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Community Readiness Assessment: Applications for Community Nutrition Research

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COMMUNITY READINESS ASSESSMENT: APPLICATIONS FOR COMMUNITY NUTRITION RESEARCH

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ABSTRACT

COMMUNITY READINESS ASSESSMENT: APPLICATIONS FOR COMMUNITY NUTRITION

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Trends in qualitative community nutrition research demonstrate a powerful, emerging perspective in the midst of a field historically dominated by quantitative methods of inquiry. For this qualitative study, ten key respondents were purposively selected and interviewed using the Community Readiness Model (CRM) to capture community knowledge of food insecurity issues and strategies. Data were analyzed using anchored rating scales, revealing readiness at a stage three, characterized by a vague awareness of local food insecurity. The purpose of this study is to report on the strengths and challenges of the CRM experienced when utilizing the model to address food insecurity. The data gathered will add to the literature on how this model can function to support community nutrition interventions.

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TABLE OF CONTENTS

LIST OF TABLES

Journal Article

CHAPTER I

INTRODUCTION

OVERVIEW

Food insecurity is a growing public health issue in the United States. In 2013, 14.3 percent (17.5 million households) of the US population was considered to have low food security, meaning they had difficulty at some time during the year providing enough for food for all household members due to lack of resources.[1,2] This percentage reflects a moderate decrease since the 2010 USDA Economic Research Service (ERS) publication documented a 15 percent rate of prevalence. However, both the 2013 and 2010 figures mark the highest levels since national monitoring of household food security status began in 1995.[3]

The term "food insecurity" was coined during the global food crisis of the mid-1970s to describe what individuals face when their food supplies lack volume and stability.[4] Food insecurity can be seen as a continuum, with individuals and households ranging from very food secure to very food insecure. Over the last 40 years, this definition has evolved to accommodate new understanding. The 2001 Food and Agricultural Organization definition describes food security as "a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[4 (p2)]

On a community level, food security has no universal definition.[6] However, Hamm and Bellows define it as "a condition in which all community residents obtain a safe,

culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance, social justice, and democratic decision making."[7(p2)]

It is important that interventions not only address the immediate nutritional needs of households but also work towards effective and sustainable solutions. There is a sizeable body of literature that provides evidence to support the relationship between food insecurity and negative nutritional outcomes.[2,3,8-10] While the relationship between food insecurity and health outcomes has been studied in depth in both child and adult populations, most of the gap in literature exists when looking at the impacts of food insecurity on communities themselves.[10] Food security is multi-faceted and qualitative research plays an important role in exploring community level concerns.[11-13]

Trends in qualitative, community nutrition research demonstrate a powerful, emerging perspective in the midst of a field historically dominated by quantitative methods of inquiry. The diversity and scope of qualitative methods offers researchers a multitude of ways to capture community stories, providing a path toward meaningful, relevant solutions that appropriately match the complexities of community level nutrition issues such as food insecurity.[10,14-16] A growing body of literature suggests that complex community issues demand interventions that reflect the needs and readiness of the community.[17-19] Individuals are at different stages of readiness to adopt behavior change; likewise, communities are at different stages of readiness to implement programs. Assessing readiness is an important step in developing effective programs that will be accepted by the community.[11,20]

In 1995, researchers at the Tri-Ethnic Center for Prevention Research at the University of Colorado developed the Community Readiness Model (CRM). It draws its theoretical framework from the Transtheoretical Model of Behavior Change, also known as The Stages of Change Theory.[21,22] Thurman and colleagues explain that this model and the theory on which it is based accurately describe(s) the level of community readiness to address a specific issue or problem.[11] While many qualitative methods of research exist, the CRM integrates unique methodology, allowing communities to address food insecurity in an ethical manner, taking into account a community's unique culture and history when developing strategies for change.[11] The methods ensure work is consistent with community goals and driven by action, toward the development and maintenance of effective programs.[11,20,21]

Since its development, hundreds of published articles have reported the practicality of using this model before, during and after community interventions. It can also be seen as a community intervention itself. The literature demonstrates how the CRM involves multiple systems within the community, utilizing unique resources and the strengths of that community in order to mobilize residents.[11,20,21,23,24] This model is a tool to empower communities and move them towards change. The CRM is most effective when applied to a focused target audience and a specific issue.[11] Most published CRM research centers around prevention of public health issues such as tobacco cessation and alcohol abuse prevention.[11,24] There is great room for growth in the application of this model in community nutrition research. Recently published articles have explored the utility of this model in obesity prevention. However, despite the increased use of

this model in prevention research, a gap in literature examining its applications in food security research remains.[23-26]

RATIONALE FOR A QUALITATIVE APPROACH

Research can be classified into three main groups: how the research will be applied, what the research objectives are and what types of information the research seeks to discover.[27] Quantitative research relies upon the numerical representation of observations in order to describe the phenomena that those observations reflect.[28] Qualitative research uses text and image data to capture stories and experience.

Both qualitative and quantitative research are important and valid methods of inquiry to the meaning of observations. Community-level nutrition issues such as food insecurity demand a multi-faceted approach. Trends in community food security research demonstrate an ever increasing understanding of this importance with an increase in the reporting on non-numerical data. Quantitative research may seek to measure the tendency and frequency with which various opinions appear in a sample. Qualitative research may seek to provide insights into the setting of a problem, gaining understanding of the underlying reasons and motivations of a community in order to move forward.[29]

The diversity and scope of qualitative methods offer researchers a multitude of ways to capture community stories, providing a path towards meaningful, relevant solutions that appropriately match the complexities of community level nutrition issues such as food insecurity.[10,14-16]

STUDY PURPOSE

The purpose of this study is to report on the strengths and challenges observed during the utilization of the Community Readiness Model in addressing food insecurity and potential improvement surrounding food access issues in a small rural community. The data gathered in this study will add to the literature on how this model can function to support community nutrition interventions.

CHAPTER II

LITERATURE REVIEW

SCOPE OF FOOD INSECURITY

A 2003 FAO report on Trade Reforms and Food Security, outlines the evolution of the term food security from its genesis in the mid-1970s.[4] It also describes the differences between chronic and transitory food security and the implications of those differing definitions on measurement. This report primarily serves to highlight the changing definitions of food security and how this modifying view provides insight into the public responsibility in addressing the issue.[4]

In 1992, Maxwell and Smith outlined nearly 200 definitions of food security published in the literature.[30] In 1974, the definition of food security began as "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices."[4(p1)] In 1981, Amartya Sen published a seminal study on food security, challenging the prevailing dialogue, suggesting that food security is an individual and household entitlement.[31] Sen suggested "entitlement as a construct [and] introduced an ethical and human rights dimension into the discussion on food security."[4(p2)] In 1983, "ensuring that all people at all times have both physical and economic access to the basic food they need" [4(p2)] was added to the working definition of food security.

In the mid-1990s, food security was beginning to be seen as a significant individual and household concern as well as a global public health priority. At the same time, food safety, nutritional balance, food preferences - socially or culturally determined - were

added to the overall definition of food security. Sen reports, “the potentially high degree of context specifically implies that the concept had both lost its simplicity and was not itself a goal but an intermediating set of actions that contribute to an active and healthy life.”[4(p3)] In 1994, the UNDP Human Development Report, also called the WIDER investigation, found that public action was necessary in combating hunger and deprivation and found “no separate place for food security as an organizing framework for action”[4(p3)] within the content of food, nutrition and social security. The conclusions from this investigation mark a significant step towards exercising best practice in the establishment of nutrition policy.

PREVALENCE

In its annual USDA-sponsored survey, the U.S. Census Bureau surveyed 44,757 households regarding food security.[32]The surveys asked participants whether a particular condition or behavior characteristic indicating food insecurity had occurred at any point during the previous 12 months. Questions included: household ability to afford balanced meals, cutting meal size, experiences with hunger and limited resources for food. Households with children aged 0-17 years were asked additional questions regarding their ability to feed their children adequate, balanced meals and whether they skipped meals or altered the size of children’s meals. If respondents reported “often”, “sometimes”, “some months but not every month”, “almost every month” or “yes” to three or more questions, they were classified as food insecure. Childless households were considered very food insecure if they responded the same to six or more questions, while households with children needed to answer similarly to eight or more questions to be considered very food insecure.

In the 2010 Household Food Security Report where these findings were discussed, Coleman-Jensen and colleagues noted that there are differences between low and very low food security and those differences lie in the extent to which households must adjust their eating patterns and intake."[1] In 2010, 9.1% of US households experienced low food security, whereas 5.4% suffered with very low food security. Among households with children, 9.8% experienced food insecurity with 8.8% of the children experiencing low food security and 1.0% experiencing very low food security. The rate of food insecurity among low-income households with incomes below 185% of the poverty line was 33.8%, significantly higher than the national average at 14.5%. In In Washington State between 2008 and 2010, food security rates hovered slightly above the national average, at 14.7%.

The United Nations Food and Agriculture Organization (FAO) definition of food security, cited in Haering and Syed's 2009 review of community food security, goes on to describe in greater detail the three implicit dimensions of food security: availability, stability and access.[10] Availability is understood in this context as having sufficient food supplies available to meet consumption needs. Stability exits when there is a minimal possibility that food consumption will fall below consumption requirements regardless of how difficult the year or season within the household. Even with bountiful supplies, many people still go hungry because they are too poor to produce or purchase the food they need; this is an issue of access.[10]

The first definition encapsulates an important social aspect of food security that was not addressed in earlier evaluations of the issue. Early evaluations of food security

were defined in the context of adequate calories to reduce household hunger. We now understand the deeper implications of food security and the need to address the quality of available food as well as the method individuals utilize to obtain it.

While the above definitions define individual and household food security, it is important to broaden our scope to define community food security as well. A seminal article published by Hamm and Bellows in 2003 describes community food security as "a condition in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximizes community self-reliance, social justice and democratic decision-making."[7(p2)] The Community Readiness Model (CRM) closely aligns with the tenets of community food security, making this model an appropriate intervention into complex issues of this nature. The CRM is primarily used in the field of public health and remains relatively unutilized within the context of community nutrition research.

The characteristics of the CRM and definition of community food security are in line with the vision of community driven, community-centered health culture. The CRM strives to maximize community self-reliance, social justice and democratic decision-making by tailoring all interventions around the readiness and willingness of the involved community to address the issue at hand. A goal of CRM developers was to provide a useful tool for community members to use themselves[20]; this can be seen in many recent narrative summaries of communities' experiences with this model and with its accompanying handbook. Community narrative summaries are often included in CRM

research reports to provide a vivid description and example of how the model was used practically to solve public health concerns.[21]

IMPACTS

As of 2010 The Academy of Nutrition and Dietetics (AND), formerly The American Dietetic Association, holds the position that a multi-system approach is necessary to address food insecurity.[2] Interventions must include innovative nutrition education programming, increased funding for food and nutrition assistance programs, the implementation and maintenance of nutrition education within food and nutrition assistance programs and increased programming that will ultimately lead to economic self-sufficiency.[2] Holben and colleagues describe food security as the linchpin of healthful living and a condition that The US Department of Health and Human Services outlined as a primary nutrition-related objective for their Healthy People 2020 initiative.

People are the country's most valuable asset and it is imperative that their food security status be addressed as the widespread public health issue that it is.[2]The consequences of food security among citizens of all ages include substandard academic achievement, inadequate intake of key nutrients, poor health, increased risk for and development of chronic disease, poor disease management, and poor psychological and cognitive functioning.[2] Food insecurity is related to both nutrition and non-nutrition outcomes. Nord and Prell summarize this complex relationship as a contributing factor in any potentially serious health and developmental condition.[33] The relationship of food insecurity to nutrition and non-nutrition related outcomes is the primary focus of a

2010 AND position paper, providing a rationale for stakeholders and practitioners to address the issue.

CRM can play a role in what the AND describes as long-range interventions, targeting the causes of food insecurity. The paper describes the USDA Community Food Security Initiative, which had a goal of cutting US food insecurity in half by 2015 through increased collaborative programming working to reduce hunger through the expansion of strong local food systems.[2] The community readiness model is a powerful tool that when put into the right hands creates opportunities to empower communities and contribute to governmental public health objectives. Holben explains that registered dietitians are in a unique position of leadership within communities. Their specialized knowledge and education allow them to develop nutrition education programming to assist the public in becoming more self-reliant, utilizing food and nutrition assistance programs to their full capacity and help break down the barriers that keep families food insecure.

Registered dietitians also have a powerful role to play in all levels of nutrition policy and advocacy.[2] Advocacy provides a way to address the root causes of many systemic barriers to food security. The AND agrees that collaborative, community-based education programming is a necessary component of the work to solve food insecurity issues in the US. The development of age appropriate food and nutrition education interventions by RDs and DTRs is one way for nutritional professionals to actively participate in food security work.[2]

McCullum and colleagues described the partnerships needed in order to develop infrastructure to ensure food security. They stressed the importance of creating

interdisciplinary collaborations.[19] The intention of the community readiness model is to also create such partnerships, gauging community readiness through structured interviews with multiple community stakeholders.

COMMUNITY FOOD SECURITY

In their seminal work, Hamm and Bellows outline a clear direction for nutrition educators' work in community food security, establishing the need for recognition of the "commonalities at the intersection of academic research, public policy development and distinctive nongovernmental organizations."[7(p1)] A primary goal of nutrition education is to instill both knowledge and skills so that patients and communities are empowered to make and sustain behavior change. Community food security is defined by Hamm and Bellows as "a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate diet through a sustainable food system that maximized community self-reliance and social justice."[7(p2)]

Going beyond more well-known definitions of food security, community food security also recognizes the importance of addressing food security within the context of a system. Systemic social and economic issues make it challenging to address the complexities of food insecurity. Hamm and Bellows propose that if nutrition educators were to invest in this work, the deeper issues behind what sustains food insecurity may have a chance of being addressed. As Hamm and Bellows point out, the challenge for nutrition educators is to consider what strengths they can bring to community and food security work, informed by their education and research and teaching experience.[7] Arguing that nutrition educators' research can provide data for public policy change, their work can assist communities and individuals in the navigation of their own

complex food environment, and empower individuals towards self-sufficiency. By working from a food systems framework, nutrition educators can see problems from a big picture perspective and address them holistically.

