SHORT NUTRITIONAL VIDEOS AND KNOWLEDGE CHANGE IN A
POPULATION OF LOW-INCOME INDIVIDUALS IN A COMMUNITY OUTREACH
SETTING.

A Thesis

Presented in Partial fulfillment of the Requirements for the Degree Master of Science in
the Graduate School of The Ohio State University

By

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* * * * *

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ABSTRACT

Lack of nutritional knowledge can lead to behaviors that increase the risk for chronic disease. Innovative nutritional programs are needed to help increase awareness and knowledge of nutrition, especially in low-income, minority populations who suffer from health disparities. The use of video and other forms of multimedia provide an easy, convenient, and cost effective means of delivering nutrition education to populations in community outreach settings.

The purpose of this study was to determine if viewing a Nutrition Short Educational Clip (N-SEC) video will be associated with a change in knowledge and on the intention to change behavior in a population of low-income individuals in a community outreach setting. Fifty-two individuals in two free community outreach settings volunteered to participate in this study. The participants were given a nutrition knowledge pretest, followed by a 3 minute Nutrition Short Educational Clip (N-SEC) of their choice - fiber or diabetes- presented on an iPad®. The participants were then given a posttest, designed to measure a change in knowledge, behavioral intention, and satisfaction for the N-SEC presentation.

The results of this study demonstrated an improvement in knowledge scores from pretest to posttest for both the fiber and diabetes Nutrition Short Educational Clips (N-SECs). Post-viewing, the vast majority of the participants reported an intention to
change behavior and were very satisfied with the N-SECs. This study demonstrates that Short Nutrition Education Clips shown in community outreach settings may be a convenient, cost effective means for nutrition information, and lead to an increase in nutritional knowledge, and in the intention to change behavior toward a healthier lifestyle.
DEDICATION

To my parents, for their unconditional love and never ending pride

To my husband, John, for his patience and support

To my children, Brian, Kristi, and Lindsay for their love and encouragement

To my grandsons, Kaesyn and Maguire for being my shining light
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To Dr. Jill Clutter, you were one of my first professors when I came back to The Ohio State University to finish my undergraduate degree. It seems only fitting that you should be with me as I complete my educational journey. Thank you for all of your encouragement, help, and comic relief throughout the years. The educational world needs more like you. I am so appreciative to have gotten to know you.

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And to the entire faculty of Medical Dietetics, I have never met a group of individuals who are more dedicated and genuinely concerned about the welfare of their
students. You have always been willing to lend a helping hand. You raise the bar, and should serve as an example for others to follow. Thank you all for a very rewarding learning experience.
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Chapter 1: Introduction

**Background of Problem**

Heart disease, stroke, diabetes, cancer, respiratory illness, arthritis, and oral diseases significantly affect our nation’s health.\(^1\) These chronic diseases have the potential to reduce quality of life and shorten a person’s life span. Our nation continues to increase spending on health care, with rates tripling since 1990, yet the life expectancy in this country is lower than many other nations that have lower health care expenditure.\(^1\) Centers of Disease Control and Prevention reports the United States spends approximately 75% of health care dollars on individuals with chronic disease.\(^1\)

Approximately one-out-of-two adults are affected by these illnesses. In addition, approximately seven-out-of-ten deaths per year are due to chronic disease.\(^1\) Therefore, one of the overarching goals of Healthy People 2020 is to “attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.”\(^2\)

**Health Disparity**

The population at greatest risk for chronic disease is those individuals least likely to afford healthcare. Low-income, ethnically and racially diverse individuals carry a higher burden of chronic disease rates. This creates health disparities, or
differences in health determinants and outcomes that affect certain populations to a greater extent. Health disparity was first defined by the National Institute of Health (NIH) in 1999 as “the differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States.”

The interrelationship of genetic, behavioral, social, physical, economic, and environmental factors influence health status and contribute to health disparity. African Americans, Asian Americans, Hispanics, American Indians, Alaskan Natives, and Pacific Islanders are reported to be in poorer health and experience higher mortality rates than Caucasians. These racial and ethnic minority groups account for an increasing percentage of the American population. Therefore improvements in health for the entire nation will affect the future health of these populations who now suffer more from chronic diseases.

When discussing improvements in health, it is important to understand that some health determinants, such as genetics, are not amenable to change. Moreover, factors such as living conditions, culture and economics can be difficult for lower socioeconomic populations to change. Behavior, however, is a personal health determinant that is amenable to change. Making positive changes, such as not smoking, making healthy food choices, and engaging in regular physical activity can help to prevent, control and decrease the incidence of chronic disease.

**Significance of problem**

Many chronic diseases, such as heart disease, diabetes and some forms of cancer have nutritional associations. In order to prevent and/or control these chronic diseases and reduce the burden on the health care system and on society in general, knowledge
and awareness of how to use nutrition to change behavior is imperative. In an effort to change behavior, knowledge is an important first step. While all people need this knowledge, there tends to be disparity in low-income, racially and ethnically diverse populations. Factors such as a lower level of education, cultural and language barriers have been shown to be correlated with health disparity. 6,7,8,9,10

The complexity of factors that interact can make it a challenge for health professionals to educate the public on ways to prevent and control chronic disease. Programs have been previously implemented to help this population become more knowledgeable about nutrition and health, and to take better control of their health. 10,11,12,13,14 The problem with some of these programs lies in the cost of implementation and maintenance. Many of these studies require the presence of a health care professional to conduct the educational program. This can become costly, especially if any long term behavioral benefit is to be realized. It would require a lengthy program, and follow up. All of this involves money and time. There is a need for learning opportunities that are convenient, simple, cost effective, and that can reach a large audience of low income, ethnically and racially diverse individuals even when nutritional professionals are not available.

With expanding technology comes innovative ways of increasing knowledge which can potentially reach larger audiences at a lower cost. Some studies have demonstrated the use of media as an effective teaching strategy. 7,11,15,16,17,18,19,20,21 More studies are needed to further demonstrate not only effectiveness, but feasibility.
in implementing programs that are easier to understand, hold the attention of the viewer in order to absorb knowledge, and reach a large number of diverse individuals.

The use of videotapes and other forms of multimedia to provide nutrition and health information in settings that will access diverse populations is important. The waiting areas of community outreach programs provide ideal locations for learning opportunities. Clients often wait for an extended period of time to visit with a health care professional, or other assistance program provider. This is an opportune time to deliver health messages through the use of video. These people may potentially be able to observe and retain some of the information from these video presentations. This could potentially lead to behavioral change, and a subsequent decreased risk for chronic disease and a better quality of life.

**Purpose of the Study**

The purpose of this study was to determine if viewing a Nutrition Short Educational Clip (N-SEC) video is associated with a change in knowledge and in the intention to change behavior in a population of low-income individuals in a community outreach setting.

**Objectives:**

1) To determine if a change in nutrition knowledge occurred post viewing of a Nutrition Short Educational Clip (N-SEC).

2) To determine the intention to change behavior post viewing of a Short Nutrition Educational Clip (N-SEC).

3) To determine participant satisfaction of a Nutrition Short Educational Clip (N-SEC) as a nutritional tool in a community outreach setting.
Definition of terms

Health determinants- A combination of many factors that affect the health of individuals and communities. Factors such as genetics, a person’s individual behaviors, living conditions, the state of the environment, income and education level, and relationships with family and friends all have a considerable impact on health.22

iPad®- a type of tablet computer designed, developed and marketed by Apple Inc. It is primarily used as a platform for audio-visual media including books, movies, games, and web content. The iPad is operated by a multitouch display, and an onscreen keyboard. The iPad uses a wireless local area network (“Wi-Fi”) to connect to the Internet.23

Socioeconomic status- the class or social standing of an individual or group. It is usually measured as a combination of income, education, and occupation.24

Operational definitions

Community Outreach- an effort by individuals in an organization or group to connect its ideas or practices to the efforts of other organizations, groups, specific audiences or the general public.25 For this study, community outreach is defined as sites providing healthcare services to persons who cannot afford or choose to not use the traditional healthcare sites for their care. In addition to healthcare services, community outreach sites also provide food, clothing and shelter to those who cannot afford the basic essentials of everyday life. The target market group of these sites is individuals who are low-income.

Nutritional knowledge – For this study, nutrition knowledge of fiber or diabetes is defined as correct answers to a five-item, multiple choice question. A perfect score is equal to 5.
Nutrition short educational clip (N-SEC) - For this study, N-SECs refer to a variety of power point presentations created by Medical Dietetic students, with nutrition education as the focus. These video presentations are uploaded onto an iPad, and presented to participants as a continuous playing presentation.
Chapter 2: Review of Literature

Health Disparity

*Healthy People 2020* defines health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.” This problem exists throughout the United States.

Low income populations don’t always have access to health care or nutritional information and knowledge that would help them prevent and control chronic diseases, such as cardiovascular disease, cancer, and diabetes. All of these diseases can be prevented and/or controlled through diet. It is important to be able to reach this population in order to give them the tools to take care of themselves properly.

Low literacy, cultural beliefs, access, and language are just a few of the barriers that members of low-income minority populations have to face. According to the results of the National Adult Literacy Survey, 41-44% of adults in the lowest
level of each of the 5 literacy scales live in poverty.\textsuperscript{27} In addition, people who live below the poverty level reported significantly poorer physical and mental health than persons living above the poverty level.\textsuperscript{28}

Low socioeconomic status (SES) is a risk factor for diabetes, and one of the factors associated with SES is level of education. There is a negative correlation between educational level and poverty status, so educational level may also be a risk factor for diabetes. The populations at highest risk for diabetes- African Americans, Hispanics, lower SES, and senior citizens- receive less formal diabetes education. People with less than a high school education also have the highest prevalence of diabetes. The disparity in DSME (diabetes self-management) can be partially explained by limited access to DSME programs and to poor quality of care for the medically underserved.\textsuperscript{9}

A study by Kemper, et al compared diabetes knowledge level of low-income adults who did not have a high school diploma or general equivalency diploma with those who did. The age range of subjects was 30-90 years, with a median age of 70.5 years. From the convenience sample of 28 individuals, sixty-one percent did not complete high school, forty-seven percent went to a health clinic for primary health care, and four had no transportation for health care appointments. The average number of years with diabetes was 11.6. Over half of the participants reported that they had one or more comorbid conditions that may be the result of diabetes: 50% reported having cardiovascular disease, 89.3% had hypertension. 75% had vision problems, 64.3% had neuropathy, 17.9% had kidney problems, and 10.7% had a limb amputated.\textsuperscript{9}

A survey was given to the subjects to address knowledge about diabetes and its management, and accessibility of community resources. The survey was written at a 4\textsuperscript{th}
grade reading level, and included sections on DSME, practice of diabetes self-management, demographics, activities, resources, and other medical problems. An investigator read the survey questions to each participant due to potential cultural and literacy issues. The two groups differed significantly in the amount of education they received in relation to the causes and treatment of hypoglycemia. The group with high school diploma reported more diabetes education about cause of low blood sugar (M = 3.55, SD = 1.21) compared to the group without high school diploma (M = 2.29, SD = 1.45). The difference was significant. High school grads reported more education on treatment of low blood sugar (M = 4.00, SD = .89) compared to the no high school grad group (M = 2.71, SD = 1.5), again, the difference was significant. Individuals without a high school diploma or GED received less formal diabetes self-management education. In addition, the two areas that were significantly different were related to understanding and management of hypoglycemia. This knowledge is essential if a self-management program is going to be effective. Due to the macro and microvascular complications of diabetes, the disease can be costly in terms of quality of life, morbidity and mortality and health care dollars spent for treatment.

