disease among children, particularly those of the ages 10-13 (Moussa et al. 2005). A World Health Organization study found that Kuwait has the highest incidence of insulin-dependent diabetes mellitus (IDDM) among children under age 15 in the Middle Eastern region (Shaltout, Qabazard, Abdella, LaPorte, Al-Arouj, Ben-Nekhi et al. 1994). The

study also showed that families with a history of Type II diabetes were more likely to have children who developed Type I diabetes at a young age. In fact, diabetes grew fourfold in Kuwait between 1980-1981 and 1990 (Moussa et al. 2005).

In the face of these statistics, education about diabetes is crucial. Type II diabetes can be controlled. People must be made aware of it so that they may take responsibility for their health care and reduce long-term complications. The key is that the disease can be controlled and even prevented.

One can only surmise the factors behind this rise. Studies discussed by Wild, Roglic, Green, Sicree, & King (2004), estimate that rates of diabetes in the U.S. are expected to increase faster than the world average, even doubling through the year 2030. An increase cannot be blamed solely on the disproportionate population growth of older people, because Type II diabetes is increasing among younger people, with up to 46 percent of new cases coming from pediatric centers (Huang, & Goran, 2003). This does not speak to the number of cases that go undiagnosed, especially among children, in whom Type II diabetes shows no symptoms. These numbers make it clear that educating the young is an effective starting point to counteract ignorance of the disease and its complications.

It is imperative to find out what people know about diabetes, and even more important to understand, how they obtain their information. The best place to start is by studying children's knowledge of the disease. The goal in preventing diabetes is life-long knowledge. Eating and dietary habits are established early in life. The sooner children learn how to prevent a life-threatening disease, the greater chance they have of leading healthy lives even into old age.

Finally, comparing children's knowledge in two dissimilar countries, the U.S. and Kuwait, allows the researcher an insight into the cultural factors impacting knowledge about the disease. This is important considering the phenomenal rise in the number of diabetes cases expected to develop in Kuwait in the next quarter century.

Objectives of the Study

The objective of the research is to determine children's awareness of diabetes by:

1. Assessing knowledge of diabetes in children among grade levels and between genders in both American and Kuwaiti Children.
2. Determining children's awareness of diabetes: where did they get their information, what do they know, do they know anyone with diabetes,
3. Determining whether children understand the causes of diabetes and know what foods make up a healthy diet,
4. Determining children's willingness to learn more about diabetes, and
5. Determining if children think that diabetes is a disease that people of all ages can get.

Hypothesis of the Study

School children in general, are uneducated about the disease of diabetes, including its causes and prevention.

Chapter 2

Review of the Literature

One may assume that diabetes awareness among children mirrors that of the population at large. If so, we may be in trouble. A study by Dodani, Mistry, Farooqi, Khwaja, Qureshi, and Kazmi, (2004) found that 58 percent of diabetic patients in Pakistan had “inadequate knowledge” of the disease. Another survey (Jackson, Wills, Davies, Meadows, Singh, & Wise, 1991) found that while 96 percent of respondents had heard of the disease, only 73 percent could define it, 48 percent were unable to name a single symptom, and only 4 percent knew that thirst was a symptom, leading researchers to define public knowledge as “poor.”

Survey data gathered from 235 persons (Satterfield, Lofton, May, Bowman, Alfaro-Correa, Benjamin et al. 2003) in focus groups supported the need to begin diabetes education in childhood. They commented that “diabetes prevention starts with children” (p. 60). At the same time they bemoaned that it is difficult to teach children to eat more nutritiously when they are used to eating highly-advertised “burgers and fries” (p. 60).

Hence nutrition knowledge in general may be more important than specific diabetes awareness. Literature shows that, overall, the public is aware of nutrition and its effects on the body, but not everyone uses the knowledge to benefit their health.

Worsley (2002) identified two types of knowledge that impact this research. One type he defined as “declarative” knowledge, which is an awareness of “what is,” and which people use for their own personal health and safety, i.e., it is not a good idea to sleep in the street or on a railroad track. The second type is procedural knowledge, or

how to do things, such as shop, consume food and drink combinations, use an ATM, and so forth.

As much as knowledge helps us understand our world, Worsley (2002) says that experiences and cultural environment influences our beliefs and knowledge. He says that if one perceives the world as flat, he will understand a phenomenon on the horizon differently from a person who perceives it as round. Hence, different people perceive the same thing in different ways "according to their origins, training and experiences" (p. 579).

Continuing his discussion of nutrition knowledge, Worsley says that most people have knowledge about nutrition insofar as their own interest. Most, he says; perceive nutrition as being about food; however it is also about lifestyle. Baranowski, Davis, and Resnicow (2000) found that in order for people to change their buying and eating habits regarding food, "they must have strong motivators; knowledge in and of itself is not enough" (p. 309). Motivators can include social influences and peer pressure, environmental rewards, ego recognition, etc. The researchers concluded that people make and use knowledge to meet their own goals and purposes.

Abdella, Khogali, Al-Ali, Gumaa, and Bajaj (1996) recognized the marked increase of Type II diabetes in Kuwait and hypothesized that the adoption of a "Western" lifestyle has led to higher rates of diabetes than in the past. The fast socioeconomic growth in the country since 1970 has induced this change, altering traditional lifestyle and behavioral (including dietary) changes. The age distribution of the country has also shifted. Today, "more than half of the population is under 20 years old; only 3 percent is age 60 and above" (p. 347). Researchers concluded that motivation of behaviors and

prevention is a key factor in prevalence of Type II diabetes as the children are at their early life stages with fresh minds. In some areas of Kuwait, “80 percent of Type II diabetics were diagnosed in individuals under 60” (p. 348). The study also verified a causal relationship between Type II diabetes and body mass index.

