ABSTRACT

DEVELOPMENT OF A TOOL TO EVALUATE NUTRITION EDUCATION WEBSITES FOR LATINO PARENTS OF PRESCHOOL CHILDREN

By

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May 2015

The purpose of this project was to create a tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. The goals of this project were to increase awareness of the Latino childhood obesity problem and provide a tool to web developers to aid in the development of culturally appropriate nutrition education websites for preschool Latino children.

The primary evaluation tool is organized into eleven groups: site content, site functionality, site design, layout, readability, user learning experience, type style, use of color, photos and illustrations, non-English site development, and site evaluation. All criteria were included based on evidence-based research and a review of literature. A feasibility study was conducted to review the primary evaluation tool and a content evaluation form for users provided feedback.

DEVELOPMENT OF A TOOL TO EVALUATE NUTRITION EDUCATION WEBSITES FOR LATINO PARENTS OF PRESCHOOL CHILDREN

A PROJECT REPORT

Presented to the Department of Family and Consumer Sciences

California State University, Long Beach

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Nutritional Sciences

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May 2015

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TABLE OF CONTENTS

Page

LIST OF TABLES vi

CHAPTER

1. INTRODUCTION 1

Introduction 1
Statement of the Problem 3
Purpose Statement 4
Project Objectives 5
Definition of Terms 5
Limitations 7
Assumptions 7

2. REVIEW OF THE LITERATURE 8

Introduction 8
Childhood Obesity 8
Roles in Statistical Disparity of Obesity 9
Race/Ethnicity 10
Socioeconomic Status 10
Acculturation 11
Access and Utilization of Health Care 12
Home Food Environment 13
Role of Interventions 15
Elements of Nutrition Education 17
Participant Understanding 18
Effectiveness 18
Family Involvement 19
Education Through Technology 19
Latinos and Technology 21
Evaluation Tools 22
Site Content 23
Site Functionality 24
Site Design 24
Site Layout 25
Site Readability 25
Learning Experience 26

CHAPTER Page

Type Style 27
Use of Color 28
Photos, Illustrations, and Symbol Use 28
Non-English Site Development and Translation 28
Site Evaluation 29

3. METHODOLOGY 30

Introduction 30
Prospective Tool Users 30
Procedures 31
Evaluation Tool Topics 32
Evaluation Tool Structure 33
Evaluation 33

4. RESULTS 34

Introduction 34
Achievements of Project Objectives 34
1. Information on Childhood Obesity and Adult Internet Usage of Latinos in the United States 34
2. Relevant Criteria For Evaluating Nutrition Education Websites Geared Towards Latino Families 35
3. Development of a Primary Evaluation Tool 36
4. Development of a Content Evaluation Tool 37
5. Feasibility Study 38

5. DISCUSSION AND CONCLUSION 40

Introduction 40
Challenges 40
Implications 42
Summary 43

APPENDICES 44

A. PRIMARY EVALUATION TOOL CRITERION 45

B. PRIMARY EVALUATION TOOL SCORING TABLE 56

C. CONTENT EVALUATION TOOL TABLE 58

D. FEASIBILITY STUDY RESULTS 60

REFERENCES 64

LIST OF TABLES

TABLE Page

1. Participants of Feasibility Study 39

CHAPTER 1

INTRODUCTION

Introduction

Rates of overweight and obese children continue to rise worldwide in all but the poorest countries (Taveras, Gillman, Kleinman, Rich-Edwards, & Rifas-Shiman, 2013). In the United States childhood obesity is considered an epidemic affecting approximately 1 in 6 children and adolescents between 2-19 years old based on the most recent National Health and Nutrition Examination Survey (Torre et al. 2013). Early nutrition predicts long-term cognitive, social, and physical health outcomes (Swindle, Ward, Whiteside-Mansell, Bokony, & Pettit 2014). Being overweight in early childhood is a significant health problem; it sets the groundwork for a lifetime of non-communicable diseases and other health disparities.

Child overweight and obesity rates have plateaued in some population subgroups in the United States like non-Hispanic Whites and higher socioeconomic status groups, but prevalence is disproportionate across subpopulations and overall rates remain high (Taveras et al. 2013). The overweight and obesity rate disparities among racial and ethnic subpopulations in the United States are widening, with Latino children being more likely to be overweight than children in other racial/ethnic groups (Pérez-Morales, Bacardî-Gascon, & Jiménez-Cruz, 2012). In children and adolescent populations, obesity affects 22% of Latinos compared to 14% of White non-Latinos (Centers for Disease Control and Prevention [CDC], 2014a).

Disparity in obesity and obesity-related diseases can be accounted for by factors including race/ethnicity, socioeconomic status, acculturation, access to and utilization of health care, and the home food environment (Dave, Evans, Pfeiffer, Watkins, & Saunders, 2009; Taveras et al., 2013; University of Minnesota [UM], 2013). These disparities exist among most of the known risk factors for childhood obesity beginning in the prenatal period and continuing throughout childhood. The prevalence of these early life risk factors for childhood obesity has been found more in children from racial/ethnic minority groups compared to their White counterparts (Taveras et al., 2013). Latino mothers commonly associate excessive weight, a BMI at or above the 97th percentile as a desirable and healthy state for their children (Gorin et al., 2014).

Children should be regularly visiting their primary care office, but BMI is often not addressed and many parents are unaware of their child's weight status. They do not receive suggestions from their pediatrician regarding techniques of improving their child's eating and exercise habits. This leaves parents uninformed on strategies to provide a healthy environment for their families and implement healthy behavior changes.

The childhood obesity epidemic in the United States is of utmost importance to address, particularly finding ways to decrease overall rates as well as eliminating disparities in prevalence among subpopulations, particularly Latinos. The CDC (2012) published that 8% of preschool children were obese with prevalence increasing with age. Emphasis should be placed on prevention of obesity rather than on treatment due to implications of childhood overweight and obesity rates on a lifetime of health complications.

Evaluation research is needed to address the best ways to provide culturally-appropriate and sustainable interventions for nutrition education to parents of Latino preschool children. Due to the current availability and widespread use of technology, the Internet is now becoming a basis for acquiring information. The Pew Research Center (2014b) reports as of 2014 that 87% of adults in the United States are now using the Internet, with 72% of users searching specifically for health-related information. Parents play a key role in the diet and lifestyle of their children throughout the early childhood period. This project will help to counteract unhealthy environments by providing a tool to evaluate the education sources available for parents. Identifying culturally-appropriate resources for the Latino population is important to narrow the disparities seen in the high rates of overweight and obese Latino children. A major benefit of this project will be improving the health status of our future Latino adults.

Statement of the Problem

High childhood overweight and obesity prevalence rates continue to be a worldwide issue. In the United States the highest rates and disparity of obesity exist for Latino children. The focus of concern with this epidemic is on the health complications that arise from a child being overweight, or the complications faced as overweight or obese adults. Management of these high prevalence rates should focus on primary prevention and keeping kids healthy throughout early childhood, allowing development into healthy adults. Primary prevention can be instituted first and foremost through the parents and enforced in preschool children. There is increasing availability of nutrition education resources online so an evaluation tool should be developed for these websites to ensure they are culturally-appropriate and specific to aiding Latino families.

Primary care physicians should be the first line of advice and suggestions for parents seeking information on raising healthy children. Data shows weight management discussion and eating/exercise habit suggestions are often not being addressed at the children's regularly scheduled visits (Gorin et al., 2014). As a result of primary care physicians themselves or due to lack of access to healthcare, the Internet often serves as a convenient source of information. In the past year 72% of adults in the United States report going on the Internet for health information (Pew Research Center, 2014b).

For this directed project, an evaluation tool will be developed specifically focused on assessing nutrition education websites geared towards Latino parents with preschool children. The tool will target web developers focused on websites that provide nutrition information for children between 2 and 5 years old and that encompass Latino culture and family healthfulness. Reinforcing engagement of parent involvement in interventions in reducing childhood obesity is key to promoting positive results.