DSME programs that reduce barriers to education in low income populations with low literacy will provide a significant investment toward health and well-being, and in health care dollars saved. Persons with diabetes who are able to manage the disease decrease the risk of complications (hypoglycemia, foot ulcers, hypertension). Educational interventions aimed at improving self-management of diabetes are needed to reach this particular population. Ninety-nine percent of disease management for diabetes requires that the client self-manage the disease, which requires education.
Theory

Knowledge is power. It is necessary but not sufficient to change behavior. However, it is an important starting place. There are a multitude of theories that explain behavior change. The field of nutrition seems to pull from several theories to explain behavior. In a population of low-income, minority individuals, there is more than just individual behavior to consider. Many other factors influence how a person behaves. In regards to nutritional choices, environment and culture play a role in minority groups, such as African American, and Hispanic. The Socio-Ecological Model can be used to explain the factors involved in behavior and in behavioral intentions. This model proposes five levels of influence on behavior: intrapersonal, interpersonal, community organizational, and public policy. It is the interaction of these levels that can influence behavior. 29

In a literature review of studies, Robinson, et al examined 12 studies that focused on fruit and vegetable intake of low-income African Americans from a socio-ecological perspective. The intent was to offer rationale for and guidance on integrating socio-ecological concepts into health promoting programs intended to improve dietary behaviors among this population. 29
The rationale for this review was that most Americans consume less than the recommended amounts of fruits and vegetables according to the USDA dietary guidelines. Non-Hispanic blacks, and low-income populations are among those who are the least likely to consume recommended amounts.

The U.S. Department of Health and Human Services associates dietary factors with 4 of the 10 leading causes of death—coronary heart disease, stroke, type 2 diabetes, and some forms of cancer. Diet is also related to HTN, osteoporosis, and iron deficiency anemia. The population groups with the highest mortality and morbidity rates due to these chronic diseases are the ones least likely to follow the USDA dietary guidelines recommendations—African Americans and persons of lower SES.²⁹

In addition to individual behaviors, there are socio-cultural factors that come into play when making decisions related to health and nutrition. In African Americans, cultural beliefs and attitudes contribute to preventative self-care behaviors. Their attitudes and behaviors are influenced by the attitudes and beliefs of past generations. This is especially true when it comes to dietary choices and their trust in health professionals. African American women also have a different perspective of ideal body size. It is more accepted in this race for women to have a larger body size, which can lead to overweight and obesity. This population is an ideal target for health promotion interventions due to their increased risk for chronic disease. However, given the social and environmental factors involved, it is a challenge to design appropriate programs that will reach this population and contribute to increasing education, and behavioral intentions.²⁹

The Socio-Ecological Model (SEM) offers a broader perspective for the African American population. This model provides a comprehensive approach involving multiple
levels of influence that are aimed toward impacting health behavior and health outcomes. These levels include intrapersonal, interpersonal, community and organizational factors, and public policies. This model includes the environmental and social components that affect individual behavioral changes.

To improve the health of certain populations, it is important to design and implement programs that include multiple levels of behavioral influence. In the review by Robinson, et al the following principles were used a basis for the degree to which an ecological approach was integrated into an educational program:

1) A program that integrates more individual and environmental targets across a variety of settings is more ecological.

2) A program will include at least two different strategies- one that uses the client as the direct target and at least one other one that uses a component of the environment as a target.

3) Because the target of an intervention defines its ecological character, rather than the setting, more emphasis should be put on the number of targets instead of the number of settings.

All 12 studies indicated that the intrapersonal level of influence should be at least one of the intervention targets. Seven studies recommended targeting the interpersonal level of influence. Four studies recommended targeting the organizational level. Two recommended the community level and one recommended the policy level of influence. Four recommended integrating environmental and individual targets across a variety of settings. Ten studies recommended at least two different strategies to increase fruit and vegetable consumption or improve dietary behaviors. Five studies met criteria for having
at least one strategy directed at the client and at least one other targeting a component of
the environment.  

All studies indicated that intrapersonal or individual factors contribute
significantly to the dietary behaviors of African Americans. All studies identified
strategies that focused on individual risk factor reduction and behavior change. Four
studies recommended targeting only the intrapersonal level. 

Intrapersonal factors that influence dietary behaviors and fruit and vegetable
intake among African Americans include taste, preferences, lack of knowledge, and/or
belief in the association between diet and health, habits and self-efficacy.

Several studies suggested that some individuals can be motivated to adopt
positive lifestyle habits and should be targeted for nutrition education programs that
increase awareness about healthy/unhealthy food choices, increase awareness of health
benefits of fruits and vegetables and the diet-disease relationship, and increase awareness
of the low cost associated with meeting the national fruit and vegetable
recommendations. Other suggestions were to target the individual focusing on self-
efficacy, and skill enhancement with regard to meal/menu planning and preparation,
reading food labels, modifying traditional recipes to be healthier and
shopping/purchasing healthy foods on a low budget.  

Seven out of eight studies that recommended targeting beyond the intrapersonal
level of influence indicated that interpersonal factors also played a key role in the dietary
behaviors of African Americans. This level of influence includes the individual’s social
environment, and the impact that family, friend, and peers have on individual behavior.
For African Americans, many of these influences are based on cultural traditions and role expectations.\textsuperscript{29}

In six of seven articles recommending targeting the interpersonal level of influence, the role of women was a major focus of this process. One study found that women are good targets for programs because they were primarily responsible for shopping and food preparation. They were also significant sources of health and nutrition information and usually more interested in improving their health habits than men.\textsuperscript{29}

Five studies recommended targeting the physical environment through one or a combination of organizational, community and public policy levels of influence. Access and availability seemed to be the driving forces for targeting components of the physical environment. One study found that women with access to supermarket shopping tended to consume more fruits and vegetables than those with access to local markets.\textsuperscript{29}

As part of the environment and organizational influence, the church was found to play a key role in influencing lifestyles and behaviors in the African American communities. It was suggested that churches be used as a prime site for implementing health education programs.\textsuperscript{29}

Five of the studies were the most ecological in that they recommended the integration of environmental and individual targets using a variety of settings, incorporating multiple targets and including at least two different strategies, with the client as a direct target and at least one other targeting a component of the environment. These studies suggested settings such as churches, neighborhoods, summer programs for children and adolescents, grocery stores, restaurants, health/medical care organizations, and health education and promotion organizations for target for intervention strategies. \textsuperscript{29}
Based on the 12 descriptive studies, the dietary behaviors and fruit and vegetables intake of African Americans are the result of a complex interplay of personal, cultural, and environmental factors that can be described using the five levels of influence conceptualized by the Socio-Ecological Model. This model provides a useful framework for achieving a better understanding of the multiple factors and barriers that impact dietary behaviors and can provide guidance for developing culturally appropriate and sensitive intervention strategies for African Americans.\textsuperscript{29}

**Educational Methods**

Various educational methods exist to attempt to raise awareness and knowledge of nutritional topics. It is important to make the public aware of these topics in order to arm them with tools to prevent nutritionally related chronic disease, and to learn how to control these diseases once they exist.

In the low income population, there needs to be an increase in awareness and knowledge, because this population has an unbalanced share of disease related to nutrition. In order to arm this population with every tool available to prevent and control disease, knowledge is key. There are different methods that have been employed in order to attempt to raise awareness and increase knowledge in this population. Some are effective, some are not. A thorough review of those studies that have been proven effective is important in order to move forward to address this problem. Researchers can build on these effective methods to design and implement interventions for this population that will work to increase their knowledge of nutrition and related disease states.
Abood, et al evaluated a school-based nutrition education with minimal intervention (MI) on the ability to increase nutrition knowledge, attitudes, peer and family influences, behavioral intentions, and program satisfaction. A nutrition program with minimal intervention (MI) is ideal for a school setting because it is brief, population-based, and low cost. It is not demanding of time or intensive. A brief intervention such as the one in this study has the potential to change behavior by increasing nutrition knowledge and improving behavioral intentions. Limited research has been done to determine if brief exposure to a nutrition program is enough to promote learning, which will change behavior.\textsuperscript{11}

The intervention consisted of two 30 minute presentations over the course of one week during regularly scheduled health classes.\textsuperscript{11} There was significant improvement in mean percentage correct on knowledge portion of the test for experimental group, and the mean percentage correct was significantly higher for the EC (experimental condition) vs. the DTC (delayed treatment condition). However, the MI had no effect on attitudes between or within groups.\textsuperscript{11} The percentage of EC subjects who believed friends felt it was important to maintain a healthy weight increased significantly from pre to post test in EC group. The posttest percentages
were significantly higher in the EC group vs. the DTC group. However, there was no difference between or within groups regarding the importance family places on maintaining a healthy weight.\textsuperscript{11}

There was a significant improvement in EC group from pre to posttest in behavioral intentions to eat fewer fried foods, eat fewer sweets, look more at food labels, and limit TV. The EC group also differed significantly than the DTC group for behavioral intentions.\textsuperscript{11}

The majority of EC subjects found the information interesting, useful, easy to follow, and the classroom teacher an effective presenter. (67% found the program interesting, 87% found the program easy to follow, 73% found the information useful, and 75% found the presenter effective).\textsuperscript{11}

The findings of the study showed that the MI program improved nutrition knowledge and improved positive behavioral intentions to eat fewer fried foods, fewer sweets, look more at food labels, and limit TV watching. It also demonstrated the role of friends in motivating positive dietary behavior and in healthy weight maintenance.

