The creation of self-directed nutrition education modules in the women, infants, and children (WIC) program

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THE CREATION OF SELF-DIRECTED NUTRITION EDUCATION MODULES
IN THE WOMEN, INFANTS, AND CHILDREN (WIC) PROGRAM

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
In
Education:
Health Education

by
Veronica Huff, MPH
Spring 2011
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Date 6/16/11
ABSTRACT

The purpose of this project was to design a series of self-directed learning modules for enrollees in the Women, Infants, and Children (WIC) program in Riverside County, California. The WIC Program is a supplemental nutrition program that, among other things, provides participants with nutrition education to help them understand the health benefits of choosing more nutritious foods. Due to declining enrollment, participants are now able to receive vouchers as a "walk-in" or "missed appointment" visit instead of being required to attend a scheduled nutrition education class. As a result, nutrition education is lost. Therefore, five self-directed learning modules were created to encourage healthy lifestyles, each including a self-directed learning sheet used as a study guide and as an informational handout to take home for future reference. This project features information concerning the problem of food insecurity, the nutrition education of low-income women and children in the WIC program, and the characteristics of adult learners.

The objective of this project was to examine the WIC participants' comprehension and willingness to use self-directed learning modules as a nutrition education supplement. Modules were piloted to over 150 WIC participants in Riverside, California. All of the participants were women with young children. A five-question evaluation tool was used before and after each
module to gain participant feedback regarding the content and perceived value of each module.

Fifty WIC participants completed the “Moove to 1% Milk” module, 50 completed the “Iron Out Anemia” module, and 50 completed the “Say Cheese” module. One hundred percent of the participants said they liked the modules, 100 percent said they were easy to complete, and 90 percent said they would like to have these modules included in the WIC program.

It is concluded that self-directed learning modules can serve as an effective tool in providing nutrition education to participants in the WIC program. Many participants in the WIC program indicated they would be willing to have supplemental nutrition education in an event that they miss their regular scheduled apportionment. Participants appeared to be willing to complete the modules in the lobby as they wait for their food vouchers. Discussion with participants showed that they like the modules and that the modules were easy to use. Some participants mentioned that they actually would prefer the modules over the classroom lectures because doing so allows them to learn at their own pace. In conclusion, this project demonstrates that self-directed learning modules can be used as an effective supplement in the WIC program.
ACKNOWLEDGEMENTS

I want to acknowledge my advisor, Dr. Kim Clark, for his encouragement while I was developing this project. I want to thank him for giving me the will to stay motivated and to continue moving forward with the task no matter what obstacles came my way. I want to thank my dean, Dr. Sandra Kamusikiri, for her efforts in reading my project and encouraging me along the way, especially towards the end when I was ready to give up hope on completing this last assignment. I want to thank my cousin, Brenée Wright, for her willingness to serve as my editor for this project, especially while being a busy mom with twins. I want to thank her for helping me complete this final academic goal in my life. I also want to thank my friend, Valerie Comeaux, for her efforts in providing feedback for the self-directed learning modules. She added just the right details to engage the readers. Thank you to Dr. Kim Clark, Dr. Sandra Kamusikiri, Brenée Wright, and Valerie Comeaux for all of their efforts—this project could not have been successful or completed without their help.
DEDICATION

I want to dedicate this project to my family and friends for their strength and encouragement while developing this project. I want to thank my grandmother, Mary Coleman, and my father David Huff, for always believing that I could do absolutely anything if I put my mind to it. I also want to thank both of them for always being so proud of my academic accomplishments.
TABLE OF CONTENTS

ABSTRACT ........................................................................................................ iv

ACKNOWLEDGEMENTS ..................................................................................... vi

CHAPTER ONE: INTRODUCTION ...................................................................... 1
  Statement of Problem ....................................................................................... 3
  Purpose of Project ........................................................................................... 4
  Limitations of the Project ............................................................................... 5
  Definitions of Terms ....................................................................................... 6

CHAPTER TWO: LITERATURE REVIEW ............................................................. 7
  The Problem of Food Insecurity ...................................................................... 8
  Women, Infants, and Children (WIC) Program ............................................. 11
  Research on WIC Interventions ..................................................................... 13
  The Behavioral Ecological Model: A Framework for Early WIC Participation ......................................................... 17
  Adult Learners .............................................................................................. 23
  Self-directed Learning .................................................................................... 24
  Conclusion ..................................................................................................... 28

CHAPTER THREE: PROGRAM DESIGN ............................................................ 29
  Theoretical Framework .................................................................................. 30
  Strategy for Module Development ................................................................ 31
  Self-directed Learning Modules .................................................................... 32
  Summary ....................................................................................................... 32
CHAPTER ONE
INTRODUCTION

The federal Women, Infants, and Children (WIC) program is a supplemental nutrition program that provides monthly food vouchers, nutrition education and referrals, breastfeeding support, and referrals for prenatal and pediatric health care services for low-income families. Many low-income families suffer from food insecurity. Various studies examining food insecurity in the United States have reported significant associations between increasing food insecurity and the following: declines in household food supplies, poor intake of fruits and vegetables, increased levels of unemployment, increased participation in food assistance programs, and unfortunately, disordered eating patterns (Kaiser et al., 2003). Nutrition education is important for families who struggle with food insecurity. These families usually are not concerned with the nutritional value of foods, but instead are more interested in purchasing foods that can provide meals that will last for the duration of the month. These inexpensive food items are usually high in fat and offer little or no nutritional value (Perales, Buck, & Stephenson, 2004).

The WIC program provides participants with nutrition education to help them understand the health benefits of choosing healthier foods that provide adequate vitamins and nutrients for their families. There are a variety of food
assistance programs serving low-income communities, and WIC is one of the well known programs. The other is the Supplemental Nutrition Assistance Program (SNAP), better known as the food stamp program. SNAP is the federally recognized name for food stamps; CalFresh is the new name for California residents. Both terms can be used interchangeably. These programs require different qualifications for enrollment. An important difference between the programs is how participants can spend food instruments. With WIC, participants are given vouchers that are food-specific. The vouchers can only be used to purchase milk, beans, formula, 100% juice, and other healthy food items. With SNAP, participants are given an Electronic Benefits Transfer (EBT) card. The EBT card acts as a debit card, pre-loaded once a month by the food stamp program, with the monetary ability to purchase any food of their choice. Most parents who receive food stamps have the option of purchasing unhealthy food items since the SNAP program has few restrictions. The WIC program participants can only purchase specific healthy food items. In contrast, many who receive WIC are also receiving food stamps because both programs target the same audience; hence, it is important for WIC participants, as well as food stamp participants, to receive nutrition education.
Statement of the Problem

A high rate of obesity is present among enrollees in the WIC Program (Sharma et al., 2010). Many of the participants are at risk of a variety of preventable chronic diseases. The importance of providing a variety of basic nutrition education classes is consistent with a preventive health education and promotion focus. Receiving nutrition education is vital to health, especially in this society where over 300,000 preventable deaths are occurring each year due to poor nutrition and physical inactivity (Center for Disease Control, 2008).

It is imperative that a nutrition education program be implemented to help foster healthy habits. However, many participants are not receiving the required education due to a large number of missed appointments or limited staff to teach the nutrition education classes. As a result of declining enrollment, or attempts to meet monthly caseloads, Riverside and San Bernardino Counties are no longer requiring participants to attend a scheduled appointment nutrition education class. Participants are now able to receive vouchers on a “walk-in” or “missed appointment” basis. Consequently, nutrition education may be lost. Participants are encouraged to attend a class that may be offered later that same day, or they are asked to attend another scheduled class at a later date. Unfortunately, many participants do not attend another scheduled class. Without nutrition education, participants may not realize the significance of healthy eating, which then poses
a continued risk for obesity, heart disease, high cholesterol, and many other preventable chronic diseases.