Purpose Statement

The purpose of this project is to develop a tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. This project will address the childhood obesity challenges unique to Latino families and the relevant criteria that the nutrition education websites should contain when geared towards this population. Providing an evaluation tool will better enable web developers to produce educational sources fit for Latino families with nutritional adequacy and cultural integration.

Project Objectives

The specific objectives of this project are to:

1. Identify key childhood obesity information and adult Internet usage specific to the Latino population in the United States.

2. Identify and analyze relevant criteria for evaluating nutrition education websites geared towards Latino families with preschool children.

3. Develop a primary evaluation tool to be used by web developers producing nutrition education sources geared towards preschool Latino children.

4. Develop a content evaluation tool to be used by Registered Dietitians (RD) professionals for external review of the content.

5. Conduct a feasibility study to test the primary evaluation tool and content evaluation tool.

Definition of Terms

Acculturation: Long-term process of adaptation to a new culture. Individuals modify certain aspects of their values, norms, and behavior in response to contact between two cultures (Dave et al., 2009).

Body mass index (BMI): Ratio calculated using child's weight and height to indicate body fatness. A measure used to determine childhood overweight and obesity using an age- and sex-specific percentile due to body composition variance (CDC, 2012).

Cultural appropriateness: A set of congruent behaviors, attitudes, and policies that come together in a system enabling effective work in cross-cultural situations. Websites that provide information within the context of the cultural beliefs, behaviors,

and needs of the Latino community (United States Department of Health and Human Services [USDHHS], 2013).

Family: Any immediate or extended family members and essential people that play an important role and are active participants in caring for and raising the children (Halgunseth, & Peterson 2009).

Food insecurity: Limited or uncertain availability of nutritionally adequate and safe foods, limited or uncertain ability to require acceptable foods in socially acceptable ways (Dave et al., 2009).

High-energy-dense foods: Foods containing high calorie count with low amount of nutrients (CDC, 2013)

Latino: Any person who identifies themselves as being from Spanish-speaking background and traces their origin/descent from Mexico, Puerto Rico, Cuba, and Central and South America (Pew Research Center, 2014a).

Overweight: BMI at or above the 85th percentile of the sex-specific CDC BMI-for-age growth charts (CDC, 2012).

Obese: BMI at or above the 95th percentile of the sex-specific CDC BMI-for-age growth charts (CDC, 2012).

Preschool age: Children between the ages of 2 to 5 years old (CDC, 2014b).

Primary prevention: Use of prevention methods aiming to prevent disease from occurring to reduce both incidence and prevalence of a disease (CDC, 2014a).

Screen time: Time spent in watching television or movies, using computers, video games, cell phones, and entertainment media (CDC, 2013).

Statistical disparity: In this project, statistically significant differences in Latino rates compared to other race/ethnicity population groups.

Web-based learning: Otherwise known as online learning, in contrast to teacher- and textbook-based learning. Provides a learning environment that can enhance knowledge by allowing student knowledge if it has a user-centered design (Hadjerrouit, 2010).

Limitations

Certain limitations and restrictions are recognized in the development of this project. The parents will need to have access to a computer with Internet, be comfortable with education in an alternative setting, and be comfortable with the use of technology to view the information. The fact that there may not be a large amount of websites aimed specifically towards the Latino population may be a limitation. The evaluation tool will not be tested extensively, but only initially tested prior to completion of the project, which could be a limitation because effectiveness of usage will not be known.

Assumptions

An assumption is that potential website visitors will have a level of literacy to access and use the information that the website is providing to engage them in behavior change. It is assumed that web developers will have enough interest in the evaluation tool to use it. It is assumed that the evaluation tool will give a credible review of the web-based nutrition education sources. A final assumption is that the web-based education sites will be providing nutrition information that is up-to-date and being continuously evaluated and updated by the developers.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this project is to develop a criterion-based tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. This project will address the childhood obesity challenges unique to Latino families and the relevant content and format that the nutrition education websites should contain when geared towards this population. Providing an evaluation tool will better enable web developers to produce educational sources fit for Latino families with nutritional adequacy and cultural integration.

Childhood Obesity

Child overweight and obesity rates are rapidly becoming serious health problems in wealthy countries worldwide (Martinson, McLanahan, & Brooks-Gunn, 2012). Rates continue to rise and have more than doubled in the past 30 years in the United States alone, despite a leveling and declining of rates in some population groups. Obesity remains a leading public health issue in the United States with approximately 1 in 6 children and adolescents between 2-19 years old considered obese (Food Research and Action Center [FRAC], 2010; Torre et al., 2013). In children and adolescent populations obesity affects 21% of Latinos compared to 14% of White non-Latinos (Torre et al., 2013). Statistics indicate that Latino children in the United States are much more likely

to be obese than White children (Martinson et al., 2012). Overall prevalence remains high and more attention is needed on the disparities that exist in rates among the different ethnic/racial subgroups (Vollmer & Mobley, 2013).

Childhood obesity has both immediate and long-term health effects, stressing the importance of primary prevention. Immediate health effects include a greater risk for bone and joint problems, increased risk of impaired glucose tolerance, and sleep apnea (CDC, 2012). Obese children may face social and psychological problems, included but not limited to stigmatization by peers and experiencing poor self-esteem (CDC, 2012; Martinson et al., 2012). Some risk factors like insulin resistance, Type 2 diabetes, and cardiovascular disease development pose as both immediate and long-term risk (CDC, 2012). Long-term health effects for obese children include adulthood obesity and obesity-related diseases. Adult obesity-related disease includes a higher risk for stroke, cancer, and osteoarthritis (CDC, 2012; Martinson et al., 2012). If children are overweight, obesity in adulthood is likely to be more severe (CDC, 2012).

Roles in Statistical Disparity of Obesity

The statistical disparities that exist in childhood obesity rates are multifactorial including factors such as race or ethnicity, socioeconomic status, acculturation, access to and utilization of health care, and the home food environment (Dave et al., 2009; Taveras et al., 2013; UM, 2013). Availability and accessibility to foods are physical components that play a role in the child's environment. Support for healthy eating, family meal patterns, family food security, and socioeconomic status are social components. Physical and social components both significantly contribute to a child's overall eating pattern (Dave et al., 2009).

Race/Ethnicity

Latinos are the fastest growing minority group in the United States showing a 43% growth in population between 2000 and 2010 from 35.3 million to 50.5 million (UM, 2013). Latino children statistically show higher prevalence of obesity and exhibit dietary patterns of poorer nutritional quality than dietary patterns of other racial populations (Dave et al., 2009). Dietary patterns include perceived benefits of fast food, lack of access and availability of fruits and vegetables at home, and eating out more often than cooking at home (Dave et al., 2009). Children of racial/ethnic minority groups have higher prevalence of early-life risk factors for obesity than their White counterparts. In infancy these include a more rapid weight gain, lower exclusive breastfeeding rates, a lower proportion of infants sleeping at least 12 hours per day, and a higher likelihood of introducing solid foods before 4 months of age (Taveras et al., 2013).

Socioeconomic Status

Socioeconomic status of the family has a role in the statistical disparity. Obesity is more prevalent among individuals with low income and low educational completion (UM, 2013). An estimated 27% of Latino children are living in poverty and Latino adults have lower rates of education completion than adults of other racial/ethnic groups (UM, 2013). Children raised in a lower socioeconomic household are more likely to be obese than those of higher socioeconomic standing (Taveras et al., 2013). Higher income households have more money for high-quality foods and often have safe environments for physical activities (Martinson et al., 2012).

A home that is food insecure can lead to fair/poor health and nutrient deficiencies (UM, 2013). The national average for high food insecurity prevalence is 5%, with Latino

households higher than the average at 17% (UM, 2013). High food insecurity is associated with a lower variety of fruits and vegetables at home (Dave et al., 2009). Higher incomes on the other hand can lead to more money being allotted towards the purchase of excess calories (Martinson et al., 2012).

Acculturation

Acculturation level of Latino families plays a significant part in the difference in childhood obesity rates. Latino immigrant adults have lower obesity rates than their native-born counterparts. This effect is thought to be due to healthy immigration selection and protective cultural practices. The difference in these subgroup rates dissipates with the length of the residence duration.