Intention to exercise more and intention to change physical activity levels did not change. The authors stated that these intentions may be more difficult to change. The authors noted that teens were more likely to change specific behavior rather than general behaviors.\textsuperscript{11}

Due to the rise of overweight and obesity in the past several decades, partially due to poor dietary choices, it is important to address ways to increase
awareness and knowledge of making healthier choices. The lower income population seems to be at higher risk. Convenience and cost determine many of their food choices, and nutrition is not the number one determinant.

The use of interactive media that is educational and entertaining is a feasible opportunity to communicate nutrition knowledge and help increase retention of knowledge in low income populations. The use of media to increase understanding of specific health issues has become more available. This approach has the capability of reaching a large, diverse audience, it is cost-effective, and it holds the audience’s interest. The MUG (Media Uses and Gratification) paradigm focuses on how individuals select and use media for their own needs. It proposes that individuals will seek out different media to satisfy their educational, entertainment, and information needs. As the number of media choices increases, health educators must consider which mode is the best one for their target audience.\textsuperscript{10}

In a study by Silk, et al the use of interactive media was used to examine the effectiveness of three modalities for delivery of nutrition education in a group of 155 low-income female between the ages of 18 and 50 years. The yearly income was \( \leq \) 185\% federal poverty level. The sample consisted of 68\% European American, 25\% African American, 5\% Latino, 1\% Asian, and 1\% other. Eighty-seven percent had less than a college education, 65\% had a computer in the home, and 75\% had Internet access in the home.\textsuperscript{10}

In this study subjects were randomly assigned to 1 of 3 media modality conditions: interactive game (\textit{Fantastic Food Challenge}); Web site; pamphlet. The
content was same across all modalities. Each contained information about the USDA MyPyramid food guidance system; food groups; serving sizes; safety and storage; meal ideas; and pricing.\textsuperscript{10}

There was a significant effect in the Web site being more likeable than the pamphlet and the game modality. The Web site modality rated highest in attention paid to the modality, understanding of content and intent to return to the modality for additional information. The web site and video game were rated significantly higher on attention, the video game was rated significantly lower than the web site on ease of understanding, and web site was significantly higher than the pamphlet on intention to use in the future. The web site group learned significantly more than the game group. There was no significant effect for overall knowledge retention by time or by modality.\textsuperscript{10}

The results of this study support the uses and gratification paradigm, in that the subjects chose the modalities in terms of attention, understanding, and intention to use for future information. This population of women paid more attention to new media technologies of game and web site rather than the traditional print modality. This indicates that novel presentations of information may be helpful in attracting interest. The web site was the most helpful in this population for understanding the messages. The game was perceived as a game rather than a source of information. There was no retention of nutritional literacy between time 1 and time 2, however. This may be because the subjects may have needed more time with the media to increase learning.\textsuperscript{10}
Multimedia and Nutritional Messages

Awareness and knowledge of health and nutrition related problems are important in any and all populations. Healthcare systems have a responsibility to educate patients about health promotion and prevention. However, most healthcare settings and healthcare practitioners have a limited amount of time for education. Strategies are therefore needed to provide this type of education. Waiting rooms of clinics, primary care offices, and public health facilities are feasible areas to provide this education, partly because this is where individuals spend a decent amount of time waiting for appointments. Patients can learn while they wait.¹⁹

In order to reach a population comprised mostly of lower-income, minorities, and possibly low literacy individuals, teaching methods that are suitable for these populations of individuals are necessary. As technology advances, the use of multimedia has increased in use, due in part to its low cost and ease of use. This method offers an effective means of reaching a large audience, especially those populations comprised of lower income, minority and lower literate individuals. It affords a way to increase knowledge in various areas of nutrition and health. The use of videotapes and other forms of multimedia provide information consistently in an interesting way, especially to those people with low literacy skills. These forms of education are a low cost method of providing information to a large number of individuals.¹⁹

Numerous studies have demonstrated the effectiveness of media in increasing awareness, knowledge, and possibly behavioral intentions. In a randomized controlled trial by Campbell, et al WIC participants viewed a soap opera type video in kiosks set up in WIC clinics. These interactive media presentations focused on choosing healthy foods,
and on improving knowledge of infant feeding practices. The intervention group participants increased their knowledge in both areas. The participants also showed increased self-efficacy immediately post intervention. However, at 1-2 months follow up, while self-efficacy still showed improvement, it was no longer significant. This study demonstrated that a tailored nutrition education program could be developed and implemented in a setting such as WIC. Nutrition knowledge and self-efficacy to choose healthier food options improved, but actual behavioral change did not change. The authors stated that the intervention was not extensive enough to demonstrate behavioral change.\textsuperscript{15}

In as much as there are benefits to videotape instruction, Oermann points out several disadvantages, such as distractions such as TV, talking, crying children, etc. These other distractions can keep some patients from fully focusing on the media that is in use. Patients are also at a disadvantage in that there is no chance to ask questions about the content of the video. In spite of these disadvantages, this type of education holds potential as an effective method for delivering important health messages to low-income, low literate individuals, who otherwise lack the means for obtaining and the understanding of more traditional forms of nutrition and health information.\textsuperscript{19}

In a study by Rifkin, et al the use of digital photo receivers (DPR) provided a new way to deliver nutritional education to low-income populations in urban settings where this population congregated to receive food stamps. A digital photo receiver uses technology to display digital photos. Up to 30 photos can be sent from an internet connection to the DPR storage site. The receiver looks like a photo frame, is lightweight and only requires a source of electricity to provide a slide show presentation. This is a
feasible method of providing health related information to the public in general, and to low-literate, low-income individuals in particular, while these people are waiting in line for food stamps, or waiting for an appointment at a health clinic.\textsuperscript{20}

The use of computers is another method of delivering education. This form of media, especially interactive multimedia (IMM), which uses text, video, audio and graphics, has grown substantially over the past 20 years. It also requires less literacy requirements when compared to computer programs that are text based. Research has shown that paper and pencil forms of evaluations can be more challenging for low-income and Hispanic populations. Computers can overcome this literacy barrier, partly because the questions can be presented through graphics and audio, which help understanding.\textsuperscript{7}

\textit{La Cocina Saludable} was an IMM program consisting of six modules that taught basic nutrition topics aimed at a convenience sample of low-income Hispanic mothers. This study by Jantz, et al took place at family learning centers in Colorado. The \textit{La Cocina Saludable} program was well received by low-income and Hispanic participants. This program was effective in increasing knowledge, skills and intended behavior.\textsuperscript{7}

More literature shows effectiveness of tailored print materials for improving nutrition. New technology, such as interactive computer-based programs can offer health information to persons with limited access to this information. Benefits include: delivery in clinical settings without reliance on staff time; less travel time; employment of an educational tool appropriate for low-literate populations; promotion of behavior change through video demonstrations vs. written descriptions; tailoring of information to user’s
needs and interest; and exposure to information technology and computer activity for populations who have little access to such technology.

In a randomized controlled trial, Tessaro, et al evaluated a computer-based interactive nutrition intervention called *Cookin’ Up Health* on the effectiveness of reducing cardiovascular disease risk in a population of low-income women by promoting an increase in fruit and vegetable intake and a decrease in dietary fat consumption. Using a cooking show theme, the program explained the benefits of healthy eating, provided information on nutrition labeling, and demonstrated meal preparation focusing on healthy choices and portion control. At the end of the study, intervention group had significantly improved scores on knowledge of dietary fats, food label reading, and readiness to eat 5 fruits and vegetables per day and foods lower in fat.²¹

Research shows that nutrition education improves the diets of low-income individuals. Video-tape is an effective, low-cost method of providing nutrition-related education, in order to increase knowledge. Video-tape instruction has been used in low-Income nutrition programs such as the Expanded Food and Nutrition Education Program (EFNEP), and the Special Supplemental Nutrition Program for
Women, Infants and Children (WIC), and in many health department waiting rooms. Few studies, however, have been done to evaluate the effectiveness of these programs.

Joy, et al evaluated the effectiveness of using a short, (12 minute) focused video-tape to increase the amount of vegetables consumed and to improve nutrition-related knowledge in food stamp recipients. Research shows that low-income families tend to have low intake of fruits and vegetables, so the video-tape theme was directed toward increasing the intake of vegetables.¹⁷

At 2-4 week post intervention, the post-test revealed a statistically significant increase in vegetable consumption for both the experimental and control groups. The experimental group increased consumption by 1.28 servings, control by 0.50 servings. When vegetables were accounted for individually, the only significant increase was in potato consumption in the experimental group. This increase was significant. The mean number of times vegetables were eaten over a 48-hour period increased for both raw and cooked vegetables in the experimental group. In addition, the vegetable knowledge score was highly significant for the experimental group.¹⁷

Addressing the problem of chronic disease in general, and in low-income, minority populations in particular, is a challenge for health professionals. Due to the complexity of interacting factors involved, there is not one single method that will eliminate health disparity and chronic disease. Various programs and methods of education and behavioral modification have been implemented, some more successful than others. Technological advances have opened the doors for newer educational methods that may prove successful for reaching a larger audience of low-income, ethnically and racially diverse individuals. For these methods to be helpful to this
population, they will need to be simple, easy to understand and use, and cost effective. The fewer barriers to cross, the greater the chance for these programs to be successful.
Chapter 3: Methodology

Introduction

This chapter describes the research design, sample and setting, instrumentation and development of videos, procedure, data collection, and statistical analysis.

Research Design

The purpose of this study was to measure a change in knowledge and the intention to change behavior post viewing of a Nutrition Short Educational Clip (N-SEC) in a population of low-income adults in a community outreach setting. This pilot study was a quasi-experimental, pretest, posttest design. The protocol for the study was submitted for review and approved by the Institutional Review Board at The Ohio State University.

Sample and setting

Fifty-two participants were recruited through two urban community outreach settings in Central Ohio. Eligibility criteria included 18 years or older, and the ability to read, write and speak English.
**Instrumentation and development of N-SECs**

The instruments used in this study were developed by the investigator and validated by experts in the field of nutrition. Please see Appendix B for examples of the instruments. The pretest consisted of four demographic questions for race/ethnicity, education level, gender, and age.

Based upon the material presented in each N-SEC, multiple choice questions were developed to measure knowledge. The questions were evaluated for correct content and answers by nutrition experts. The following five multiple choice questions were used to measure knowledge regarding fiber.