Studying another population, Hart, Greenwood and Truby, (2003) sampled three groups in the United Kingdom in an effort to determine whether increased social and financial freedom among the population led to healthier choices and behaviors. Their goal was to investigate motivators and reinforcers for behavior change within families of primary-school children in order to develop a parent education program to help stem the rise in childhood obesity among otherwise healthy children. The researchers found that parents generally rejected traditional nutritional messages in favor of a more “flexible approach with short-term health focus” (p. 366). The researchers found that the respondents were interested in health, but had “suboptimal nutritional knowledge, set unrealistic targets and an inadequate awareness of their own influence as a model for their children’s behavior” (p. 366).

Harnack, Block, Subar, Lane, & Brand, (1997) studied a sample of American adults and found that, after social, economic and nutritional confounders were taken into consideration, fat, fiber, fruit and vegetable intakes were closer to dietary recommendations among respondents who had knowledge about cancer prevention. Worsley and colleagues (2002) concluded that “since consumers interested in nutrition had greater nutrition knowledge, nutrition interest is a key mediator in a link between personal values and dietary choices” (p. 148).

In studies focusing on teaching children proper nutrition, parental role modeling is crucial, since parents determine, for the most part, their children's diets.

The American Diabetes Association (2002) advised that blood glucose levels among children with Type I diabetes can be maintained through individualized meal planning, self-monitoring of blood glucose levels, and education. Nutrition recommendations for Type II diabetes among children are the same as among adults. The goal is to "normalize glycemia and facilitate a healthy lifestyle" (p. 56). To do this, the ADA recommends "encouraging healthy eating habits and regular physical activity for the entire family" (p. 56).

Teachers are also lacking in diabetes knowledge, according to a study in England by Greenhaigh, (1997). Next to the parents, teachers are the main care-givers of school-aged children, therefore better communication and dissemination of information between specialists in the health field, and teachers, is required.

This leads to another obvious factor in considering childhood nutrition: the availability of sweets and snacks in vending machines, especially in schools. Some states in the U.S. are considering banning vending machines in schools (Chang & Alicia, 2004). One New York legislator said that allowing "junk food" purchases through vending machines is not teaching children good nutrition. Opponents of such measures, however, say that banning vending machines does not teach children that there are other ways to lose weight, such as through exercise. But because schools receive a portion of the profits from the vending machines in schools, the vending machine issue is not one of nutrition but of finances.

Aware of the economic impact of changing diet and lifestyle, public health efforts have been ongoing in the United States in order to assist people in making lifestyle and diet changes. Because Type II diabetes disproportionately strikes low socio-economic and minority groups, public health agencies are excellent sources of educational programs.

Medical journals and Internet sites describe ongoing educational efforts in East Harlem, N.Y., (Horowitz, Williams, & Bickell, 2003) and a rural area in Mexico (Valenzuela, Mata, Mata, Gabali, Gaona, Thom et al. 2003). Knowing how much information people have about diabetes, and where it was obtained, is essential in the development of programs to bring proper information to the public.

An article in *Diabetes Week* (2005) addressed the issue of how lifestyle changes can prevent diabetes in older adults. The oral survey was administered to 23 women and 17 men ranging in age from 18 to 55, 52% of whom were in their 20s and 30s. Just five were under 20, five were 50 and over, and seven were between 40 and 50 years of age. The percentage of respondents who had heard of diabetes was 100 percent. Four of the 40 respondents, 10 percent, did not know of anyone with the disease. The percentage of respondents who wanted to learn more about diabetes was 100 percent, the same number was aware that healthy eating helped diabetes. Answers varied as to where respondents had received information on diabetes. Nearly half, 45 percent had learned of diabetes from the internet. The percentage which learned of it from the newspaper and the television was equal: 15 percent. One-fourth of the respondents said they learned of diabetes from all three sources. Less than 10 percent of the respondents, all under 21

years old, answered that insulin is not a medicine. One thought insulin was sugar, one thought it was a disease, and one answered "other."

What about the effect of other influences on diabetes, or of good health in general? A study on physical inactivity and its health benefits, undertaken by random telephone survey of 2,002 households across the U.S. (Morrow, Krzewinski-Malone, Jackson, Allen, Bungum, Fitz et al. 2003) revealed that the public is generally aware of traditional physical activities, but less aware of specific exercise guidelines.

In other words respondents knew that, exercise is "good," but they are not cognizant of the definition of "good exercise." Researchers concluded that the respondents did not have enough knowledge on how to make necessary behavior changes for better health.

One college professor said that people are often overwhelmed at the thought of starting an exercise program and do not realize that simply walking briskly for 30 minutes a day is a good place to start. Unfortunately, when they feel overwhelmed, they simply do nothing; most goals are so lofty that people give up very easily (Morrow et al. 2003).

Literature also shows that many Americans feel that they are unable to get nutritious and good-tasting meals. This is another educational obstacle to preventing Type II diabetes, particularly their contention that they are not sure that their families or caregivers know what constitutes a nutritious meal. This leads credence to a study of attitudes about diet and health among adults in the U.S. and Switzerland by Girois, Shiriki, Kumanyika, Morabia, and Mauger (2001) that concluded that a sizable gap exists between what is recommended in terms of healthy eating and what is practiced by

consumers. According to the researchers, the lag in consumer implementation of health-related dietary guidance in the face of a high burden degenerative disease gives new impetus to population-based research on consumer eating behavior.

Girois and colleagues (2001) also concluded that the need for education was crucial when individuals responding to the question; "Do you believe that what people eat and drink has an effect on or can prevent a major disease?" All U.S. respondents agreed that eating the right kinds of foods can reduce the chances of developing a major disease, but women showed greater awareness than men of the connection between diet and disease. However, the study also showed that while respondents linked diet with cancer, heart disease and obesity, they did not link diet with diabetes or hypertension (p. 420). While many were concerned with eating a high-fiber, low-fat diet, and those with higher body mass index (BMI) were concerned about being overweight, they had little knowledge about other diet and health issues. Thus, researchers concluded that "aside from the observation that overweight individuals in both populations were substantially more likely to view overweight as an important, associations of BMI with knowledge and attitudes about other diet and health issues were generally absent. This has direct implications for the particular need to offer dietary guidance to those at higher risk." (p. 422-423).