Purpose of the Project

The purpose of the project is to provide the WIC program with a series of self-directed learning modules. The creation and implementation of modules in the WIC program will help participants understand the importance of eating a variety of colorful fruits and vegetables, being physically active, and learning pertinent health information. These modules will also fill a programmatic gap for WIC participants.

A series of self-directed learning modules will be created to ensure that participants are receiving the nutrition education they need even when appointments are missed or staff is limited. Modules will be completed by WIC recipients while sitting in the lobby waiting for their vouchers to be printed. Each module will mirror the current WIC classes being taught, by providing approximately 15 minutes of self-directed education.

The Behavioral Ecological Model will be used for this project. Each module will include references to peer, family, and cultural norms and expectations, plus skill-building (self-efficacy) components (Hovell, Wahlgren, & Gehrman, 2002). These references will help give the learner a better
understanding of the content material by including familiar information that relates to the learner's peers, family, and culture.

Limitations of the Project

Low-income and prenatal mothers and fathers with children younger than five years old are eligible to participate in the self-directed learning models, but the majority of participants will be mothers. Hence, the content will focus on mothers and their children. The introduction of self-directed learning modules also assumes that clients are literate and that they have both the time and incentive to participate in the modules.

In addition, the initial language of the modules will be English, although a number of WIC participants speak Spanish. The modules will be translated into Spanish by WIC-approved translators once the project is complete.

WIC is currently seeking a supplement class to offer participants. Current discussions are considering offering on-line education. Until then, these self-directed learning modules stand a chance of being administered in Riverside County's WIC program as well, especially since they are the same curriculum material being taught currently, only in a modified version; however, their use is not guaranteed.
Definition of Terms

Adult Learner: “Those who, in the midst of life and career, have returned to studies to better themselves, retool, or qualify for advancement in their jobs” (Badke, 2008, p. 48).

Food insecurity: Food security refers to the availability of food and one's access to it. A household is considered food secure when its occupants do not live in hunger or fear of starvation (Kaiser et al., 2003).

Food Stamps: The United States Supplemental Nutrition Assistance Program (SNAP), historically and commonly known as the Food Stamp Program, is a federal-assistance program that provides assistance to low- and no-income people living in the United States (US). California uses the name CalFresh (Food and Nutrition Services, 2011).

Self-Directed Learning: “A process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes” (DeMauro, 2008, p.20).

WIC: Women, Infants, and Children (WIC) program provides food assistance for families with children younger than five years (Food and Nutrition Services, 2009).
CHAPTER TWO
REVIEW OF THE LITERATURE

In response to food insecurity and inadequate nutrition, the United States Department of Agriculture (USDA) has implemented many programs in the United States to improve the nutrition education status throughout low-income communities. Some of the USDA's earlier accomplishments reported by Scheffler and Hammond (1992) include:

- The establishment of effective working groups to develop a department-wide nutrition education policy and oversee its implementation;
- The adoption of a nutrition education initiative to enhance the department's nutrition research, monitoring, and education activities;
- The improvement of the nutritional quality of school meals to enhance children's nutritional well-being and strengthen the school cafeteria's role as a learning laboratory for healthy eating habits.

(p. 3)

The USDA continues to strive to improve the health of underserved communities and help them overcome the problems of food insecurity and inadequate nutrition education.
The Problem of Food Insecurity

Food insecurity exists among many communities throughout the United States and throughout the world. A variety of studies have been conducted to determine who is at risk and what can be done to combat the problem.

Kaiser et al. (2003) conducted a cross-sectional survey of low-income Latino households to examine the relationship between food insecurity and food supplies in Latino households. Six California counties were examined, in which 274 low-income Latino families with pre-school children were recruited from WIC, Head Start, and other community-based organizations. The interviewers were trained over a three-day period to standardize collection procedures, bilingual and bicultural interviews, and confidentiality. The survey materials used were 24-hour recalls, maternal child weight and height, frequency of food consumption among children, household consumption, and participation in food programs. Variables measured were food security and Household Food Score (Kaiser et al., 2003). Household Food Score is a tool developed by the USDA to measure household food security through a series of questions answered by the interviewee. The interviewers used the last three months as the frame of reference. Pearson correlations, Kruskal-Wallis test, and logistics regression with significance level at P< .05 were used in analysis. The results demonstrated how food insecurity is associated with lower variety of most foods, especially
fruits and vegetables, in Latino households. Many studies also show the same correlations in African-American households (Kaiser et al., 2003).

Chang, Brown, Nitzke, & Baumann (2004) conducted a study on food insecurity, providing information on how to develop learning tools to increase awareness of lowering fat intake. Over the past 20 years, the percentage of total calories as fat for low-income women averaged 34.2% to 34.4% (Chang et al., 2004). Mothers of young children are especially high risk targets and should be an area of concern because of the long-term health implications for their children's dietary needs as well as their own. Two-hundred-eleven low-income non-pregnant mothers were recruited from Head Start and WIC programs. Questionnaires assessing the demographics and health status indicators of the participants were administered. Researchers used a cross-sectional design. Variables measured were predisposing, enabling, and reinforcing constructs of the PRECEDE-PROCEED model (Chang et al., 2004).

The results indicated good reliability, construct validity, and discriminant validity. The findings provided insight regarding predisposing factors of low-income mothers and high-fat-intake diets (Chang et al., 2004). The recommendations that were offered in this study were to implement the learning tools in WIC programs. Incorporating a nutrition education component in WIC to lower high-fat diets may add value to the program.
The WIC program was created to help low-income families with food insecurities by providing them with food vouchers, nutrition education and strategies to stretch their food to last all month. Taren, Clark, Chernesky, & Quirk (1990) conducted research on families frequently experiencing a monthly food shortage. The number of families experiencing the shortage has increased over the past 10 years. Populations that are at risk for food shortages include the elderly, young children, and single family households. As mentioned in the “Development of an Instrument to Assess Predisposing, Enabling, and Reinforcing Constructs Associated with Fat Intake Behaviors of Low-Income Mothers” study (Taren et al., 1990), these shortages are usually seen towards the end of the month. Low-income communities as well as those who are on food assistant programs both experience the food shortage.

Taren et al. (1990) also determined if weekly food servings consumed by low-income families enrolled in food assistant programs and those not enrolled in such programs could be directly related to food shortages at the end of the month. Random samples of low-income communities were selected and separated into two groups, one that participated in food assistant programs and another that participated in nutrition education. The focus of the study was on weekly food servings in the home. The results showed that those not enrolled in nutrition education had a decrease in weekly food servings as compared to those enrolled in food assistance programs, especially during the last week. The
results also indicated that the low-income families who were not enrolled in food assistance programs were younger, had more children, and were less established in their current residences (Taren et al., 1990).

Nutrition education is important for everyone, especially in low-income communities among those receiving food vouchers or food stamps. When the WIC staff teaches families how to make healthier food choices by adopting healthy portion sizes, participants may be able to help reduce their risk of developing chronic diseases and learn how to stretch their grocery dollar.

Women, Infants, and Children Program

The WIC program is a federal grant program that targets low-income women, infants, and children. Recipients of the program include pregnant, postpartum, and breastfeeding mothers and other participants with medical risks (e.g., anemia, history of pregnancy complications, or poor outcomes), and their infants and children up to age five, who may be nutritionally at risk (i.e., failure to meet dietary guidelines of Americans or those who have poor nutrition practices) (Food and Nutrition Services, 2009). WIC typically provides nutrition education in a classroom setting, referrals to health and other social services, and breastfeeding support, as well as food vouchers or checks to purchase formula and food for families. The program is available in all 50 states, 34 Indian Tribal Organizations, and several US territories, including American Samoa, District of
Columbia, Guam, Commonwealth Islands of the Northern Marianas, Puerto Rico, and the Virgin Islands (Food and Nutrition Services, 2009). In fiscal year 2006, Congress appropriated $5.2 billion for WIC to provide benefits for eight million people (most of whom were children) each month (Klotter, 2006). By comparison, in fiscal year 2010, Congress increased its appropriation to $7.2 billion. During the final quarter of fiscal year 2009, the number of women, infants, and children receiving WIC benefits each month reached approximately 9.3 million people (Food and Nutrition Services, 2009).