Hamm and Bellows use the example of a childhood obesity intervention to discuss a food systems approach to childhood obesity. A food systems approach to childhood obesity extends beyond educating that child on a healthy, balanced diet. Instead it might address the lack of grocery stores in the community where that child lives, thus the lack of easy accessibility to fresh fruits and vegetables in a neighborhood with a high concentration of fast food establishments. A food systems approach may also consider a local decline in school-based physical education programs or the low walkability score and lack of greenspace in the community.

Traditionally, the community mechanisms in place that address food insecurity have consisted primarily of emergency food and anti-hunger organizations. Community food security organizations have focused more attention on building different infrastructure in communities such as farmers markets and co-op markets that promote the consumption of locally grown foods from sustainable sources. Hamm and Bellows agree that both mechanisms towards food security are necessary, with the long-term goal of no longer being reliant upon emergency food.[7] Hamm and Bellows outline three primary ways nutrition educators can integrate their skills and education with the core values of community food security: A) Actively listen to community members at a grassroots level, allowing their feedback to guide the nutrition educator's scope of work and path of intervention. B) Offer research, analysis, educational and health interventions. C) Utilize special training and experience to advocate for social policy

change on community food security and related issues.[7] Nutrition educators' work may also include the provision of nutrient analysis and diet recommendations for community members; advocacy for important local nutrition policy; and evaluation of the adequacy of local food stores to serve the community's health needs.[7]

Collaboration between community food security workers and nutrition educators may prove less resource intensive than a scenario in which each discipline is attempting to solve community issues on their own. Utilizing nutrition educators' skills and educational training is beneficial for all parties involved. Hamm and Bellows suggest the role that nutrition educators play in community food security be both direct and indirect. An example of direct involvement may include collaboration with local planners to develop policy that will affect residents' nutritional health on a community level.[7] Such policy may address the impact that a lack of public transportation has on healthy food access for community members who are without reliable transportation.

An example of indirect involvement may include the gathering, analysis and reporting out of data relevant to local food policy initiatives. Hamm and Bellows note that community-based research methods emerged from the social sciences. These research methods have powerful implications for nutrition educators because they merge education and research efforts. The Community Readiness Model represents emergent education and research efforts, while closely aligning with the goals of community food security and nutrition education outlined above. It seeks to empower communities and can be easily used by both nutrition educators and community members.

QUALITATIVE RESEARCH IN THE FIELD OF NUTRITION

In 2009, Harris and colleagues wrote an important article published in the Journal of the Academy of Nutrition and Dietetics titled, "An Introduction to Qualitative Research for Food and Nutrition Professionals." Harris and colleagues' purpose was to not only define qualitative research but to explain its design and role in the field of nutrition and dietetics. The article outlines practical ways for nutrition practitioners and researchers to conduct publication-worthy qualitative research. Misconceptions about qualitative research stem from what the authors explain as a historical bias against qualitative methods resulting in subjective outcomes. Harris and colleagues demonstrate the ways in which qualitative research can enhance quantitative methods, adding richness to the data and providing a fuller picture of the reasons for a phenomenon. The article was primarily intended to be both encouraging and instructional and thus, is practical in its description of qualitative research and its applications.[14] Harris and colleagues begin by defining the characteristics of qualitative research and important terms. The terms most applicable to the community readiness model are outlined in TABLE 1.

TABLE 1: Important Terms in Qualitative Research

Term	Definition[14]
Qualitative Research	Approach that produces findings not derived from standard statistical procedures or other means of quantification. Defined as a naturalistic approach that seeks to understand phenomena in uncontrolled, content-specific settings, in which data are not numbers, but text, audio, or visual.
Quantitative Research	Approach in which findings are derived from standard statistical procedures and other means of quantification. Experiments are conducted under controlled conditions in which data are numbers. “The gold standard” of this type of research is the randomized, controlled, clinical trial.
Mixed methods research	Qualitative and quantitative research methods are combined in a single study to gain a fuller understanding of a phenomenon.
Induction	Method of study that begins with observation and is followed by derivation of conclusions.
Deductive	Method of study that collects data to determine if they are consistent with predetermined assumptions and hypotheses.
Phenomenology	Study of peoples’ first-hand emotions, attitudes, thoughts, meanings, perceptions and bodily experiences as or after they have experienced a phenomenon.

Table 1: Important Terms in Qualitative Research, Continued. . .	
Term	**Definition**[14]
Participatory action Research	Approach that involves planning and implementing an action and then observing the effect, taking into consideration the setting, characteristics of the community, culture, interveners, materials used, methods used, and other important factors to get a complete understanding of the effect of the intervention. Considered the "qualitative version of a clinical trial."
Case Study	Meticulous investigation of individuals, groups, institutions, or other social units. A subsequent report is written describing the unit.
Purposive sampling	Intentional sample selection based on a specific characteristic or characteristics.
Maximum variation sampling	Intentional sample selection of a wide variety of participants to get a balanced perspective.
Personal notes	Written or typed personal impressions, reactions or memories.
Methodology notes	Writings about methods used, reasons for using those methods, and changes in methods.
Theoretical notes	Writings about emerging concepts, interrelationships and hypotheses.

Table 1: Important Terms in Qualitative Research, Continued. . .	
Term	**Definition**[14]
Content analysis	Approach to data collection that involves organizing, classifying and summarizing qualitative data.
Coding	Method in which classification codes are created either before or during qualitative data analysis to organize the data.
Triangulation	Method of data validation that involves multiple methods, sources and/or investigators to promote cross comparison of results.
Practice-based research	Systematic inquiry into the systems, methods, policies, interventions and programmatic applications in dietetics practice. Conducted in practice-oriented settings.

The simply stated purpose of qualitative research is to "understand phenomena from the perspective of research participants."[14(p80)] Qualitative research also has the potential to determine causal explanations of phenomena in their national settings, "determine[ing] the culturally specific reasons for [a] barrier"[14(p82)] to food and nutrition related issues. Qualitative research seeks to study the process or natural history of a phenomenon, for example observing the implementation of a new procedure or policy in a clinical setting. The results of the observation can improve implementation. Harris and colleagues note that a limiting factor of qualitative research is the ability to generalize the results. Ensuring that research is well-conducted with vigorous

methodology and validation, research gained at one institution through qualitative means may help food and nutrition professionals in similar settings.[14]

Qualitative research provides a way to understand the culture, traditions, symbols, perception, emotions, language and meaning of phenomena to participants.[14] Harris and colleagues cite an example of a nutrition support dietitian working in a hospital with a predominantly Latino population. The dietitian could employ qualitative methods to determine how the Latino community perceives the end of life use of hydration and nutrition support. With such a sensitive topic, it is important for dietitians to understand how the culture of patients informs their perceptions and emotions on the topic.[14] Qualitative research can describe the context of a phenomenon and thus complement quantitative research, fully exploring an issue. For example, the community readiness model could be employed in a community as a way of gathering qualitative feedback about a community's readiness and willingness to address an issue which can provide the basis for a tailored intervention. The tailored intervention may utilize quantitative methods, building upon a foundation of qualitative data; both are essential pieces of a complex puzzle. Likewise, qualitative research can generate tentative theories and hypotheses that can later be further tested and explored through quantitative methods.

Harris and colleagues explain that qualitative methods also provide a way to describe an unfamiliar community or culture, which can provide helpful context for future researchers. Harris and colleagues provide the example of a registered dietitian writing a narrative describing the Orthodox Jewish community they work or live in, sharing food-related rules and traditional perceptions of the medical community. This

narrative would be beneficial to any fellow food and nutrition professionals who are faced with a similar population in their practice. A deeper understanding of a population's culture is essential for maintaining cultural competency.

Qualitative research can validate theory, "to determine to what degree study evidence is consistent with the theory."[14(p83)] For example, Harris and colleagues describe the qualitative process of validating the Health Belief Model as an explanation for human behavior. A food and nutrition professional might observe and interview individuals on their consumption of fruits and vegetables. The "evaluation of their perceptions of benefits, barriers, susceptibility to disease, and severity of disease related to fruits and vegetables could determine how well the Health Belief Model explains consumption."[14(p83)]

Further outlined in a separate section of this literature review, qualitative methods can also be used to conduct formative evaluation. Harris and colleagues explain how this approach has been used for many years by the Commission on Accreditation for Dietetics Education. When dietetics programs are undergoing accreditation, Academy site visitors conduct focus groups, interviews and observe activities to evaluate a dietetics education program.[14]

Harris and colleagues describe the four components of qualitative research in depth: research strategies, methods of sampling, data sources and collection, and data analysis. There are a multitude of qualitative research strategies; the most common are outlined with examples of how food and nutrition professionals can employ such strategies in their field. The strategies that relate closest to the Community Readiness Model include phenomenology, participatory action research and case studies. Other

examples of qualitative strategies have strong applications in the field of nutrition and dietetics research, such as ethnography - observing the social system and daily activities of a culture - or using narratives as a way to understand patients by looking into themes related to food and family history.[14] However, focusing on those which are most applicable to this study will help build a stronger case for increasing the use of this model in the field.

The qualitative research strategies that align most closely with the Community Readiness Model and have been cited in the literature in conjunction with the model are phenomenology, participatory action research and case studies. Phenomenology is described by the authors as an attempt "to understand people's emotions, attitudes, thoughts, meanings, perceptions, bodily experiences as or after they have experienced a phenomenon. . .focus[ing] on experiences of individual people."[14(p83)] The semi-structured interview style and question content of the Community Readiness Model allow for the capturing of such attitudes and perceptions. An upcoming discussion of data collection methods will further describe of the benefits of semi-structured interviews.

Participatory action research is considered the "qualitative clinical trial" by Harris and colleagues. Often a mixed methods approach is employed with this strategy. Harris and colleagues propose that a mixed methods approach presents a powerful place for qualitative research in the field of nutrition and dietetics, suggesting that the additional quantitative analysis adds rigor to the methodology while not discounting the value of qualitative data as well. Harris and colleagues discuss how participatory action research may be utilized on a college campus in the development of online sports

nutrition education materials for student athletes to utilize. A campus dietitian may conduct focus groups with those invested in the outcome of such online sports nutrition education materials. Coaches, student athletes, and athletic directors may help develop the site and relevant content. After development, the website may be evaluated by the same focus group members and then made live online for other students to have access to. Harris and colleagues explain, "after the website is implemented for athletes the investigator collects qualitative data to assess the effectiveness of the website, reasons for effectiveness or lack thereof and the thoughts, attitudes, and feelings of constituencies."[14(p84)] This feedback will help improve the website and its effectiveness among the target population.

The community readiness assessment conducted in Ellensburg, WA is a case study of how this model can be utilized in a small community to assess readiness to address issues of food insecurity. Case studies can be conducted on individual and community levels. Qualitative case studies often involve interviews with individuals in a community, looking for "common and differing personal characteristics, treatment approaches, reactions to treatment, compliance, and treatment response."[14(p84)] In the context of community-based prevention research, case studies can look a lot like participatory action research, describing an intervention and observing its effects, as well as interviewing individuals on their perception of its effects.

The next component of qualitative research includes methods of sampling. The Community Readiness Model employs a key respondent sample, which is analogous to the better known purposive sampling technique. Purposive sampling is prevalent in qualitative research, which is less concerned than quantitative research in having a

representative sample. It is defined as “an intentional selection of a sample based on some characteristic.”[14(p84)] In the case of community readiness, participants (called key respondents) are selected based on their perceived knowledge of the community and issue at hand. They are thought to have an “ear to the ground” in the community, able to shine light on other community members’ general perceptions and attitudes toward the subject which is being assessed.

Other types of qualitative sampling, all purposive in nature, include the following[14]:

- Maximum variation sampling: Wide variety of participants to achieve a balanced perspective.
- Extreme case sampling: Participants who represent extremes with the purpose of comparing and contrasting.
- Homogenous sampling: Participants who are alike with the purpose of studying their experiences in their culture.
- Theoretical sampling: Selection of participants who fit a theoretical construct in order to test their reaction and experience within a study.
- Snowball sampling: One participant is chosen and then they provide a list of others likely to participate.

The third component of qualitative research includes data sources and collection. Harris and colleagues outline many types of qualitative data collection, including focus groups, observation, photograph inspection, a group interviewing approach known as the Delphi Technique and internet-based methods such as email, blogs and websites. Harris and colleagues describe the interviewing process as another qualitative data collection method,

which is what is used in the Community Readiness Model. Harris and colleagues explain that interviews can vary in their structure; they can be structured, semi-structured or in-depth. While all forms garner different types of information and may be more beneficial in some studies than in others, the Community Readiness Model employs a semi-structured approach where questions are open ended and answers are often limited to a list of topics. Harris and colleagues explain that in-depth interviews are traditionally considered best practice, allowing study participants to discuss an issue in detail without the restraint of structured questions. They are also cited as containing less bias. It is recommended that all interviews be recorded on video or audiotape and then transcribed.[14]

The fourth and final component of qualitative research is data analysis. While not all qualitative research is devoid of statistical analysis, it is more common to see data gathered, organized, coded and classified into themes. Harris and colleagues explain the process of qualitative data analysis.[14] A) organizing, classifying and summarizing data; B) writing a cohesive description of the setting, context, and people; C) discovering patterns and themes; D) determining the meaning of phenomena to participants; E) summarizing tentative answer to research questions; F) conceptualizing hypotheses and theories; and G) deciding what to report to others.

Coding is common in qualitative research. Harris and colleagues describe codes as "derived from the research questions or keywords or phrases that frequently appear in the text"[14(p86)] In the case of the Community Readiness Model, data are analyzed and classified with the use of anchored rating scales. The process of analyzing qualitative data is labor intensive and often occurs simultaneously with data collection. Computer software can be used to speed up the process of data analysis.