Cultural-based Latino health beliefs can differ from major beliefs of the residents in the county to which they are living and can influence when or if a person decides to seek care. These health beliefs include placing little value on early detection and preventive health care, which could be attributed to lack of knowledge of the benefits of early detection and prevention (UM, 2013). This belief emphasizes the importance of educating Latino parents on primary prevention aimed at preschool children.

Foreign-born mothers show adherence to healthier behaviors like breastfeeding and lower smoking rates compared to native-born mothers (Martinson et al., 2012). Latino adults living in low-income households show acculturation accompanied by unhealthy dietary and lifestyle changes like increased fat intake, decreased fiber intake, less physical activity, and an overall increased risk of chronic disease (Dave et al., 2009). Some immigrant backgrounds associate overweight children to represent a healthy body

type as well as economic success, contributing to the observed disparities (Martinson et al., 2012).

Access and Utilization of Health Care

Nonfinancial and financial factors impact Latino children's access to and use of health care services (UM, 2013). Nationally a decline in uninsured children is reported, but Latino children are more likely than any other racial/ethnic group to be uninsured (UM, 2013). Roughly 68% of Latino children have a usual source of medical care with 21% being uninsured (UM, 2013).

Latino culture emphasizes trust and personalized care in their medical interactions. This is negatively impacted if they feel uncomfortable with providers or provider attitudes, an unavailability of translators, inconvenient locations, or being unaware of services (UM, 2013). Delivering effective health care to the Latino population requires knowledge of cultural health-related beliefs, practices, and risks specific to them. Culturally-appropriate health care practice goes beyond just being aware and sensitive, it requires providers to apply understanding and respect towards the different culture to reduce disparity (UM, 2013).

Some common Latino-based health beliefs do not put high value on early detection and preventive care, in addition to accepting infrequent medical visits resulting in delayed treatment when symptoms may occur (UM, 2013). Nutrition education can be more culturally-appropriate by increasing cultural awareness and knowledge about using health services, including family and community members, and overall immersion into the Latino culture (UM, 2013).

Home Food Environment

Home food environment encompasses factors such as parental role modeling, the maternal role, fast food availability, and screen time. Child eating behaviors are a function of the shared environment with the behaviors and personal characteristics of other family members (Dave et al., 2009). Parents control an average of 83% of the foods that their children eat at home, so they can and should play primary roles in controlling the home food environment (Dave et al., 2009). Parents are the food gatekeepers for the food purchased and prepared for their children. Giving parents support to increase their knowledge and skills to make changes should be an aim of nutrition interventions (Swindle et al., 2014). Authoritative parenting style shows greater benefit, featuring emotional warmth but high expectations (Turner, Navuluri, Winkler, Vale, & Finley, 2014). Future studies should examine parenting styles among Latinos with differing levels of acculturation.

Mother and father's weight changes are independently associated with children's weight. Role modeling a healthier diet and covertly restricting access to unhealthy foods has shown greater benefit to children's dietary adequacy and behavior (Turner et al., 2014). Children whose parents did not monitor food intakes or reinforce healthy behaviors showed more physical inactivity and ate less healthy foods (Turner et al., 2014). Parents have important roles in ensuring family empowerment and involvement in addressing highly obesogenic environments (Turner et al., 2014). Parents should adopt positive practices that allow parent-to-child interaction to influence the children's food and activity choices for healthier eating and physical activity patterns (Dickin, Hill, & Dollahite, 2014).

Maternal role is critical in a child's health status. Particular maternal factors have been shown to increase short- and long-term obesity risk in children. Factors include intrauterine exposure to maternal smoking, excessive maternal weight gain, elevated glucose levels, and higher rates of maternal depression (Taveras et al., 2013). Latino children of native-born mothers are at a higher risk of being overweight than children of native-born Whites (Martinson et al., 2012). This could be attributed by cultural belief of a positive association between high BMI and child's health, genetic factors, and cultural practices (Martinson et al., 2012). A high maternal education leads to knowledge of healthy food and activity choices, emphasizing the importance of educating the mother in nutrition and healthy food practices early in the child's life (Martinson et al., 2012).

Mothers of young children that are being exposed to childhood obesity prevention messages are acknowledging understanding them, but messages may not be implemented or interpreted correctly (Vollmer & Mobley, 2013). Incorrect parental interpretation, adherence to implementation, differences in child feeding practices, barriers to a healthful diet experienced among mothers of different racial/ethnic groups, should be further researched.

There is a higher prevalence of televisions in the bedrooms, higher consumption of sugar-sweetened beverages, and more fast food given to the children in racial/ethnic minority groups (Taveras et al., 2013). Parents that serve three fast-food meals per week report significantly lower availability of vegetables and higher availability of energy-dense foods and salty snacks compared to homes with fewer fast-food meals per week (Dave et al., 2009). Fast-food meals at home are negatively associated with availability of vegetables at home (Dave et al., 2009).

People living in rural, minority, and lower-income neighborhoods have less access to stores and supermarkets that sell healthy and affordable foods (CDC, 2013). Supermarket access is associated with reduced obesity risk for children (CDC, 2013). Parents who live in areas where limited access to healthy foods tend to have greater availability of high-energy-dense foods and sugary beverages (CDC, 2013). Children consuming high-energy-dense diets are associated with a higher risk for excess body fat, sugary drink consumption, and obesity (CDC, 2013).

In the United States 83% of children from 6 months to less than 6 years old spend about 1 hour and 57 minutes a day of screen time (CDC, 2013). Increased screen time contributes to obesity by allowing more time for eating opportunities and a higher energy intake, less time for physical activity, and exposure to unhealthy food advertisements (CDC, 2013; Dave et al., 2009). These all lead to an increased availability of high-energy-dense foods at home (CDC, 2013; Dave et al., 2009). When children are presented with less healthy food messages there is more negative impact on their food choices compared to if they were to receive no message at all. Since a wide range of competing unhealthy food messages appear in the media, the likelihood of having an impact on children's eating behavior is greater than if they were to receive no message at all (United States Department of Agriculture Nutrition Evidence Library [USDA NEL], 2013).

Role of Interventions

Few childhood obesity prevention studies have targeted a primarily Latino audience. Culturally-appropriate approaches should be taken to develop multifaceted interventions and study the impact on behavioral changes in these Latino communities.

All interventions should be tailored to meet cultural, social, and economic needs (Perez-Morales et al., 2012; Torre et al., 2013; Turner et al., 2014). Sparse data exists on the efficacy of school and community-based interventions that target obesity prevention or promote healthy lifestyles for Latino children. Nutrition education interventions that targeted Latino parents of young children report an improvement in lowering BMI status, but it is unclear if approach can be intensified and achieve sustainable results (Torre et al., 2013). Counseling for diet change in an unhealthy food environment should include identification of local alternatives to food items and ways to modify local cuisine norms to make them healthier (Turner et al., 2014). According to the Health Belief Model parents are more likely to adhere to dietary recommendations for children if they are aware of the associated health risks of a poor diet for children and the health benefits of a quality diet are advocated (Swindle et al., 2014).

Current weight management programs focus on older and significantly obese children. These programs highlight obesity treatment instead of obesity prevention. The role of early life risk factors in obesity development and the need for earlier intervention should be emphasized. Widely available cost-effective obesity prevention approaches are needed to promote healthy lifestyles early on in life. This need is the motivation to develop an evaluation tool for preschool age (Gorin et al., 2014; Taveras et al., 2013).

If accessible, children see their health care provider regularly yearly after 2 years of age. In 2007 the American Academy of Pediatrics (AAP) implemented new guidelines that outline a 15-minute obesity prevention protocol to improve early identification of elevated BMI, medical risk, and unhealthy habits in children. Guidelines have not been widely adopted due to the 20-minute average length of well-child visit, lack of clinician

confidence in family-counseling on obesity, and a belief that counseling will not make a difference (Gorin et al., 2014). Nationally only half of pediatricians report calculating children's BMIs at visits. Diet and physical activity histories are reported in only 69% and 15% of charts respectively (Gorin et al., 2014). Research is needed to test if brief and recurrent motivational interviewing coupled with key behavioral strategies like goal setting and self-monitoring can promote weight control and be integrated into primary care visits (Gorin et al., 2014). It is necessary to further explore how to best support behavior change process both in and outside the clinical setting.