1. Which food contains the most fiber:
   a. Apple
   b. Chocolate chip cookie
   c. Cheese
   d. Fried chicken

2. Fiber is beneficial for:
   a. Preventing constipation
   b. Lowering blood sugar levels
   c. Reducing cholesterol levels
   d. All of the above

3. Which would be the best rice to choose for increasing fiber:
   a. Brown rice
   b. White rice
   c. Fried rice
   d. All of the above
4. Which would be the best cereal choice for increasing fiber:
   a. Corn flakes
   b. Rice Krispies
   c. 100% bran cereal
   d. Fruit loops
5. How much fluid should you drink per day when increasing fiber (or anytime):
   a. 1-3 glasses
   b. 2-5 glasses
   c. 5-8 glasses
   d. 8-12 glasses

The following five multiple choice questions were used to measure knowledge regarding diabetes.

1. Which is the best activity to help reduce your risk for diabetes:
   a. Walking
   b. Gardening
   c. Dancing
   d. All of the above
2. Which is the best ways to help reduce your risk for diabetes:
   a. Eat more fiber
   b. Lose a few extra pounds if overweight
   c. Be more active
   d. All of the above
3. To help reduce your risk for diabetes, which is the best food choice:
   a. French fries
   b. Apple juice
   c. Black beans
   d. Hot dog
4. To help reduce your risk for diabetes, which is the best beverage choice:
   a. Orange soda pop
   b. Kool-Aid
   c. Apple juice
   d. Fat free milk
5. To help reduce your risk for diabetes, which is the best meal choice:
   a. A cheeseburger with French fries
   b. Whole wheat pasta with marinara (tomato) sauce and a vegetable salad
   c. Beef and cheese burrito with Mexican rice
   d. Fried chicken with mashed potatoes and gravy

The pretest and the posttest consisted of the same five knowledge questions; however they were in a different sequence. The posttest also consisted of five questions to measure the intention to change behavior. These were also multiple choice, with three possible answers: “yes”, “no”, or “I don’t know.”

The five questions to measure intention to change behavior for the fiber N-SEC were:

1. I will try to choose more raw fruits and vegetables.
   a. Yes
   b. No
   c. I don't know
2. I will try to choose more foods that have at least 5 grams of fiber per serving.
   a. Yes
   b. No
   c. I don't know
3. I will try to choose bread that lists “whole wheat” as the first ingredient on the label.
   a. Yes
   b. No
   c. I don't know
4. I will try to choose high fiber cereal for breakfast
   a. Yes
   b. No
   c. I don't know
5. I will try to choose brown rice instead of white rice.
   a. Yes
   b. No
   c. I don't know

The five questions to measure intention to change behavior for the diabetes N-SEC were:

1. I will try to be more active to reduce my risk for diabetes.
   a. Yes
   b. No
2. I will try to eat foods higher in fiber to reduce my risk for diabetes.
   a. Yes
   b. No
   c. I don't know
3. I will try to choose brown rice instead of white rice to reduce my risk for diabetes.
   a. Yes
   b. No
   c. I don't know
4. I will try to choose whole wheat bread instead of white bread to reduce my risk of diabetes.
   a. Yes
b. No  
c. I don't know

5. I will try to limit the amount of sugary foods and beverages I choose to reduce my risk for diabetes.  
a. Yes  
b. No  
c. I don't know

For each Nutrition Short Educational Clip (N-SEC) there were four acceptability/satisfaction measurements regarding the actual N-SEC on the posttest. The answers to these questions were “yes” or “no”.

These questions included the following:

1. This Nutrition Short Educational Clip (N-SEC) was easy to read.  
a. Yes  
b. No

2. The information in this Nutrition Short Educational Clip (N-SEC) was confusing.  
a. Yes  
b. No

3. This Nutrition Short Educational Clip (N-SEC) would be a good way to occupy my time while waiting for my appointment.  
a. Yes  
b. No
4. I would like to see more of these Nutrition Short Educational Clips (N-SECs) on different nutritional topics.
   a. Yes
   b. No

There was also one open-ended question: “Any other comments?”

The two Nutrition Short Educational Clips (N-SECs), “Eat More Fiber” and “Ideas for Reducing Your Risk for Diabetes” were developed by undergraduate and graduate students majoring in Medical Dietetics at a Midwestern University. The N-SECs were then reviewed by three to four dietitians for nutrition knowledge content. Each N-SEC lasts approximately three minutes, is written at the sixth grade level, and is made to be shown on portable medians such as the iPad. For this study, the video and the survey instruments were loaded to the iPads.

**Procedure**

Individuals 18 years and older were approached by the investigator and a research assistant during their waiting time at a community outreach setting and requested to participate in a research project on nutrition. The investigator explained the viewing of the Nutrition Short Educational Clip (N-SEC), the format of the pre and posttest, and instructed the participants on the use of the iPad. Please see Appendix A for the script used in requesting clients to participate in the study. The iPad provided a convenient method of personal viewing which is also easy to operate. The subjects were able to choose from two topics- one focused on fiber and one on diabetes. The investigators selected two topics that are widely known to affect this population, and of which knowledge could be of assistance to many of the clients visiting the community.
outreach sites. Fiber is a general nutrition topic needed by most people, and diabetes is a more specific topic to a disease state increasingly found in all populations.

Those individuals who agreed to participate were given the pretest, the design of which has been previously explained. Upon completion of the pretest, the participants viewed a three minute N-SEC of their choice- fiber or diabetes- on an iPad.® Immediately following the N-SEC, the participants were given a posttest, the design of which has been previously explained.

**Data Collection:**

Data was collected at two community outreach settings on five separate occasions. The two sites were selected due to the diverse groups of persons visiting the sites as well as the known waiting time to see a healthcare professional, or to receive other services. The results from the questionnaires were then entered into Google Documents, an online data program. This program enters data from the surveys onto a spreadsheet, and returns summary of responses.

**Statistical Analysis:**

Means, standard deviations, frequencies, and percentages, were used to analyze and describe the data. A paired t-test was conducted to determine if differences existed in the pre and post knowledge scores. A p-value of $\leq 0.05$ was used to determine significance.
Chapter 4: Results and Discussion

The purpose of this study was to determine if viewing a Nutritional Short Educational Clip (N-SEC) video is associated with a change in knowledge and in the intention to change behavior in a population of low-income individuals in a community outreach setting. A secondary objective was to measure viewer’s satisfaction of the Nutrition Short Educational Clip (N-SEC) videos in this setting. This research is based on health disparity in a low-income population, and the consequential effect on nutritional knowledge and related health behaviors. The change in knowledge was assessed by pre and post viewing of a nutritionally themed video. In addition, the intention to change behavior was measured post viewing of the N-SEC, as was the acceptability of the N-SEC to the participants.

Subjects

A total of 52 individuals from two community outreach settings in urban Central Ohio volunteered to participate in the study in July-August, 2011. They completed a pretest, which measured knowledge and current nutritional behavior. They then viewed a Nutrition Short Educational Clip (N-SEC) video of their choice—fiber or diabetes- and completed a posttest, which measured a change in knowledge and the intention to change behavior.
Slightly over one-third (n=19) of the participants were male, and nearly two-thirds (n = 33) of the participants were female (Table 4.1). When calculated, a total of 24 participants viewed the fiber video, 6 male and 18 female (Table 4.2). Of the 28 participants who viewed the diabetes video, 13 were male and 15 were female. Nearly one-fourth (n=12) of the 52 participants were ages 18-29 years (Table 4.3). The next largest groups were participants ages 50-59 and 60-69, both with n=11 participants. This accounts for approximately one-fifth each of the total 52 participants. Only a small portion, (n=3) were age 70 years and older. When compiled by age according to N-SEC choice, the largest number (n=6, or 25%) of those 24 participants who chose to view the fiber N-SEC were 60-69 years (Table 4.4). In comparison, the largest number (n=7, or 25%) of the 28 participants who chose to view the diabetes N-SEC were 18-29 years.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19</td>
<td>37%</td>
</tr>
<tr>
<td>Female</td>
<td>33</td>
<td>63%</td>
</tr>
</tbody>
</table>

Table 4.1 Gender of participants in study

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>6</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>75%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Gender</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>54%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2 Gender of participants by N-SEC viewed
<table>
<thead>
<tr>
<th>Age in years</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td>30-39</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td>40-49</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>50-59</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>60-69</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>70 and older</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Average age = 47 years

Table 4.3 Age of participants

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Age in Years</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>5</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>4</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>5</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>6</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>70 and older</td>
<td>1</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Average age = 47 years

<table>
<thead>
<tr>
<th>Diabetes</th>
<th>Age in Years</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>7</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>3</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>5</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>6</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>5</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>70 and older</td>
<td>2</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
<td><strong>100%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Average age= 47 years

Table 4.4 Age of participants by N-SEC viewed
### Table 4.5 Race/Ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>21</td>
<td>40%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>26</td>
<td>50%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

One-half of the participants were Caucasian (26 out of 52 total participants). There were 21 out of 52 African American participants. These were the two largest groups by race/ethnicity. The smallest group was the Hispanic group with 2 participants (Table 4.5).

The largest proportion of participants (n=22) out of a total of 52 participants were high school graduates or obtained their GED (Table 4.6). This represents 42% of this population. The next largest category comprises participants (n=14) with some college. This represents 27% of this population. There were 9 participants out of 52 with some high school. The smallest category, 8th grade or less, was comprised of 2 participants out of 52 total.