Perhaps the biggest sticking point for many institutions and academic journals in regards to the publish ability of qualitative research lies in the author's assurance of the validity, reliability and relevance of their work. Harris and colleagues stress the importance of conducting well-planned qualitative research, with adequate ways to ensure the validity and reliability of findings. In this way, researchers will be able to contribute to the body of qualitative nutrition and dietetics research. Harris and colleagues describe a few ways to ensure the validity and reliability of qualitative research including triangulation, respondent validation, comparison with similar studies documenting any pre-study author bias and including a clearly written narrative of methodology so the study has the potential to be repeated.[14] Triangulation involves the use of more than one analyzer of data, so the results can be compared. If results from both analyzers are similar, the study can be considered more reliable.[14] Respondent validation occurs when researchers present themes and an overall summary to study participants to make sure "participants' perspective and meaning is represented; they are the best ones to say whether the results and conclusions have captured them appropriately."[14(p87)]

The following section of this literature review represents an overview of a few recently conducted qualitative research studies, as well as a continuation of the discussion on challenges and opportunities for qualitative research in the field of nutrition and dietetics. A series of articles on qualitative research in nutrition and dietetics was published in 2010 in the Journal of Human Nutrition and Dietetics, the official journal of the British Dietetic Association. Two articles written by Pilnick and colleagues and Draper and colleagues assessed quality and data collection. They address common questions of those who may be unfamiliar with qualitative research. They also suggest basic evidence-based

guidelines to ensure qualitative research within the field of nutrition and dietetics is high quality and reliable.[15,16]

Handforth and colleagues from Yale University conducted interviews among a sample of twenty food banks from the National Feeding America Network. The objective was to assess nutrition-related policies and practices and determine obstacles to implementing nutrition policy.[34] Many food banks are attempting to change how they operate in order to increase the nutrient density of items offered and improve the health, well-being, and food security status of food bank patrons. Some nutrition-related strategies assessed during the interviews included provision of more fruits and vegetables, evaluation of nutrient content of items using nutrient analysis software, and ceasing to give out low-nutrient dense items such as soda and candy. Obstacles to the implementation of similar strategies or policies included concerns over patron and community donor perception, fear of burning bridges with community partners and reducing the overall amount of food distributed.

Food banks were purposively selected to ensure variation. Interview questions were open ended and designed to gather as much qualitative feedback as possible. Interviews were analyzed and coded for themes by two independent coders. Consensus scores were drawn after differences in analysis were observed between coders. Interviews were reanalyzed by one coder after consensus was agreed upon. Handforth and colleagues explain they overcame interpretation bias by, "reduce[ing] validating results using the concept-indicator model, examining negative cases, and referring back to transcripts to ensure findings [were] grounded in data."[34(p412)] Data were presented in the form of participant quotes to highlight key components of the study.

Leung and colleagues from the Harvard School of Public Health conducted a qualitative assessment of expert views regarding the barriers to healthy eating during participation in the SNAP program.[35] SNAP is the largest US federal food and nutrition assistance program with ever increasing program enrollment. It is essential that a program, which is supposed to address food security status, does not contribute negatively to the health of participants.

This study used a key informant, purposive sampling process to select 27 individuals, presenting diverse expert opinion. Snowball recruiting techniques were employed; key informants referred Leung and colleagues to their peers that may be interested in participating in the study. In-depth, semi-structured interviews were conducted with questions "target[ing] multiple levels of SNAP policies that might influence health."[35(p71)] Interviews were transcribed and initially analyzed and coded by the primary researcher. Once themes and subthemes were drawn, three independent researchers coded and reviewed the data from each transcript. Final transcripts were inputted into software to further analyze for themes. Data were presented in qualitative form and highlighted by verbatim quotes.

The data revealed barriers to improved diet on SNAP, including high cost of purchasing nutrient-dense foods, inadequate SNAP benefits, lack of access to healthy food, and environmental factors associated with poverty, such as lack of local supermarkets in low-income neighborhoods. Leung and colleagues outline the six themes emerging from the data, suggesting ways to address these barriers, including incentivizing the purchase of nutrient-dense items, restricting the purchase of foods low in nutrient-density, modifying the frequency of SNAP benefit distribution,[35] increasing nutrition education, increasing the

amount of healthy food items available to SNAP benefit users in their own environment and local stores, and improving the coordination and implementation of state and federal SNAP benefits.

Kortright and colleagues performed a qualitative analysis of household food growing and its contributions to community food security in two low - to medium - income Toronto neighborhoods.[18]They used the Hamm and Bellows definition of community food security, "a situation in which all community members are able to access a safe, nutritious, and culturally acceptable diet, achieved sustainably and in a way which maximizes community self-reliance and social justice"[7(p2)] to analyze the results within this context.

Kortright and colleagues conducted in-depth semi-structured interviews, utilizing a grounded theory approach, with the goal of generating a theory based on findings. Out of the 125 residents screened, 23 interviews were conducted. Data was gathered through multiple means, including interviews, photographs, and sketches of gardens, field notes and survey results.[18]Data from multiple sources was triangulated to increase validity and reliability of results. Kortright and colleagues explain, "gardeners could be compared and characterized based not only on the coded interview transcripts but also on their survey responses and the amount and type of food they planted in their gardens."[18(p42)]

Five different typographical descriptions of gardens were developed to classify the study participants: cook's gardens, teaching gardens, environmental gardens, hobby gardens and aesthetic gardens. For example, environmental gardens were tended by those whose primary purpose in growing food was to limit their impact on their environment, while teaching gardens were most often cultivated by respondents who valued gardening as an opportunity to teach their children about food.[18] While overlap existed between the

groups, the authors explain the objective of this classification was to gauge the gardeners' motivation in growing food. Most study participants reported being food secure but many stated that gardening changed the way they ate, increasing accessibility and intake of fresh fruits and vegetables.[18]

Kortright and colleagues note the importance of communities not only having access to nutritious foods but foods that are culturally appropriate in order to enhance community food security. Study results revealed culturally appropriate food was less of a consideration for participants than was the connection of families to their historical roots of gardening. Kortright and colleagues explain that what participants grew in their gardens, "embodied the connection of the past to the present. . .[and] moral values and philosophies, such as a reverence for life, belief in the importance of caring for one's environment. . .their gardens were a way of maintaining their cultural and personal identity, which may or may not have been deeply rooted in a particular ethnic tradition."[18(p46)]

Results revealed that hobby and environmentalist gardeners saw gardening as a way of making community connections; they were more likely to share produce with their neighbors, friends and fellow gardeners, sharing gardening tips and building skills. These gardeners were also more likely to grow large enough quantities of produce to share. For gardeners who did share, they noted motivation in doing so was to strengthen social ties through conversation about food and gardening, as well as in the act of sharing their harvest. Other important aspects of community food security addressed in this study were safety and control, environment and sustainability. Both were top priorities and motivations for household food growers. Each type of garden was unique as were the motivations for gardeners; each contributed to community food security in its own way. Kortright and

colleagues conclude, “The most significant impact of home food gardening on food security found was its ability to enhance the accessibility and nutritional value of diets of the gardeners interviewed.”[18(p50)] Kortright and colleagues identified gardening skills and resources as a limiting factor in participation. Kortright and colleagues included a discussion around accessibility to produce to those who lacked the space for a personal garden and described this as a study limitation, one that ought to be explored further in future research.

TRENDS IN COMMUNITY BASED NUTRITION INTERVENTIONS

The literature identifies multiple effective intervention strategies to assist food insecure individuals in meeting their nutritional needs. The Academy of Nutrition and Dietetics Evidence Analysis Library (EAL) outlines the following evidence, providing a rating system to determine the strength of the authors’ findings. Out of the five studies highlighted in this section, two studies were randomized controlled trials (RCT), considered by the Academy to provide the strongest evidence in a literature review. Three studies reviewed are cross-sectional studies, which provide evidence of great value but fewer conclusions are able to be drawn about these interventions’ direct effects on participant outcomes.

Eicher-Miller and colleagues conducted an RCT to observe the effect of Food Stamp Nutrition Education (FSNE) in Indiana on participants’ food insecurity and food insufficiency.[36,37] They began with a sample of 236 low-income women, 98.6% were non-Hispanic white. Eicher-Miller and colleagues concluded that study limitations included the applicability of these finding in a more ethnically, or racially, diverse population. The intervention included FSNE-led interactive food preparation and cooking classes, covering a

wide variety of topics including healthy food selection and purchasing, budgeting, food label reading, and cooking skills.

Those in the intervention group took a pre-test following their first group class and took a post-test after 4 weeks of lessons, occurring over a 5 week period. The control group took a pre-test after one group class but received no additional nutrition education during the subsequent 5 week period before taking their post-test. Eicher-Miller and colleagues found food security improved significantly in the intervention group when controlling for pre-test scoring and employment. Food insufficiency was also measured and that showed a statistically significant improvement. Eicher-Miller and colleagues concluded that nutrition education is an effective intervention for food security.

Goodner and colleagues conducted a cross-sectional study to determine if food intake patterns would improve with the provision of food stamps alone without accompanying nutrition education.[37,38] The study was led by graduate students, under the supervision of registered dietitians. Participants consisted of 208 South Carolina residents; 151 were food stamp recipients, while 57 were not. Goodner and colleagues noted that a limitation of this study included the differing age, education and income levels of participants. Food stamp recipients were older, more highly educated and had lower incomes than non-food stamp recipients.

The study assessment included the collection of data from 24-hour diet recalls; a survey where participants were asked to provide information regarding demographics, food behavior and nutrition knowledge; and measurements of anthropometrics, blood pressure and their physical activity. Findings revealed no statistical significance between mean total energy intakes, vitamin A, E, B6 and iron. Both groups fell below 100% of the RDA in all

categories. There were some nutrient-specific differences between food stamp recipients and non-food stamp recipients, notably vitamin B12 and zinc, in which intake was significantly higher in food stamp recipients. Both groups had a reported low fruit and vegetable intake, consuming less than what was recommended by the Healthy People 2000 initiative objectives.

Goodner and colleagues concluded that while food stamps allow recipients to have more control when purchasing food, they do not ensure a nutrient dense diet.[37,38] They theorize that low income status and education level may play a key role in less than optimal dietary habits and suggest that these low income individuals would benefit from additional nutrition education in conjunction with food stamp dissemination.[38] It is important to note, in discussion of this study and others that employ a 24 hour diet recall data collection strategy, that the literature is mixed on the validity and reliability of this instrument. It is important to consider potential underreporting of intake and the impact of age, gender, socioeconomic status, education level and income on their reporting.[39] Although this is a generally accepted tool, some studies suggest it is most effective and reliable when used in conjunction with other data collection tools such as food records.[40] Other studies suggest the use of multiple days of unannounced recalls versus food records.[41]

Kennedy and colleagues conducted a RCT among 40 obese African American women to test the feasibility of a Rolling Store, a food-delivery intervention, in conjunction with a nutrition education program to help prevent weight gain through the consumption of healthy foods.[42] The Rolling Store consisted of a truck with detachable camper containing fruits and vegetables, parked outside of a central location once per week, essentially a

modified farmers market on wheels. Kennedy and colleagues note a limitation of this study included the small sample size.

The control group received nutrition and physical activity information once per month for six months at which time peer educators would also measure blood pressure and weight. The intervention group received the same monthly nutrition and physical activity information as the control but it was provided in a group class setting along with healthy cooking demonstrations and weekly access to fresh fruits and vegetables and recipes from the Rolling Store for 24 weeks. Kennedy and colleagues found that both groups experienced a mean decrease in weight but the intervention group experienced significantly more weight loss during the 6 month participation, as well as a decrease in overall BMI. Consumption of fruit and vegetables rose significantly in the intervention group as well. Kennedy and colleagues conclude that while sample size was a limiting factor, "The Rolling Store", when provided alongside nutrition education programming, may make weight loss and healthy eating more feasible among populations that resemble the small community center participants found in this study.[42]

Pempek and colleagues conducted a cross-sectional study among 30 low-income, African American children in Washington, D.C to observe changes in these children's' snack selection and eating habits after playing an electronic advergame. The advergame used in this study is one that promoted foods similar to those seen in advertisements typically marketed towards children. These foods tended to be less healthy, lacking nutrient density.[43] Pempek and colleagues also set out to determine whether advergames could promote healthy behavior change and alter consumption patterns by exposing the child to

healthy food choices. Possible limitations to this study include the lack of stated inclusion and exclusion criteria and lack of provided anthropometrics.

Participants were organized randomly into one of three groups. The intervention groups (healthy advergame, less healthy advergame) played their games twice, filled out a survey and then were asked to choose a snack and beverage. Pempek and colleagues provided the same snacks and beverages for this study as those that were advertised in the game. [43] Control chose their snack and beverage before playing the healthy advergame and then filled out a survey.

Pempek and colleagues found that with less than 10 minutes of exposure to the advergames, participants chose and ate the snacks being marketed by their advergame, regardless of whether it was healthy or not. There was no significant difference between the numbers of healthy snacks eaten by those in the control group. However, those exposed to the healthier advergame tended to eat a greater amount of healthy and nutrient dense snacks when compared to the participants who played the unhealthy advergame.[43] Pempek and colleagues conclude that advergames can be used to promote healthy food choices. Interestingly, researchers also found that while there was no significant impact of gender on snack selection. Survey data also revealed girls were more likely to visit food websites (36% girls visited sites compared to 0% of boys), suggesting that girls may be at a higher risk for obesity-related disease due to exposure to targeted marketing.[43]

Wiig and colleagues conducted a cross-sectional study among 92 low income women and children to examine grocery shopping behaviors and other factors that could influence food choice and food stamp usage. Wiig and colleagues utilized both qualitative and quantitative methods of data collection, dividing participants into 14 focus groups. Wiig

and colleagues explain a limitation of this study is that results may not be generalizable to other populations.[44]

Focus groups revealed the importance of store location on shopping behavior and that reliable transportation was a barrier. Participants reported spending 50% of their food budget on higher-fat, cheaper cuts of meat such as ground beef and hot dogs. Fresh fruits, vegetables and dairy were perceived as expensive. Milk and dairy were consumed more rapidly by family members and therefore considered expensive to keep replenished.[44] Other food purchases were based on family preference and what items were allowable on food assistance programs. Based on the focus group results, Wiig and colleagues conclude nutrition education could prove useful and have a positive health impact on low-income families if it includes instruction on food budgeting, and on meal preparation with less meat and more fruits and vegetables.

EAL outlines significant scientific studies that demonstrate the importance of culturally competent interventions. In an evidence analysis report, the EAL describes four studies: one prospective cohort study, one cross-sectional study, one RCT and one study without a noted study design.[45] Brown and colleagues conducted a prospective cohort study among 126 diabetic Mexican-American adults. The purpose of the study was to determine the impact of culturally competent diabetes education on metabolic control, diabetes knowledge or diabetes-related health beliefs. The control group was on a one year waitlist to receive similar treatment. Brown and colleagues note that ethical considerations were a limitation in the controlling this study. The control group did receive some diabetes education if they brought up questions during medical visits.[46]

The experimental groups received 3 months of weekly diabetes education sessions, 6 months of biweekly sessions and 3 months of monthly sessions. Sessions were conducted by bilingual nurses and registered dietitians and focused on culturally acceptable health recommendations.[46] Session topics included nutrition, glucose self-monitoring, exercise, food preparation demos and self-care topics. Results found statistically significant differences between the experimental and control groups in the following categories: fasting blood glucose, HgA1c control and diabetes knowledge/health beliefs. Brown and colleagues conclude that addressing language barriers through bilingual medical staff and acknowledging differences in cultural food preferences play an important role in the treatment of diabetes in Mexican-American subjects.