WIC was established in 1974 and funded by USDA. Today, there are 21 WIC site locations in Riverside County, with the current total caseload of 82,525 participants per month. WIC appointments are flexible to accommodate participants by having evening and Saturday appointments at selected sites. To qualify for WIC, applicants must be at no more than 185% of the poverty level, live in the state of California, and be in a category served by WIC including prenatal women or families who have children younger than five years of age. Immigration status has no effect on eligibility, and applicants may qualify even if employed.

WIC vouchers are given to participants to purchase healthy allowable foods. Vouchers are redeemable for only 30 days. Participants must use the vouchers either on or before the expiration date. Lost or stolen vouchers cannot be replaced. Participants can only purchase foods allowed by the WIC

12
A new food package was introduced in 2009 to include whole grains, soy products, and fresh fruits and vegetables (D. Wayne, personal communication, May 1, 2010).

Research on WIC Interventions

A variety of studies have been conducted on the WIC program to determine its need, effectiveness, impact on fruit and vegetable consumption, Five-a-Day promotions, physical activity interventions, cultural sensitivities, pregnancy outcomes, and infant feedings. Black et al. (2004) conducted a study in Washington DC on 5,923 WIC-eligible caregivers to determine the need of WIC assistance in the community. The study examined the association between people enrolled in WIC and people who were not enrolled. Researchers wanted to determine whether being enrolled in WIC would have better outcomes regarding food insecurity, weight of the babies, including over and underweight, and perceived health of the caregiver.

A cross-sectional survey was administered at urban medical centers in five states and Washington DC, from August 1998 to December 2001. As previously mentioned, 5,923 WIC-eligible caregivers of infants twelve months or younger were interviewed. The interviews took place in emergency rooms and hospital clinics. Outcomes measured were weight for age, length for age, weight for length, caregiver's perception of infant's health, and household food insecurity.
(Black et al., 2004). After eliminating participants for various reasons, including language barriers, inability to describe food insecurity, or refusal to be interviewed, researchers interviewed 5,923 infant caregivers, of whom 5,395 received WIC assistance and 528 did not.

The results showed that 91% of WIC-eligible participants received WIC. Sixty-four percent of WIC-eligible families who were not receiving WIC reported not participating due to access problems. These problems included waiting lists, missed appointments, lack of time to collect vouchers, transportation, lack of identification, homelessness, and more. Thirty-six percent reported not needing the WIC program.

Participation in WIC vs. eligible non-participation in WIC showed clear benefits for those enrolled in the program. Enrollees showed higher rates of marriage, higher education, higher employment, higher breastfeeding initiative, lower likelihood of accessing public housing, and more food stamp utilization in comparison to those who complained of having problems gaining access to the program. Interestingly, participants who are not willing to comply with the process of enrolling in WIC are usually groups who are most at need (Black et al., 2004).

Scheffler (1992) described many positive experiences that mothers and families have had during their WIC visits. One mother described how WIC helped her during a difficult pregnancy. During her pregnancy, she was unable
to maintain weight. She had dropped to a low, unhealthy weight and had to be hospitalized. She was overwhelmed with frustration and sought help from WIC. Upon enrolling her in the WIC program, the WIC staff provided her with nutrition counseling to help increase weight gain. The support from WIC continued throughout her pregnancy and after she gave birth. Many positive stories like this one are mentioned in Scheffler (1992).

WIC sets a higher standard for nutrition education program participation, as compared to other federal food programs such as the food stamp program. It is necessary for mothers to learn the importance of eating healthy because mothers are role models for their children. Developing healthy behaviors at an early age will help children develop and foster healthy behaviors as adults (Scheffler, 1992).

WIC continues to grow. In 1974, WIC served 88,000 women, infants, and children and cost $10 million. In 1992, WIC served 5.3 million participants each month, costing $2.6 billion for the year (Scheffler, 1992). Today, the WIC program continues to increase its participants and expenditures. In 2009, WIC served 9.3 million participants, costing $7.2 billion (Food Nutrition Services, 2009). Today, 85,000 participants are served in Riverside County alone as compared to 88,000 participants in 1974 serving the entire United States.

A letter was issued by the federal government in 2006 discussing WIC program nutrition changes. WIC had not changed its food package since the
program began. The old food package contained large quantities of whole milk, fruit juices, limited sources of protein, and limited food variety. The package did not provide low-fat, non-fat, soy, or tofu choices. The new package includes fresh fruits, vegetables, and whole grains, including corn tortillas, brown rice, soy milk, salmon, and more variety of foods (Klotter, 2006). Adding fresh fruits and vegetables to the WIC package may increase fruit and vegetable consumption in many low-income families.

Research suggests that many WIC participants have a low intake of fruits and vegetables. Herman, Harrison, Afifi, & Jenkins (2008) observed produce consumption in low-income women enrolled in WIC. The researchers conducted a study of 451 women who enrolled in postpartum services at three different WIC sites in Los Angeles County. The objective of the study was to determine whether a subsidy for fruits and vegetables in the WIC program would increase consumption of fruits and vegetables. The women were divided into an intervention group and a control group. The intervention group was given food vouchers with access to farmers' markets and supermarkets. The control group was given a minimal non-food incentive. The women participated in the study for six months. The participants' diets were followed for an additional six months after the program. The results were significant. The women in the intervention group increased their consumption of fruits and vegetables and sustained consumption for six months after the intervention. Farmers' market participants
showed an increase in 1.4 servings per day, and supermarket participants showed an increase of .8 servings per day. Whites and African Americans showed a greater increase in vegetable consumption over time, whereas Hispanics showed an increase in fruit consumption. Participants valued the availability of fresh fruits and vegetables. The 2009 WIC package, as mentioned in "Townsend Letter for Doctors and Patients" by Klotter (2006), includes a variety of healthy food items, including vouchers for fresh fruits and vegetables benefiting participants in the program (Herman et al., 2008).

The Behavioral Ecological Model: A Framework for Early WIC Participation

Nutrition education accompanied with the availability of nutrient-dense food creates a healthy learning environment. The Behavioral Ecological Model (BEM) is a useful tool to use as a framework for early WIC participation (Debate & Pyle, 2004). The authors discussed how the BEM has important elements that health educators should consider before conducting a program. The model takes into account personal, cultural, and environmental influences. As these factors are addressed, the program becomes more effectively focused on the needs of the specific individuals. WIC programs address all of these needs to promote healthy lifestyles.
Debate and Pyle (2004) conducted a study to determine reasons for early WIC participation among clients in local communities. A convenience sample of WIC participants was collected in a health department waiting room as they waited to receive their food vouchers. Participants were questioned on different days of the week and at different times of the day to reduce bias. A 42-item Likert-type questionnaire was developed to assess intrapersonal beliefs, perceptions, and knowledge; local network reinforcements; and community and systemic influences regarding WIC participation (DeBate & Pyle, 2004). Part One of the assessment tool examined the different levels of the Behavioral Ecological Model. Part Two of the assessment tool examined socio-economic status, race, gender, sex, age, education, and marital status. All of the participants were between the ages of 20 and 29; the majority were Caucasian while the remaining were split between African American and Latino. Sixty-five percent of the participants reported having a high school education. Many of the participants had very low incomes, ranging from $5,000 to $15,000 per year.

The results showed that most participants entered the program due to financial constraints, individual willingness, cultural reasons, and community influences. Findings also showed that WIC participants understood the importance of feeding their children nutritious meals to help develop healthy children. Overall, most of the clients agreed that WIC was a positive influence in their lives, and they were grateful for such a program.
A variety of intervention studies have been conducted in the WIC program to improve the overall health of the participants. Havas et al. (1998) conducted a study on the results of a Five-A-Day program that was implemented in WIC located in Maryland. Findings indicated that increasing the intake of fruits and vegetables may reduce the risk of some cancers. Based on this evidence the National Cancer Institute implemented the national Five-A-Day for Better Health Program in 1991 to encourage Americans to increase their produce intake. Studies showed that many Americans have a poor intake of fruits and vegetables. In the Maryland Study, a randomized crossover design was used. Women were recruited from 16 WIC clinics. The intervention included nutrition education, printed materials, visual reminders, and direct mail.