Elements of Nutrition Education

Nutrition education can include a wide array of messages if relevant to the participant's nutritional risk factors, nutritional needs and concerns, and their potential emerging health issues. Messages should be tailored to the individual's needs in order to maximize benefit and impact (Women, Infants, and Children [WIC], 2006). Health promotion should be emphasized instead of solely weight loss. Weight should not be the primary focus instead adherence to healthier eating habits and exercise should be the focus. Nutrition and the relationship between nutrition, physical activity, and health as a whole must be emphasized (WIC, 2006). According to the Health Belief Model parents are more likely to adhere to dietary recommendations for children if they are aware of the associated health risks of a poor diet for children and the health benefits of a quality diet are advocated (Swindle et al., 2014).

Educational-based feeding programs must promote consumption of locally available fruits and vegetables, safe water sources, and increased physical activity while simultaneously restricting access to calorie-dense, fat-dense, nutrient-poor foods and

beverages (Perez-Escamilla, Hospedales, Contreras, & Kac, 2013). Nutrition and physical activity information should be integrated with parent education in an applied manner like food tasting and hands-on activities to better absorb the learned information (Dickin et al., 2014). Innovative and attractive social marketing effort is essential for effective education on dietary guidelines and other evidence-based messages on nutrition and physical activity (Perez-Escamilla et al., 2013).

Participant Understanding

Participant understanding of the educational material presented is very important. Individuals vary greatly in how they learn, process, and their readiness to use information to change (WIC, 2006). To increase understanding and enhance effectiveness the participant's personal and cultural preferences should be considered and their educational and environmental limitations (WIC, 2006). Obesity prevention messages must be culturally sensitive and take into account the participant's personal beliefs associated with body image (Perez-Escamilla et al., 2013).

Effectiveness

Effective nutrition education consists of counseling methods that consider multiple learning aptitudes (WIC, 2006). No one counseling method or teaching strategy will fit all participants needs (WIC, 2006). Education should take place at every level of childhood particularly in crucial periods through optimal infant feeding practices, daycare, kindergarten, preschool and primary school (Perez-Escamilla et al., 2013). Focus should be on healthy behavior for life instead of short-term sights. Well-informed parents need easy choices available to them regarding healthy eating and active living in different areas of their life. These parental options should include, but not be limited to

their home, work place, and where they eat (Perez-Escamilla et al., 2013). Obesity prevention should be a multidisciplinary intervention and collaboration between schools, families, and society as a whole to increase effectiveness (Perez-Escamilla et al., 2013). If positive changes in dietary and physical activity habits are achieved and maintained this results in improved nutritional status and prevention of nutrition-related problems (WIC, 2006).

Family Involvement

A strong relationship exists between parenting practices and children's eating, physical activity, and weight status. Lack of evidence- and criterion-based guidelines exists for optimal and practical feeding strategies for parents to use with young children to reduce their dietary risk for weight gain and potential negative health problems (Reznar et al., 2014). This is exemplified among families who have limited resources (Reznar et al., 2014). Few childhood nutrition interventions address parenting practices or have been able to successfully reach parents directly or intensively enough. Fewer of these interventions reach low-income families who face challenging barriers to adopting healthy food and activity habits (Reznar et al., 2014). Educators are testing interventions that translate evidence into feasible and practical approaches for healthy weight maintenance among children (Reznar et al., 2014).

Education Through Technology

Low-income parents face many barriers to enrolling and attending intervention programs for parent education programs (Swindle et al., 2014). Time constraints, child care needs, transportation issues, and work conflict are the most reported challenges that parents report regarding enrolling and remaining engaged in parent education programs

(Swindle et al., 2014). In the current digital age, technology and the Internet can play a large role in overcoming these barriers for education. Internet-based education programs are able to reach a larger audience at lower costs compared to traditional classroom methods (Case, Cluskey, & Hino, 2011). The use of technology to promote education ensures that interventions and information can be delivered to a wide range of people in a variety of settings (USDA NEL, 2013). Technology can be used to reach parents with new material, increase program participation, and obtain needed information on progress or the barriers to goals (Swindle et al., 2014).

Web-based interventions are effective in promoting healthy eating habits, can be customized to individual's needs and pace, are available on-demand, and can be delivered through a variety of multimedia tools (Case et al., 2011). Due to competition for online user attention educators need to be successful in delivery by addressing the participant's unique needs, issues, interests, and be responsive to user's motivation to learn and change behaviors. Effectiveness of technology interventions could be greater with low-income families compared to in-person contact programs due to the barriers families face to recruit and retain in onsite programs (Swindle et al., 2014).

The Internet is the most used resource for health information for adults in the United States (Swindle et al., 2014). The Internet is used daily by a reported 69.9% if low-income adults in the United States (Swindle et al., 2014). The most popular food and nutrition source websites are those for cooking, particularly if they offer information on food preparation and purchasing. Formal nutrition education information websites are visited less frequently. Participants would be persuaded to access these formal nutrition education sources more often if they were based around something that they personally

valued, like feeding their children (Case et al., 2011). Interest in receiving nutrition information is a potential marker to improve health behaviors. Over 50% of low-income U.S. adults report interest in receiving parenting, child care, or nutrition information (Swindle et al., 2014). Participants want online education sites that they can return to often, which gives educators the potential to facilitate ongoing education if web pages are well-designed and well-received (Case et al., 2011).

There is a lack of evidence on how and why low-income learners would choose the Internet for nutrition education because it is on a voluntary basis (Case et al., 2011). A challenge faced is keeping people engaged online. It needs to be determined how online tools and methods can be created to be more appealing and result in meaningful behavior change (Case et al., 2011). Review of web-based nutrition education sites shows a limited number that exist to serve the target population of this project, preschool Latino children. There are federal and non-federal websites that can be accessed. Including Nourish Interactive (2014); KidsHealth (2015); MyPlate for Preschoolers (USDA, 2014); Ways to Enhance Children's Activity and Nutrition [WE CAN] (2013); National Institute of Health [NIH], 2013). A better understanding is needed on the appropriateness and effectiveness of online educational programs.

Latinos and Technology

In 2012 the number of Latinos who say they go online at least occasionally is at 78% compared to Whites at 87% (Lopez, Gonzales-Barrera, & Patten, 2013). Pew Research analysis shows Latinos are going online at similar rates to other racial/ethnic groups but only 72% own their own desktop or laptop computer. Their White counterparts own their own desktop or laptop computer at a higher 83% (Lopez et al.,

2013). 76% of Latino Internet users go online using their mobile device compared to 60% of White Internet users (Pew Research Center, 2014). The rate of Latinos going online has increased since 2009 but a digital divide exists among the Latino population.

English-dominant and native-born Latinos are more likely to go online than their Spanish-dominant and foreign-born Latino counterparts (Lopez et al., 2013). Latino Internet users are more likely to be fluent in English than Latino non-Internet users. Latino Internet users are 31% English-dominant and 41% are bilingual accounting for nearly every 3 in 4 Latinos who use the Internet (Lopez et al., 2013). There is a link between Latinos going online and having children in the household. With 52% of Latino Internet users showing they have dependent children under the age of 18 living with them (Lopez et al., 2013). Particular demographic characteristics show correlation with the adoption of technology among Latinos. Key characteristics include being 18-29 years old in comparison to 65 or older, college education level, and higher annual family income (Lopez et al., 2013).

Evaluation Tools

Evaluation helps meet the participant's needs best by guided efforts to enhance participant engagement, monitor participant's progress in the mastering of key nutrition aspects, and assess the program's effects on nutrition-related behavior (Cates et al., 2014). It is a tool that provides information to ensure program accountability, program improvement, and creation of evidence-based intervention (Cates et al., 2014). Standardized and science-based criteria for the development and evaluation of web-based nutrition education will ensure that participants receive effective, high-quality, and pertinent nutrition education (United States Department of Agriculture [USDA], 2004).