Clearly, when adults are confused about beneficial nutrition, exercise and its effect on a disease such as diabetes, they pass this confusion or lack of knowledge on to their children. Encouraging research by Hood, Kelly, Martinez, Shuman, and Secker-Walker (1997) found that children are more accepting of lifestyle changes than adults, and when communities target messages and interventions on children, "the community as

a whole is more likely to adhere to the changes," (p. 277) resulting in higher success rates.

Summary

The literature shows that people of all ages, in all socio-economic groups and in many countries, are not well educated about nutrition. Despite the information they do have, they do not appear to be motivated to use the information to practice a healthier lifestyle. This was supported by Khan's 1993 study in Pakistan, in which 48 percent of people surveyed were unable to name a single symptom of diabetes, and in Kuwait where Abdella (1996) recognized a correlation between the adoption of a "Western" lifestyle and diet with higher rates of Type II diabetes. A study by Hart et al. (2003) found that parents in the United Kingdom typically rejected traditional nutritional messages in favor of a flexible approach with a short-term health focus. In the U.S., Harnack et al. (1997) found that Americans most likely to adhere to dietary recommendations were those seeking to prevent cancer.

The literature is not more favorable among teachers. Too many sweets and snacks are available in school vending machines, yet those administrators who do not favor banning machines claim that they want to teach children that losing weight is possible through exercise, not only diet. At the same time, 100 percent of respondents to a 2005 survey said they wanted to learn more about diabetes. Since many said that making lifestyle changes is too overwhelming, a goal of diabetes educators must be to teach the effects of bad nutrition in such a way that all people are motivated to make, and adhere to, dietary changes.

Chapter 3

Methodology

The methodology of this research was to study 180 subjects from four grade levels, grades K, 1, 2 and 3, using an eight-item questionnaire to be administered to classrooms of area public school children in both the United States and Kuwait. The researcher obtained a total number of 361 subjects for both countries.

Using yes/no and multiple choice questions developed by the researcher (Appendix A), the questionnaire asked each child's gender, age and grade, then asked whether the student has heard of diabetes, knows anyone with the disease, asked its association to sugar, its association to various healthy and unhealthy foods, and asked where the children learned their information. Also, teachers administered the questionnaire orally to non readers to make sure it was understood. The researcher picked up the completed questionnaires and tallied the answers from 361 students from both countries and analyzed the results.

Based on the hypothesis of the research, school children in general, worldwide, are uneducated about the disease of diabetes, including its causes and prevention.

The objective of the research is to determine children's awareness of diabetes by:

1. Assessing knowledge of diabetes in children among grade levels and between genders in both American and Kuwaiti Children.
2. Determining children's awareness of diabetes: where did they get their information, what do they know, do they know anyone with diabetes,
3. Determining whether children understand the causes of diabetes and know what foods make up a healthy diet,

4. Determining children's willingness to learn more about diabetes, and
5. Determining if children think that diabetes is a disease that people of all ages can get.

Assumptions of the Study

The following assumptions were made relative to this study:

- 1.) The researcher assumed that some parents do not fully understand a child's risk for developing diabetes and were not prepared for the child's physical examinations that tested for diabetes.
- 2.) The researcher assumed that, in general, people do not think it is important for children to be educated on diabetes, because they see no threat of diabetes in children. Thus, educating children on the disease causes needless worry, and children ought not to be concerned with such things.
- 3.) The researcher assumed that diabetes education helps children be healthier in the present time as well as when they reach adulthood.
- 4.) The researcher assumed that children are capable of being taught important, life-long dietary habits.

Instrumentation

Seeking to compare a sample to 1991 statistics that appeared in *Diabetic Medicine*, the researcher developed an instrument for gathering 2005 data. The instrument for gathering data was an oral eight-item self-report questionnaire, described earlier in this chapter, administered to 361 children at public schools in the Midwestern American state of Illinois and in Kuwait. The questionnaire was developed in English for

American students and in Arabic for the Kuwaiti students. Permission for the study was obtained from the Ministry of Education and Health in Kuwait and from the Institutional Review Board at Eastern Illinois University.

Questions were grouped according to knowledge of the disease of diabetes in general; nutrition and diet choices related to the disease; age factors in developing the diseases; and source of knowledge about the disease. To simplify the process, all but the last two questions required a simple "yes" or "no" answer since young children are rarely able to explain the thought processes behind their answers.

In addition, young children tend to accept what they hear and are told and are not at an age of questioning. They tend to accept knowledge as fact. These "facts" are precisely what researchers need to know in order to dispel myths and develop good diabetes education programs for children. Questionnaire data analysis consisted of coding of the questionnaire and entering the data into a computer for analysis.

Limitations of the Study

The researcher is aware that the sample might be too small to allow generalizations of results, especially in a country as large as the United States. But, after collecting the data process, the researcher came up with a total number of 361 subjects for both countries. Kuwait also has regions where the incidence of diabetes is higher; this study did not delve into specialized populations. Almost half of Kuwait's 2004 population of 2,257,549 is made up of 1,291,354 non-nationals whose backgrounds are not defined.

The diverse socioeconomic backgrounds of American public school children were not taken into account for the research. While Type 2 diabetes disproportionately

affects African Americans, Hispanic/Latino Americans, some Asian Americans, Pacific Islanders and Native Americans, children's ethnic backgrounds (particularly American) were not part of the research.

Health conditions of the children were not ascertained. Whether the children, or anyone in their families, had diabetes was not determined. The research was limited to children's knowledge of diabetes at the time of the study. Although it questioned the media source of diabetes education, the study did not establish a link between children's personal lives and diabetes.

Language used in the survey was extremely simple in order to be understood by a very young population. The researcher cannot be certain that all questions were fully understood by the children since the survey was not administered orally to children who read. Children had limited opportunity to ask questions.

The research questions did not differentiate between Type I and Type II diabetes. Questions were asked about the overall disease of diabetes and how children perceived the impact of both healthy eating and age on the likelihood of developing the disease.