Elder and colleagues conducted an RCT examining the one year impact of a 14-week behavior change program. The program targeted the reduction of dietary fat and increase in dietary fiber among 375 Spanish-language dominant Latinas. The majority participants had low incomes and less than a middle school education.

Participants were randomly assigned to one of three groups. The first group received weekly nutrition counseling from lay health advisors called promontoras. Sessions were conducted in person or via telephone and also included 12 tailored homework assignments delivered to participants' homes. Elder and colleagues note a limitation of this study is that it is unclear how many promontora visits occurred in person versus via telephone. The second group received 12 tailored homework assignments delivered to participants' homes. The third, control group consisted of basic materials for Spanish speaking Latinos that were delivered by mail, untailored to specific needs.[46]

Results revealed a statistically significant difference between groups one (promotoras + materials) and two (materials alone) in total intake of fat, glucose, and fructose. Elder and colleagues also note a trend toward significance in intake of total energy and total CHO ($P < 0.1$). There was a significant difference between group one and group three (control) in intake of total energy and total CHO. There was also a trend toward significance in intake of total fat and saturated fat ($P < 0.1$). Elder and colleagues report that these findings are the result of the significant reinforcing, hands-on approach of promotoras. Elder and colleagues suggest that the home visits and phone calls may have made it easier to tailor materials to the subjects, making the intervention more effective than the comparison groups.

The tailoring of homework assignments is a way that this study was able to address individual needs and remain culturally competent. Elder and colleagues explain that cultural competency goes beyond offering bilingual services and involves understanding and respecting cultural differences including how these differences affect the entire communication process.[46] The AND continues to explain that effective cross-cultural communication involves the ability and willingness to address verbal and nonverbal cues. Elder and colleagues addressed this in their group one promotora intervention by having the lay health workers meet with participants in person and via telephone.

Ingram and colleagues performed a large cross-sectional study to evaluate the impact that diabetes self-management education has on patients' control of diabetes. The study was conducted among two groups of Hispanic diabetes patients living near the US-Mexico border. Both groups had roughly the same balance of male to female participants with approximately the same group mean weight. Ingram and colleagues explain a major

limitation of this study included a high dropout rate (location one-Yuma, AZ: 81% graduated, 79% reached for follow up; location two-Santa Cruz, AZ: 33% graduated, 30% reached for follow up).

Both sites received the same intervention: 5 weeks of diabetes education led by community health workers (promotores) offered one time per week for two hours. Authors note promotores were a pivotal piece of the program education model. As observed by Elder and colleagues, promotores and community members serving as lay health workers can serve as culturally competent and community accepted deliverers of health information. Topics covered in the diabetes education classes included: physical activity, dietary intake control, blood glucose monitoring, medication compliance and awareness of diabetic complications. Ingram and colleagues explain another limitation included inconsistencies in program implementation between two sites due to differences in site resources. These inconsistencies resulted in some data gaps which may or may not have affected the results of the study.

Elder and colleagues found a significant decrease in both the random blood glucose measurements and blood pressure among participants at both locations. In both locations, participants reported significant increases in self-management behaviors: diet, foot care and glucose monitoring. Among those who began the program with a high HbA1c in location one (Yuma, AZ), there was a significant decrease. Ingram and colleagues conclude that those who participated in this program are more likely to improve their blood glucose levels and blood pressure. Participants improved their diabetes self-management behaviors as well and their ability to maintain normal blood glucose levels over time.[46] The

potential impact of data gaps and inconsistencies in program implementation remains unknown in this study.

Schillinger and colleagues conducted an RCT among 339 patients from ethnically and socioeconomically diverse backgrounds. Many participants had limited literacy and/or English proficiency. Schillinger and colleagues explain that the objective was to observe the reach of self-management support strategies among diabetes patients across three dimensions: participation among clinics, providers and patients; representativeness of patients; and patient engagement with self-management support strategies. Schillinger and colleagues observed differences in how diabetics with diverse socioeconomic and linguistically varied backgrounds respond to different methods of self-management support strategies.[47] Half of the participants were uninsured and the other half were insured by MediCal, Medicare or another insurance carrier. English speaking participants accounted for 53.4% of overall participants, while 35.7% were Spanish-speaking and 10.9% were Cantonese-speaking.

Participants were randomly assigned to one of three groups: standard care (no self-support management), automated telephone disease management, or monthly medical visits. Results demonstrated high levels of engagement in the automated telephone disease management group (93.8% response rate) among both those who were English-language proficient and literate and those who were not. However, according to the researchers, in both groups receiving the telephone disease management and monthly medical visits, the automated telephone disease management system reached more individuals with limited English language skills and literacy.[47] Among group two, participants who attended monthly

medical group visits had moderate levels of engagement. A limitation of this study was the small subgroup sample size of Spanish-speaking and Cantonese-speaking participants.

Kirkpatrick synthesized two articles exploring the barriers to healthy eating among low-income Americans. The rationale for this synthesizing is the growing body of literature suggesting disparities in access to healthy foods in the United States among low-income and minority households. Both articles "highlight the need for efforts to improve access to healthy foods among vulnerable subgroups, as well as to pursue strategies to ameliorate the economic circumstances that underlie food insecurity."[3(p617)] The literature demonstrates a connection between areas of low food security and low concentrations of supermarkets with healthy food options and high concentration of fast-food restaurants. Kirkpatrick suggests that the food purchasing habits of low-income and food-insecure households can reveal barriers to healthy eating among these same groups.

Walker and Kawachi used a participant-driven process to form a concept map of factors that influence purchasing patterns of food secure and food insecure individuals. Walker and Kawachi discovered little difference between the prioritized factors. Results from this article suggest that available financial resources have more of an influence over purchasing than nutrition education.[3,48] Walker and Kawachi also outline the need for further investigation into the nutritional quality of the actual purchases. Walker and Kawachi caution against drawing a causal relationship between obesity and food insecurity; there is little evidence to suggest a strong relationship between the two conditions. Walker and Kawachi suggest focusing intervention efforts on population-specific strategies that will address the complex nature of obesity.[3,48]

The second article synthesized in this paper explores barriers to access to farmers markets for SNAP recipients. Although many farmers markets nationwide now allow SNAP recipients to use their benefits to purchase healthy food at the market, participation rates are low. Buttenheim and colleagues evaluated one strategy that may increase access to healthy food for nutrition assistance program participants.[3,49] Funded by a USDA grant, Buttenheim and colleagues replaced a central Electronic Benefits Transfer (EBT) card terminal at a Philadelphia Farmers market with multiple terminals. This pilot program increased the participation of EBT card holders by 38% at the market.

Buttenheim and colleagues' program proved financially unsustainable without the help of grant funding. Kirkpatrick aptly highlights the many unevaluated health and nutrition initiatives in the US today, noting the need for careful evaluations that will hone in on effective strategies instead of implementing those that are not evidence-based.[3] Kirkpatrick highlights the importance of evaluating barriers to sustainable strategies.[3] The Community Readiness Model and associated instruments offer a methodology in line with these study findings.

In 2006, Smith and colleagues conducted a review of the literature surrounding the implementation of community-based prevention programming. Literature reveals an overriding consensus on five main recommendations for effective program implementation: 1) The community must be ready for a prevention program; 2) effective community coalitions must be developed; 3) programming must fit the community; 4) program fidelity should be maintained; and 5) adequate resources, technical assistance, and attention to evaluation are necessary.[50] The role of the Community Readiness Model is in line with expert opinion on effective program implementation.

Millar and colleagues conducted an obesity prevention project among Australian adolescents in 2013. They sought to measure the correlation between increased community capacity to promote healthy eating and physical activity and the reduction of overweight/obesity. The intervention took place within secondary schools.[17] Utilizing the Community Readiness Model tool as an evaluation instrument, Millar and colleagues determined community capacity before and after their obesity prevention intervention. Results indicated a significant increase in capacity in the schools that received the intervention versus those that did not. Millar and colleagues conclude, effective obesity prevention efforts in the community must work to increase community capacity if they are to be effective and sustainable.[17]

COMMUNITY READINESS

OVERVIEW

Since the mid-1950s the term community readiness has been discussed in scientific literature, historically in the context of organizational, community and social psychology research. Since the late-1990s the concept of community readiness has come be understood as a an important moderator in programming intervention and implementation.[51-53] Multiple models exist to provide a conceptual framework for community readiness and serve different purposes for research and direct community use.

The Community Tool Box, a public service of the Work Group for Community Health Development at the University of Kansas, provides insight into a few characteristics of the Community Readiness Model that align closely with the goals of the USDA Community Food Security initiative and the DHHS Healthy People 2020 initiative.[54] Community readiness is issue-specific. It is important to understand that this model is measuring readiness around

a specific issue, with the understanding that like - the theory in which it is rooted in - the Stages of Change theory, a community can be at different stages of readiness to address an issue. While a community may be ready to address one issue, it may not be ready to address another.[54] According to the Work Group for Community Health Development community readiness is measurable and varied across multiple dimensions. Some groups, especially those directly affected by the issue, may have a deeper sense of urgency to address it than other groups which are mostly unaware of the prevalence of the issue. The work group continues on to stress the importance of allowing community readiness to help planners tailor an intervention or strategy to what the community is willing to accept and get involved in. The knowledge gleaned from participants can stimulate community change, promoting recognition and ownership of the issue because it can both be used by community members while recognizing their needs and assumptions.

The most commonly used community readiness model was developed by the Tri-Ethnic Center for Prevention Research at Colorado State University in the late 1990's. In 2006 developers created an instrument in the form of a handbook which can be used by community members themselves to determine readiness. This is the model that was used to assess willingness and readiness to address issues of food security in Ellensburg. The instrument and instructions for scoring are detailed in the methods section of this thesis.

CONCEPTUAL MODELS

In 1991, Mary Ann Pentz of the Midwest Prevention Project, presented a paper at the Kentucky Conference for Prevention Research. This paper outlined the beginnings of what would become the theory of community readiness. Pentz explained that unless a

community was ready for change, a prevention program may not get off the ground and may certainly lack sustainability.[20] This presentation is what stimulated the senior staff at Tri-Ethnic Center for Prevention Research to develop their community readiness theory and accompanying tools. Developers Edwards, Jumper-Thurman, Plested, and Oetting were the authors of many articles surrounding the development and usage of this model in the late 1990s and early 2000's.[11,20,55,56] In 2000, Edwards and colleagues published an article detailing the development and validation of model constructs.

The Tri-Ethnic Center for Prevention Research at Colorado State University has been conducting social science research since 1964, working to empower communities and intervene to help prevent public health issues such as tobacco use, intimate partner abuse, and alcohol and substance abuse. It became clear a unifying theory and tool to assist communities in their prevention efforts was needed and thus, the Tri-Ethnic Center for Prevention Research brought together their research and applied experience to develop a model based on the general groundwork already laid.[20]

In 1992, Wandersman and colleagues were working with community coalitions to develop a similar theory of readiness, with an emphasis on how community stress and environmental stress inhibit community motivation.[57] Edwards and colleagues explain that "Community motivation is a similar construct to community readiness. It derives from community climate. . .sense of community has a catalytic effect on local action."[20(p295)]

DiClemente and Norcross developed the Transtheoretical Model in the early 1980s, also known as the Stage of Change Theory.[58] This model sought to describe individual readiness for change which is in some ways analogous to the Community Readiness Model, although individual readiness does not account for the psychology of groups or the

important role that leadership plays in a community's readiness for change. Edwards and colleagues explain that individual readiness is unidimensional. For example, among the five stages of change, one may be at the pre-contemplation stage and have minimal awareness of the problem and no intention of acting on it. That individual cannot also be in the action stage, where they are actively implementing behavior change. In contrast, Edwards and colleagues explain, community readiness is multidimensional. This theory explains that some sectors within the community may be more ready to address certain aspects while others are not and likewise, communities may be ready to address a dimension of the issue but less ready to address other dimensions. A multidimensional approach is vital when assessing community readiness.

The Community Readiness Theory is composed of nine stages of community readiness that can be measured across six dimensions. Dimensions in which to assess readiness include: 1) community efforts; 2) community knowledge of the efforts; 3) leadership; 4) community climate; 5) community knowledge about the issue; and 6) resources related to the issue. Originally developed to address substance abuse and intimate partner abuse issues, the model and accompanying handbook can be adapted to address nearly any issue-specific community problem including health and nutrition or environmental issues.[21] Similarly to Prochaska and DiClemente's Stages of Change Model, there are different stages of community readiness, including no awareness, denial, vague awareness, preplanning, preparation, initiation, stabilization, and confirmation/expansion. Each stage has a description of the characteristics that a community must demonstrate in order to be categorized at that stage of readiness. These descriptions are outlined in detail in the Community Readiness Handbook, published by the Tri-Ethnic Center for Prevention

Research in 2006.[21] It is important to note that these stages of community readiness and dimensions of readiness were refined by community prevention experts during a qualitative evaluation process.

The objective of the community readiness theory development was to provide constructs with which to understand complex community prevention issues, but also to develop tools which communities themselves could use. From both personal experience in the field and years of prevention research, theory developers understood the importance of developing a model that was useful and based on expert experience. The model underwent a qualitative validation process including the development of anchored rating scales. Edwards and colleagues based their usage of anchored rating scales on the successful work of Dickenson and Tice (1977), Hamilton (1970), Invancevich (1980), Jacobs, Kafrey and Zedeck (1980), Kavanagh and Duffy (1978), Porter, Steers, Mowday and Boulian (1974), Ronan and Schwartz (1974), Saal, Downey and Lahey (1980), Sechrest (1968) and Smith and Kendall (1963).

Tools used to test the validity of model constructs had been used previously in a multidimensional psychology model that involved stages of development, closely related to the Community Readiness Model developed by Edwards and colleagues. While Edwards and colleagues provided construct dimensions, experts developed descriptive statements to serve as anchor statements to represent the attitudes and behaviors related to community readiness that experts observed during their work in the community.[20] Prevention experts, with extensive experience working in the field, were then brought in to match these statements with the devised dimensions. Any statements unable to be matched with a dimension were discarded or revised. Edwards and colleagues explained that the theoretical

model we know today has undergone redrafting upon further analysis and use by community members. Edwards and colleagues made changes, including adding another dimension and another level of readiness to best reflect the experience of communities. This feedback was given during Tri-Ethnic Center workshops and was considered to be highly valuable and a necessary part of theoretical model development. After anchored rating scales were developed with appropriate descriptive statements included, accurate and reliably definable stages of readiness were developed by experts.[20] Stages of readiness were also refined by experts and community prevention workers during a series of workshops.