Evaluation tools will be useful in identifying the web-based nutrition information that is culturally-appropriate for the Latino population by including a variety of approaches to reach diverse subgroups. New insight into these differences is needed to develop culturally-appropriate obesity prevention techniques and lower rates of disparity (Vollmer & Mobley, 2013). The criteria for an effective evaluation tool for online sites is organized into eleven groups: site content, site functionality, site design, layout, readability, user learning experience, type style, use of color, photos and illustrations, non-English site development, and site evaluation (USDA, 2004). This project will develop a primary evaluation tool adapted from an evaluation of electronic-based nutrition education originally developed for WIC participants (USDA, 2004).

Site Content

The purpose of the website should be immediately obvious to the user, with content and purpose evident in the title and home page so that the user can feel that the site is relevant to them (Bouch, Kuchnisky, & Bhatti, 2000; Lazarus & Mora 2000; McGee, 1999). The site should identify the organization that is producing the site and clearly state contact information in order for user to be able to ask further questions if needed. The source of all dispensed nutrition and health information should be clearly stated to ensure the reliability of the sources (McGee, 1999). In addition to being reliable, the information should be accurate to reflect current and up-to-date guidelines. The site should include dates to ensure the user that information is being regularly updated (McGee, 1999). The content should be free of spelling and grammatical errors. It is important to ensure that the amount of information provided is reasonable for the intended audience. Information should be grouped concisely with clear sequence, and

with the most important points listed first and last (Bouch et al., 2000; Macario, Emmons, Sorensen, Hunt, & Rudd, 1998). Research should indicate that the content is providing the most effective nutrition interventions and they are culturally-appropriate (Lazarus & Mora 2000; Macario et al., 1998; Shire, 2002)

Site Functionality

Site functionality includes more technical aspects of the site. To minimize user frustration when navigating through the content the speed of the site download should be acceptable, if applicable the site links should work properly, and the audio and video resources should be maintained and work properly (Lazarus & Mora 2000; Lynch & Horton, 2011). To increase availability to more users, the site should work in multiple browsers and should work in "text-only" mode in the case of a text-based browser is being used (Lazarus & Mora 2000). The site should be easy to navigate by clearly labeling navigation buttons. The site should also be mobile-friendly due to 76% of Latinos are going online through their mobile devices (Pew Research Center, 2014).

Site Design

The site should look appealing and aesthetically pleasing. Empirical studies support the use of open space to increase website user satisfaction. The use of open space can be accomplished by proper organization and grouping of information (Doak, Doak, & Root, 1992; McGee, 1999). Brief and easy to understand instructions can enhance site use by informing users on how to move through the site and complete desired activities. If graphics are used they should be directly related to content and placed near the related text, and when appropriate they should be labeled and explained. Only including graphics that enrich content will increase understanding for low-literacy

users (Lazarus & Mora 2000). The graphic design should use contrast, indentation, bullets, and interactive buttons to clearly signal main points making the text easy to read (Doak et al., 1992).

Site Layout

Overall site layout should seem unified and consistent from page to page to portray organized interfaces, to ensure layout consistency, and reduce un-needed elements. Material should be logically organized into meaningful segments, sections, pages or pop-ups. All design elements including the use of banners, headings, and subheadings should be clear, informative, and signal to the user what is coming next (Doak et al., 1992; McGee, 1999). The material should emphasize and summarize main points to increase comprehension (Doak et al., 1992; McGee, 1999). Pages should be laid out in a manner that minimizes scrolling. Users often miss important information when it is placed outside of the primary screen area. Fitting information in the horizontal viewing area and minimizing vertical scrolling will allow the user to see more information. Using categorical menus on each page will increase search performance and satisfaction, and can be searched faster when arranged in menus rather than rows (Lazarus & Mora 2000).

Site Readability

The material should be written primarily in the active voice giving the user a feasible action to take and can help move the user into behavior change (Doak et al., 1992; Lazarus & Mora 2000). The reading level should be appropriate for the intended audience. Previous studies show that readability at grade 6 or lower are desirable when the primary audience has limited literacy or is targeting immigrants (Lazarus & Mora

2000). By keeping the words and sentences generally concise, simple, and direct it will reduce eye movement, keep user attention, and help low literacy users understand the messages (Doak et al., 1992; Lazarus & Mora 2000; McGee, 1999). When technical terms are used they should be explained with helpful and concrete examples so the user can become familiar with new jargon (Doak et al., 1992; McGee, 1999).

Learning Experience

The site's learning experience should be engaging, motivating, and support the user. Developing education sites should be based on establishing principles of teaching and learning, properly identifying realistic education goals, and defining learning objectives (Doak et al., 1992; Smith et al., 2002). Like in face-to-face education, effective communication methods are important to the quality of instruction. The site should use a learning/behavior change model to plan the content, choices, and interactivity to enhance education quality (Lazarus & Mora 2000).

Strategies to engage the user should be used to provide user interaction, which has proved important to effective nutrition education. If users are completing activities the site should provide immediate feedback in order to move learners in a direction and allow them to experience success (Block et al., 2000). Education should incorporate four elements that have proven enhancement of adult learning and include respect, building on previous experiences, immediacy of application, and the opportunity to practice. Recommending actions and urging feasible and culturally-appropriate behavior to user will increase the likelihood that they will adopt the new behaviors (Shire, 2002).

With nutrition education the recommended actions for food purchasing, preparation, and eating should be low-cost in money, time, and effort. This customizes

the learning experience, increases user interaction, and increases user's level of motivation to factor into their intent to change (Block et al., 2000; Lazarus & Mora 2000; Shire, 2002). Customizing site information and recommendations to the user allows the individual to perceive social support and self-efficacy, both effective in inducing dietary changes. Tailored nutrition education has proven a more effective tool to motivate people to change to healthier diets compared to general nutrition education (Block et al., 2000; Macario et al., 1998).

Including printable materials will help with repetition of nutrition education messages and reinforce the learning experience. Offering additional resources for more information and assistance like Farmers Market locations, food assistance organizations, etc. will enhance nutrition education (Lazarus & Mora 2000).

Type Style

The site should use an effective combination of readable type styles and font sizes, which gives good contrast between text and titles. Evidence suggests that the most commonly used fonts are equally legible at 10-, 12-, and 14-point size (Doak et al., 1992). Capital letters should only be used when they are grammatically needed, because text in all caps has shown to be difficult to read (Doak et al., 1992). If the site uses italics and bolding it should only be used to emphasize text and draw attention to important words or phrases, if used excessively it can cause the site to clutter and distract the user (Doak et al., 1992). The lines of text should be of appropriate length and easy to read, people with lower literacy levels have performed better when line length is approximately seven words. When a sentence takes more than one line it can cause confusion on how to read correctly (McGee, 1999). Contrast should be provided between the text and

background to increase readability. A dark text on light backgrounds is better for comprehension, reading speed, and minimizing eyestrain.

Use of Color

Color should be used in a consistent and deliberate way throughout the site and should only enhance the meaning and impact of key information. Color can change the look of the page, increase readability, separate information, and create impact (Lynch & Horton, 2011). When choosing colors it is important to take into account the cultural significance in the psychological effects color has on users. To do this, test color effects with members of the target population during site development (Lynch & Horton, 2011).

Photos, Illustrations, and Symbol Use

When including photos, illustrations, or symbols on the site they should relate and support the message presented. Unrelated visuals will distract users and increase confusion. When photos and illustrations are used it should be culturally significant to the intended population. It should be representative of their demographic, physical appearance, behavior, and cultural elements (Doak et al., 1992; McGee, 1999). The visuals used should be consistent in style to portray a uniform and high quality professional look (McGee, 1999). Evidence does not show an advantage of using animated graphics over non-animated graphics. It is suggested that animated graphics should be kept to a minimum to reduce user distraction and download time (Bernard, 2003).