Operational Definitions

For the purpose of this study, the following terms were operationally defined.

Diabetes is defined as a disease caused by a defective carbohydrate metabolism.

An alternate definition of diabetes is "a chronic illness that disrupts the body's ability to regulate its primary and indispensable source of energy, glucose (sugar) which is found in the bloodstream or (medically known as *diabetes mellitus*) is the name given

to disorders in which the body has trouble regulating its blood glucose, or blood sugar, levels” (Juvenile Diabetes et al. 2003).

Type I diabetes, known as *juvenile diabetes*, is a condition in which the pancreas produces no insulin. Type I is caused by autoimmune disorders, genetics, and environmental agents.

Type II diabetes, also known as *adult-onset diabetes*, is a condition in which insulin may be available, but the body is not able to use it because cells do not respond normally to the hormone, or, in other words, cells are *insulin-resistant*.

Older adult is defined as persons 40 and over.

Juvenile, as in *juvenile diabetes*, is defined as under age 20.

Children are defined as people aged 4 to 10.

Obesity is defined as increase in body weight beyond skeletal and physical standards as the result of an excessive accumulation of fat in the body.

Healthy lifestyle is defined as a low-fat, low-sugar diet, encouraging and maintaining a healthy weight, participating in 30 minutes of exercise per day, non-smoking and a regular check of glucose, blood pressure, and cholesterol.

Pilot Study

The researcher conducted a pilot study in early 2005 by administering a similar study to a classroom of public school children in Illinois. Based on that survey, the researcher developed these educational recommendations:

1. An informational website on diabetes.
2. Informative presentations on television and in the Living sections of

newspapers in terms of healthy eating, insulin and other news stories about diabetes, particularly people living with it and how they cope.

3. Increase awareness of the risk factors of Type II diabetes.

The modern lifestyle today includes poor diet choices and reliance on frozen or fast foods rather than healthy fresh fruits and vegetables as well as a sedentary lifestyle often lacking in exercise to reduce weight and blood pressure, two factors directly related to diabetes.

The survey could be improved with questions addressing specific knowledge sources about Type II diabetes to differentiate it from Type I. The survey was simplistic at best, failing to ask if respondents were diabetic themselves. It did not define "healthy foods." When it asked where people heard about diabetes, the answer "other" did not provide a clear idea of whether the internet, TV or newspaper was the dominant medium from which the information was learned.

Chapter 4

Results

According to 2000 census data, the Middle Eastern country of Kuwait has one of the highest rates of Type 1 diabetes in the region, making diabetes one of the country's most common chronic diseases. In the U.S., nearly 20 percent of the population over age 65 has diabetes, about 10% of population age 20 and older, around 0.22 % of people under age 20, overall population percentage of 7 %, a ranking that puts it the third-highest in the world in incidence (CDC et al. 2005). In Kuwait, by comparison, nearly 12.8 %, which is still considered as a high range (Kuwait Information Office et al. 2005). Regardless of the country, the incidence of diabetes is growing throughout the world. In the Arab world, little information about Type 1 diabetes is available.

Asking school children how much they know about diabetes is a basic step in educating a population, for if a preventable disease of such proportions is to be eradicated, people must know its causes and treatment. Health care professionals see prevention as the only way to stop the rise in diabetes diagnoses, and education as the way to prevent it (Girious et al. 2001, Satterfield, Lofton, May, Bowman, Alfaro-Correa, Benjamin, & Stankus, 2003).

In this study, elementary students in four grade levels—kindergarten, first, second and third grades—were given an eight-item questionnaire to determine what they knew about diabetes and where they had obtained the information.

The researcher surveyed 204 American and 157 Kuwaiti Kindergarten, first, second and third grade students. Questions were grouped according to general knowledge

of the disease, nutrition and diet choices, age, factors, and source of knowledge about the disease.

Table 1
Percentage of All Students That Answered YES To (Questions 4-9): By Country

Question*	Q#4	Q#5	Q#6	Q#7	Q#8	Q#9
Country						
USA	58	30	65	75	77**	91
KUWAIT	73	64	69	63	78**	62
SD	.005	.000	.433	.019	.954	.000

*Question#4: Have you ever heard of diabetes disease?

*Question#5: Do you know anyone with the disease of diabetes?

*Question#6: Do you think that diabetes has anything to do with sugar?

*Question#7: Do you think that diabetes can be helped by eating healthy foods such as apples and carrots?

*Question#8: Do want to learn more about diseases in school?

*Question#9: Do you think that diabetes is a disease that infants, toddler, children, teens, adults, and older people can get?

**Rounded to nearest whole number

Table 2
Percentage of All Students That Answered MCQ#10*: By country

Answer	A	B	C	A&B
Country				
USA	2.9	36	45	14
KUWAIT	1.9	27	64	6

SD = .008

*Question#10: Do you hear about diabetes on the:

A) Internet

B) T.V.

C) None of the above

Table 3
Percentage of All Students That Answered MCQ#11*: By Country

Country	Answer		
	A	B	C
USA	21	52	22
KUWAIT	31	52	17

SD = .094

*Question#11: Insulin is a:

A) Medicine

B) Sugar

C) Other

Table 4
Percentage of All Students That Answered YES (Questions 4-9): By Grade Level

Questions*	Grade				Average
	KG	1 st Grade	2 nd Grade	3 rd Grade	
4	50	49	71**	81	65**
5	46**	42	44**	47**	45**
6	57	65	74	70**	67**
7	75**	61**	67	73**	70
8	93**	73**	74	71**	78**
9	90	77**	67	78**	78

*Question#4: Have you ever heard of diabetes disease?

*Question#5: Do you know anyone with the disease of diabetes?

*Question#6: Do you think that diabetes has anything to do with sugar?

*Question#7: Do you think that diabetes can be helped by eating healthy foods such as apples and carrots?

*Question#8: Do want to learn more about diseases in school?