### Table 4.6 Education level

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th grade or less</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Some high school</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td>High school graduate/GED</td>
<td>22</td>
<td>42%</td>
</tr>
<tr>
<td>Some college</td>
<td>14</td>
<td>27%</td>
</tr>
<tr>
<td>College graduate</td>
<td>5</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4.6 Education level
Analysis of Objectives

Scores for nutrition knowledge were measured using a pretest and posttest for each Nutrition Short Educational Clip (N-SEC). Both the pretest and the posttest contained the exact same five questions, but rearranged in a different order between the tests. The results of questions and responses from pretest to posttest by N-SEC viewed are compiled in table 4.7 for fiber and table 4.8 for diabetes.
<table>
<thead>
<tr>
<th>Question</th>
<th>Pretest Frequency of responses</th>
<th>%</th>
<th>Posttest Frequency of responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which food contains the most fiber:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Apple</td>
<td>22</td>
<td>92%</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>- Chocolate chip cookie</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- Cheese</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- Fried chicken</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Fiber is beneficial for:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Preventing constipation</td>
<td>6</td>
<td>25%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>- Lowering blood sugar levels</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>- Reducing cholesterol levels</td>
<td>2</td>
<td>8%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- All of the above</td>
<td>15</td>
<td>63%</td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td>Which would be the best rice to choose for increasing fiber:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Brown rice</td>
<td>21</td>
<td>88%</td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td>- White rice</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- Fried rice</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- All of the above</td>
<td>2</td>
<td>8%</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Which would be the best cereal choice for increasing fiber:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Corn Flakes</td>
<td>3</td>
<td>13%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- Rice Krispies</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>- <strong>100% Bran Flakes</strong></td>
<td>20</td>
<td>83%</td>
<td>23</td>
<td>96%</td>
</tr>
<tr>
<td>- Fruit Loops</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>How much fluid should you drink per day when increasing fiber (or anytime):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1-3 glasses</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>- 2-5 glasses</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>- 5-8 glasses</td>
<td>10</td>
<td>42%</td>
<td>5</td>
<td>21%</td>
</tr>
<tr>
<td>- 8-12 glasses</td>
<td>12</td>
<td>50%</td>
<td>18</td>
<td>75%</td>
</tr>
</tbody>
</table>

Table 4.7 Nutrition knowledge questions and responses for fiber N-SEC
<table>
<thead>
<tr>
<th>Question</th>
<th>Pretest Frequency of responses</th>
<th>%</th>
<th>Posttest Frequency of responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which is the best activity to help reduce your risk for diabetes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Walking</td>
<td>15</td>
<td>54%</td>
<td>4</td>
<td>14%</td>
</tr>
<tr>
<td>-Gardening</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-Dancing</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-All of the above</strong></td>
<td><strong>12</strong></td>
<td><strong>43%</strong></td>
<td>24</td>
<td><strong>86%</strong></td>
</tr>
<tr>
<td>Which is the best way to help reduce your risk for diabetes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Eat more fiber</td>
<td>3</td>
<td>11%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>-Lose a few extra pounds if overweight</td>
<td>7</td>
<td>25%</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>-Be more active</td>
<td>1</td>
<td>4%</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td><strong>-All of the above</strong></td>
<td><strong>17</strong></td>
<td><strong>61%</strong></td>
<td>23</td>
<td><strong>82%</strong></td>
</tr>
<tr>
<td>To help reduce your risk for diabetes, which is the best food choice:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-French fries</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-Apple juice</td>
<td>7</td>
<td>25%</td>
<td>4</td>
<td>14%</td>
</tr>
<tr>
<td><strong>-Black beans</strong></td>
<td><strong>19</strong></td>
<td><strong>68%</strong></td>
<td>23</td>
<td><strong>82%</strong></td>
</tr>
<tr>
<td>-Hot dog</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>To help reduce your risk for diabetes, which is the best beverage choice:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Orange soda-pop</td>
<td>1</td>
<td>3%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-Kool-Aid</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>-Apple juice</td>
<td>8</td>
<td>29%</td>
<td>10</td>
<td>36%</td>
</tr>
<tr>
<td><strong>-Fat free milk</strong></td>
<td><strong>19</strong></td>
<td><strong>68%</strong></td>
<td>17</td>
<td><strong>61%</strong></td>
</tr>
<tr>
<td>To help reduce your risk for diabetes, which is the best meal choice:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-A cheeseburger with French fries</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Whole wheat pasta with marinara (tomato) sauce and a vegetable salad</strong></td>
<td><strong>25</strong></td>
<td><strong>89%</strong></td>
<td><strong>25</strong></td>
<td><strong>89%</strong></td>
</tr>
<tr>
<td>-Beef and cheese burrito with Mexican rice</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>-Fried chicken with mashed potatoes and gravy</td>
<td>1</td>
<td>4%</td>
<td>1</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 4.8 Nutrition knowledge questions and responses for diabetes N-SEC
Nutrition knowledge scores were calculated for each participant on a scale from 0 to 5 correct answers on both the pretest and posttest. The results of the paired t-test indicate that there is a statistically significant change in knowledge from pretest to posttest for both the fiber and the diabetes N-SEC (p=0.0011 and p=0.0005, respectively). This value was significant when calculated for the videos separately and when combined (Table 4.9). For the fiber N-SEC, the mean pretest knowledge score was 3.8 ± 1.1, averaged from a range of scores from 0-5. The mean posttest knowledge score was 4.5 ± 0.8, showing an improvement in knowledge score. The mean pretest knowledge score for the diabetes N-SEC was 3.3 ± 1.4 averaged from a range of scores from 0-5. The mean posttest knowledge score for diabetes was 4.1 ± 1.4 again showing an improvement in knowledge score. When the nutritional knowledge scores from both of the N-SECs were combined, the mean pretest score was 3.5 ± 1.3, and the mean posttest score was 4.4 ± 1.0, indicating improvement in nutritional knowledge scores overall (p=0.0001). The calculated p-values were well below the standard set for significance at p < 0.05, indicating a high probability that the Nutrition Short Educational (N-SEC) had an effect on nutritional knowledge in this population.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest mean score</th>
<th>Standard deviation</th>
<th>Posttest mean score</th>
<th>Standard deviation</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber nutrition knowledge</td>
<td>3.8</td>
<td>1.1</td>
<td>4.5</td>
<td>0.8</td>
<td>0.0011</td>
</tr>
<tr>
<td>Diabetes nutrition knowledge</td>
<td>3.3</td>
<td>1.4</td>
<td>4.1</td>
<td>1.4</td>
<td>0.0005</td>
</tr>
<tr>
<td>Combined fiber and diabetes nutrition knowledge</td>
<td>3.5</td>
<td>1.3</td>
<td>4.4</td>
<td>1.0</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Table 4.9 Nutrition knowledge scores, paired t-test

The intention to change behavior was measured with five questions each for fiber and diabetes on the posttests. The results from the fiber posttest are compiled in table 4.10. The results from the diabetes posttest are compiled in table 4.11. The vast majority of the participants (average 96%) answered “yes” to the questions regarding intention to change behavior for fiber. For the intention to change behavior for diabetes, the average response to “yes” was 91%.
<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency of responses</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will try to choose more raw fruits and vegetables:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Yes</strong></td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td><strong>-No</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-I don’t know</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I will try to choose more foods that have at least 5 grams of fiber per serving:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Yes</strong></td>
<td>23</td>
<td>96%</td>
</tr>
<tr>
<td><strong>-No</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-I don’t know</strong></td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>I will try to choose bread that lists “whole wheat” as the first ingredient on the label:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Yes</strong></td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td><strong>-No</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-I don’t know</strong></td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>I will try to choose high fiber cereal for breakfast:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Yes</strong></td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td><strong>-No</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-I don’t know</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I will try to choose brown rice instead of white rice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>-Yes</strong></td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td><strong>-No</strong></td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>-I don’t know</strong></td>
<td>2</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 4.10 Intention to change behavior-Fiber
<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency of responses</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will try to be more active to reduce my risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>26</td>
<td>93%</td>
</tr>
<tr>
<td>-No</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>-I don’t know</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>I will try to eat foods higher in fiber to reduce my risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>27</td>
<td>96%</td>
</tr>
<tr>
<td>-No</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>-I don’t know</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I will try to choose brown rice instead of white rice to reduce my risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>25</td>
<td>89%</td>
</tr>
<tr>
<td>-No</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>-I don’t know</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I will try to choose whole wheat bread instead of white bread to reduce my risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>23</td>
<td>82%</td>
</tr>
<tr>
<td>-No</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>-I don’t know</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>I will try to limit the amount of sugary foods and beverages I choose to reduce my risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>27</td>
<td>96%</td>
</tr>
<tr>
<td>-No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-I don’t know</td>
<td>1</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 4.11 Intention to change behavior- diabetes
The acceptability of the Nutrition Short Educational Clips (N-SECs) was measured on each posttest for fiber and diabetes with four yes/no questions. The results for the acceptability of the fiber N-SEC are compiled in table 4.12 and diabetes in table 4.13. The fiber N-SEC was acceptable to 98% of the participants, while the diabetes N-SEC was acceptable to 96% of the participants.

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency of responses</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Nutrition Short Educational Clip (N-SEC) was easy to read:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>-No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>The information in this Nutrition Short Educational Clip (N-SEC) was confusing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>-No</td>
<td>22</td>
<td>92%</td>
</tr>
<tr>
<td>This Nutrition Short Educational Clip (N-SEC) would be a good way to occupy my time while waiting for my appointment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>-No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I would like to see more of these Nutrition Short Educational Clips (N-SECs) on different nutritional topics:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Yes</td>
<td>24</td>
<td>100%</td>
</tr>
<tr>
<td>-No</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 4.12 Acceptability of the fiber N-SEC
### Table 4.13 Acceptability of the diabetes N-SEC

<table>
<thead>
<tr>
<th>Question</th>
<th>Frequency of responses</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Nutrition Short Educational Clip (N-SEC) was easy to read:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td>28</td>
<td>100%</td>
</tr>
<tr>
<td>- No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>The information in this Nutrition Short Educational Clip (N-SEC) was confusing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>- No</td>
<td>25</td>
<td>89%</td>
</tr>
<tr>
<td>This Nutrition Short Educational Clip (N-SEC) would be a good way to occupy my time while waiting for my appointment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td>28</td>
<td>100%</td>
</tr>
<tr>
<td>- No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>I would like to see more of these Nutrition Short Educational Clips (N-SECs) on different nutritional topics:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td>27</td>
<td>96%</td>
</tr>
<tr>
<td>- No</td>
<td>1</td>
<td>4%</td>
</tr>
</tbody>
</table>

In addition, an open ended “Any other comments?” question was included. The majority of the open ended comments indicated that the participants felt that the N-SECs were acceptable. The comments were mostly positive. Some of these comments included:

- “Very well produced and easy to understand (jargon free).”
- “Interesting way to learn.”
- “Very easy to understand. Having audio for non-readers would be helpful. Use of color is excellent.”
- “Very informative”
“Very educational, it contains information that many people don’t know, and it is required to understand in order to have a healthy long lasting life.”
• “Of course someone talking will help explain more of the video."
• “Interesting and enjoyable. Very colorful."

Discussion

This study was conducted to determine if viewing a Nutrition Short Educational Clip results in a change in knowledge and in the intention to change behavior in a population of low-income adults in a community outreach setting.

The results from this study demonstrate a statistically significant improvement in knowledge scores from pretest to posttest, indicating that the N-SECs had a positive effect on knowledge in this population. Previous studies have demonstrated the effective use of videos to deliver nutritional education to this population. Low-income individuals congregate in community outreach settings to receive services. Providing nutritional education in these locations provides a convenient, easy to understand method that can reach a large audience.