At the time, this study was one of a kind in reporting statistically significant changes in nutrition intake. Intervention participants showed a greater change in stages of change, knowledge, attitudes, and self-efficacy. Changes in consumption were closely related to the number of nutrition sessions attended, baseline stage of change, race, and education. One year later, mean consumption had increased by an additional 0.27 servings in both intervention and control participants (Havas et al., 1998).

Atwood, Walker, Johnson, & Berg (2004) conducted a randomized pilot test on mothers enrolled in WIC. The pilot studied a physical activity (PA)-focused program entitled "Moms on the Move." The pilot was created because
physical activity is a very important component in women's health. More than 43% of women living in the United States do not perform any form of physical activity, while 24% are active on occasion. Studies also show that women with children are less active than women who do not have any children. In addition, women with higher incomes have shown to be more active than women with lower incomes (Atwood et al., 2004).

Sedentary mothers were randomly assigned either “Mothers on the Move” (which was the PA intervention) or to counseling on self-breast examinations (which was the control). Pre and post measurements were conducted using stage of behavioral change, PA behavior, decisional balance, self-efficacy, and social support. By the end of the study, the experimental group met the Surgeon General's criteria of 150 minutes of moderate or intense PA per week (Atwood et al., 2004). The positive results of the study indicate the need for successful physical activity programs in WIC.

When conducting any program, whether it is in the WIC program or any other agency, it is important to be culturally sensitive to the target group being studied. Ikeda, Pham, Nguyen, & Mitchell (2002) conducted culturally relevant nutrition education among WIC-eligible Vietnamese immigrants to improve their dietary intake. The Vietnamese population is the fastest growing segment of the Asian/Pacific Islander population in the United States (Ikeda et al., 2002). Still not much is known about the nutrition intake of this population. What little is
known is that when they immigrate to the United States, the Vietnamese adapt to the U.S. diet by consuming large amounts of fatty foods, soft drinks, and unhealthy snacks. They also lower their intake of fruits and vegetables (Ikeda et al., 2002).

The researchers conducted a study to promote healthy diets among Vietnamese women enrolled in the WIC program. Homemakers were recruited from WIC sites in five California counties. The intervention involved culturally-specific nutrition education lessons and food recalls. The results showed an increased intake in the number of recommended food group servings and an increased intake in vitamins and minerals. It is evident that an intervention is more successful when it is culturally specific to the target group (Ikeda et al., 2002).

El-Bastawissi, Peters, Sasseen, Bell, & Manolopoulos (2007) conducted a retrospective cohort study in Washington State to determine if the WIC program had a positive influence on pregnancy outcomes. The study was conducted due to the significant health problems of babies born preterm, as shown by an 18% increase in preterm deliveries from 1990 to 2004. A variety of influences trigger preterm labor, such as poor nutrition during pregnancy, smoking and more. The WIC program provides nutrition education, both prenatal and postpartum, to encourage healthy eating for the fetus, newborn and child.
This cohort study examined records of eligible women enrolled in the WIC program in Washington from 1999 to 2000. Records of birth and fetal death were examined. A control group of women who were not enrolled with WIC was also examined (El-Bastawissi et al., 2007).

Over 50,000 WIC participants were eligible to participate in the study. After various exclusions, only 29,013 WIC women actually participated. The results showed that women who were enrolled in WIC vs. women who were not enrolled in WIC were less likely to deliver preterm babies. Although the findings are inspiring, variables including number of abortions and prenatal care also contributed to this result. Overall, enrollment in the WIC program may help prevent preterm labor by providing mothers with adequate nutrition assistance as well as nutrition education.

A longitudinal study conducted by Michaels et al. (2007) studied infant feeding and its direct effect on obesity throughout a life span. The Centers for Disease Control and Prevention promote breastfeeding as a tool for preventing overweight and obesity in adulthood (Centers for Disease Control, 2008). One of the important elements of WIC is encouraging women to breastfeed exclusively for the first six months of the infant’s life. This study was conducted to determine if breastfed babies would decrease their chances of becoming overweight and obese as adults. Participants in the nurse’s health study followed 35,526 women from 1989 to 2001. The participants were mailed a questionnaire
regarding the duration of breast or bottle feeding. Each participant was also asked to report body shape and height of her child at ages 5, 10, and 18 (Michaels et al., 2007).

The results showed that breastfeeding exclusively, and for longer durations, was not associated with being obese or overweight in childhood. Girls who were breastfed for at least six months had a leaner body shape at age five compared to non-breastfed girls or to girls who were breastfed less than a week (Michaels et al., 2007). The results seem promising and indicate that breastfeeding not only provides babies with most of the nutrition they need, but also promotes leaner body shapes later in childhood. The downside of the study is that leaner body shapes did not seem to persist during adolescence or adulthood.

Breastfeeding is usually done by women with higher social economic status and has been for the past decade (Michaels et al., 2007). Today, WIC clinics, hospitals and other health professional agencies encourage women to breastfeed their babies exclusively. WIC encourages its participants to breastfeed their babies and offers awards and prizes for those who do.

Adult Learners

Adult learners are faced with a variety of challenges. They are usually involved with full-time jobs, spouses, and children. Most have been away from
the academic field for at least 10 years or more, and returning could be challenging (Badke, 2008). Adult learners are those who, in the midst of life and career, have returned to studies to better themselves, retool, or qualify for advancement in their jobs.

Jack Meiziro first introduced the theory of adult learning in 1978 (Taylor, 2008). His theory explained how adult learners exhibited different learning styles as compared to their younger counterparts. Meiziro’s theory discussed the idea of “transformative learning” which is considered to be “uniquely adult-grounded in human communication, where learning is understood as the process of using prior interpretation to construe a new revised interpretation of the meaning of one’s experience in order to guide future action” (p. 5).

Over the past years, research has changed and may pose as a challenge to the adult learner. In the early 1980s and 1990s, technology and research were not major requirements of students. Today, however, without a computer, not much informational research can be accomplished by the learner. (Badke, 2008)

**Self-directed Learning**

When creating an educational self-directed learning tool, it is important to understand the difficulties of the adult learner in order to develop the program accordingly. Eneau (2008) discussed new perspectives on self-directed learning,
reporting on the importance of a learner's autonomy. Researchers argue whether self-directed learning is autonomous for the learner or if the learner becomes autonomous as a result. A variety of theories try to rationalize the true meaning of the self-directed learner and in which manner he/she actually learns.

Hill (2008) discussed the difficulties adult learners face today. He mentioned different views on adult learning regarding modern and postmodern ways of learning and understanding. His definition of adult learning includes the quest for truth, authenticity, and what is right.

A randomized trial was conducted by Campbell et al. (2004) of a tailored nutrition education program through self-directed learning using CD-Rom media for low-income women receiving food assistance. Research has shown that tailored interventions may help lower dietary fat and increase fruit and vegetable consumption. The participants were recruited from the WIC program. Groups were randomized into a control and intervention. They were surveyed at baseline and post. The demographics of the participants were 50% or more African American, and 96% were female. The study sample included 307 individuals.

The intervention was an interactive CD-ROM which consisted of a targeted video soap opera, a dietary assessment, and individually tailored dietary feedback and strategies for change. Findings indicated that the intervention group increased self-efficacy (P<.01) and scored significantly higher (P<.05) on
both low-fat and infant feeding knowledge compared to the controls. No differential effect was observed for dietary intake variables (Campbell et al., 2004). The results show that a CD-ROM intervention program may have an impact on mediators of dietary change but not significant enough to change behavior.