Edwards and colleagues discuss the use of key informants in the evaluation of community readiness, explaining that the use of key informants has a long and successful history citing the work of Aponte (1978), Hagedorn, Beck, Beubert, and Werlin (1976), and Warheit, Bell and Schwab (1977).[20] Key informants are individuals who are thought to have a detailed awareness of the issue at hand and of community opinion. These are individuals who are involved in community life and in the lives of those in the community. Previously conducted studies, which Edwards and colleagues cite as rationale, have validated the use of four to five key informants to accurately assess readiness. This qualitative means of recruitment means careful selection of respondents who represent the community and its various subpopulations. This model is best utilized in small communities and very little literature exists regarding the adaptation of the model to a more urban, metropolitan setting.[51]

In the initial validation of sample size methodology, Edwards and colleagues compared the results of each key informant and discovered that no new information had been provided by an additional key informant. Additionally, highly trained individuals

interviewed key informants to further assess the reliability of the process.[20] A unique and innovative component of the Tri-Ethnic Center Community Readiness Model is the community readiness handbook, which includes guidance to increase the readiness of a community that is currently not ready to take ownership of the issue. This inclusion is where the model diverges from remaining theoretical and becomes practical. The tasks suggested at each stage of readiness are intended to move a community to a higher level of readiness. They were developed by the same community groups that helped to evaluate and clarify the dimensions and stages of readiness.

In 1997, Beebe and colleagues at the Minnesota Department of Human Services developed the Community Readiness Survey: A mail survey measuring population attitudes toward substance abuse and potential receptivity of communities to different prevention efforts.[59] This survey with new constructs from the original Community Readiness Model, was developed to provide an inexpensive way for prevention workers to empirically gauge the readiness of communities to address the issue.

Beebe and colleagues take issue with some of Edwards and colleagues' methodology and seek to address it in their 2001 publication on the development and initial validation of their Community Readiness Survey. They argue flaws in model design increase challenges for the researcher and make it difficult to measure its actual contribution to the community. Beebe and colleagues propose that the Community Readiness Model has a strong theoretical foundation but lacks empirical validity. Their primary point of concern is in the evaluation of readiness through key informants. Beebe and colleagues question the ability of key informants to provide enough information about a community to draw conclusions about its unique perspective, knowledge and attitude.[59] They fear that key

informants may represent a “vocal minority” rather than the community majority and may also utilize resources in an uneconomical and inefficient way. Beebe and colleagues cite Oetting and colleagues explaining that one study utilizing the Community Readiness Model required five weeks to complete, which may be too labor intensive for many public health professionals to afford. Another flaw in the method design Beebe and colleagues cite is the fact that the instrument employed by interviewers to gauge readiness was never externally validated and only through qualitative means. Beebe and colleagues note the importance of a qualitative validation process however they argue that it is insufficient on its own.

While Beebe and colleagues criticize the Community Readiness Model development and validation process, the publication on their own survey development mirrors that of Oetting and colleagues in many ways. The mail survey was also developed and refined through a process that began with a literature review, followed by a series of meetings (or workshops in the case of the Oetting and colleagues) with experts, community practitioners and focus groups. Experts that helped develop the survey were recruited from a well-established community-based prevention project located in the same region where the survey would be distributed. Experts from this prevention project and the organization which facilitated the project, also served as external validators.

A survey of 89 items was developed to address eight readiness domains, including perception of an alcohol, tobacco or other drug problem in the community, ownership of the problem and possible solutions, support for prevention, community efficacy, community commitment, social norms related to substance use, communication about prevention, and substance use behaviors. Beebe and colleagues defined each item to relate to only one domain. They employed a variety of analytical strategies to help them develop and refine

their survey. The goals of their analyses were to validate the hypothesized domains to assess internal consistency and variance, develop scales and reduce the number of survey items and conduct initial validation of the scales.

A random sample of households was selected using Survey Sampling Inc. and mailed to 15,000 adult Minnesotans in 30 different communities. There was a 53% response rate which Beebe and colleagues noted was considered acceptable in light of the National Committee for Quality Assurance acceptable range of 50-60%. Survey results revealed a relatively demographically representative sample, although men and seniors were oversampled. Authors note that given the results and sample demographics, it is important to not generalize to an entire population.[59] Results demonstrated that the theoretical domains hypothesized were internally valid and now empirically supported. As Beebe and colleagues note, "scale reliability was demonstrated by high levels of internal consistency, and construct validity was demonstrated by the relationships between selected scale scores and community readiness as evaluated by prevention planners." [59(p67)]

Beebe and colleagues found that prevention planners perhaps did not have enough of an in-depth knowledge of the community as researchers would have hoped and it made for some generalization that affected the conclusions. This is similar to the concern they had regarding the use of key informants in the community readiness model. Beebe and colleagues note that while much data gathered provided helpful insight into the validity of the tool, there were large amounts of data that lacked practical utility as anything more than an evaluation tool. This study served as preliminary work and more work is needed to adapt the model to different issues and build upon the work of other theories presented in the literature. [59] The Community Readiness Model developed by Oetting and colleagues is

criticized for a lack of empirical foundation. However it is clear from its utilization in many studies that it does not lack in application ability. It serves as a useful tool to empower communities and raise issue awareness.

Chilenski and colleagues propose that community readiness is a multidimensional construct.[51] In their mixed method analysis of community readiness, they propose new constructs and methods of assessing readiness that differ in some ways from existing models. A goal of this study was to report on the development of a "model that integrated organizational psychology and community readiness literature into a comprehensive model useful for community-based collaborative prevention activities."[51(p348)] Organizational and community psychology research form the theoretical foundation on which this model is built. The second goal of this study was to assess "the extent to which the constructs of the model 'fit' empirical data by assessing psychometric properties of the corresponding measurement model."[51(p348)] As Chilenski and colleagues explained, empirical data is only now beginning to operationalize the constructs outlined in this model.

The third and final goal of this study included the application of the model and its constructs in a school-community-university research project to test the validity of the model while addressing the community issue at hand. Chilenski and colleagues note that the overall goal of constructing a new community readiness model based on both organizational and community psychology research is to guide communities to more effective and collaborative prevention initiatives.[51]

The consistent understanding across both organizational psychology and community readiness literature, regardless of the differing constructs, is that readiness ought to be seen as a precursor to program implementation. The level of readiness with

which an individual, organization or community is at will mediate their likelihood to be accepting of change.[51,60] Chilenski and colleagues outline a conceptual model of readiness that is said to focus on preexisting psychosocial characteristics of communities and be composed of four interrelated, yet distinct factors or perceptions: Community Attachment, Initiative, Efficacy, and Leadership.[51,61]

Within this model, the perception of community attachment or sense of community describes the sense of trust among community members, emotional ties to the community and between residents. Attachment is the first construct of this model. The authors cite community psychology research to validate this as a worthwhile, evaluative factor, explaining that sense of community predicts involvement and that those who feel affiliated would likely feel invested and more willing to collaborate in order to reach a successful outcome on a shared goal.[51]

A second factor that makes up the multidimensional construct is initiative, which describes how actively involved and engaged community members are already. Chilenski and colleagues explain that the level of historic community engagement and current engagement is a predictor of readiness. This construct is a bridging of organizational and community psychology research. Chilenski and colleagues cite the work of Simpson and colleagues in their discussion of individual influence and autonomy in the context of organizational psychology research.[62] They also cite the work of Perkins and colleagues in their discussion of the importance of citizen participation as a predictor of readiness.[63]

Efficacy makes up the third construct of the proposed model, describing the perception of past success as a result of community collaboration being important in improving future outcomes.[51] Both self-efficacy and community efficacy is defined within

this construct. Community efficacy is defined by Chilenski and colleagues as a collective belief that a group can be successful in making change.[51,61] The more positively the community views their ability to be successful, the more likely that community is to engage in behavior that will lead to change. Leadership is the fourth and final construct in the proposed model. Chilenski and colleagues built upon both community and organizational psychology to develop the construct of leadership, so it would encapsulate the true meaning of leadership in the context of community readiness. They explain that leadership quality is as important as the presence of leaders themselves. They describe leadership quality in the context of perceived effectiveness and consensus-building skills.[51] Chilenski and colleagues cite an abundance of literature that supports the idea that leaders who engage and collaborate with individuals can more effectively lead communities towards change.[64,65]

As is traditional within all currently published community readiness models, Chilenski and colleagues stress the importance of interviewing both key leaders and community residents. They argue that while key leaders may be more involved in change efforts, change is impossible without the support of the community. Both are essential in the assessment of readiness. Upon gathering the best practices from organizational and community psychology, Chilenski and colleagues conclude the following four target groups are necessary in order to measure community readiness from the context of a representative community sample. The sample, called “prevention team members” in this study, included general community members (including parents, youth), staff in participating agencies, agency directors in those agencies and key leaders in their communities.

Gathering information from a representative community sample allowed researchers to test the agreement of a readiness construction among community members as many residents may have a unique perception of their own community.[51] The previously mentioned constructs of this model (Attachment, Initiation, Efficacy and Leadership) are joined by two additional psychosocial constructs to further assess readiness: community norms regarding the problem behavior and residents' perception of the awareness of the problem in the community. Chilenski and colleagues explain the model validation process as such, "measuring the psychosocial characteristics of the school and other involved organizations will help assess the readiness of involved organizations and it can validate the degree to which the proposed construct globally measures these characteristics of communities."[51(p352)]

In 2007, Chilenski and colleagues from The Prevention Research Center at Pennsylvania State University conducted a community-based prevention trial utilizing their PROSPER (PROmoting School-Community-University Partnerships to Enhance Resilience) model. The study sample was composed of 225 participants within 28 communities in two states. Participating communities in each state were randomly assigned to one of the seven intervention groups or one of the seven control groups. The average number of participants per control group was 4 to 10 while intervention groups consisted of 8 to 15 participants.

The PROSPER model utilized both community and school leadership to spearhead a community-based prevention team.[51] The study is a collaboration between local Cooperative Extension Services (CES) at state universities and local public schools. Prevention teams (representative sample) were co-led by a CES educator and local public school representative such as a principal or vice principal. The authors explained that other

team members included parents, youth, faith leaders, and mental health and substance abuse workers. The subject matter of this study was middle school students' substance abuse.

Eligible communities were recruited based on size (< / = 5,200 students in district), socioeconomic status (> / = 15% of students eligible for free or reduced school lunch), resident employment or education status (< 49% population employed by or attending a university), and affiliation with similar programs (eligible communities must not be currently involved in a university-affiliated research project with youth).[51] Initial contacts were made to local CES to gauge interest in and availability for the study. When interest was expressed, researchers provided more detailed information and screened for programming expertise, which was considered an additional requirement for leading a prevention team. After a CES educator was recruited, researchers set about to recruit local public school representatives to co-lead the prevention teams alongside the CES educator.

Prevention team members were recruited and randomized into intervention or control groups. Team members (community members) and agency directors (also called key leaders) were asked to complete a one-hour computer-assisted face to face interview in which most items were administered using a four-point Likert scale from "strongly disagree" to "strongly agree" describing the model constructs.

Multiple conceptually based scales were adapted from organizational and community psychology research in order to assess attachment (Example item on three-item scale: "Most people who live here feel a strong tie to this community."), initiative (Example item on four-item scale: "It is difficult to get people in this community involved in community activities."), efficacy (Example item on four-item scale: In the past the

community has been successful at addressing social problems."), and leadership (Example item on four-item scale: "Community leaders are able to build consensus across the community.")[51] Additional scales were constructed to gauge workplace atmosphere, school functioning, community norms and perception of the problem. Chilenski and colleagues used complex multivariate structural equation modeling analysis to evaluate the data gathered from structured interviews. The purpose was to gauge hypothesized model fit compared to an alternative independence model. This process helped in validating the model as a reliable way to gauge community readiness.

Chilenski and colleagues concluded, that the model was acceptable at predicting individual and community characeristics.[51] However, they discovered a significant amount of variance in readiness and were able to determine the main constructs on which team members differed. They tested agreement to determine if the variance occurred within and among communities or across team members. Chilenski and colleagues determined that regardless of their organizational level, respondents from the same community could all demonstrate disagreement about the level of readiness of their community.[51] Some results demonstrated significant agreement among team members. Chilenski and colleagues discuss the importance of aggregating the data, which revealed the differences of opinion and moderate agreement between community members and key leaders. They also suggest that the level of variability in a workplace makes it challenging to generalize and that perhaps the best approach is to recognize that different community members have different skills and experiences that may be more salient in getting the community involved and it is important to capitalize on those particular experiences.[51]

Limitations of this study include sample size, self-report bias and community demographics. This model utilized multiple communities, which allowed for increased sample size and statistical analysis; however, Chilenski and colleagues note that an even larger sample would have allowed researchers to gain greater confidence in making generalizations based on findings. Although, by design, this model has a small sample size, the authors conclude that it will inevitability not detect certain relationships that could be potentially significant.[51] The sample lacked diversity of demographics and Chilenski and colleagues note the importance of future research investigating the applications of this model in the context of diverse populations.[51] Finally, they conclude that in order to further validate this model's usage and effectiveness in gauging community readiness, longitudinal community-level studies are necessary.

TRENDS IN COMMUNITY READINESS RESEARCH

The amount of literature on the subject of community readiness is staggering and spans multiple disciplines including but not limited to environmental health, organizational psychology, community psychology, public health prevention and nutrition. The application of the community readiness model, developed by the Tri-Ethnic Center is perhaps best demonstrated through in-house case examples and success stories. A brief sampling of successful applications of the model since its development in 1995 is available on the Center's main website. Many of the example applications provided are pertinent to the field of nutrition and dietetics and reveal areas of research opportunities for registered dietitians and nutrition professionals. A few examples include cultural competency, program evaluation, grant making

organizations and school and community programming.