Due to the disproportionate burden of chronic disease in lower income populations, it could be beneficial to provide this population with information and education that they can use. However, there is more than just educational level and income level to consider when attempting to bring education to people. The Socio-Ecological theory demonstrates other factors, such as living conditions, culture, etc.
play a role in behaviors in this population. While it is important to recognize these factors when designing nutrition education programs, providing this population with knowledge is an important first step toward changing behaviors.

While the results from this study clearly demonstrate an increase in knowledge from previewing to post viewing of the N-SECs, it is interesting to note that the mean score on the knowledge pretest was 3.8 for fiber and 3.3 for diabetes. This indicates that this population has a basic knowledge of nutrition and health. Other barriers, such as access to healthy, more affordable food, however, may prevent them from using this knowledge to make healthier nutritional choices. Some of the comments from the participants indicated that they knew that whole wheat bread was better, but it was also more expensive, so they buy white bread. They also recognize the nutritional importance of fresh fruits and vegetables, but they have limited resources to purchase these more expensive foods.

One interesting result is shown in the summary of responses for diabetes (table 4.8) On the pretest, for the question: “To help reduce your risk for diabetes, which is the best beverage choice: Orange soda-pop, Kool-Aid, Apple juice, Fat free milk” with the correct choice being “fat free milk,” 8 out of 28 participants chose “apple juice”. On the posttest for the same question, 10 out of 28 participants chose “apple juice.” In comparison, 19 out of 28 participants chose fat free milk on the pretest and 17 out of 28 participants chose fat free milk on the post test. This would indicate a decrease in knowledge on this question. This question could have been assuming too much. In the N-SEC, while a picture of milk can be seen in the pictures of foods to choose, there was no specific mention of fat-free milk as a choice. There was a choice for water over sugary beverages.
Perhaps many people are under the assumption that juices are a healthier option than milk. Overall, however, for this question, more people chose fat free milk on both the pretest and the posttest (19 vs. 8 participants on the pretest and 17 vs. 10 on the posttest).

The results show that the greatest number of participants who viewed the fiber N-SEC were in the 60-69 year age group, while the greatest number of participants who viewed the diabetes N-SEC were in the 18-20 year age group. This could have happened by chance; however, the participants were able to choose which N-SEC to view, fiber or diabetes. It is also possible that in the 60-69 year age group, there is more interest in the benefits of fiber than at a younger age. In comparison, diabetes is being diagnosed at earlier ages now, so the younger age group might have more interest in finding out more about how to prevent diabetes. In addition, when broken down by gender and type of N-SEC viewed, more female participants chose fiber than male (18 female vs. 6 male). It could be that the female population has more interest and concern with getting enough fiber.

The results demonstrate that nearly all of the participants showed a high intention to change behavior toward making healthier nutritional choices. While behavioral change requires more than viewing a Nutrition Short Educational Clip (N-SEC) one time, there is a potential that this population could gain knowledge after repeatedly viewing these videos during wait times in community outreach settings.
Nearly all of the participants had a high acceptability rating for the N-SECs and would like to see more of them. They thought that it was a good way to occupy time while waiting for an appointment, and they felt that the videos were easy to understand.

**Strengths:**

The researcher collected the data, allowing time for observations of the population. This could also be a limitation, if the researcher wanted to sway the results. However, this study was set up as a straightforward pretest, view video and posttest, without any input from the researcher, except to explain the study and ask for participation. Another strength is the use of a pretest and a posttest, which allowed for stronger comparison of knowledge scores. In addition, the use of an iPad® allowed for more focus on the N-SEC. The participants held the iPad®, as compared to watching a video on a TV monitor. This could have provided less distraction.

**Limitations:**

Perhaps the pretest was too easy. Future questions could be developed for a higher educational level. The majority of this population in this study had at least a high school education. These questions were created for a sixth grade reading level. Another limitation is that this study might not be generalizable to other populations. Future studies could test these N-SECs in other populations. A convenience sample was used. Therefore, this study lacks the statistical power of a randomized controlled study. In addition, these participants self-selected the N-SEC of their choice. This
could indicate that the N-SEC of choice is one that they already have awareness or some degree of knowledge. The small sample size of 52 participants could have also decreased the statistical power.

**Implications for future studies/Conclusion**

For future studies, researchers might consider income level and education level as a variable when comparing nutrition knowledge. While education level was one of the demographic variables, the objectives of this study did not include measuring the level of education in relation to nutrition knowledge. This would be an important measure to consider for future studies, as previous studies have shown that there is a relationship between education level and nutrition knowledge.6,7,9,13,28

Future studies might develop sound and/or voiceovers in various languages for the videos. Some of the comments indicated that sound would have been nice to have. There were positive comments also about the pictures. This is important in an audience that is not completely English speaking, and in those who have low-literacy skills. Pictures can help to understand the N-SEC.

This study clearly demonstrated that this population of lower socioeconomic level individuals improved their nutritional knowledge scores after viewing a Nutrition Short Educational Clip (N-SEC). In addition, they had positive intentions to change behavior toward a healthier lifestyle, and they were satisfied with the N-SECs. This indicates that there is potential to implement these N-SECs in other community settings where people gather so that knowledge is gained. The results demonstrate that nearly all of the participants showed a high intention to change behavior toward making healthier nutritional choices. While behavioral change requires more than viewing a Nutrition...
Short Educational Clip (N-SEC) one time, there is a potential that this population could gain knowledge after repeatedly viewing these N-SECs during wait times in community outreach settings.
CHAPTER 5: Short Nutritional Videos and Knowledge Change in a Population of Low-Income Individuals in a Community Outreach Setting.

Roberta L. Davis, B.S., Kay N. Wolf, PhD, RD, Jill E. Clutter, PhD, MCHES,
Diane L. Habash, PhD, RD

ABSTRACT

Objective: To determine if viewing a nutritional video will be associated with a change in knowledge or on the intention to change behavior in a population of low-income individuals in a community outreach setting.

Methods: This pilot study was a quasi-experimental, pretest, posttest design. The pretest consisted of four demographic questions, and five knowledge questions. The posttest consisted of the same five knowledge questions as on the pretest, arranged in a different sequence. It also contained five questions on the intention to change behavior, and four questions on the acceptability of the video.

Analysis: Means, standard deviations, frequencies, and percentages were calculated. A paired t-test determined a difference between pre and post-test knowledge scores.

Setting: Two community outreach settings in urban Central Ohio, serving a low socioeconomic status population.

Participants: A convenience sample of 52 adults over the age of 18 years.
Results: The results demonstrated an improvement in knowledge scores from pretest to posttest for both the fiber and diabetes Nutrition Short Educational Clip (N-SEC). The results also indicated that most of the participants intended to change behavior and were satisfied with the N-SECs.

Conclusion: This study demonstrates that in a population of low-income adults, the use of video in a community outreach setting can lead to an increase in nutritional knowledge, and in the intention to change behavior toward a healthier lifestyle.

INTRODUCTION

An increase in the incidence of chronic disease in the United States can result in a poorer quality of life, a shorter life span, and increased health care costs for the nation. Low-income, ethnically and racially diverse individuals carry a higher burden of chronic disease rates, creating health disparities, or differences in health determinants and outcomes that affect these populations to a greater extent. These differences are associated with social, environmental, and economic disadvantages, and are the result of the interaction between genetics, environmental factors, and behavior.

Nutritional status is strongly correlated to chronic disease. Unfortunately, persons who are in a lower-socio economic status may find themselves at a decreased nutritional status and without the background to make correct choices.\textsuperscript{1,2,3,4,5} In regards to nutritional choices, environment and culture play a role in behaviors of certain minority groups. The Socio-Ecological Model (SEM) can be used to explain the factors involved in behavior and in behavioral intentions. According to this model, five levels of influence- intrapersonal, interpersonal, community organizational, and public policy- can affect a person’s behavior.\textsuperscript{6} The Socio-Ecological Model provides a comprehensive
approach involving multiple levels of influence that are aimed toward impacting health behavior and health outcomes. This model includes the environmental and social components that affect individual behavioral changes. In order to improve the health of specific populations, it is important to design and implement programs that include multiple levels of behavioral influence.\(^6\)

In designing educational programs, it is important to realize that knowledge is the first step in changing behavior. Previously, programs have been implemented to assist lower SES populations become more knowledgeable about nutrition and health, so that they can take better control of their health.\(^5,7,8,9,10\) The cost of implementation and maintenance made many of these programs not sustainable over time. In addition the programs required the presence of a health care professional to conduct the educational program. This can become costly, especially if any long term behavioral benefit is to be realized. There is a need for learning opportunities that are convenient, simple, cost effective, and that can reach a large audiences in diverse community settings.

With expanding technology comes innovative ways of increasing knowledge which can potentially reach larger audiences at a lower cost. Some studies have demonstrated the use of media as an effective teaching strategy.\(^2,7,11,12,13,14,15,16,17\) More studies are needed to further demonstrate not only effectiveness, but feasibility in implementing programs that are easier to understand, hold the attention of the viewer and can be used in a diverse set of community settings. The use of videotapes and other forms of multimedia to provide nutrition and health information in the community settings demonstrates potential in reaching large numbers of individuals who might otherwise not have access to nutrition education.
The waiting areas of community outreach programs provide ideal locations for learning opportunities. Clients often wait for an extended period of time to visit with a health care professional, or other assistance program provider. This is an opportune time to deliver health messages through the use of a video. These people may potentially be able to observe and retain some of the information from these video presentations. This could potentially lead to behavioral change, and a subsequent decreased risk for chronic disease and a better quality of life. Therefore, the purpose of this study was to determine if viewing a Nutrition Short Educational Clip (N-SEC) video is associated with a change in knowledge and the intention to change behavior in a population of low-income individuals in a community outreach setting.

METHODS AND DESIGN
This pilot study was a quasi-experimental, pretest, posttest design. After approval from the Institutional Review Board at a Midwestern university, participants were recruited through two urban community outreach settings in Central Ohio. Eligibility criteria included 18 years or older, and the ability to read, write and speak English.