*Question#9: Do you think that diabetes is a disease that infants, toddler, children, teens, adults, and older people can get?

**Rounded to nearest whole number

Table 5
Percentage of All Students That Answered MCQ#10: By Grade Level

MCQ#10*	KG	1 st Grade	2 nd Grade	3 rd Grade	Average
A	3	3**	4**	0.9	3**
B	35	15**	30**	42	32
C	35	78	57	51**	54**
A&B	27**	0	8	6	11**

*Question#10: Do you hear about diabetes on the:

- A) Internet
- B) T.V.
- C) None of the above

**Rounded to nearest whole number

Table 6
Percentage of All Students That Answered MCQ#11: By Grade Level

MCQ#11*	KG	1 st Grade	2 nd Grade	3 rd Grade	Average
A	23**	35**	32**	18	26
B	55**	41**	51**	63	53
C	23**	25**	18**	18	21**

*Question#11: Insulin is a:

- A) Medicine
- B) Sugar
- C) Other

**Rounded to nearest whole number

Table 7
Percentage of All Students That Answered YES: By Gender

Questions*	Gender		Average	SD
	Male	Female		
4	66	63**	65**	.516
5	44	46**	45**	.756
6	66	67	67**	.853
7	73**	66	70**	.194
8	75**	81**	78**	.184
9	82**	75**	78	.113

*Question#4: Have you ever heard of diabetes disease?

*Question#5: Do you know anyone with the disease of diabetes?

*Question#6: Do you think that diabetes has anything to do with sugar?

*Question#7: Do you think that diabetes can be helped by eating healthy foods such as apples and carrots?

*Question#8: Do want to learn more about diseases in school?

*Question#9: Do you think that diabetes is a disease that infants, toddler, children, teens, adults, and older people can get?

**Rounded to nearest whole number

Table 8
Percentage of All Students That Answered MCQ#10: By Gender

MCQ#10*	Gender		Average
	Male	Female	
A	3	2**	3**
B	32	32**	32
C	51**	56	54**
A&B	13	9**	11**

SD = .317

*Question#10: Do you hear about diabetes on the:

- A) Internet
- B) T.V.
- C) None of the above

**Rounded to nearest whole number

Table 9
Percentage of All Students That Answered MCQ#11: By Gender

MCQ#11*	Gender		Average
	Male	Female	
A	28	23	26
B	55**	52	53
C	17**	25**	21**

SD = .180

*Question#11: Insulin is a:

- A) Medicine
- B) Sugar
- C) Other

**Rounded to nearest whole number

Table 10
 Percentage of Kuwaiti Students That Answered YES (Questions 4-9) Grade Levels

Questions*	Grade				Average
	KG	1 st Grade	2 nd Grade	3 rd Grade	
4	78**	59**	84**	72**	73**
5	65	54**	68**	69	64
6	63**	78	68**	67**	69
7	73**	68	51	59	63**
8	95	71**	68	77**	77
9	90	63	41**	51	61**

*Question#4: Have you ever heard of diabetes disease?

*Question#5: Do you know anyone with the disease of diabetes?

*Question#6: Do you think that diabetes has anything to do with sugar?

*Question#7: Do you think that diabetes can be helped by eating healthy foods such as apples and carrots?

*Question#8: Do want to learn more about diseases in school?

*Question#9: Do you think that diabetes is a disease that infants, toddler, children, teens, adults, and older people can get?

**Rounded to nearest whole number

Table 11
 Percentage of American Students That Answered YES (Questions 4-9) Grade Levels

Questions*	Grade				Average
	KG	1 st Grade	2 nd Grade	3 rd Grade	
4	30**	36**	60	87**	53**
5	32**	25	25	35	29**
6	53**	46	79	71	62**
7	76**	50	79	80**	71**
8	91**	75	79	68**	78**
9	91**	96	88**	92**	92**

*Question#4: Have you ever heard of diabetes disease?

*Question#5: Do you know anyone with the disease of diabetes?

*Question#6: Do you think that diabetes has anything to do with sugar?

*Question#7: Do you think that diabetes can be helped by eating healthy foods such as apples and carrots?

*Question#8: Do want to learn more about diseases in school?

*Question#9: Do you think that diabetes is a disease that infants, toddler, children, teens, adults, and older people can get?

**Rounded to nearest whole number

Interpretation of Data

In many ways, childrens' responses were similar, yet they were dissimilar in others. One of the biggest disparities appeared in the responses to question number four, "Have you ever heard of diabetes?" As noted in Table 10, seventy eight percent of Kuwait kindergarteners answered "yes," compared with 30 % of American kindergarten students noted in Table 11. In all but the third grade, more Kuwaiti children 59 % in grade 1, 84 % in grade 2 (Table 10) than American children 36 % in grade 1, 60 % in grade 2 (Table 11) answered in the affirmative. In third grade, 87 % of American children responded they had heard of diabetes (Table 11), compared to 72 % of Kuwaiti children (Table 10).

The question number five, "Do you know anyone with diabetes?" was answered in the affirmative by more Kuwaiti than American children (64 % Kuwait children vs. 30 % American children) (Table 1). This shows that American children are less aware of the disease. Perhaps they do not know who has the disease, since it is impossible to tell by appearance.

Question number six, "Do you think diabetes has anything to do with sugar?" again was more often answered "yes" by Kuwaiti than American students, by a (69 % to 65 %) (Table 1). Only by third grade did Americans catch up to their counterparts, answering "yes" by 71 % (Table 11), compared to 67 % of Kuwaiti children (Table 10). Answering in the affirmative that diabetes can be helped by eating healthy foods in question number seven, more American children, particularly in the kindergarten, where 76 % of American children said, "Yes," (Table 11) compared to just 73 % of Kuwaiti

children as it showed in (Table 10). By third grade, American children who answered in the affirmative was 80 % (Table 11) compared to 59 % of Kuwaiti children (Table 10).