Non-English Site Development and Translation

The websites being evaluated will be targeted towards the Latino population so it is important to evaluate Non-English site development and translations. The site should

be available in Spanish and clearly direct users to alternate versions of the content in other languages (Lazarus & Mora 2000). The translation should not just be a literal translation from English, but done to portray correct meaning of information and ease of reading (Lazarus & Mora 2000). Someone proficient in the language should evaluate the site and who is culturally-appropriate of the intended audience (Lazarus & Mora 2000).

Site Evaluation

The importance of overall site evaluation supports this project's goal of developing an evaluation tool. The site should contain information that has undergone research and is designed with the intended users in mind. The users should feel that the site was designed to reflect their needs, interests, learning styles, and cultural preferences (Lazarus & Mora 2000; McGee 1999). User relevance can be tested by a pre-testing with the intended audience rating their comprehension, ease of use, cultural acceptance, and interaction to enhance learning (McGee, 1999). The site should be reviewed and evaluated by the appropriate professionals prior to the launch to ensure that the information is current and meets all criteria (Smith et al., 2002; Lazarus & Mora 2000; McGee, 1999). To effectively conduct nutrition education, feedback of the user's knowledge, attitude, and behavior (based on learning objectives) is important (Smith et al., 2002). When feedback is collecting user information it can be used for site modifications to increase user satisfaction, behavior change, and overall site development (Block et al., 2000).

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this project is to develop a criterion-based tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. This project will address the childhood obesity challenges unique to Latino families and the relevant content and format that the nutrition education websites should contain when geared towards this population. Providing an evaluation tool will better enable web developers to produce educational sources fit for Latino families with nutritional adequacy and cultural integration.

Prospective Tool Users

The primary evaluation tool for web-based nutrition educational sites will be designed for web developer that are behind the designing of these sites for preschool Latino children between the ages of 2 and 5 years old. The childhood obesity in the United States is an epidemic, specifically affecting 21% of Latino children and adolescent groups (Torre et al., 2013). This age range was chosen to specifically target Latino childhood obesity prevention websites. It is vital to educate parents on their roles in their child's nutritional adequacy and weight management. The evaluation tool will be developed based on criteria inclusive of site content, site functionality, site design, layout, readability, user learning experience, type style, use of color, photos and illustrations,

non-English site development, and site evaluation. Through a review of literature this criterion was found to be the most relevant tools pertaining to effective web-based nutrition education, adult/child learning and behavior change theory, and Internet evaluation.

Procedures

The following procedures for the development of this project are comprised of five steps:

The first step will include identifying important obesity-prevention information for preschool Latino children and Latino Internet usage in the United States. The information will be based on the review of the literature.

The second step will be identifying pertinent and applicable criterion in evaluating web-based nutritional education to establish goals of an evaluation tool. The goals will be specific to Latino families with preschool children.

The third step will be to develop the primary evaluation tool that would be applicable to the websites identified in step two. The evaluation tool will include a scoring system to be used during the process.

The fourth step will be to develop a content evaluation tool to be given to Registered Dietitians to provide feedback on the primary evaluation tool developed in this project.

The fifth step will be conducting a feasibility study to test the quality of both the primary evaluation and the content tools. The primary evaluation tool will undergo external review by 2-3 individuals for content. The content evaluation tool will undergo

official review by 5 RD professionals. Results of the feasibility study will provide feedback needed for changes in the tools prior to publication.

Evaluation Tool Topics

Topics to be included in the evaluation tool will be selected based on information in recent research studies. A current review of literature identifying the most relevant tools pertaining to effective web-based nutrition education, adult/child learning and behavior change theory, and Internet evaluation will be included in the evaluation tool.

Web-sites that provide nutrition education specific to families with preschool children ages 2 to 5 will be the target websites that the evaluation tool would serve best for. Incorrect interpretation and implementation of childhood obesity prevention messages by mothers that are exposed to them has shown barriers due to different ethnic and racial groups, stressing the importance of culturally-appropriate obesity prevention techniques (Vollmer & Mobley, 2013). It is important to create an evaluation tool that can identify whether these websites are useful and are applicable to the intended target population.

In summary, the tool that will be created to evaluate web-based nutrition education will include: (1) site content, (2) site functionality, (3) site design, (4) layout, (5) readability, (6) user learning experience, (7) type style, (8) use of color, (9) photos and illustrations, (10) non-English site development, (11) and site evaluation. It will include a scoring method to give an overall score of the site being evaluated. The evaluation tool will help web developers in producing websites that teach the basics of childhood obesity and the importance of staying healthy as a family, providing information in a culturally-appropriate way.

Evaluation Tool Structure

The primary evaluation tool will be adapted from eleven criterion identified and used in USDA's 2004 publication for WIC. It will be user-friendly to allow high usability and understanding and only contain evidence-based criterion. A scoring system will be included in the primary evaluation tool to grade the websites based on the criterion listed. Refer to Appendix B.

Evaluation

The content evaluation tool will be designed and included in the project to evaluate the primary evaluation tool that will have been created. The form will be created to obtain feedback from an expert-review panel of RDs on the effectiveness and appropriateness of the tool. Refer to Appendix C. The content evaluation tool will be given to the panel to review once the first draft is developed. Results of this feasibility study will be used by the researcher to make improvements on the content and design of the primary evaluation tool prior to publication.

CHAPTER 4

RESULTS

Introduction

The purpose of this project was to develop a criterion-based tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. This project addressed the childhood obesity challenges unique to Latino families and the relevant content and format that the nutrition education websites should contain when geared towards this population. Providing an evaluation tool will better enable web developers to produce educational sources fit for Latino families with nutritional adequacy and cultural integration.

Achievement of Project Objectives

Five main objectives were stated at the beginning of this project. These objectives were all accomplished by the completion.

1. Information on Childhood Obesity and Adult Internet Usage of Latinos in the United States

Key childhood obesity information was identified for Latino children in the United States. Obesity is a leading public health issue with approximately 1 in 6 children and adolescents between 2-19 years old considered obese (FRAC, 2010; Torre et.al., 2013). Among preschoolers more than 1 in 4 Latinos (27.7%) are overweight or obese compared to 1 in 6 White non-Latino children (17.4%) (Ryan, 2010). The project

identified the roles in the ethnic/racial statistical disparity that exists in the high childhood overweight and obesity rates. The statistical disparities that exist are multifactorial and include race or ethnicity, socioeconomic status, acculturation, access to and utilization of health care, and the home food environment (Dave et al., 2009; Taveras et al., 2013). Physical and social components of the child's life also both significantly contribute to a child's overall eating pattern (Dave et al, 2009).

Statistical data among Latino adults Internet-users in the United States was identified. The rate of Latinos going online has increased since 2009 (Pew Research Center, 2014). Research analysis shows Latinos are going online at similar rates to other racial/ethnic groups but a digital divide exists among the Latino population. Trends among Latinos Internet-users were found. Latino Internet users are 31% English-dominant and 41% are bilingual. This accounts for every 3 in 4 Latinos who are using the Internet (Lopez et al., 2013). There is a positive link between Latinos going online and having children in their household under the age of 18 (Lopez et al., 2013). The Internet is the most used resource for health information for adults in the United States, inclusive of all race and ethnicities (Swindle et al., 2014). The statistical data supported the purpose and need for the development of this project.

2. Relevant Criteria For Evaluating Nutrition Education Websites Geared Towards Latino Families

Through a review of literature the most important elements of nutrition education were identified. Elements include participant understanding, effectiveness, and family involvement. Nutrition messages should be tailored to the individual's needs in order to maximize benefit and impact (WIC, 2006). Parents in particular are more likely to adhere to dietary recommendations for their children if they are aware of the associated

health risks of a poor diet for children and the health benefits of a quality diet (Swindle et al., 2014). Low-income parents face many barriers when it comes to enrolling and attending intervention programs for parent education (Swindle et al., 2014). Technology and the Internet can play a large role in overcoming these barriers for education and Internet-based education programs can reach a larger audience.