The Community Readiness Model is a widely accepted and frequently utilized method of gaining insight into how ready and willing a community is to address an issue. Literature reveals researchers outside of the Tri-Ethnic Center for Prevention Research have sought to further validate its methods and add rigor to the assessment strategies. Schroepfer and colleagues utilized the Community Readiness Model in their attempt to address cancer health disparities. Rather than discuss the results of their assessment, they published their qualitative findings on the scoring procedures in detail. This publication included the consensus portion of the scoring process, as well as the triangulation of the scores to increase the process vigor.[66]

Schroepfer and colleagues briefly describe other developed readiness models and explain their rationale for choosing the Community Readiness Model. They chose to use the model developed by Oeting and colleagues at the Tri-Ethnic Center noting that its qualitative nature, use of leaders as key informants, and methodology are in step with the tenets of community-based participatory research. Use of the Community Readiness Model in this project allowed for "full participation of community leaders, thus giving voice to their wisdom and knowledge of their community's readiness to address cancer issues."[66(p272)]

Schroepfer and colleagues enhanced the rigor of the scoring process by employing investigator triangulation, utilizing two independent data scorers. They also integrated interdisciplinary triangulation by bringing on four independent scorers, from separate academic disciplines; this allowed for varied technical feedback. The use of these two methods of triangulation helped reduce the chances of bias in scoring

procedures. A master scorer was recruited to help the scoring team to remain objective and cognizant of the meaning of consensus and accurate independent scoring. To further add vigor to the study, Schroepfer and colleagues audio recorded each consensus meeting, with recordings independently analyzed for content by two researchers not a part of the scoring team.

Data from this qualitative analysis of scoring procedures indicate that scorers felt lack of information from key informants increased scoring difficulty. They found that many leaders were uncomfortable generalizing their responses about the community and therefore cited lack of sufficient knowledge to answer the question. This lack of knowledge made it challenging for the scorers to accurately rate readiness in that dimension. Lack of strong interviewing skills was another cited challenge to accurate scoring. When key informants got off topic, misinterpreted a question or gave a vague response, many interviewers were unable to redirect. This lack of ability was reflected in scoring challenges.

Recommendations provided by Schroepfer and colleagues include the distribution of a detailed letter to key informants prior to their interview, outlining the purpose of the study and requesting their response as to their comfort with the subject matter. Schroepfer and colleagues explained that this will help in the recruitment of key informants who have the requisite community knowledge in order to answer the questions fully. A second recommendation to help overcome community readiness model scoring challenges included training of interviewers to ensure they have baseline knowledge of strong interviewing techniques.

Schroepfer and colleagues note how important it is that interviewers are able to

make the key informants comfortable throughout the interview, while remaining professional, as well as redirecting and clarifying questions to obtain high quality content. The final recommendation Schroepfer and colleagues outline is "when an academic and community partnership is conducting the assessment, the use of community members as interviewers may be best, as knowledge of their own community may enable them to probe more effectively.[66(p285)]

Jarpe-Ratner and colleagues presented an adapted version of the community readiness model in their formative evaluation of a school-based social and character development intervention.[67] The intervention was part of an RCT in Chicago Public Schools from 2004 through 2010. A gap in funding occurred from 2006-2007, leaving schools unable to continue their intervention. Jarpe-Ratner and colleagues hypothesized difficulty implementing their strategies after the gap and the Community Readiness Model was employed to help reestablish program implementation efforts by assisting researchers develop individualized strategies to address varying degrees of school readiness.[67] The Community Readiness Model was implemented as a formative evaluation strategy in the fall of 2008, 2009 and 2010.

Jarpe-Ratner and colleagues demonstrate the community readiness model's usefulness in capturing community opinion and intervening on specific characteristics of readiness in order to maximize the potential for programming success[67]; it allowed for tailored technical assistance to each school. Assessments also informed researchers as to where support should be targeted.[67] Jarpe-Ratner and colleagues commented that while the model implementation required much staffing, it was less resource intensive than most qualitative methods of data collection. The readiness model is typically used

as a mediator of program intervention; this study's unique approach shows the model's potential usefulness in program evaluation as well. Formative evaluation is an important component of effective program design and delivery. This study is also the first documented use of the community readiness model in a school among students, teachers, staff and administrators.[67]

Slater and colleagues also used the community readiness model as a tool in formative evaluation in their randomized group prevention trial involving a participatory community-media intervention. They reported their findings in the Journal of Community Health in 2005, partnering with Tri-Ethnic Center model developers. Slater and colleagues used the assessment to supplement individual-level analyses. Results from the readiness assessment laid the groundwork for a coalition-building workshop. They revealed the success of the intervention in raising community knowledge of efforts, improving prevention leadership quality and improving community climate around the prevention efforts. Slater and colleagues conclude that community readiness assessments can play a valuable role in randomized community trials, by providing insight into community dynamics, tailoring community interventions based on need and offering a tool that can be used by community members themselves and in conjunction with community health workers and advocates.[26]

Sheldon and colleagues at Georgia State University employed the community readiness model in their policy research initiative, the PLAY (Policy Leadership for Active Youth) initiative. They presented their findings at The Active Living Research annual conference. Their assessment revealed the involved communities were in a preplanning stage of readiness and while funds may not be necessary to move interventions

forward, collaboration and coalition building would help to empower and support communities. Qualitative results showed communities would benefit most from more marketing, educating, coordinating, collaborating and leading efforts to move them to a higher stage of readiness to address issues of childhood obesity. Results also indicated the need for local government intervention in order to get efforts off the ground. As a result of this research, four communities received grants to help implement childhood obesity prevention initiatives.[68]

Kesten and colleagues conducted the first community readiness assessment in the UK. A growing interest in the effectiveness of community-based prevention interventions and uncertainty of how to tailor interventions to community needs led researchers to adopt the model. Kesten and colleagues sought to assess community readiness for overweight and obesity prevention in pre-adolescent girls. Researchers reported their findings in a case study published in BMC Public Health in 2013.[24] The adapted the model methodology to best fit their community by selecting key informants through focus groups composed of pre-adolescent girls to identify their biggest influencers. While some influencers, such as celebrities, did not meet the criteria for a model key informant, Kesten and colleagues found the focus groups to be particularly helpful in tailoring their work.

Results indicated the community was at a higher level of readiness to address issues of physical activity related to overweight and obesity prevention rather than healthy eating and drinking. The lowest levels of readiness were found in the resources and community knowledge of the issue dimensions. Qualitative feedback revealed prevention work should tailor their intervention to target priority areas such as physical

education training for primary teachers, raising awareness of the prevalence of the issue on a community level and increased resources to support the development of programs that support after school healthy eating and drinking.

Kesten and colleagues note that the qualitative component of this model allowed for the revelation of information that will inform the tailoring of future interventions.[24] Included in a discussion of limitations, Kesten and colleagues critique the community readiness model scoring procedure, explaining that assigning a number to each readiness stage may inadvertently cause the data to lose some richness and not fully capture the meaning of the results.[24] To overcome some of this limitation, Kesten and colleagues chose to report much of their data in the form of key informant quotes, revealing wisdom and feedback this qualitative approach is able to offer researchers.

Sliwa and colleagues utilized the community readiness model to select communities for a community-wide obesity prevention intervention. Communities applied to be part of the research study, ten finalists were selected and the community readiness model protocol was utilized to narrow down the search to the top six to receive the intervention. Forty key informant interviews were conducted among ten communities of similar size and socioeconomic status across (four per community) following community readiness protocol. Appropriate key informants were considered gatekeepers in the context of this study (e.g: mayor, school superintendent), resulting in the small sample. Results indicated a mean readiness score of 4.28, corresponding with the “preplanning” stage of readiness. Sliwa and colleagues used readiness scores and qualitative data to help select the communities that would participate in a replication study.[25] In this case, the community readiness model assisted in the control program

planning and implementation.

Buckner-Brown and colleagues performed a retrospective analysis of the collaborative redevelopment of the High Point neighborhood in Seattle, Washington. They published this research as a Center for Disease Control community case study. The purpose was to examine the effects of collaborative neighborhood redevelopment, describing their analysis through the lens of the Tri-Ethnic Center's Community Readiness Model.

The redevelopment of the infrastructurally unsound and crime ridden community took place between 2000 and 2010, with the active involvement of residents. Buckner-Brown and colleagues note that community members were involved in every aspect of the redevelopment process from planning to evaluation.[23] They chose to describe the process of community redevelopment as happening in the following stages: awareness, preplanning, preparation, initiation, stabilization, confirmation and expansion, community ownership. Buckner-Brown and colleagues did so to highlight the collaborative effort of development that took place in High Point as well as draw on what they consider to be an important conversation regarding the necessity to match a community's readiness for change with the intervention. Buckner-Brown and colleagues conclude that community engagement in redevelopment efforts helps to ensure culturally appropriate results.[23] This case study illustrates how "involvement and commitment of local residents in the planning and implementation of a local housing improvement effort can contribute to its success."[23(p6)]

Ehlers and colleagues demonstrated the effectiveness of using the community readiness model in the context of a school community for a physical activity

intervention, Ready for Recess. They conducted pre and post readiness assessments to measure how effective their intervention was at raising readiness to adopt behavior change. Ehlers and colleagues rationalized the use of this model in their study in light of their most recent findings outlining the importance of school readiness in the implementation of school-based childhood obesity prevention.[69]

Ehlers and colleagues conducted a baseline community readiness assessment of 98 key school stakeholders, across 17 schools. Results indicated that principals scored higher than teachers in overall readiness and knowledge of the issue; however they actually scored lower in leadership post-intervention than pre-intervention. Ehlers and colleagues suggest this may indicate that principals overestimated the readiness of staff to implement the intervention. They may also have overestimated their ability to provide adequate support to their staff in order to successfully implement the intervention.[69] Ehlers and colleagues agree that the study results highlight the importance of evaluating and increasing school readiness prior to any intervention within that environment.[69]

One example of how the Tri-Ethnic Center for Prevention Research has partnered with other organizations is in their work with the Centers for Disease control to train domestic violence community response teams. Another example of how this model has been utilized is with the National Children's Alliance, who employed the model to develop cultural competency within the organization and disseminated the model to local advocacy centers for usage.[70] Other organizations, whose names were left out of the description, based on the sensitivity of the issue of cultural competence, used the structure of the model and validated questions to capture readiness. Other

organizations reportedly used the model to gain a baseline understanding of the stage of readiness their organization was at and utilized the center's workshops to develop creative solutions to increase readiness around cultural competency.

The Centers for Disease Control has offered funding to various organizations to implement the community readiness model to reduce injuries.[70] Grant agencies themselves have employed the model to make sure they utilize their resource effectiveness. Grant organizations have made decisions on funding based on the likelihood that the proposed research will succeed in the community, utilizing the readiness model to help make the decision. Thus, the Community Readiness Model may also provide baseline data that grant agencies are looking for before agreeing to fund research. This is especially important for the field of nutrition and dietetics research, which often seeks grant funding for important nutrition initiatives.

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Chapter III

Journal Article

Community Readiness Assessment: Applications for Community Nutrition Research

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ABSTRACT

Trends in qualitative community nutrition research demonstrate a powerful, emerging perspective in the midst of a field historically dominated by quantitative methods of inquiry. For this qualitative study, ten key respondents were purposively selected and interviewed using the Community Readiness Model (CRM) to capture community knowledge of food insecurity issues and strategies. Data were analyzed using anchored rating scales, revealing readiness at a stage three, characterized by a vague awareness of local food insecurity. The purpose of this study is to report on the strengths and challenges of the CRM experienced when utilizing the model to address food insecurity. The data gathered will add to the literature on how this model can function to support community nutrition interventions.

KEY WORDS: Community Readiness Model, community food security, food insecurity, qualitative, nutrition.

BACKGROUND

Both qualitative and quantitative methods represent valid forms of research that work to capture the meaning of observations. Quantitative research seeks to measure the tendency and frequency with which various opinions appear in a sample, while qualitative research seeks to provide deeper insight into the setting of a problem, and develop understanding of the underlying reasons and motivations of a community in order to move forward.[1] Both types of research have great potential to complement each other, offering a broader picture of an issue.

While many forms of qualitative research exist, the current study employed the Community Readiness Model (CRM).[2] In 1991, researchers at the Tri-Ethnic Center for Prevention Research at the University of Colorado developed the CRM. CRM is rooted in the Transtheoretical theory of stages of change, and the developers noted that just as individuals are at different stages of readiness to adopt behavior change, communities are also at different stages of readiness to implement municipal programs.[3] Assessing readiness is an important step in developing effective programs that will be accepted by the community.[2,3,4,5,6] The model was developed to provide a unifying theory to help community health workers develop effective, sustainable programming to help move the community towards a greater stage of readiness to accept change. In 2006, the developers designed a handbook to serve as a practical guide for communities wishing to assess readiness for change.[2] This research will utilize and assess the effectiveness of the CRM model in a community nutrition setting.

Readiness is assessed across six dimensions: community efforts, community knowledge of efforts, leadership, community climate, community knowledge of issue,

and resources. Each dimension represents an important component of whether a community is ready to move forward toward solving the issue at hand.[2] When an intervention is implemented, readiness can increase or decrease depending on the intensity and appropriateness of community efforts. Community Readiness is a multidimensional construct and can be seen as a continuum, characterized by nine different stages: no awareness, denial/resistance, vague awareness, preplanning, preparation, initiation, stabilization, confirmation/expansion, and high level of community ownership.

A long term goal of implementation of the CRM is to increase community capacity and resilience. The model was developed with the capacity to be used in collaboration with community members directly. Recent research has begun to explore how this model can bridge the gap between academic researchers and communities in order to ensure interventions are in line with community goals and help to empower communities. The CRM has been used to tailor interventions; as a method of formative evaluation; and to gather data for grant funding.[6,7,8,9] A gap in the literature exists when looking at the application of this model in the field of nutrition and dietetics, specifically in gauging community opinion of food insecurity.

Food insecurity is a growing public health issue in the United States. In 2013, 17.5 million US households were considered to have low food security, meaning they had difficulty at some time during the year providing enough food for all household members due to lack of resources.[10,11] There is a sizeable body of literature that provides evidence to support the relationship between food insecurity and negative nutritional outcomes, including inadequate intake of key nutrients, poor physical and psychological

cognitive functioning, substandard academic achievement, and increased risk for and development of chronic disease.[10,11,12,13,14] Food security is multi-faceted and qualitative research can play an important role in exploring community level awareness and concerns.[4,16,17]

The purpose of this study is to report on the strengths and challenges observed during the utilization of the CRM in addressing food insecurity and potential improvement surrounding food access issues in a small rural community. The data gathered in this study will add to the literature on how this model can function to support community nutrition interventions.