Answers to the question number eight, "Do you want to learn more about diseases in schools?" were most similar between the two groups. The percentages of those who answered "yes" in kindergarten were 95 % Kuwaiti (Table 10), 91 % American (Table 11); first grade, 75 % Kuwaiti (Table 10) and 71 % American (Table 11); Second grade, 68 % Kuwaiti (Table 10) and 79 % American (Table 11); and third grade, 77 % Kuwaiti (Table 10) and 68 % American (Table 11). The total percentages of children of both nationalities who favored learning more about diseases in school was nearly identical, 78% for both Kuwaiti and American students (Table 1).

Overall, however, American students were well ahead of their counterparts in general information about diabetes. Some 91 % American children answered "yes" in response to question number nine, "Do you think that diabetes is a disease that infants, toddlers, children, teens adults and older people can get?" compared to just 62 % of Kuwaiti students (Table 1).

In all questions, Kuwaiti kindergarten students were more likely to answer "yes" than children of other grades. No less than 63 % "yes" was indicated for any question. Whether the children did not understand the question, and choose "yes" for simplicity, is not known.

In all other questions, the number of affirmative responses in grade 1 was lower than the number of such responses from kindergarten students. Affirmative responses in grade 3 rose with two exceptions: "Have you ever heard of diabetes?" was a "yes" for

84 % second grade Kuwaiti students compared to just 72 % of third grade students (Table 10); and “Do you think diabetes has anything to do with sugar?” was answered in the affirmative by 68% of second grade Kuwaiti students, but just 67 % of third grade students (Table 10).

Overall, by looking at the “yes” responses, children are well informed about most issues with diabetes. Among Kuwaiti students in all grades, no less than 59.95% answered in the affirmative to every question (Table 10).

Only question number 5, “Do you know anyone with diabetes?” was answered “yes” by just 30 % of American students (Table 1). This does not necessarily reflect ignorance of the disease; Rather, it shows that they do not talk about, or observe anyone, with the disease. With this age group, unless someone explained that another person had diabetes, they would not be able to determine it for themselves.

This study suggests that children have an awareness of diabetes and its association with a healthy diet. They also have a desire to learn about diseases in school. That they do have an awareness of the disease and a desire to learn shows that they are ripe to learn about this information. Studying nutrition in a health curriculum is a good place to begin to make them aware that they are what they eat, and not eating well now could hurt their health as they get older.

Chapter 5

Discussion, Summary, Conclusion, Recommendation

This research was designed to determine how much young primary-school age children in the United States and Kuwait know about diabetes. Determining how much they know is important because Kuwait has one of the highest rates of Type I diabetes in the region (Kuwait Information Office et al. 2005), while one-fifth of the United States population over age 65 suffers from the disease (CDC et al. 2005).

These figures translate to Kuwait's leading the Middle Eastern region in the number of persons suffering from diabetes, as (12.8%) of the population have diabetes. This number is double that seen in the United States where (7%) of the population has diabetes.

Regardless of the country's individual incidents and rankings, the incidence of diabetes is predicted to increase considerably by 2030. (Wild et al. 2004). Therefore, educating school children about the disease is critical. If changes are not made in lifestyle, including diet and exercise, today's children may become the diabetics of tomorrow.

The concern is more acute in the Middle East because information about Type I diabetes is lacking in the Arab world at the same time that Abdella and colleagues (1998) established a correlation between the adoption of a "Western" lifestyle and the increasing incidence of diabetes in this region of the world. More important, Abdella found that half of the population in the Arab world is under 20 years old, unlike that in the developed world, where older people make up the highest segment of the population.

This research project revealed that in Kuwait, more children in the early elementary school grades have heard of diabetes (78%), as opposed to their American counterparts, who receive little information on diabetes until they reach second grade (30%). By third grade, 87% of U.S. children have heard of diabetes compared to Kuwaiti children (72%).

This research also shows that the percentage of children that know someone with the disease correlates with the number indicating they are familiar with the disease. For example, 32 % of American kindergarten children surveyed answered in the affirmative that they knew someone with the disease (Table 11), compared with 65 % of Kuwaiti children of the same age (Table 10). These figures nearly correspond with the numbers of children who replied that they had heard of diabetes, leading one to surmise that the reason young children have heard of the disease is not because they have learned about it in school, but because they know someone with the disease.

As American children reach second and third grades, and begin to learn about diabetes (Table 11, question number 4), this research showed that they are less inclined to have obtained their information by knowing someone with diabetes (25 % of U.S. second graders and 35 % U.S. third graders (Table 11), compared with 68 % of Kuwaiti second graders and 69 % of Kuwaiti third graders) (Table 10). One may surmise the reason is that they have talked about it in school, even though a 1997 study showed teachers in England are lacking in diabetes knowledge.

Whether information passed along to people in low socio-economic groups studies, through educational efforts in rural Mexico (Olvera-Ezzell et al. 1994) or East Harlem (NYC) (Horowitz et al. 2003) is spread to children or not, couldn't be determined

by those studies. Also, the same can be said about potential lifestyle changes among adults, where results of telephone interviews published in Diabetes Week, showed how Type II diabetes can be prevented stated that "Lifestyle changes especially effective in preventing diabetes in older adults." The children in my study showed less desire than adults in previous studies to learn more about diabetes (69.8 % of American children in kindergarten vs. 100 % of the Diabetes Week respondents) (Lifestyle changes especially effective at preventing diabetes in older adults, Diabetes Week et al. 2005). This may have been childhood curiosity; this level of childhood interest declined, according to my research, then picked up again by the third grade. Even so, less than 70 % of American children in any grade indicated a desire to learn more about diabetes.

My research showed Kuwaiti children are more curious than American children of the same age. Some 80 % of Kuwaiti kindergarteners want to learn more. Then, as with American children, their desire waned for a year or two. Then, at all levels except third grade, more Kuwaiti children than American children wanted to learn more about diabetes.