Self-directed learning is not a new training measure, but it has begun to emerge as a better method for meeting continuing education needs and skills retention. Self-directed learning is being used in many organizations. DeMauro (2008) discussed how firefighters use self learning courses as a relevant form of training. Self-directed learning is “a process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes” (p. 20).

Hoffmann and Miner (2008) discussed the concept of “Blended Learning.” “Blended learning means using the best delivery methodologies available for a specific objective, including online, classroom-based instruction, electronic performance support, paper-based, and formalized or informal on-the-job solutions among numerous others (p. 28).” The researchers surveyed more than 1,500 organizations to understand various blended learning methods. They found that some organizations that claimed to practice blended learning methods
displayed minimal areas of blended learning while others contributed more. The article also highlights the best practices in some of the organizations.

The role of self-directed learning is discussed by Laff (2008). A California based company called Informatica described how it used self-directed learning. The company launched a learning management system (LMS) to help employees decide if they would be interested in a career change within the organization. The LMS system was used to discard the one size fits all vertical advancement that most organizations have. It allowed employees to explore new opportunities without a formal move and provided self-directed learning to see if they were capable of making the switch (Laff, 2008). The manager of the company stated [the message to managers is, we would rather lose this employee to another department than lose them to another company] (p.8).

Rabe and Cadorna-Carlos (2007) conducted a study on curriculum at a medical school in the Philippines, which involved a curriculum change that included self-directed learning. The curriculum allotted a four hour session twice per week for tutorials, one to two hours per day for lectures, three hours twice per week for laboratory work and four hours twice per week for independent study time, which comprised protected study time for students to learn individually (Rabe & Cardona-Carlos, 2007). Faculty hypothesized that "individual casework could be a way to better identify knowledge deficits and increase experience in self-directed learning" (p. 511). Students were given PowerPoint presentations
with hyperlinks and other learning tools to obtain additional information regarding the topic. After each presentation, the students received questionnaires to see how much of the information presented was retained. Overall, 88% of the students reported that their understanding of the course material was comprehended at a higher level and that the selected material better addressed their learning needs. The results show that self-directed learning is a positive component in a learning program (Rabe & Cardona-Carlos, 2007).

Conclusion

As studies show, food insecurity can be decreased through nutrition education. The WIC program provides both food security and nutrition education. Nutrition education is imperative in helping families learn the importance of obtaining a healthy diet by incorporating more fruits and vegetables and being physically active. It would be disappointing if the educational component were lost as a result of low enrollment or lack of time to teach classes. To prevent education from being lost, it may be beneficial for participants to have access to a self-directed learning assessment tool.

A self-directed learning assessment tool, constructed according to known principles of adult learning, could enhance the nutrition education of the WIC program for clients who are otherwise unable to meet the nutrition education requirements due to missed appointments.
In Riverside County, most WIC participants have appointments to receive nutrition education before receiving their food vouchers. The nutrition education is taught in a classroom setting. Every two months the nutrition education topic changes. Subjects vary and may include healthier eating, breastfeeding, physical activity, healthy grocery shopping, and more. Each class usually lasts about 15 minutes. If appointments are missed for whatever reason, participants are encouraged to reschedule for another nutrition education segment. Some participants do not reschedule and as a result, do not receive the required nutrition education.

In efforts to increase case load in WIC, participants are able to receive vouchers as on a “walk-in” or “missed appointment” basis. As a result, nutrition education is lost. Participants are encouraged to make up their nutrition education class on the same date of their “walk-in” visit if the nutrition education class is being offered, or they are asked to attend the next scheduled nutrition class available. However, a high number of participants do not reschedule their nutrition education class.

Self-directed learning modules were created to allow participants to educate themselves in the lobby while they await their food vouchers. These
modules include a variety of subjects that are commonly taught in the WIC classes. All participants are given a pre-test before being given the module. The modules include a two-page sheet, double sided with five test questions provided at the end to serve as a post-test to determine if the participant comprehended the subject. The participants will have access to the answers at the bottom of the page written in smaller, gray colored font if needed as a reference. Each participant is expected to take home the completed module as a reminder of the subject for future reference and personal use.

Theoretical Framework

The Behavioral Ecological Model (Hovell, Wahlgren, & Gehrman, 2002) was used as the theoretical framework. Each module includes references to peers, family, cultural norms, and expectations, plus skill-building (self-efficacy) components. The modules are geared to individual learning, with encouragement to share the information with family and friends. Modules are sensitive to cultural norms that exist; therefore, all topics are presented in a culturally-sensitive and value-neutral format. The modules allow learners to learn at their own pace for better comprehension of the subject matter.

The Behavioral Ecological Model stresses behavioral expectations (i.e. what happens if the behavior takes place, whether it is positive or negative). It also stresses the varied environmental influences on behavior (Hovell, 2002). "It
extends the understanding of populations' behavior and culture by reliance on a hierarchy of interacting reinforcement contingencies” (p. 1).

Strategy for Model Development

Five modules were created. The models created are modified versions of the original WIC classes that are currently being taught today. The lesson topics have been reviewed by a supervising WIC nutritionist with Riverside County for face validity. The nutritionist suggested subjects that she would like to be re-created to a self-directed learning class. All of the modules created may be administered in Riverside County's WIC program, but their usage is not guaranteed.

The modules are created in English for the purpose of the completion of the project. They will all later be translated into Spanish for future use at the WIC sites. All modules are written for low literacy audiences (sixth grade reading level). The modules also include bright colorful pictures. The format is a two-page sheet, double sided. All of the modules will be housed in a case located in the lobby so that participants may choose a subject of their interest. A pre-test is included with each module to test baseline knowledge, prior to completing the module. A supervising dietitian reviews and approves the test items for face validity.
Self-directed Learning Modules

A variety of topics that target the concerns and needs of the participants are included in the modules. Topics are as follows:

1. Good Fat, Bad Fat and More
2. Iron Out Anemia
3. Moove to 1% Milk
4. Say Cheese
5. Try Something New with Fruits and Vegetables

Summary

As mentioned in the limitations, these modules may be used in Riverside County's WIC program; however, their use is not guaranteed. Implementing self-guided written modules also assumes that the clients are literate and that they have both the time and incentive to participate in the self-directed learning modules.

The initial languages of the modules are English although a number of WIC participants are Spanish speakers. The modules will eventually be translated into Spanish by WIC-approved translators once the project is complete.
CHAPTER FOUR
FINDINGS AND RESULTS

Nutrition education in WIC is a required element that sets the program apart from other food assistant programs such as the SNAP program. According to Food and Nutrition Services (2006), Federal regulations require that WIC nutrition education be a benefit that is available at no cost to participants, be easily understood by participants, bear a practical relationship to the participant's nutritional needs, household situation and cultural preferences, and be designed to achieve the regulatory nutrition education goals (p.1).

Riverside County Nutrition Services (RCNS) has 21 WIC sites throughout Riverside County and is actively involved in providing nutrition education to its participants. WIC designates a supervising nutritionist to oversee the nutrition segment of the program. The nutritionist develops or adapts the nutrition curriculum to meet the needs of WIC participants. Once the modules are complete, the lessons are piloted at an in-service of health educators. The health educators will later be responsible for delivering the modules to the participants. During the in-service, the class is demonstrated by a supervising nutritionist, and the health educators provide feedback. Once the questions and
answers are discussed by both the health educators and supervising nutritionist, the lessons are taken to WIC sites and taught to participants.

Module Construction

Adult learners are busy with their everyday lives taking care of children, spouses, and careers; therefore, their time is limited. Most adult learners want everything they do to count. They have very little tolerance for things considered to be irrelevant (Badke, 2008). Thus, a self-directed learning module for adults must provide direct information on the subject matter with little or no unnecessary jargon. The self-directed learning modules created offer direct information on the subject matter in a timely manner. They also provide vital information for the participant to take home and share with family and friends.