During the review of literature, eleven areas were identified as the most fundamental criteria for evaluating nutrition education websites for Latino families. Criteria were adapted from an evaluation of electronic-based nutrition education originally developed for WIC participants (USDA, 2004). The criteria for an effective evaluation tool for online sites is organized into eleven groups: site content, site functionality, site design, layout, readability, user learning experience, type style, use of color, photos and illustrations, non-English site development, and site evaluation (USDA, 2004). The eleven criterions comprise the primary evaluation tool developed (Appendix A). The tool will enable web developers to better develop culturally appropriate nutrition education websites geared towards the target Latino population.

3. Development of a Primary Evaluation Tool

A primary evaluation tool (Appendix A) was developed for web developers to use when producing and evaluating nutrition education sources geared towards preschool Latino children. The evaluation tool includes all criteria identified as effective for evaluating nutrition education websites. In initial drafts of the evaluation tool, site design and site layout were separated. After feedback from the feasibility study and more revisions, site design and site layout were merged into one content area. The users may navigate through the tool at their own discretion, as not all evaluation content may be

applicable to their needs. A scoring system for the tool was created to score the appropriateness and effectiveness of the website (Appendix B). A feasibility study was conducted for the evaluation tool and scoring system. Both underwent review for feedback from a panel of professionals. The primary evaluation tool underwent review by one web developer and two mothers of young children, including a Latino mother. All reviewers thought the evaluation tool was appropriate for use by web developers. Feedback was summarized into positive comments and suggestions for improvement (Appendix D).

4. Development of a Content Evaluation Tool

A content evaluation tool (Appendix C) was developed for RD professionals for external review of the content. A content evaluation tool was part of the feasibility study to help gather comments and feedback on the primary evaluation tool from an expert review panel. The evaluation asks evaluators to rate the tool's clarity, quality, organization, and value. Extra space was provided at the end of the evaluation form for additional comments and points to improve upon.

The content evaluation tool underwent review by an expert review panel of five Registered Dietitians (RD) working in different settings. Two RDs working in Boston hospitals (Carney Hospital and Brigham and Women's Hospital), one RD at the University of Connecticut, the Nutrition and Food Service Manager for Orange County Head Start, and an Outpatient Pediatric RD in Orange County. All reviewers provided affirmative feedback indicating a useful and appropriate evaluation tool. Feedback was summarized into positive comments and suggestions for improvement (Appendix D).

5. Feasibility Study

A feasibility study was conducted with eight participants to test the primary evaluation tool and content evaluation tool prior to publication. Feasibility study results were important in determining areas for improvement and changes to better the tools. The researcher initiated the feasibility study by contacting a diverse group of 8 professionals to participate through email. Individuals were asked to represent different areas of interest and professionals in the field (Table 1). All reviewers who were chosen agreed to participate. Once individuals had agreed to participate, the evaluation tool was sent to them and they were given a 2-week period to respond with feedback. Reviewers were not aware of other participants in the study, allowing individuals to give unbiased responses. Feedback was returned through email correspondence and a summary can be seen in Appendix D. Comments and suggestions were taken into account and were part of the editing and revision process for the final versions of the evaluation tools.

TABLE 1. Participants of Feasibility Study

Participant	Position
1. Josh Burns	Web Developer
2. Christine Fonseca-Perez	Latino Mother
3. Staci Johnson	Mother
4. Megan Gerber	RD, Carney Hospital
5. Julia Luksha	RD, Brigham & Women's Hospital
6. Julia Shook	RD, CD-N, University of Connecticut Student Health Services
7. Megan Somerville	RD, Pediatric Outpatient at St. Joseph Health
8. Isabel Simard	RD, CLE, MS, Nutrition and Food Service Manager at Orange County Head Start

CHAPTER 5

DISCUSSION AND CONCLUSION

Introduction

The purpose of this project was to develop a criterion-based tool to evaluate web-based educational sources that are geared towards Latino parents with preschool children to combat childhood obesity and to promote healthy lifestyles. A thorough review of the literature was conducted and identified key Latino childhood obesity rates, statistics on Latino adult Internet usage, and relevant nutrition education criteria for developing websites targeting this population. This project addressed the childhood obesity challenges unique to Latino families and the relevant content and format that the nutrition education websites should contain when geared towards this population. From that information a primary evaluation tool was created for web developers to evaluate the nutrition education websites for preschool Latino children. A content evaluation tool for testing effectiveness of the primary evaluation tool itself was created for feedback purposes. A feasibility study was conducted for both the primary and content evaluation tools to undergo review. Providing an evaluation tool will better enable web developers to produce educational sources fit for Latino families with nutritional adequacy and cultural integration.

Challenges

The development of this project faced some challenges. In the future there could be changes to the conduction of the feasibility study. More instructions should be given to reviewers prior to the feasibility study if conducted through email correspondence.

Conducting the feasibility study in person can eliminate confusion or questions right away. This could ensure clarity and improve time efficiency. Some reviewers mentioned that they needed clarification on defining "sixth grade reading level." Defining appropriate reading level for the audience and examples could be given with instructions prior to the conduction of the feasibility study. Addition of simple instructions on how to complete each content page should also be included if the feasibility study is repeated.

Formatting is a challenge that was faced in the development of the tools. One reviewer commented that the evaluation tool would look better in table form. In the future the evaluation tool could be given in a table form and as bulleted questions to compare tool formats and gauge professional opinion. Positioning of topics on pages was also a formatting challenge. An additional question for the future could include a comment by reviewers on whether all criteria should be broken up on separate pages or flow continuously.

The implementation of any evaluation tool will face some challenges. A major challenge will be advertising the tool itself. The specificity of the tool could serve as an advantage for web developers who are proactive in tackling the Latino childhood obesity health problem or as a disadvantage in being able to reach the niche audience. Advertising of the tool will be done to web development journals and nutrition and technology sources to get published and reach a larger population.

Another challenge is that nutrition education for Latino preschool children is a narrow category of online nutrition education. Currently there are not many websites that are geared specifically towards Latino preschool children. There were limited resources

to use as comparison or test the tool's effectiveness. The tool is only applicable for web developers working with the specific target population.

Implications

The specificity of the tool is a challenge but can serve as an opportunity and platform to indicate the need for nutrition education websites to exist for Latino preschool children. It is important to bring attention to the existing and growing Latino childhood obesity problem. People are more likely to access nutrition education websites more often if they are based around something they personally value (Case et al., 2011). By informing people how vital nutrition is in helping slow the growing Latino childhood obesity problem, it will increase their interest in acquiring information. This is where the evaluation tool will serve its purpose in building these specific nutrition education websites that are needed.

In 2012, 78% of Latinos reported going online at least occasionally (Lopez et al., 2013). Statistics indicate a large percentage of the Latino population is accessing the Internet. More people are using the Internet for acquiring health information and answering their health questions. The Internet is the most used resource for health information for adults in the United States (Swindle et al., 2014). The need for nutrition education websites for Latino children will increase as the obesity rates and demand for information will rise alongside. Web developers will use this tool to develop culturally-appropriate nutrition education websites and join the effort of slowing the health epidemic.

Summary

The Latino childhood obesity problem is a very real, prevalent, and ever-growing health epidemic in the United States. The Latino obesity trend and prevalence continues through childhood and adolescence. Without intervention the Latino overweight and obese children in our country will lead to overweight and obese adults. As the tendency for people to retrieve nutrition education online grows, it is of utmost importance to provide a tool for web developers to design appropriate online nutrition education for Latinos. With the implementation of this primary evaluation tool it will produce nutrition education websites that are culturally-appropriate, provide current nutrition information, and become a positive source of health information for Latino parents. The implementation of this tool and rise of relevant and available nutrition education will provide parents with resources to raise healthy children in a nutritious food environment. The logical next step for the tool would be to implement and use it for evaluation of appropriate target websites.