Teaching children the connection between a healthy diet and diabetes is needed, according to my research. Among American children, just 76 % of kindergarten students and 50 % of first and 79% second-grade students said that healthy eating had something to do with the disease (Table 11), a figure quite low compared to 73 % of Kuwaiti kindergarten students (Table 10). First and second grade students' correlation between diabetes and healthy eating dropped to 67.5 % and 51.3 %, respectively, and rose just to 56.2 % by third grade. Some 79 % of third-grade Americans, by comparison, correlated a healthy diet with preventing diabetes, according to my research.

Another topic of interest is the question, "Do you think that diabetes is a disease that people of all ages may develop."

This was answered correctly by a majority of American children in my questionnaire. As noted in Table 1, more than 90 % of American respondents said they believed that infants, toddlers, teens and adults can develop the disease compared to 62% of Kuwaiti responses. Among Kuwaiti students, 90 % of kindergarteners, 63 % of first graders, 41 % of second graders, and 51 % of third graders answered that people of all ages can develop the disease (Table 10).

Summary

While this research showed that young children in both the United States and Kuwait have an awareness of and a desire to learn more about diabetes, the research did not uncover how or why the children learned about diabetes and what propelled their interest. Data on children's knowledge is lacking. The majority of the literature pertained to adults. This researcher can surmise that since adults know so little about the disease and appear to do little to prevent or treat diabetes, according to the literature, children are not being taught how to prevent or treat it, either, since children commonly follow the patterns of the adults in their societies. This is precisely why this research was developed: to find a starting point for children's educational programs to help them avoid developing diabetes later in their own lives.

Generally speaking, Kuwaiti children are more knowledgeable about diabetes than their American counterparts as seen in questions 4, 5, 6, and 11. On the other hand, American children are also more knowledgeable about the healthy food that may help prevent diabetes according to their affirmative response to question number seven. The

lone exception, according to my research, is Kuwaiti first graders, who are eager to learn more.

Conclusion

The research conclusion is that nearly two-thirds of the 361 primary-grade children surveyed in Illinois (U.S.) and Kuwait are informed about the basic issues of diabetes. (Jackson et al. 1991) found that while 96 percent of respondents had heard of the disease, only 73 percent could define it, 48 percent were unable to name a single symptom, and only 4 percent knew that thirst was a symptom, leading researchers to define public knowledge as "poor". No question among the Kuwaiti children surveyed had less than a 59 % affirmative response. However, among this age group, much of this information would be impossible for the children to know unless they had been specifically educated about it. The children indicated much of their information came from the media (television and Internet), rather than the school classroom.

Recommendation

The recommendation of this researcher is that basic diabetes education begin in kindergarten. Children are not too young to learn the association between healthy food and healthy bodies. Most of them know that foods high in sugar are empty calorie foods that are not healthful, and yet the studies by Girois et al. (2001) of attitudes about diet and health among adults in both the U.S. and Switzerland show adults are lax about making dietary and lifestyle changes that will improve their health. If adults will not mirror appropriate behavior for their children, it is unlikely that young children will adapt it for themselves (Girois et al. 2001).

Teaching children early should have additional benefits since young children rarely question what is being taught. In teaching about diabetes, this is good; by the time children come to question the information, they will realize that what they have been taught in their early years is sound advice. Hopefully, these lessons will begin to sink in before they have made bad choices and bad habits that will impact their health.

The ultimate goal is to reverse the predictions of the rapid rise in the number of cases of diabetes expected in the world by 2030. That is a generation away. Hopefully, educational programs can begin in the public schools to teach the youngest generation that they do not have to develop diabetes.

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Appendix A

Data Collection Instrument (English Version)

9. DO YOU THINK THAT **DIABETES** IS A DISEASE THAT INFANTS, TODDLER, CHILDREN, TEENS, ADULTS, AND OLDER PEOPLE CAN GET? **YES** **NO**

10. DO YOU HEAR ABOUT **DIABETES** ON THE: (Choose ALL answers that's apply to you)

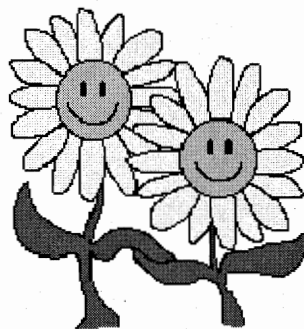
- A. INTERET
 - B. T.V.
 - C. NONE OF THE ABOVE
-

11. INSULIN IS A: (Choose ONLY ONE answer)

- A. MEDICINE
 - B. SUGAR
 - C. OTHER.....WHAT IS IT!!!!
-

THANK YOU FOR YOUR TIME ☺

GOOD LUCK



Appendix B

Data Collection Instrument (Arabic Version)

ملاحظة:الرجاء عدم كتابة الإسم على هذه الورقة.

* ضع دائرة حول الاجابة المناسبة:

- 1- هل انت ؟ ذكر انثى
- 2- ما هو عمرك بالسنوات؟ 4 5 6 7 8 9 10
- 3- المرحلة الدراسية: أولى روضة - أولى ابتدائي - الثاني ابتدائي - الثالث ابتدائي
- 4- هل سمعت من قبل عن مرض السكري؟
لا نعم
- 5- هل تعرف أحدا مصابا بمرض السكري؟
لا نعم
- 6- هل تعتقد أن مرض السكري له علاقة بالسكر؟
لا نعم
- 7- هل تعتقد أنه ممكن معالجة مرض السكري بتناول الأطعمة الصحية مثل التفاح والجزر؟
لا نعم
- 8- هل تريد ان تتعلم أكثر عن مرض السكري في المدرسة؟
لا نعم

9- هل تعتقد بأن مرض السكري ممكن أن يصيب كل من الرضع والأطفال والمراهقين وكبار السن؟
نعم
لا

10- هل سمعت عن مرض السكري في: (يمكن لاختيار أكثر من اجابة)
أ- الانترنت
ب- التلفاز
ج- ليس أي مما سبق

11- الاسولين هو: (لاختار اجابة واحدة فقط)
أ- سكر
ب- دواء
ج- شيء آخر ما هو؟.....