Five self-directed learning modules were created as samples for this project. Each module was adapted from classes currently being taught in the WIC program, and transformed from a lecture format to a self-directed learning handout. The subjects were chosen by a supervising nutritionist responsible for the education component in the WIC program. The modules offer a wide variety of information that many WIC participants can use in their daily lives. Topics include breast-feeding, bringing home a new baby, and feeding children healthy meals. The modules are featured in the WIC lobby area where the receptionist sits.
The modules are sensitive to the needs of WIC participants. They are written at a sixth grade reading level and include bright, colorful pictures. Each module is in handout format written on two pages, front and back. Five test questions are included each module before and after the handout is assigned. WIC participants are graded on their knowledge of the information read. After it has been graded by the WIC receptionist, the handout is returned to the participants to take home for future reference. The handout includes the test questions and answers. Once these modules are approved for use in the WIC program, they will also be translated into Spanish since over 50% of all WIC participants in Riverside County are Spanish speakers (Riverside County Nutrition Services, 2010).

Findings

Modules were piloted to 150 WIC participants in Riverside and tested to determine if their use would be beneficial to these participants. Three classes were piloted: “Moove to 1% Milk,” “Iron out Anemia,” and “Say Cheese.” After participants completed a module, they were given a short five question evaluation regarding the lesson. The questions asked if they liked the lesson, if it was comprehensible, and if they would like to have the module in the WIC program. All of the participants received a small nutrition-related incentive for
their time and cooperation. Some of the incentives given were aprons, cookbooks and lunch bags.

Results

Fifty WIC participants completed the “Mooove to 1% Milk” module, 50 completed the “Iron out Anemia” module, and 50 completed the “Say Cheese” module. All of the participants were women with young children. One-hundred percent of the participants said they liked the modules, 100 percent said the modules were easy to complete and 90 percent said they would like to have these modules included in the WIC program.

Summary

The self-directed learning modules can serve as an effective tool in providing nutrition education to participants in the WIC program. Based on this project, it appears that participants were willing to complete nutrition education modules in the lobby as they wait for their food vouchers. Discussion with the participants in this project showed that they liked the modules and that the modules were easy to use. Some participants mentioned that they actually would prefer the modules over the classroom lectures because they learned the content conveniently and at their own pace. Many participants in the WIC
program seemed to be willing to have a supplemental nutrition education in the event they missed their scheduled appointment.
CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

As pointed out in the review of literature, food insecurity can be decreased through nutrition education. By providing both food security and nutrition education, the WIC program strives to help families learn the importance of obtaining a healthy diet through incorporating more fruits and vegetables and being physically active. Nutritionists and health educators staff can help prevent education from being lost due to “missed appointments” or “walk-in” visits, by providing participants with other options in obtaining nutrition education at WIC by having access to a self-directed learning assessment tool.

A self-directed learning assessment tool, constructed according to known principles of adult learning, can enhance the nutrition education of the WIC program for clients who are otherwise unable to meet the nutrition education requirements.

Results of surveys from WIC participants revealed an interest in having a self-directed learning tool. The tool allows participants to learn at their own pace and provides the convenience of self-directed learning that lecture classes do not provide. The self-directed learning lessons are demonstrated as a favorable method of nutrition education in the WIC program and that the lessons can serve as a supplement to the current education that is provided.
Future Recommendations

The WIC program continues to grow and increase in case load each year, therefore allowing more participants to "walk-in" in order to receive vouchers with minimal nutrition education. WIC continues to strive for excellence by introducing new learning methods in its nutrition education program to keep up with the evolving knowledge each year. Recommendations should include lecture classes to continue in the program because they involve cooking demonstrations, props to illustrate lesson ideas, and group discussions, all of which engage the participants.

An additional recommendation would include self-directed learning modules be used as a supplement for those who miss lecture classes. Computers should also be installed at all WIC site lobbies, for participants to have the option of taking the self-directed learning modules on the computer. WIC participants should be allowed to choose which nutrition education topic they are interested in, whether it is in a lecture format or self-directed learning.
APPENDIX A:

MODULES FOR SELF-DIRECTED LEARNING
**Iron Out Anemia**

### Objectives:
When you complete this lesson, you will be able to:
- Review the common signs and symptoms of anemia
- List a good source of iron food
- List a food high in vitamin C and iron

---

### What is Anemia?
Iron deficiency anemia is a common blood condition that can be or may be caused by not eating enough iron foods. You need iron to carry oxygen throughout your body.

---

**Write the signs or symptoms of anemia that you have heard from your doctor or other healthcare provider.**

---

**Common Signs of Anemia**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tired, weak</td>
<td>Children have poor growth</td>
</tr>
<tr>
<td>Loss of energy</td>
<td>Difficulty concentrating</td>
</tr>
<tr>
<td>Poor appetite</td>
<td>Get sick easier, stay sick longer</td>
</tr>
<tr>
<td>Pale</td>
<td>Shorter attention span</td>
</tr>
<tr>
<td>Cranky, irritable</td>
<td>Learning and developing problems</td>
</tr>
<tr>
<td>Shortness of breath and headache, especially with exercising</td>
<td></td>
</tr>
</tbody>
</table>
Now, you will see which foods contain iron. Take a look at the pictures inside the box.

After looking at the list of iron foods, list one iron food you have eaten in the last day or two.

You may have noticed some of these foods are WIC items. The rice, pasta, bread, tortillas, and cereals are all enriched with iron, meaning iron has been added to them.
Eating Vitamin C with an iron food at the same time helps your body absorb iron better.

Now take a look at the "Vitamin C nutrient sheet" handout.

Write down Vitamin C foods that you can eat with your iron foods and how you would serve them.

Conclusion
As a parent or someone who is taking care of young children, you want to be healthy and have energy.
You want your children to also be healthy so that they can grow and learn.
One way to make sure you are all at your best is by eating a balanced diet that includes iron and Vitamin C foods daily.
By doing this you can reduce your risk of anemia.
You have read a lot about anemia and foods high in iron in this lesson, including:
- The signs and symptoms of anemia
- Why you need to eat a Vitamin C food with an Iron food.

With everything you have read about iron and Vitamin C foods this lesson, what is the one thing you might try to do at home to prevent your family from developing iron deficiency anemia?

Test yourself
1. Write two common signs of iron deficiency anemia.

2. Is iron is needed to carry oxygen throughout your body?
   □ yes □ no

3. Write two foods high in iron.

4. Write two foods high in Vitamin C.

5. Does eating Vitamin C with and iron foods at the same time help your body to absorb iron better?
   □ yes □ no

Hooray! You're done. Please return to front desk.

Answer box: (1) Tired, poor appetite (2) yes (3) Chicken, tofu (4) bell peppers, strawberries (5) yes

Healthy Tip: Use a cast iron pot or pan to increase iron in your food.

Many iron rich foods can be found in the meat group of the MyPyramid. For additional information visit MyPyramid.gov
Mooove to 1% Milk

Objectives: When you complete this lesson, you will be able to:

- Compare four milk labels: whole, 2%, 1%, fat-free
- Determine which milk is the healthiest
- Write one tip for switching to low-fat milk

Think of yourself, when you were a child, what type of milk did you drink?

- Do you still drink the same kind of milk today?
- What kind of milk does your child drink?

Many people continue to drink the same type of milk they grew up on because that is simply what they are used to drinking.

Have you heard, "You are what you eat?" In many ways this is true.

- Foods we eat on a regular basis can affect our health. Eating a dinner high in fat increases our chances of having health problems.
- We can make better choices by reading the food label. The food label lists nutrients and can help you compare one food to another food.