APPENDICES

APPENDIX A

PRIMARY EVALUATION TOOL CRITERION

Site Content

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the purpose and content of the website evident in the title and home page? ____

Can the user easily identify the organization in charge of producing the website? ____

Is the contact information for the web developer easily available for further questions? ____

Is the nutrition and health information clearly cited to ensure reliability? ____

Is the nutrition and health information accurate, current, and does it reflect up-to-date guidelines? ____

Are their dates showing last revision? ____

Is the content free of spelling and grammatical errors? ____

Is the amount of information provided reasonable for the intended audience? ____

Is the information grouped concisely with a clear sequence? Are the most important points listed first and last? ____

Does the content provide effective and culturally appropriate nutrition Interventions? ____

Total Score:

Total N/A:

Site Functionality

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Does the site content download at an acceptable speed? ____

Do the site links, audio, and video resources work properly? ____

Does the site work in multiple browsers? ____

Does the website work in "text-only" mode for text-based browser use? ____

Is the website mobile-friendly? ____

Are there clearly labeled navigation buttons to make navigation easy? ____

Is the site appealing and aesthetically pleasing? Is there use of open space? ____

Are instructions brief and easy to understand that inform users how to navigate the site and complete desired activities? ____

Are graphics directly related to content? Are they placed appropriately and labeled? ____

Is the text easy to read? Does the graphic design use contrast, indentation, bullets, and interactive buttons to signal main points? ____

Total Score:

Total N/A:

Site Design & Layout

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the overall site layout unified and consistent from page to page? ____

Is the material logically organized into meaningful segments, sections, pages, or pop-ups? ____

Are design elements (including banners, headings, subheadings) clear and informative to user? ____

Is the material emphasized and are main points summarized throughout the site? ____

Are the pages laid out in a manner that minimizes scrolling? _ ____

Are categorical menus used on each page? ____

Total Score:

Total N/A:

Site Readability

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the material written primarily in an active voice? ____

Are the words and sentences generally concise, simple, and direct? ____

Is the reading level appropriate for intended audience? Is it written at grade 6 reading level or lower? ____

When technical terms are used are they then defined and explained? Are concrete examples given? ____

Total Score:

Total N/A:

User Learning Experience

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the site engaging, motivating, and supportive of the user? ____

Are learning objectives defined? ____

Does the site use a learning or behavior change model to plan the content, choices, and interactivity? ____

Does the site provide user interaction? If users are completing activities is immediate feedback provided? ____

Does the education incorporate the "four elements" (respect, building on previous experiences, immediacy of application, and opportunity to practice)? ____

Are the site's recommended actions feasible and culturally-appropriate to the user? ____

Are recommended actions for food purchasing, food preparation, and eating low in cost/money/time/effort? ____

Is the site information/recommendations customized to the individual user? Is the nutrition education tailored? ____

Are printable nutrition education materials provided? ____

Are additional resources offered? Ex. Farmers market locations, food assistance organizations, etc. ____

Total Score:

Total N/A:

Type Style

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Does the site use an effective combination of readable type styles and font sizes? ____

Is there a good contrast between text and titles? ____

Is there contrast between text and background? ____

Is the font legible? Is it 10-, 12-, and 14-point size? ____

Are capital letters used only when grammatically needed? ____

Does the site use italics and bolding? Is it only used when trying to emphasize text and draw attention to important words/phrases? ____

Are the lengths of the lines of text appropriate length and easy to read? Does the lines length exceed approximately 7 words? ____

Total Score:

Total N/A:

Use of Color

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the color used consistent and uniform throughout the site? ____

Does the use of color enhance meaning and impact of the key information? ____

Does color choice take into account cultural significance in the psychological effects the colors have on users? ____

Are the color choices visually accessible in high contrast? ____

Total Score:

Total N/A:

Photos and Illustrations

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Are the photos and illustrations on the site related to the message presented? ____

Are the photos and illustrations used culturally significant to target user population? ____

Are the visuals used consistent in style? ____

Are animated graphics used? ____

Are animated graphics kept to a minimum? _ ____

Total Score:

Total N/A:

Non-English Site Development and Translation

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Is the site available in Spanish? ____

Is the Spanish translation done correctly? ____

Does the translation portray the correct meaning of information and ease user reading? ____

Are users clearly directed to versions of the content in Spanish? ____

Has the translation been evaluated by someone proficient in the language? ____

Total Score:

Total N/A:

Site Evaluation

NA = not applicable
0 = no
1 = needs improvement
2 = yes

Does the site contain information that has undergone research and is it designed for the intended users? ____

Has user relevance (comprehension, ease of use, cultural acceptance, interaction) been pre-tested with the intended user population? ____

Has the site been reviewed and evaluated by the appropriate professionals prior to launch? Is the information current and meeting all criteria? ____

Has user feedback been collected? ____

Total Score:

Total N/A:

APPENDIX B

PRIMARY EVALUATION TOOL SCORING TABLE

Primary Evaluation Tool Criteria Score		
Criteria Category (Possible total score)	**Criteria Scores**	**"Not Applicable" Responses**
Site Content (20)		
Site Functionality (20)		
Layout (12)		
Readability (8)		
User Learning Experience (20)		
Type Style (14)		
Use of Color (8)		
Photos and Illustrations (10)		
Non-English Site Development (10)		
Site Evaluation (8)		

Total Score out of 130 possible points:
(sum of criteria category scores)

APPENDIX C

CONTENT EVALUATION TOOL TABLE

Name:

Title:

Date:

Evaluation Criteria	*Strongly Agree*	*Agree*	*Disagree*
The material is presented clearly and is easy to understand.			
There is a high quality of writing and the content investigates aspects pertinent to the target population.			
The content is organized with a logical presentation of information.			
There is potential value as future reference material.			

Things to Improve:

Additional Comments or Questions:

APPENDIX D

FEASIBILITY STUDY RESULTS

Evaluator	Positive feedback	Suggestions for improvement
Josh Burns	-Great primary evaluation tool! -The wording is clear and sensical to web-developers achieving a nutrition education website targeting preschool-age Latino children.	-Use of Color topic might not need "Was there testing with target population during site development?" maybe add "Are the color choices visually accessible in high contrast? -"Site Design" and "Site Layout" are too similar, consider making them one
Staci Johnson	-I think it's great! -I think the language is clear, makes sense to me and I think the checklist is comprehensive.	-I think for me as a parent to give feedback, I would need to see a sample site to know what I think web developers should be looking to do.
Christine Fonseca		-I would not put multiple questions on one line. Some people might feel differently about both questions -Not sure what "Is the material emphasized and are the main points summarized?" means -How would someone know what a 6th grade reading level looks like? -Split questions.

Evaluator	Positive feedback	Suggestions for improvement
Julia Shook	- I have reviewed the evaluation sheet and it looks great! - It is very neat and easy to follow.	- Depending on the time of comments you want to receive for your tool, maybe a bit more space
Megan Wroe	- I would love to see your finished tool!	- I don't know why it is important for an evaluation tool to be presented in an interesting manner-it is important for the tool to evaluate if the *site* is interesting. So instead of this category I would ask whether the content of the evaluation tool investigates aspects of the site that are pertinent to the target population? -Not sure that you should have a "not applicable" category on this type of eval form. You should only be asking applicable questions about the evaluation tool itself.
Isabel Simard		- I suggest including the reading level of the material presented. - I also suggest adding a criteria or adding to once the evaluation of the pictures and illustrations.
Julia Luksha	-It covers all the bases as far as different aspects to evaluate and the layout is good.	-It could be beneficial to add a criteria addressing the resources used to create the material to make sure the information came from a reliable source. -In the first evaluation criteria box, the phrase "easy to

		follow" seems similar to organization and a logical presentation of information. Maybe changing the word follow to understand might go better with material being presented clearly. -For evaluation criteria #2, what exactly do you mean by high quality of writing? Are you evaluating grammar, vocabulary, sentence structure, etc? Also, if the websites are for pre-school aged kids, it may be more important for the writing to be at a lower grade level. Also in this evaluation criteria, two different things are being evaluated - quality of writing and if it's interesting. The tool might be easier to use if these two things were their own separate criteria to evaluate.
Megan Gerber		-I would be more specific on what “high quality of writing” means; either grammatically correct or use of advanced wording, etc -Another evaluation of content could be seeing if it is realistic/applicable to real life for the target population -Another idea is to mention the level of nutrition knowledge/education presented

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