Two Nutrition Short Educational Clips (N-SECs), “Eat More Fiber” and “Ideas for Reducing Your Risk for Diabetes” were developed by undergraduate and graduate students majoring in Medical Dietetics at The Ohio State University. The N-SECs were then reviewed by three to four dietitians for nutrition knowledge content. Each N-SEC lasts approximately three minutes, was written at the sixth grade level, and was made to be shown on portable medians such as the iPad. For this study, the N-SEC and the survey instruments were loaded to the iPads.
Demographics, nutrition knowledge, intention to change behavior, and satisfaction with the Nutrition Short Educational Clip (N-SEC) were measured utilizing a questionnaires developed by the investigator. Nutrition knowledge was measured utilizing five multiple choice questions with four answers each. These questions were designed from the information for each of the N-SECs. These five questions were the same on both the pretest and the posttest, however in a different sequence. Five additional multiple choice questions on the posttest only were used to measure the intention to change behavior. Four multiple choice questions on the posttest measured satisfaction with the N-SECs.

Sample and Setting

The sample included 33 females and 19 males (26 Caucasian, 21 African American, 2 Hispanic, and 3 in the category of other).

Procedure

The individuals who agreed to participate in the study were asked to take a pretest to gather general demographic information and to assess their knowledge. They then viewed a 3 minute Nutrition Short Educational Clip (N-SEC) video presentation on an iPad. They were able to choose from two topics-- fiber because it
is a general topic, or diabetes, a more specific topic. Immediately after viewing the N-SEC, they were given a posttest to measure a change in knowledge, behavioral intentions, and acceptability of the N-SEC video.

**Statistical Analysis**

Means, standard deviations, frequencies, and percentages, were used to analyze and describe the data. Quick Calcs, an online Graphpad Software program was used to calculate a paired t-test to determine if differences existed in the pre- and post-knowledge scores.\(^{18}\) A p-value of \(< 0.05\) was used to determine significance.

**RESULTS**

Of the 52 participants who viewed the N-SECs, slightly over one-third (n= 19) of the participants were male, and nearly two-thirds (n = 33) of the participants were female (Table 5.1) Ages varied, with 26 Caucasian and 21 African American participants.

One-half of the participants were Caucasian (26 out of 52 total participants).

There were 21 out of 52 African American participants.

The largest proportion of participants (n=22; 42\%) out of a total of 52 participants were high school graduates or had obtained their GED. Fourteen (27\%) participants reported some college; 9 with some high school and 2 with 8\textsuperscript{th} grade or less.

A total of 24 participants viewed the fiber N-SEC, 6 male and 18 female. Of the 28 participants who viewed the diabetes N-SEC, 13 were male and 15 were female.

When compiled by age according to N-SEC choice, the largest number (n=6, or 25\%) of those 24 participants who chose to view the fiber N-SEC were 60-69 years. In comparison, the largest number (n=7, or 25\%) of the 28 participants who chose to view the diabetes N-SEC were 18-29 years.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>19</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>52</td>
<td>100%</td>
</tr>
<tr>
<td>Age (years)</td>
<td>18-29</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>7</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>40-49</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>50-59</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>70 and older</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Average age = 47 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>African American</td>
<td>21</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Caucasian</td>
<td>26</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Level of Education</td>
<td>8th grade or less</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Some high school</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>High school graduate/ GED</td>
<td>22</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>Some college</td>
<td>14</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>College graduate</td>
<td>5</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 5.1 Description of participants (n=52)

Scores for nutrition knowledge were measured using a pretest and posttest for each N-SEC. Both the pretest and the posttest contained the exact same five questions, but rearranged in a different sequence between the tests. The breakdown of questions and responses from pretest to posttest by N-SEC viewed is compiled in Table 5.2.
## Nutrition Knowledge

<table>
<thead>
<tr>
<th>Content</th>
<th>Question</th>
<th>Pre-test percent</th>
<th>Post-test percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber</td>
<td>Which food contains the most fiber:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>-Apple</strong></td>
<td>92%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>-Chocolate chip cookie</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Cheese</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Fried chicken</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Fiber is beneficial for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>-Preventing constipation</strong></td>
<td>25%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Lowering blood sugar levels</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Reducing cholesterol levels</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td><strong>-All of the above</strong></td>
<td>63%</td>
<td>92%</td>
</tr>
<tr>
<td></td>
<td>Which would be the best rice to choose for increasing fiber:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>-Brown rice</strong></td>
<td>88%</td>
<td>92%</td>
</tr>
<tr>
<td></td>
<td>-White rice</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Fried rice</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td><strong>-All of the above</strong></td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Which would be the best cereal choice for increasing fiber:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>-100% Bran Flakes</strong></td>
<td>83%</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>-Corn Flakes</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Rice Krispies</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td><strong>-All of the above</strong></td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>How much fluid should you drink per day when increasing fiber (or anytime):</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>-1-3 glasses</strong></td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-2-5 glasses</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-5-8 glasses</td>
<td>42%</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td><strong>-8-12 glasses</strong></td>
<td>50%</td>
<td>75%</td>
</tr>
</tbody>
</table>

Table 5.2 Nutrition knowledge questions and response percentages for fiber and diabetes N-SECs

**The correct answers are in bold**
<table>
<thead>
<tr>
<th>Content</th>
<th>Question</th>
<th>Pre-test percent</th>
<th>Post-test percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>Which is the best activity to help reduce your risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Walking</td>
<td>54%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>-Gardening</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Dancing</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-All of the above</td>
<td>43%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Which is the best way to help reduce your risk for diabetes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Eat more fiber</td>
<td>11%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Lose a few extra pounds if overweight</td>
<td>25%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>-Be more active</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>-All of the above</td>
<td>61%</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>To help reduce your risk for diabetes, which is the best food choice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-French fries</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Apple juice</td>
<td>25%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>-Black beans</td>
<td>68%</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>-Hot dog</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>To help reduce your risk for diabetes, which is the best beverage choice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Orange soda-pop</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>-Kool-Aid</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Apple juice</td>
<td>29%</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>-Fat free milk</td>
<td>68%</td>
<td>61%</td>
</tr>
<tr>
<td></td>
<td>To help reduce your risk for diabetes, which is the best meal choice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-A cheeseburger with French fries</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Whole wheat pasta with marinara (tomato) sauce and a vegetable salad</td>
<td>89%</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>-Beef and cheese burrito with Mexican rice</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>-Fried chicken with mashed potatoes and gravy</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 5.2 Nutrition knowledge questions and response percentages for fiber and diabetes N-SECs

**The correct answers are in bold**
Nutrition knowledge scores were calculated for each participant on a scale from 0 to 5 correct answers on both the pretest and posttest. The results of the paired t-test indicate that there is a statistically significant change in knowledge from pretest to posttest for both the fiber and the diabetes N-SEC (p=0.0011 and p=0.0005, respectively). This value was significant when calculated for the N-SECS separately and when combined (Table 5.3). For the fiber N-SEC, the mean pretest knowledge score was 3.8 ± 1.1, averaged from a range of scores from 0-5. The mean posttest knowledge score was 4.5 ± 0.8 showing an improvement in knowledge score. The mean pretest knowledge score for the diabetes N-SEC was 3.3 ± 1.4 averaged from a range of scores from 0-5. The mean posttest knowledge score for diabetes was 4.1 ± 1.4 again showing an improvement in knowledge score. When the nutritional knowledge scores from both of the N-SECS were combined, the mean pretest score was 3.5 ± 1.3, and the mean posttest score was 4.4 ± 1.0, indicating improvement in nutritional knowledge scores overall (p=0.0001). The calculated p-values were well below the standard set for significance at p ≤ 0.05, indicating a high probability that the Nutrition Short Educational Clips (N-SECs) had an effect on nutritional knowledge in this population.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest score</th>
<th>Posttest score</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber nutrition knowledge</td>
<td>3.8 (1.1)</td>
<td>4.5 (0.8)</td>
<td>0.0011</td>
</tr>
<tr>
<td>Diabetes nutrition knowledge</td>
<td>3.3 (1.4)</td>
<td>4.1 (1.4)</td>
<td>0.0005</td>
</tr>
<tr>
<td>Combined fiber and diabetes nutrition knowledge</td>
<td>3.5 (1.3)</td>
<td>4.4 (1)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Data presented as mean (SD)

Table 5.3 Nutrition knowledge scores, paired t-test
Most of the participants (average 96%) answered “yes” to the questions regarding intention to change behavior for fiber. For the intention to change behavior for diabetes, the average response to “yes” was 91%.

The fiber N-SEC was acceptable to 98% of the participants, while the diabetes video was acceptable to 96% of the participants.

In addition, an open ended “Any other comments?” question was included. The majority of the open ended comments indicated that the participants felt that the N-SECs were acceptable. The comments were mostly positive. Some of these comments included:

- “Very well produced and easy to understand (jargon free).”
- “Interesting way to learn.”
- “Very easy to understand. Having audio for non-readers would be helpful. Use of color is excellent.”
- “Of course someone talking will help explain more of the video.”
- “Interesting and enjoyable. Very colorful.”

DISCUSSION

This study was conducted to determine if viewing a Nutrition Short Educational Clip (N-SEC) resulted in a change in knowledge and in the intention to change behavior in a population of low-income adults in a community outreach setting.

The results from this study demonstrate a statistically significant improvement in knowledge scores from pretest to posttest, indicating that the N-SECs had a positive effect on knowledge in this population. Previous studies have demonstrated the effective use of videos in this population. In places such as community outreach settings, low-income individuals congregate. Providing nutritional education in a convenient, easy to understand method serves to reach a large audience.
Due to the disproportionate burden of chronic disease in lower income population, it could be beneficial to provide this population with information and education that they can use. There is more than just educational level and income level to consider when attempting to bring education to people. The Socio-Ecological theory demonstrates that there is more involved than just lack of education. Other factors, such as living conditions, culture, etc. play a role in behaviors in this population. While the results from this study clearly demonstrate an increase in knowledge from pre viewing to post viewing of the N-SECs, it is interesting to note that the mean score on the knowledge pretest was 3.8 for fiber and 3.3 for diabetes. This demonstrates that this population has a basic knowledge of nutrition and health. However, other barriers, such as access to healthy, more affordable food is lacking. Some of the comments from the participants indicated that they knew that whole wheat bread was better, but it was also more expensive, so they buy white bread. They also have limited resources for fresh fruits and vegetables due to price.