Milk Nutrition Facts Label

<table>
<thead>
<tr>
<th>1 cup milk (8 oz)</th>
<th>Calories</th>
<th>Total Fat</th>
<th>Protein</th>
<th>Calcium</th>
<th>Vitamin D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat Free</td>
<td>90</td>
<td>0 grams</td>
<td>9 grams</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Low-Fat 1%</td>
<td>120</td>
<td>2.5 grams</td>
<td>11 grams</td>
<td>35%</td>
<td>25%</td>
</tr>
<tr>
<td>Reduced Fat 2%</td>
<td>130</td>
<td>5 grams</td>
<td>10 grams</td>
<td>35%</td>
<td>25%</td>
</tr>
<tr>
<td>Whole</td>
<td>150</td>
<td>8 grams</td>
<td>8 grams</td>
<td>30%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Take a look at your "Moove to low-fat or fat-free milk" handout. Please write one item that is the same and write one item that is different on the labels.

see other side
Recommendations:

- Whole milk is recommended for 1- to 2-year-olds because they need the fatty acids for brain development.
- After the age of 2 years 1% or fat-free milk is recommended.
- Note: The WIC program no longer provides whole milk to children over 2 years old.

Please write down how many grams of fat are in 1 cup of whole milk.

You are correct; there are 8 grams of fat in 1 cup of milk. Eight grams is roughly the same as 2 teaspoons. So, that means 1 cup of whole milk has 2 teaspoons of fat per serving.

If you consume 3 (8 oz) cups of whole milk a day, times 365 days a year, it adds up to 22 ½ pounds of additional body fat.

Over time it really does make a difference.
Tips for Switching to Low-fat or Fat-free Milk

Now that you have read which milk is healthier and best for your families, you are now going to read tips to make it easier to switch to a lower fat milk, such as 1% or fat-free milk.

Below are more possible answers:
- Make the change gradually
- Mix low-fat milk into whole milk jug
- Use low-fat milk to make smoothies
- Explain to your family why it's important to change to low-fat milk
- Use low-fat milk in cooking oatmeal, soups, pudding, pancake mix, etc.

There is one simple thing you can do for your family to have a healthier diet, and that is to switch to low-fat milk. It is important to get children off to a healthy start in life by getting them used to drinking low-fat milk. This little change can make a big difference over time.

Please write down one thing you can do to make it easier to switch to low-fat or fat-free milk.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Test yourself

1. Write one item that is the same in the "Mooove to low-fat or fat-free milk" handout.

2. Write one item that is different in the "Mooove to low-fat or fat-free milk" handout.

3. How many grams of fat are in one cup (8 oz) of whole milk.
   - 2 grams
   - 5 grams
   - 7 grams
   - 8 grams

4. Which type of milk is the healthiest?
   - whole
   - 2%
   - 1%
   - fat free

5. Name one tip for switching to low-fat or fat-free milk.

Healthy Tip: Drink or eat 3 to 4 servings of milk, yogurt, or cheese each day to meet your calcium needs.

The Milk group is part of the MyPyramid. For additional information visit MyPyramid.gov

Hooray! You're done. Please return lesson to front desk.

Answer box: (1) Vitamin D (2) Grams of fat (3) 8 grams (4) Fat-free (5) Make the change gradually, etc...
Objectives: When you complete this lesson, you will be able to:

- Compare the nutrient content in various WIC cheese choices
- Write a tip for cooking with cheese
- Prepare low-fat cheese recipes

WIC's Cheese Choices
Please write one way your family enjoys eating and cooking with cheese.

You can buy many different kinds of cheese with your WIC checks and they are all listed in your "Shopping Guide."

You may have noticed that you can buy low-fat, reduced-fat, or non-fat cheese with your WIC checks.

Take a look at your WIC choices on page 5. Please write down what types of cheese you buy for your family.

Have you tried any of these cheeses? □ yes □ no

Not all stores will carry all of the WIC cheese choices. You can talk to the store manager about getting other cheeses. If there is an interest, stores may order them because they want your business.

See other side
What's in Your Cheese?

There are so many types of cheese to choose and many of us do not think about the nutritional differences between them.

Take a look at the "What's in Your Cheese" handout.

Please notice that this chart gives you information on the serving size, calories, and total and saturated fat, as well as protein and calcium of 3 different types of cheese:
- "Regular" Cheddar, Colby, and Jack – made from whole milk
- These same cheeses are made with reduced-fat (2%) milk
- Mozzarella cheese made with part skim milk

In summary, reduced-fat and part-skim cheeses, compared to "regular" whole milk cheeses:
- Are lower in total and saturated fat.
- Have the same amount of protein.
- Have the same or more calcium.

Soy and tofu WIC Options

If you or your family members on WIC do not drink milk or eat cheese. WIC is now offering soy milk and tofu as a substitute.

Soy milk and tofu can be a good source of calcium; however, the amounts vary so it is important to read the Nutrition Facts label.

If you are receiving a soy package from WIC, please feel free to request a "What's in Your Soy" handout for information on choosing these foods.
Tips for Cooking and Storing Cheese

Now take a look at the cooking with cheese handout. Please read the tips on "Cooking with Cheese."

As you read them, please think about what is useful to you. Write down other tips on "Cooking with Cheese" that you would like to add.

Your handout also lists important reminders for storing cheese.

The 3 "Cs" for Storing Cheese are:
- Covered
- Cold
- Clean

Cooking with Cheese for YOUR Family

There are 3 delicious recipes on your handout that help enjoy cheese with less fat.
- The Apple Chicken Quesadilla recipe uses reduced-fat cheese.
- The Vegetable Chowder uses a sharp cheddar cheese, and the
- Eggplant Mozzarella uses part skim mozzarella.

Do you think your family would enjoy these recipes? □ yes □ no
You have read a lot about cheese in this lesson including:
- Your WIC choices
- Nutrition information
- Cooking and storing tips
- Recipes using lower fat cheese

With everything you have read about cheese in this lesson, what is the one thing you might try to do at home?

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</tbody>
</table>

Test yourself
1. Name two different kinds of cheeses you can purchase with your WIC checks.
   - 
   - 

2. What is a serving size of cheese?
   - 1 cup
   - ½ cup
   - 1 ounce
   - 2 ounces

3. Can you purchase soy or tofu items with your WIC checks?
   - yes
   - no

4. The 3 "Cs" for storing cheese are:
   - 
   - 
   - 

5. Name a low-fat cheese recipe.
   - 

Hooray! You’re done. Please return lesson to front desk.

Answer box: (1) Mozzarella, Cheddar, etc... (2) 1 ounce (3) yes (4) Covered, Cold and Clean (5) Eggplant Mozzarella, Apple chicken quesadilla or Vegetable Chowder

Healthy Tip: Try low-sodium cheese soup over whole wheat chips for a low-fat snack.

Cheese belongs to the milk group in the MyPyramid. For additional information visit MyPyramid.gov
Good Fat, Bad Fat & More

Objectives: When you complete this lesson, you will be able to:
- Recognize the different types of fat in foods.
- Choose low fat vs. high fat meals throughout the day.

If someone told you "All fats are the same". Do you think this statement is true or false?
- True
- False

There are 4 different kinds of fat.
First let's take a look at 2 types of fat: Monounsaturated and polyunsaturated fats.

Monounsaturated
- Heart Healthy
9 calories per gram
Examples: Olive, peanut and canola oils
   Avocados
Liquid at room temperature

Polyunsaturated
- Heart Healthy
9 calories per gram
Vegetable oils
Examples: Fish: tuna, trout, salmon
Nuts and seeds
Liquid at room temperature

Keep this question in mind as you continue on reading this lesson.

See other side
Now let's take a look at the last 2 types of fat: saturated fat and trans-fatty acids known as "trans fat".

**Saturated Fat**
- Increase risk of heart disease
- Increase blood cholesterol
- 9 calories per gram
- Lard, butter, meat, dairy products
- Coconut, palm and palm kernel oils
- Solid at room temperature

**Trans Fat**
- Increase risk of heart disease
- Increase risk of blood cholesterol
- 9 calories per gram
- Processed foods- fried foods, crackers, fries, baked goods, chips, margarine
- Semi-solid or solid at room temperature
- (vegetable oil) + (hydrogen) = hydrogenated oil or Trans-fat

Back to the statement "All fats are the same", the answer is yes and no.

In terms of calories all fats are the same.
- Fat has 9 calories per gram.
- So if you're trying to lose weight or maintain your weight, all types of fat have the same amount of calories.