شكرا لكم تمنياتي لكم بالنجاح والتوفيق

Appendix C

Data Collection Permission Form (State of Kuwait)



Ministry Of Health
Food & Nutrition Admin.

وزارة الصحة
إدارة التغذية والإطعام

June 7th, 2005

To Whom It May Concern:

SUBJECT: HANDOUTS DISTRIBUTION

RESEARCH TITLE: DIABETES KNOWLEDGE AMONG
CHILDREN: A COMPARISON STUDY OF DIABETES
KNOWLEDGE IN SCHOOL AGE CHILDREN BETWEEN USA AND
KUWAIT

This is to provide permission to Mr. NAYEF BU-MARYOUM, graduate student at Eastern Illinois University to conduct surveys regarding Diabetes Knowledge Among School Age Children in any Kuwaiti selected schools with the assistant of the schools teachers and we wish him a good luck in his further studies.

Sincerely,

Dr. Entisar Al-Shami

Dr. Entisar Al-Shami
Nutrition Research and School Education Unit
Administration of Food and Nutrition
Al-Sabah Hospital
Ministry of Health
State of Kuwait

P.O.Box 4078 SAFAT
State of Kuwait 13041
Phone: 4836155-4841384-4816043-4816059
Fax: 4813905

ص.ب. 4078 الصفاة
دولة الكويت 13041
تلفون: 4816059-4816043-4841384-4836155
فاكس: 4813905

Appendix D

Data Collection Permission Form (U.S.A.)

CHARLESTON

Community Unit School District

District Administration Office
Phone: (217) 345-2106 410 West Polk Avenue, Charleston, IL 61920 Fax: (217) 345-8121

TO: BUILDING ADMINISTRATORS AND SECRETARIES

SUBJECT: DISTRIBUTION OF HANDOUTS

ORGANIZATION/ACTIVITY Diabetes Awareness Among Children
A Comparison Study of Diabetes Awareness in Schools for Children
NAME OF PUBLICATION Diabetes Survey Between US & Kuwait

APPROVED

- Place in office for pickup
- Place on table(s) for students Grade(s) _____
- Distribute through classroom Grade(s) _____
- Building administrator's prerogative to distribute to interested staff
- Post in building
- Place in faculty lounge

OTHER APPROVED INFORMATION FOR DISTRIBUTION

- Representative will be contacting the building administrator. Participation is determined by the building principal.
- Permission to conduct survey providing the building administrator and teacher(s) involved are agreeable. All necessary documentation is on file with the Assistant Superintendent. CS & MT

DENIED

Reason: _____

Gary C. Niehaus
Dr. Gary Niehaus, Superintendent

11/22/04
Date

*This form must be presented, in person, at each attendance center where materials are to be distributed.

A **1**st-rate public education for a caring community!

Appendix E

Parents Consent Form (U.S.A.)

Dear Parents\Guardians,

I am conducting research for my master's thesis in Family and Consumer Sciences – Nutrition Concentration. The main idea if this project is to discover diabetes awareness among school age children. The 11-Items survey will take approximately 10 minutes to answer by your child with assistance of his/her teacher. Parents should know that there will be no personal identity collected and the participant (child) is free to quit anytime of the survey. Thanks in advance for your time and assistance.

Best Regards,

Nayef Bu-Maryoum

FCS – Nutrition Graduate Student
Eastern Illinois University

PLEASE, fill and sign the form below and return it in with your child to the school. Thanks ☺

-----Detach here-----

I give permission for my child to participate in the Diabetes Awareness Survey in assistance of his\her teacher.

Childs name: _____

Grade: _____

Signature of parents/guardians: _____

Appendix F

Teachers Guide Form (State of Kuwait)

إلى حضرات المدرسات العزيزات
تحية طيبة وبعد ،،،

يرجى التكرم بتوزيع أسئلة الامتحان على الطلبة مع مراعاة الآتي:

- 1- التوضيح للطلبة انه استبيان فقط غير داخل في التقييم الفصلي لهم.
- 2- المشاركة اختيارية ويمكن لهم التوقف عن المشاركة في أي وقت كان وانه لا يوجد عقوبة على ذلك.
- 3- التأكد بان الطلبة أجابوا على أول 3 أسئلة ومساعدتهم إن احتاجوا ذلك.
- 4- الاجابة على الأسئلة من 4-11 من الاستبيان.
- 5- يرجى تزويدهم بشرح شفهي مبسط للأسئلة إن كان لديهم أي استفسار.

* للإستفسار: يرجى الاتصال على مدير البحث نايف بومريوم - ت: 9440092

شكرا جزيلا ونتمنى لكم دوام الصحة والعافية،،،

Appendix G

Teachers Guide Form (U.S.A.)

Dear Teachers,

Please pass survey questionnaires to all students who were approved to participate by guardians or parents in answering the survey questions. First of all, be sure that children answer the first three demographic questions. Then, going from question# 4 through question# 11 to answer the rest of the survey questionnaires.

Please, provide a simple oral explanation of the questions to the children before they start answering them. Also, Students should know that it is a research project and it is not part of the school curriculum, participation is voluntary, they can stop participating at any time, and there is no penalty if they choose not to participate.

THANK YOU FOR YOUR TIME ,,,,

Appendix H

Results Discussion Letter (State of Kuwait)

MINISTRY OF HEALTH
NUTRITION & FOOD ADMIN



وزارة الصحة
إدارة التغذية والأغذية

Dear Dr. Jim Painter,

It gives me a great pleasure discussing with Mr. Nayef Bu-Maryoum former dietician and dietetics training coordinator used to work at the Ministry of Health in Kuwait in Administration of Food and Nutrition and currently is a teacher at the Health Science College at Public Authority for Applied Education and Training. The results of the thesis were very beneficial and helpful to use in our future diabetes researches.

In addition, I will look forward to work with Mr. Bu-Maryoum on additional researches in the future. Thanks.

Sincerely,

Dr. Entisar Al-Shammari
Ministry of Health,
State of Kuwait.
26.11.2005

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4813905 / ف