METHODOLOGY

Sample, Recruitment, Data Collection

Ten key respondents were purposively selected based on the researcher's perception that they had extensive knowledge of the community and local food insecurity issues. One to two key respondents were chosen from each of the following community sectors: local government, healthcare leadership, educational leadership, college student body, involved citizens, and religious leadership. Respondents were recruited via telephone or email for participation in a 15 to 45 minute telephone interview where they were asked a series of thirty-eight semi-structured questions consisting of a mix of forced choice and open-ended questions. Refer to the Community Readiness Handbook[2] for a list of CRM interview questions. Interviews were conducted over the course of twelve weeks and transcribed by two independent transcribers,

unconnected with the study, to limit potential bias. Table 1, from the Community Readiness Handbook[2], outlines the nine stages of community readiness, a brief description of that stage and a goal associated with each stage to help guide the researcher develop an appropriate community intervention.

Table 1: Nine Stage of Community Readiness Model, Adapted from The Community Readiness Handbook

Stage of Readiness	Brief Description	Goal
Stage 1: No Awareness	Issue is not generally recognized by the community or leaders as a problem.	Raise awareness of issue.
Stage 2: Denial/Resistance	At least some community members recognize that it is a problem, but there is little or no recognition that it might be a local problem.	Raise awareness that a problem exists in the community.
Stage 3: Vague Awareness	Most feel that there is a local problem, but there is no immediate motivation to do anything about it.	Raise awareness that community can do something.
Stage 4: Preplanning	There is no clear recognition that something must be done, and there may even be a committee. However, efforts are not focused or detailed.	Raise awareness with concrete ideas to address problem.
Stage 5: Preparation	Active leaders begin planning in earnest. Community offers modest support of efforts.	Gather information with which to plan and improve programs.
Stage 6: Initiation	Enough information is available to justify efforts, and activities are underway.	Provide community-specific information.
Stage 7: Stabilization	Activities are supported by administrators or community decision makers. Staff are trained and experienced.	Stabilize efforts/programs.
Stage 8: Confirmation/Expansion	Standard efforts are in place. Community members feel comfortable in using services and support expansions. Local data regularly obtained.	Expand and enhance services.
Stage 9: High level of community ownership	Detailed and sophisticated knowledge exists about prevalence, risk factors, and causes. Staff members are highly trained. Effective evaluation is in place.	Maintain momentum and continue growth.

Data Analysis

CRM data are analyzed using anchored rating scales. These scales are modeled after Behaviorally Anchored Rating Scales (BARS), which are commonly used in both qualitative and quantitative research. BARS are used to compare an individual's

performance against specific examples of behavior that are anchored to a numerical rating.[18] Within the current study, the anchored rating scales were used as a means of scoring themes, with numerical ratings of one to nine with one representing "no awareness" and nine representing "high level of community ownership."[19]

Transcribed interviews were analyzed by two independent scorers. This method of triangulation is commonly used in qualitative research to enhance the validity and reliability of data analysis methods and results. Once each researcher had completed analyzing all ten interviews independently, they met to discuss any differences in scores. Consensus scores were agreed upon and overall readiness was determined, with each interview receiving a score. Readiness levels derived from each respondent at each dimension were then averaged to provide an overall readiness score for each key respondent. All key respondent readiness levels were averaged to provide an overall community readiness score. Scores that were not a whole number were rounded down. CRM recommendations include the avoidance of scoring a community too high and consequently implementing a strategy that is not suitable for the community. It is recommended that scores be rounded down to avoid an artificially high value.

After the scoring of interviews was complete, the primary researcher wrote a brief report summarizing the dimension scores determined, their meanings (as revealed by rating scales) and major themes that emerged. The researcher read all interviews to identify major themes within each dimension; strengths, weaknesses and obstacles to action; and the leaders and community members that can be enlisted to help address the issue.

RESULTS

Table 2 outlines the overall readiness score for each dimension used to assess the willingness and readiness of the community to address the issue of local food insecurity.[2] The community was assessed at a stage three readiness level, associated with vague awareness of local food insecurity. A review of themes that emerged from each dimension illustrates nuances of perceived community knowledge of surrounding local efforts. Major obstacles in access to services that address food insecurity included embarrassment in self-identifying at food bank, lack of access to transportation, lack of knowledge of available services and how to access them, and disabilities and physical accessibility. Respondents cited a number of misconceptions regarding efforts that currently exist to address local food insecurity. The four major misconceptions noted were: efforts only assist the poor and/or homeless; efforts are not needed; this is not a problem here; and that the community doesn't know who qualifies for services.

The most commonly cited efforts that address food insecurity included the food bank, local churches, non-profit sponsored meals, El Pollo feeding program, and federal programs such as the Supplemental Nutrition Assistance Program and Women, Infants and Children. The primary identified obstacles to addressing issues of food insecurity were community misconceptions about efforts, an overall lack of knowledge about the scope and prevalence of local food insecurity, and lack of knowledge of food insecurity as an issue itself. These study findings can assist local community health workers, food bank staff, nutrition professionals, future graduate students and involved citizens tailor their efforts in addressing food insecurity by focusing efforts on addressing specific misconceptions and obstacles.

Table 2: Readiness Score for Each of the Six Dimensions of Readiness

Dimension	CE	KE	L	KI	CC	R	Overall*
Numerical Stage of Readiness	3	4	3	3	4	3	3
Descriptive Stage of Readiness	VA	PP	VA	VA	PP	VA	VA

Dimensions: CE=Community Efforts; KE=Knowledge of Efforts; L=Leadership; KI=Knowledge of Issue; CC=Community Climate; R=Resources.

Stage of Readiness: VA=Vague awareness; PP=Preplanning.

**Non-whole number values were rounded down in accordance to the CRM handbook guidelines.*

DISCUSSION

The community was assessed at a stage three readiness level, associated with vague awareness of local food insecurity. Reported methodology and results demonstrated how this model could be used in other communities to address issues of food insecurity, providing a way to tailor interventions to appropriately match the level of community readiness, serving as formative evaluation or building on community wisdom in order to empower communities towards change. The CRM is often conducted in a community setting. However, the process of utilizing the CRM as part of academic research provided insight into how this model functions in a university research setting when addressing issues related to community nutrition. This community readiness assessment of food insecurity revealed the community's stage of

readiness across multiple dimensions. Both obstacles and opportunities arose and were observed during the utilization of this model in an academic research setting.

OPPORTUNITIES

Tailored Interventions

Interview questions included both forced choice and open ended questions. The semi-structured nature of the CRM interview questions gave respondents direction but allowed them space to provide additional feedback that had the potential of illuminating community perspective on a particular dimension. When asked whether there are misconceptions about food insecurity in the community, one key respondent shared an experience with a summer meals program, explaining *"somebody, adults or kids, were just saying this program is for the poor and we're not the poor. . . now [the summer meals program] is not supported. As long as we have that kind of dichotomy, we're not going to be able to address the kids. . .providing them sufficient nutrition."* Most effective tailored efforts will need to address misconceptions.

The qualitative feedback CRM interviews provide can help community nutrition professionals and health workers tailor interventions. The CRM handbook provides a list of validated generalizable strategies to match each readiness level and can help community nutrition professionals move forward after preliminary research is conducted.[2] For example, food bank staff may want to utilize the CRM prior to integrating new programming. Intervention efforts could be tailored to best meet clients' needs once staff determines how willing and ready the community is to receive nutrition and health education in this venue.

Formative Evaluation

The CRM can serve as a tool for formative evaluation of current community perception of food security efforts that already exist in the community. Although efforts to raise awareness of local food insecurity including a community food assessment and annual food days exist, the current study's results revealed a low awareness of the scope and prevalence of the issue as well as a lack of knowledge of the issue itself. When asked what type of information is available about food insecurity in the community, one key respondent explained, *"I don't think it's called food insecurity when somebody's addressing it. . .if you want [information] you would have to go find it, not that many people do that. . .it's not a big priority."* Effective tailored efforts should include raising awareness of local food insecurity in visible ways through posters and flyers, rather than only through community events that reach a particular audience. Another example of how the CRM can be utilized by nutrition professionals may include the following: School food service staff may be concerned by a decreased participation in weekly communal meal time since the consulting dietitian introduced Meatless Monday. Using key informant interviews, staff can assess faculty perceptions and stage of readiness to accept Meatless Mondays as part of their routine. CRM data might show a lack of understanding of reasons for Meatless Mondays or distaste for vegetarian options offered.

Capitalize on Community Wisdom

The current study revealed insight into the perceptions of local food insecurity, how it is being addressed, how much of a priority it is to leadership, how much the

community climate provides an environment supportive of local efforts to address the issue and to what extent resources exist to address the issue in a deeper way. Community feedback ought to be used to inform interventions, capitalizing on community wisdom and giving voice and value to community experience with food insecurity. When asked what local resources are available to address food insecurity, one key respondent replied, *"There are just a handful of people tackling this issue, year after year. . .maybe we are not doing it the right way."* Another key respondent replied, *"It's just a matter of getting all these agencies to work together. There used to be a thing called interagency council. I've suggested that these agencies list every service they provide because people are getting funneled from one service to another."*

The CRM strategic planning ideas listed in the handbook are only a starting point to help tailor interventions to raise the level of community readiness. It is most important to use feedback provided directly by community members to help inform next steps. Nutrition professionals could capitalize on key respondent feedback to develop environment-based nutrition interventions that help to make sure the community environment is conducive to healthy nutrition behaviors.[22] The CRM protocol could be implemented to capture local perceptions of how ready and willing the community is to allocate additional resources for food and nutrition assistance. This feedback could help develop tailored interventions to mobilize community resources and inform how leaders should intervene.[22]

The CRM can be successfully implemented in academic settings as part of research. The CRM could be implemented in a scenario where nutrition faculty feel students need more hands on experience before graduation and are concerned with

their students' low match rates for dietetic internships. Researchers could utilize CRM to assess departmental capacity for providing more hands on practice and gauge students' stage of readiness to engage in hands on activities. It is important to note there are obstacles to utilizing this model in an academic setting, as evidenced by the current study's findings.

OBSTACLES

Data Collection

Despite the perception that selected key respondents had knowledge prior to the start of the study, many respondents cited a lack of knowledge on many questions or fear of misrepresenting by answering on behalf of the community. Many key respondents opted to not answer certain questions and this refusal resulted in gaps in data collection, specifically in the leadership dimension. Questions were minimally adapted for clarification; for example, the word "community" was replaced with "Ellensburg" and the word "issue" was replaced with "food insecurity." Further adaptation of the leadership dimension questions may be beneficial to clarify how respondents may interpret leadership. A clear understanding of leadership may increase the comfort of respondents in answering questions within this domain and decrease gaps in data. Reducing gaps in data will help ensure that the community readiness is assessed correctly in each dimension.

This study's findings along with those previously cited in the literature suggest a few recommendations for nutrition professionals in their future utilization of this model.[20,21] It would be beneficial to provide training to those conducting interviews so

they are comfortable thinking critically in interviews, putting respondents at ease, and encouraging them to answer to the best of the their ability. In addition, it may be beneficial to conduct an initial screening of key respondents to ensure they are a good fit for the study. This screening could be as simple as sending an introductory email, asking them to reply by describing their comfort level with the subject matter and format of the study.

Data Analysis

Nutritional professionals utilizing this model in future research should be aware of the important role that a second scorer plays in the validation of data during analysis. In the present study, both scorers arrived at very different readiness scores in each dimension, demonstrating a possible misunderstanding of how to interpret the anchored rating scales. Scorers analyzed the interviews a second time after instructions were clarified, resulting in again different, but more similar, results. It is expected that scorers will interpret results slightly differently, but if large discrepancies exist it can indicate a need for reevaluation of results. It may be beneficial for future researchers to have both scorers individually read and analyze one interview while sitting together and compare their methods of analysis before moving forward with the rest of the interviews.

No information was provided in the handbook regarding ways to avoid bias in consensus scoring or the best way to go about choosing a second scorer, if it was not obvious from the start of the study, who that person would be. Increased rigor and validation of methodology are important components of published research. A growing body of literature has been looking to further validate CRM methods.[7,8,9,19] It may be

important for future researchers to conduct a literature review beyond the scope of the CRM handbook if they wish to understand the methods more fully.

Post-Community Readiness Assessment: Now What?

The CRM is often used to gather preliminary research rather than serving as an intervention itself. A major limitation of using the findings of this study within the confines of academic research was the lack of collaboration between the university and community partners. The results suggest ways to tailor interventions in this community but do not suggest who will be leading those interventions. A way to address this limitation in future studies may include using a community member as a second scorer or research assistant. Involving key community members in the research process in this way will increase the likelihood that the data gathered would have a direct impact on the community. It is important to also identify potential funding sources to implement the proposed changes.

CONCLUSION

The community was assessed as having a stage three readiness level, associated with vague awareness of local food insecurity. Reported methodology and results demonstrate how this model could be used in other communities to address issues of food insecurity. The Community Readiness Model provides a conceptual model with which to judge the readiness of a community around complex issues like food insecurity.

The model handbook was easy to adapt and provided a simple, inexpensive and practical way to capture community perceptions of food insecurity. The steps outlining the methodology of data collection and analysis allow both researchers and community

members alike to utilize the tool. There was limited information in the handbook on the validation of methodology and limited instructions on how to avoid bias in key respondent selection and data analysis. It may be beneficial for future researchers to supplement the instructions in the CRM Handbook with recommendations provided by other researchers who have utilized this model and discovered obstacles in its implementation. The overriding themes discovered throughout this study provide insight into the issue of local food insecurity and entry points for future nutrition researchers. Experiences reported can help inform future research, increasing its community effectiveness.

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Community Knowledge of Current Effort

Note: If there are no efforts, this dimension receives a N/A (not applicable)(Those directly involved in local efforts are not included in the definition of "community members".)

1 Community has no knowledge about local efforts addressing the issue.

2 Community members have misconceptions or incorrect knowledge about current efforts.

3 A few community members have at least heard about local efforts, but know little about them. For example, they know local efforts exist and may recognize their names, but they have little other knowledge.

4 Some community members have at least heard about local efforts, but know little about them. For example, they know local efforts exist and may recognize their names, but they have little other knowledge.

5 Most community members have at least heard about local efforts. For example, they know local efforts exist and may recognize their names, but they have little other knowledge.

6 Most community members have at least basic knowledge of local efforts. For example, they can identify specific efforts and their basic purposes.