In terms of health, all fat are **NOT** the same.

Some fats are heart healthier than others, but whether it is a good fat or bad fat, you want to limit your fat intake for good health.

Saturated fats and trans-fats can clog your arteries and lead to heart disease and stroke.

Did you know that more than 500,000 people each year die from heart disease alone?
Guess the Fat Activity

Please circle a breakfast, lunch or dinner that is lower in fat.

Breakfast A
1 ¼ cup Cheerios
8 oz. 1% milk
1 banana
6 oz. 100% orange juice

Breakfast B
2 eggs
2 pancakes
2 sausages
8 oz. of 2% milk

Lunch A
bacon cheeseburger
medium fries
soda

Lunch B
turkey club sandwich
soda
Or
Wendy's taco supreme salad

Dinner A
3 ounces fried chicken
¾ cup coleslaw
1 biscuit

Dinner B
¾ cup chicken stir fry with
vegetables and
1 cup white rice

You might wonder how much is too much fat.

For a 2000 calorie diet, it is recommended you eat less
than 65 grams of total fat per day, which is about 30%
of your total calories.

Children under age 2 do not need to limit their fat.
It is NOT recommended. Fat is still needed for brain
and central nervous system development.

Breakfast A: This healthier choice meal has 5 grams of fat.
Breakfast B: This meal has 29 grams of fat.

Lunch A: This meal has 47 grams of fat.
Lunch B: This healthier choice meal has 16 grams of fat.

Dinner A: This meal has 30 grams of fat.
Dinner B: This healthier choice meal has 5 grams of fat.

See other side
We've talked about fat and how it fits into our diet, now let's talk about Cholesterol. Cholesterol is a fat-like substance needed for our bodies to be healthy. It is used to make cells, some hormones and vitamin D. Our liver makes about 80% of all cholesterol we need, the other 20% comes from the food we eat. Cholesterol is ONLY found in food from animal sources, such as meat, eggs and dairy products. Too much cholesterol in your diet can cause it to build up in your arteries and this "build up" is called plaque. As plaque builds up, less blood can pass through your arteries to get to your heart and brain and over time leads to heart disease and stroke.

Guidelines:
Total Cholesterol <200 mg/dl
HDL—Good Cholesterol >60 mg/dl is recommended.
LDL—Bad Cholesterol <100 mg/dl

Prevention is your best tool to take action against high cholesterol:
1. Physical activity will help lower "bad" cholesterol (LDL) and raise "good" cholesterol (HDL).
2. If you are overweight, try to lose weight. Talk to your doctor for advice.
3. If you smoke, try to stop smoking. Talk to your doctor for advice.

Test yourself
1. List a healthy food that is rich in monounsaturated fat.
   Monounsaturated rich food _________________

2. List an unhealthy food that is rich in saturated fat.
   Saturated rich food _________________

3. True or False. Being overweight can lead to high blood pressure and related complications.
   □ True   □ False

4. True or False. HDLs are considered "good" cholesterol and LDLs are considered "bad" cholesterol.
   □ True   □ False

5. Being physically active and obtaining a healthy diet low in saturated and trans-fats can help prevent high cholesterol?
   □ True   □ False

One size doesn't fit all. MyPyramid offers personalized eating plans and interactive tools to help you plan/assess your food choices based on the Dietary Guidelines for Americans. For additional information visit MyPyramid.gov

Healthy Tip: Try baking, broiling, or grilling instead of frying.

Hooray! You're done. Please return lesson to front desk
Try Something New with Fruits & Vegetables

Please write your personal shopping experience, about how you used the new checks for fruits and vegetables.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Which one is more difficult for you to add to a meal or as a snack?

☐ Fruits  ☐ Vegetables?

Circle a picture located in the box of a fruit or vegetable that you have tasted, or would like to try, taste, or learn more about.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Objectives: When you complete this lesson, you will be able to:
- Write a personal experience shopping with new checks for fruits and vegetables.
- Distinguish the difference between WIC Farmer’s Market checks and WIC Fruit and Vegetable checks.
- Write one example of how their family might incorporate more fruits or vegetables into meals.

WIC provides fruits and vegetables in your monthly food package because of the many health benefits—including weight maintenance, control of blood sugar, and reduced risk of many cancers.

<table>
<thead>
<tr>
<th>Pineapple</th>
<th>Mango</th>
<th>Cauliflower</th>
<th>Beets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage</td>
<td>Chayote</td>
<td>Asparagus</td>
<td>Turnip</td>
</tr>
<tr>
<td>Greens</td>
<td>Jicama</td>
<td>Berries</td>
<td>Kiwi</td>
</tr>
<tr>
<td>Noplas</td>
<td>Papaya</td>
<td>Eggplant</td>
<td>Okra</td>
</tr>
<tr>
<td>Summer Squash</td>
<td>Opo</td>
<td>Winter Squash</td>
<td>Asian Pear</td>
</tr>
</tbody>
</table>

See other side
## Know the Difference!

<table>
<thead>
<tr>
<th>WIC Farmers' Market Checks</th>
<th>WIC Fruit and Vegetable Checks</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Can only be redeemed at WIC approved Farmers' Markets. Look for the WIC logo.</td>
<td>* Can only be redeemed at WIC approved Grocery Stores. Look for WIC logo.</td>
</tr>
<tr>
<td>* Buy any fresh fruits and vegetables only.</td>
<td>* Buy fresh, frozen or canned fruits and vegetables.</td>
</tr>
<tr>
<td>* Can buy cut herbs.</td>
<td>* The only herbs you can buy are parsley, cilantro, mint and basil.</td>
</tr>
<tr>
<td>* Can buy any kind of potato like white, yellow, purple, sweet potatoes, and yams.</td>
<td>* Can only buy sweet potatoes and yams.</td>
</tr>
<tr>
<td>* Checks valued at $20 are given only per family, per season (May through November).</td>
<td>* Checks are provided to each participant on a monthly basis year round. Value varies.</td>
</tr>
<tr>
<td>* Farmer does not need to write in purchase price.</td>
<td>* Cashier must write in the purchase price.</td>
</tr>
<tr>
<td>* Participant signature is not required.</td>
<td>* Participant signature is required.</td>
</tr>
</tbody>
</table>
Why Eat More?

Please check each statement about fruits and vegetables that you feel are important to you.

- □ Naturally low in calories and mostly fat free
- □ Help you get to a healthy weight
- □ Help reduce the risk of many cancers
- □ Provide many vitamins and minerals
- □ Great source of fiber

More is Easy!

What have you heard about how many fruits and vegetables your family needs everyday?

- It is important to eat different colors of fruit and vegetables because they supply different important nutrients.
- Bright colorful fruits and vegetables have the most nutrients.
- Eat 3-5 cups of fruits and vegetables each day.

Please write one tip or idea on how to prepare a fruit or vegetable for your kids and family to enjoy everyday.

________________________________________

________________________________________

See other side
You have read a lot about fruits and vegetables in this lesson including:

- Writing a personal experience shopping with new checks for fruits and vegetables.
- Knowing the difference between WIC Farmer’s Market and WIC fruit and vegetable checks.
- Writing one example of how your family might incorporate more fruits or vegetables into meals.

Test yourself

1. Name a fruit and a vegetable that you can purchase with your WIC checks.
   Fruit ________  Vegetable ________

2. True or False. WIC approved Farmers’ Markets checks can only be redeemed at WIC approved Farmers’ Markets.
   □ True  □ False

3. True or False. WIC Fruit and vegetable checks can only be redeemed at WIC approved Grocery stores.
   □ True  □ False

4. True or False. Fruits and vegetables are naturally low in calories and mostly fat-free.
   □ True  □ False

Hooray! You’re done. Please return lesson to front desk

Answer box: 1. Any fruit or vegetable is correct. 2. True. 3. True. 4. True.

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Healthy Tip: Fill half of your plate with fruits and veggies at every meal.
REFERENCES


63