One interesting result is shown in the summary of responses for diabetes. On the pretest, for the question: “To help reduce your risk for diabetes, which is the best beverage choice: Orange soda-pop, Kool-Aid, Apple juice, Fat free milk” with the correct choice being “fat free milk,” 8 out of 28 participants chose “apple juice”. On the posttest for the same question, 10 out of 28 participants chose “apple juice.” In comparison, 19 out of 28 participants chose fat free milk on the pretest and 17 out of 28 participants chose fat free milk on the posttest. This would indicate a decrease in knowledge on this question. This question could have been assuming too much. In the N-SEC, while a picture of milk can be seen in the pictures of foods to choose, there was no specific
mention of fat-free milk as a choice. There was a choice for water over sugary beverages.
Perhaps many people are under the assumption that juices are a healthier option than milk. Overall, however, for this question, more people chose fat free milk on both the pretest and the posttest (19 vs. 8 participants on the pretest and 17 vs. 10 on the posttest).

Nearly all of the participants had a high acceptability rating for the N-SECs and would like to see more of them. They thought that it was a good way to occupy time while waiting for an appointment, and they felt that the N-SECs were easy to understand.

**Strengths:**

The researcher collected the data, allowing time for observations of the population. This could also be a limitation, if the researcher wanted to sway the results. However, this study was set up as a straightforward pretest, view of the N-SEC and posttest, without any input from the researcher, except to explain the study and ask for participation. Another strength is the use of a pretest and a posttest, which allowed for stronger comparison of knowledge scores. In addition, the use of an iPad® allowed for more focus on the N-SEC. The participants held the iPad®, as compared to watching a video on a TV monitor. This could have provided less distraction.

**Limitations:**

Perhaps the pretest was too easy. Future questions could be developed for a higher educational level. The majority of this population in this study had at least a high school education. These questions were created for a sixth grade reading level. Another limitation is that this study might not be generalizable to other populations. Future studies could test these videos in other populations. A convenience sample was used, which can decrease statistical power. In addition, these participants self-selected the N-SEC of their
choice. This could indicate that the video of choice is one that they already have awareness or some degree of knowledge. Another limitation is the small sample size of 52 participants can also decrease statistical power.

CONCLUSION

This study clearly demonstrated that this population of lower SES individuals improved their nutritional knowledge scores after viewing a Nutrition Short Educational Clip (N-SEC). In addition, they had positive intentions to change behavior toward a healthier lifestyle, and they were satisfied with the N-SECs. This indicates that there is potential to implement these N-SECs in other community settings where people gather so that knowledge is gained. The results demonstrate that nearly all of the participants showed a high intention to change behavior toward making healthier nutritional choices. While behavioral change requires more than viewing an N-SEC one time, there is a potential that this population could gain knowledge after repeatedly viewing these Nutrition Short Educational Clips (N-SECs) during wait times in community outreach settings.
REFERENCES


APPENDIX A: INVESTIGATOR SCRIPT

Clinical Research Center
2115 Davis Medical Clinic
College of Medicine
480 Medical Center Drive
Columbus, OH 43210-1228
Phone: 614.293.8750
FAX:

Hello my name is Bobbi Davis

I am a Medical Dietetics graduate student at Ohio State. We are conducting a study at Ohio State to determine if short videos on nutrition topics are helpful to patients.

I wanted to know if you would possibly assist with the project while you are waiting? Whether or not you participate will not affect your care or service, and you may quit at any time.

The study would require you to answer a short questionnaire, then watch the video, and then answer another short questionnaire. This whole process should take about 15 minutes. All your answers will be confidential.

If you have any questions, please feel free to ask me today or to e-mail or call my advisors – Dr. Kay Wolf at 614-292-8131 or wolf.4@osu.edu or Dr. Diane Habash at 614-293-6689 or Diane.Habash@osumc.edu
APPENDIX B: QUESTIONNAIRES

Fiber Pre test
We would like to ask a few questions before you view the Nutrition Short Educational Clip (N-SEC)
These questions are for research only. No personal information will be collected.

Fiber- A
Part I
Please answer the following questions:
1. What is your race/ethnicity:
   - African American
   - Caucasian
   - Hispanic
   - Asian/Pacific Islander
   - Somali
   - Other (please state) ______________________________________________________
2. How many years of education have you had? ________________________________
3. What is your gender? (please circle)
   - Male
   - Female
4. What is your year of birth? _____________________________

Part II
Please answer the following questions:
1. Which food contains the most fiber:
   - Apple
   - Chocolate chip cookie
   - Cheese
   - Fried chicken
2. Fiber is beneficial for:
   - Preventing constipation
   - Lowering blood sugar levels
   - Reducing cholesterol levels
   - All of the above
3. Which would be the best rice to choose for increasing fiber:
   - Brown rice
   - White rice
   - Fried rice
   - All of the above
4. Which would be the best cereal choice for increasing fiber:
   e. Corn flakes
   f. Rice Krispies
   g. 100% bran cereal
   h. Fruit loops
5. How much fluid should you drink per day when increasing fiber (or anytime):
   e. 1-3 glasses
   f. 2-5 glasses
   g. 5-8 glasses
   h. 8-12 glasses
6. I currently choose foods that are high in fiber.
   a. never
   b. sometimes
   c. always

Thank you for sharing!
Fiber Post test
We would love your feedback on our Nutrition Short Educational Clip (N-SEC)

Fiber-B
Part I
Please answer the following questions:
1. Which would be the best rice to choose for increasing fiber:
   a. Brown rice
   b. White rice
   c. Fried rice
   d. All of the above
2. Which would be the best cereal choice for increasing fiber:
   a. Corn flakes
   b. Rice Krispies
   c. 100% bran cereal
   d. Fruit loops
3. Fiber is beneficial for:
   a. Preventing constipation
   b. Lowering blood sugar levels
   c. Reducing cholesterol levels
   d. All of the above
4. How much fluid should you drink per day when increasing fiber (or anytime):
   a. 1-3 glasses
   b. 2-5 glasses
   c. 5-8 glasses
   d. 8-12 glasses
5. Which food contains the most fiber:
   a. Apple
   b. Chocolate chip cookie
   c. Cheese
   d. Fried chicken

Part II
Please answer the following questions:
1. I will try to choose more raw fruits and vegetables.
   Yes
   No
   I don’t know
2. I will try to choose more foods that have at least 5 grams of fiber per serving.
   Yes
   No
   I don’t know
3. I will try to choose bread that lists “whole wheat” as the first ingredient on the label.
   Yes
   No
   I don’t know
4. I will try to choose high fiber cereal for breakfast.
5. I will try to choose brown rice instead of white rice.
   Yes
   No
   I don’t know

6. This Nutrition Short Educational Clip (N-SEC) was easy to read.
   Yes
   No

7. The information in this Nutrition Short Educational Clip (N-SEC) was confusing.
   Yes
   No

8. This Nutrition Short Educational Clip (N-SEC) would be a good way to occupy my
time while waiting for my appointment.
   Yes
   No

9. I would like to see more of these Nutrition Short Educational Clips (N-SECs) on
different nutritional topics.
   Yes
   No

Any other comments?

Thanks for sharing!
Diabetes Pre test
We would like to ask a few questions before you view the Nutrition Short Educational Clip (N-SEC)
These questions are for research only. No personal information will be collected.
Diabetes-A
Part I
Please answer the following questions:
1. What is your race/ethnicity:
   - African American
   - Caucasian
   - Hispanic
   - Asian/Pacific Islander
   - Somalian
   - Other (please state) ________________________________
2. How many years of education have you had? ____________________
3. What is your gender? (please circle)
   - Male
   - Female
4. What is your year of birth? ____________________
Part II
Please answer the following questions:
1. Which is the best activity to help reduce your risk for diabetes:
   - e. Walking
   - f. Gardening
   - g. Dancing
   - h. All of the above
2. Which is the best way to help reduce your risk for diabetes:
   - e. Eat more fiber
   - f. Lose a few extra pounds if overweight
   - g. Be more active
   - h. All of the above
3. To help reduce your risk for diabetes, which is the best food choice:
   - e. French fries
   - f. Apple juice
   - g. Black beans
   - h. Hot dog
4. To help reduce your risk for diabetes, which is the best beverage choice:
   - e. Orange soda pop
   - f. Kool-Aid
   - g. Apple juice
   - h. Fat free milk
5. To help reduce your risk for diabetes, which is the best meal choice:
   e. A cheeseburger with French fries
   f. Whole wheat pasta with marinara (tomato) sauce and a vegetable salad
   g. Beef and cheese burrito with Mexican rice
   h. Fried chicken with mashed potatoes and gravy
6. I currently make food choices that will help me decrease my risk for diabetes:
   a. Always
   b. Sometimes
   c. Never

   Thank you for sharing!
Diabetes Post test

We would love your feedback on our Nutrition Short Educational Clip (N-SEC)

Diabetes-B

Part I

Please answer the following questions:

1. To help reduce your risk for diabetes, which is the best beverage choice:
   a. Orange soda pop
   b. Kool-Aid
   c. Apple juice
   d. Fat free milk

2. Which is the best ways to help reduce your risk for diabetes:
   a. Eat more fiber
   b. Lose a few extra pounds if overweight
   c. Be more active
   d. All of the above

3. To help reduce your risk for diabetes, which is the best meal choice:
   a. A cheeseburger with French fries
   b. Whole wheat pasta with marinara (tomato) sauce, and a vegetable salad
   c. Beef and cheese burrito with Mexican rice
   d. Fried chicken with mashed potatoes and gravy

4. Which is the best activity to help reduce your risk for diabetes:
   a. Walking
   b. Gardening
   c. Dancing
   d. All of the above

5. To help reduce your risk for diabetes, which is the best food choice:
   a. French fries
   b. Apple juice
   c. Black beans
   d. Hot dog

Part II

Please answer the following questions:

1. I will try to be more active to reduce my risk for diabetes.
   a. Yes
   b. No
   c. I don’t know

2. I will try to eat foods higher in fiber to reduce my risk for diabetes.
   a. Yes
   b. No
   c. I don’t know

3. I will try to choose brown rice instead of white rice to reduce my risk for diabetes.
   a. Yes
   b. No
   c. I don’t know

4. I will try to choose whole wheat bread instead of white bread to reduce my risk of
diabetes.
Yes
No
I don’t know
5. I will try to limit the amount of sugary foods and beverages I choose to reduce my risk for diabetes.
Yes
No
I don’t know

6. This Nutrition Short Educational Clip (N-SEC) was easy to read.
   Yes
   No
7. The information in this Nutrition Short Educational Clip (N-SEC) was confusing.
   Yes
   No

8. This Nutrition Short Educational Clip (N-SEC) would be a good way to occupy my time while waiting for my appointment.
   Yes
   No
9. I would like to see more of these Nutrition Short Educational Clips (N-SECs) on different nutritional topics.
   Yes
   No
Any other comments?

   Thank you for sharing!