7 Most community members have more than basic knowledge of local efforts, including names of specific efforts, basic purposes, target audiences, and other specific information about the efforts.

8 Most community members have considerable knowledge of local efforts, including the level of program effectiveness.

9 Most community members have considerable and detailed knowledge of local efforts, including the level of program effectiveness and evaluation data on how well the different local efforts are working and their benefits and limitations.

Leadership
(includes elected and appointed leaders & influential community members)

1 Leadership believes that the issue is not a concern.

2 Leadership believes that this issue is a concern, in general, but believes that it is not a concern in this community.

OR

Leadership believes that this issue is a concern in this community, but doesn't think it can or should be addressed.

3 Leadership believes that this issue may be a concern in the community. They show no immediate motivation to act. It may not be seen as a priority.

4 Leadership acknowledges that this issue is a concern in the community and that some type of effort is needed to address it. They may be supportive of current efforts. They are not involved in work to develop, evaluate, or improve efforts.

5 Leadership is actively supportive of continuing or improving current efforts or in developing new efforts (possibly attending committee or group meetings that are working toward these efforts). They are not key players or driving forces in these activities.

6 Leadership plays a key role in planning, developing and/or implementing new, modified, or increased efforts, possibly as key players in groups or committees, as public proponents, and/or as driving forces behind these activities.

7 Leadership is actively involved in ensuring or improving the long-term viability of the efforts to address this issue.

8 Leadership plays a key role in expanding and improving efforts, through evaluating and modifying efforts, seeking new resources, and/or helping develop and implement new efforts.

9 Leadership is continually reviewing evaluation results of the efforts and is modifying financial support accordingly.

Community Climate

(Those directly involved in local efforts are not included in the definition of "community members".)

1 The community believes that the issue is not a concern.

2 The community believes that this issue is a concern, in general, but believes that it is not a concern in this community.

OR

Community believes that this issue is a concern in this community, but doesn't think it can or should be addressed.

3 The community believes that this issue may be a concern in the community. They show no immediate motivation to act. It may not be seen as a priority.

4 The community acknowledges that this issue is a concern in the community and that some type of effort is needed to address it. They may be passively supportive of current efforts. They may feel as if current efforts are sufficient to address the issue.

5 The attitude in the community is —We are concerned about this and we want to do something about it. They may believe that current efforts are not sufficient to address the issue or that current efforts should be improved.

6 The attitude in the community is —This is our responsibility , and some community members are involved in addressing the issue through planning, developing and/or implementing new, modified, or increased efforts.

7 The attitude in the community is —We have taken responsibility . There is ongoing community involvement in addressing the issue.

8 The majority of the community strongly supports efforts or the need for efforts. Participation level is high. —We need to continue our efforts and make sure what we are doing is effective.

9 Most major segments of the community are highly supportive. Community members are actively involved in evaluating and improving efforts and they demand accountability.

Community Knowledge about the Issue

(Those directly involved in local efforts are not included in the definition of "community members".)

1 Community members have no knowledge about the issue.

2 Only a few community members have knowledge about the issue. There may be many misconceptions among community members about the issue, how and where it occurs, and why it needs addressing. There may be little knowledge among community members about its occurrence locally or why it may be a problem locally.

3 Community members have only vague knowledge about the issue (e.g. they have some awareness that the issue can be problem and why it may occur). Among some community members, there may be misconceptions about the issue, how and where it occurs, and why it needs addressing.

4 Community members have limited knowledge about the issue. For example, they are aware that the issue can be problem and they know some limited information about causes, consequences, signs and symptoms. They may know that the issue occurs locally, but they have little knowledge about how much it occurs locally and/or its causes and consequences.

5 Community members have basic knowledge about the issue. For example, they are aware of why the issue is a problem, and they have some basic knowledge about causes, consequences, signs and symptoms. They are aware that the issue occurs locally, but they may have little knowledge about how much it occurs locally and/or what can be done to address it.

6 Community members have basic knowledge about the issue. For example, they are aware of why the issue is a problem, and they have some basic knowledge about causes, consequences, signs and symptoms. They are aware that the issue occurs locally, and they have some knowledge about how much it occurs locally, its effect on the community, and/or what can be done to address it.

7 Community members have more than basic knowledge about the issue. For example, they understand the causes, consequences, signs and symptoms. They are aware that the issue occurs locally, and they have some knowledge about how much it occurs locally, its effect on the community, and/or what can be done to address it.

8 Community members have more than basic knowledge about the issue (e.g., they understand the causes, consequences, signs and symptoms). They also have significant knowledge about local prevalence, its effect on the community, and what can be done to address it.

9 Community members have detailed knowledge about the issue, are aware of its effect on the community, and have significant knowledge about local prevalence.

Resources Related to the Issue (people, money, time, space, etc.)

1 There are no resources available for dealing with the issue.

2 Community members and/or leaders do not support using available resources to address this issue.

3 Current efforts may be funded, but the funding is not necessarily stable or continuing. There are limited resources (such as a community room) identified that could be used for further efforts to address the issue. There is little motivation to allocate these resources to this issue.

4 Current efforts may be funded, but the funding may not be stable or continuing. There are limited resources identified that could be used for further efforts to address the issue. Some community members or leaders are looking into using these resources to address the issue.

5 There are some resources identified that could be used for further efforts to address the issue.

Some community members or leaders are actively working to secure these resources; for example, they may be soliciting donations, writing grant proposals, and seeking volunteers. Current efforts may be funded, but the funding may not be stable or continuing.

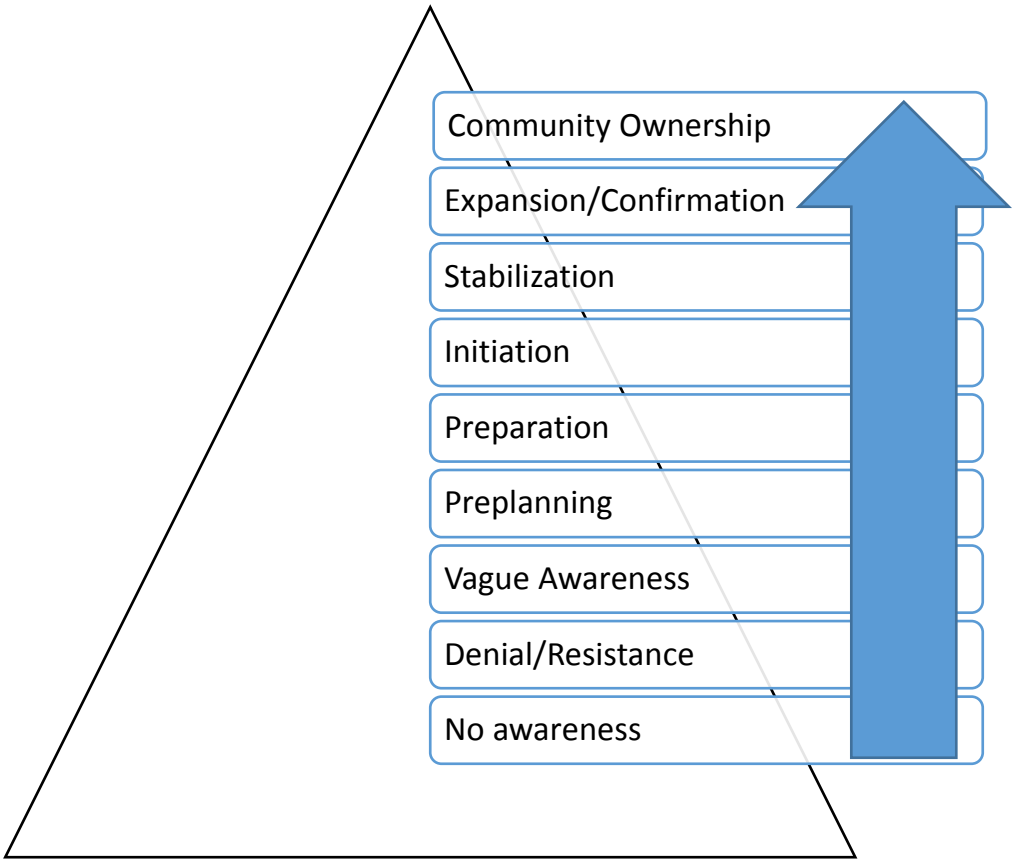
6 Resources have been obtained and/or allocated to support further efforts to address this issue.

7 A considerable part of allocated resources for efforts are from sources that are expected to provide continuous support.

8 A considerable part of allocated resources are from sources that are expected to provide continuous support. Community members are looking into additional support to implement new efforts.

9 Diversified resources and funds are secured, and efforts are expected to be ongoing. There is additional support for new efforts.

APPENDIX B: THE COMMUNITY READINESS MODEL DEFINES
NINE STAGES OF COMMUNTY READINESS



1. No Awareness:
The community or the leaders do not generally recognize the issue as a problem. "It's just the way things are." Community climate may unknowingly encourage the behavior although the behavior may be expected of one group and not another (i.e., by gender, race, social class, age, etc.).

2. Denial/Resistance:
There is little or no recognition that this might be a local problem but there is usually some recognition by at least some members of the community that the behavior itself is or can be a problem. If there is some idea that it is a local problem, there is a feeling that nothing needs to be done about it locally. "It's not our problem." "It's just those people who do that." "We can't do anything about it." Community climate tends to be passive or guarded.

3. Vague awareness:
There is a general feeling among some in the community that there is a local problem and that something ought to be done about it, but there is no immediate motivation to do anything. There may be stories or anecdotes about the problem, but ideas about why the problem occurs and who has the problem tend to be stereotyped and/or vague. No identifiable leadership exists or leadership lacks energy or motivation for dealing with this problem. Community climate does not serve to motivate leaders.

4. Preplanning:
There is clear recognition on the part of at least some that there is a local problem and that something should be done about it. There are identifiable leaders, and there may even be a committee, but efforts are not focused or detailed. There is discussion but no real planning of actions to address the problem. Community climate is beginning to acknowledge the necessity of dealing with the problem.

5. Preparation:
Planning is going on and focuses on practical details. There is general information about local problems and about the pros and cons of prevention activities, actions or policies, but it may not be based on formally collected data. Leadership is active and energetic. Decisions are being made about what will be done and who will do it. Resources (people, money, time, space, etc.) are being actively sought or have been committed. Community climate offers at least modest support of efforts.

6. Initiation:
Enough information is available to justify efforts (activities, actions or policies). An activity or action has been started and is underway, but it is still viewed as a new effort. Staff is in training or has just finished training. There may be great enthusiasm among the leaders because limitations and problems have not yet been experienced. Community climate can vary, but there is usually no active resistance, (except, possibly, from a small group of extremists), and there is often a modest involvement of community members in the efforts.

7. Stabilization:
One or two programs or activities are running, supported by administrators or community decision-makers. Programs, activities or policies are viewed as stable. Staff are usually trained and experienced. There is little perceived need for change or expansion. Limitations may be known, but there is no in-depth evaluation of effectiveness nor is there a sense that any recognized limitations suggest an immediate need for change. There may or may not be some form of routine tracking of prevalence. Community climate generally supports what is occurring.

8. Expansion/Confirmation:
There are standard efforts (activities and policies) in place and authorities or community decision-makers support expanding or improving efforts. Community members appear comfortable in utilizing efforts. Original efforts have been evaluated and modified and new efforts are being planned or tried in order to reach more people, those more at risk, or different demographic groups. Resources for new efforts are being sought or committed. Data are regularly obtained on extent of local problems and efforts are made to assess risk factors and causes of the problem. Due to increased knowledge and desire for improved programs, community climate may challenge specific efforts, but is fundamentally supportive.

9. Community Ownership (Also called "Professionalization" in some earlier literature):
Detailed and sophisticated knowledge of prevalence, risk factors and causes of the problem exists. Some efforts may be aimed at general populations while others are targeted at specific risk factors and/or high-risk groups. Highly trained staff are running programs or activities, leaders are supportive, and community involvement is high. Effective evaluation is used to test and modify programs, policies or activities. Although community climate is fundamentally supportive, ideally community members should continue to hold programs accountable.

APPENDIX C: ABBREVIATED LIST OF CRM INTERVIEW QUESTIONS

Knowledge of Efforts	**Leadership**	**Community Climate**	**Knowledge of Issue**	**Resources**
Are there efforts in Ellensburg that address food insecurity?	Scale 1-10: How much of a concern is food insecurity to the leadership of Ellensburg? Can you tell me why?	Scale 1-10: How much of a concern is food insecurity to community members? Can you tell me why?	Scale of 1-10: How much do community members know about food insecurity? Explain.	How are current efforts funded? Is this funding likely to continue into the future?
Briefly describe each effort?	How much of a priority is addressing food insecurity to leadership? Can you explain?	How much of a priority is addressing this issue to community members? Can you explain?	Would you say the community members know nothing, a little, some or a lot about the following as they pertain to food insecurity: signs/symptoms,	What resources are available to address food insecurity in Ellensburg?

			causes, consequences, how much food insecurity occurs locally, what can be done to prevent or treat food insecurity, the effects of food insecurity on family and friends.	
How long have each of these efforts been going on?	Does leadership support current efforts passively or actively?	Do community members support current efforts passively or actively?	What are the misconceptions among community members about food insecurity?	Would community members and leadership support using these resources to address food insecurity? Please explain.
Who do each	Does the	About how	What type of	Scale 1-5: How

of these efforts serve?	leadership support expanded efforts in the community to address food insecurity?	many community members would support expanding efforts in the community to address food insecurity – none, a few, some, many or most?	information is available in Ellensburg about food insecurity?	much effort do community members and/or leadership put into using these resources to address food insecurity in Ellensburg?
About how many community members are aware of each of these efforts – none, a few, some, many, or most? Why?	Who are leaders that are supportive of addressing this issue in your community?	Are there community members who oppose or might oppose addressing food insecurity?		Are you aware of any proposals or action plans that have been submitted for addressing food insecurity in Ellensburg?
	Are there leaders who	Are there ever any		

	might oppose addressing food insecurity?	circumstances in which members of Ellensburg might think that this issue should be tolerated? Explain.		
Are there misconceptions or incorrect information among community members about current efforts?		Describe Ellensburg.		
How do community members learn about the current				

efforts?				
Do community members view current efforts as successful?				
What are the obstacles to individuals participating in these efforts?				
What are the strengths of these efforts?				
What are the weaknesses of these efforts				
Are there evaluation results being used to make changes in the				

efforts or to begin new ones?				
What planning for additional efforts to address food insecurity is going on in Ellensburg?				