



## Improving the Management of Obesity in a Rural Community

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IMPROVING THE MANAGEMENT OF OBESITY IN A RURAL COMMUNITY

by

Ashley M. Jones

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As members of the DNP Project Committee, we certify that we have read the DNP Project prepared by Ashley M. Jones entitled “Improving the Management of Obesity in a Rural Community” and recommend that it be accepted as fulfilling the DNP Project requirement for the Degree of Doctor of Nursing Practice.

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SIGNED: Ashley M. Jones

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## DEDICATION

To my loving family, thank you for helping make my dreams come true. For all of your support, your words of encouragement, your constant love and your unwavering belief in me, I am truly grateful. This is for all of you.

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## ABSTRACT

*Background:* Nearly half of the US population is overweight or obese, carrying with them a higher risk for morbidity and mortality and rising healthcare costs. Rural women are disproportionately affected, with higher rates of obesity, obesity-related chronic diseases, and poorer health outcomes (Befort, Nazir, & Perri, 2012; Penney, Rainham, Dummer & Kirk, 2014). There may be several factors. In general, rural health systems are more isolated, with a lack of healthcare resources including quality providers, technology, and public health services (IOM, 2009).

*Purpose:* The purpose of this quality improvement project was to assess how obesity is managed in women residing in one rural community- Ritzville, Washington.

*Methods and Aims:* Charts of all women  $\geq 18$  years of age receiving care at Hometown Family Medicine clinic (HTFM) were queried for a diagnosis of obesity. The prevalence of obesity in this group was calculated. Of those identified as obese, thirty charts were selected at random and reviewed. The following was determined: 1) Prevalence of chronic disease in adult women who receive care at HTFM; and 2) The management of obesity at HTFM compared with current evidence-based guidelines. This was followed by a community assessment to determine the resources available for the prevention and treatment of obesity in Ritzville, WA.

*Results:* The prevalence of obesity (36.9%) and chronic diseases (hypertension, diabetes type 2, dyslipidemia, and heart disease) in the population studied were found to be significantly higher than both state and national averages. Due to a lack of basic resources, (access to weight loss specialties, exercise facilities, healthy foods, etc.) management of obesity in Ritzville, WA may be challenging. Findings from this study helped to inform resource allocation and identified

opportunities to improve the management of obesity based on current practice guidelines.

Primary health care may be the only opportunity to promote healthy behaviors and improve health outcomes in this vulnerable population. Action needs to be taken or the burden of obesity will continue to rise.

## INTRODUCTION

### Background Knowledge

Obesity, defined by a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup>, is an escalating problem, with more than 1.4 billion affected worldwide (World Health Organization, 2014). In the US alone, 30% of adults are obese, representing a 134% increase in the past three decades (LeBlanc, O'Connor, Whitlock, Patnode & Kapka, 2011). Amid those who suffer from obesity in the US, rural populations appear to be more susceptible, specifically women (Penney, Rainham, Dummer & Kirk, 2014). These populations have increased rates of obesity compared to their urban counterparts. One study revealed that 23% of women residing in rural areas were obese compared with 16% of those in the urban setting (Befort, Nazir, & Perri, 2012).

Along with the increasing numbers of obese adults come escalating health burdens. It is estimated that over 3.4 million people die every year in US as a result of being obese. In fact, obesity remains the number one cause of premature morbidity and mortality in the world (AHA, 2013; WHO, 2014). Obesity is a known risk factor for many chronic diseases (e.g., cancer, cardiovascular disease, joint degeneration, type 2 diabetes and depression), among others (Ades & Savage, 2013; AHA, 2013; Leblanc, O'Connor, Whitlock, Patnode, & Kapka, 2011; Pandyla et al., 2011; WHO, 2014). To add to this, the economic burden of obesity includes billions of dollars per year in healthcare costs. For example, in 2013, obesity related expenses in the US exceeded \$254 billion dollars. Researchers believe that if this trend continues, costs could reach upwards of \$957 billion dollars in the next 15 years, accounting for 18% of all US expenditures (AHA, 2013; WHO, 2014).

Fortunately obesity is treatable. Weight loss has been proven to reduce or even eliminate many of the comorbidities associated with obesity (AHA, 2013). Studies suggest three main foci to weight loss including diet, exercise and behavioral changes (LeBlanc et al., 2011). Healthy dietary recommendations include fruit, vegetables, low fat dairy, lean meats, whole grains and nuts with avoidance of “fast foods,” processed foods and beverages high in sugar (AHA, 2014; Dietary Advisory Committee, 2010). The physical activities suggest 150 minutes of both aerobic and strength training weekly guidelines (US Department of Health and Human Services (DHHS), 2008). Behavioral interventions advocate for self-awareness via self-monitoring techniques (Johnson & Wardle, 2011).

In brief, nearly half of the U.S. population is overweight or obese, carrying with them a higher risk for morbidity and mortality and rising healthcare costs. Rural women appear to be more vulnerable, suffering from higher obesity rates despite various weight loss recommendations. What is needed is an understanding of whether weight loss recommendations are ineffective in this population or not being utilized and to identify reasons. The purpose of this quality improvement project was to assess how obesity is managed in women residing in rural Ritzville, Washington.

### **Local Problem**

HTFM is located in the rural town of Ritzville, WA. It is a primarily Caucasian, low-income community with approximately 18% of the population below the federal poverty limits (United States Census Bureau, 2010). According to the Washington State Department of Health (2015), this population is estimated to have higher rates of obesity, diabetes and hyperlipidemia

compared with state and national averages. The population in Ritzville, however, has not been studied before.

During my nurse practitioner rural clinical rotation at HFTM, my preceptor and I both noted that many of the female patients were either overweight or obese. Although evidence-based guidelines for the management of obesity have been developed, it was difficult to determine the implementation of these guidelines due to the limited staff and resources at this clinic, and availability of resources in the community. For example, many of the obese patients I encountered lacked an obesity diagnosis in their electronic health record (EHR), and it was sometimes difficult to determine what, if any, weight loss interventions had been attempted. The provider and I both acknowledged a need to better understand this underserved population, including the proportion of women with obesity, the practice management patterns, and the available community resources. The opportunity to do so could allow for the development of evidence-based recommendations for streamlining care by maximizing limited resources in this setting.

### **Intended Improvement**

The aim of this quality improvement project was to improve the identification and care of obese women in a rural community practice, utilizing the electronic health record (EHR). The project utilized a random sample to perform a retrospective chart review, utilizing evidence based-guidelines for obesity management and comparing them to the standard of care in the practice. Community resources for obesity management were also assessed. Findings informed evidence-based recommendations for practice. The overall objective was to improve the management of obesity, thus improving patient outcomes.

### **Study Questions**

This study answered the following questions:

1. What proportion of adult women who receive care at HTFM are obese (BMI  $\geq 30$  kg/m<sup>2</sup>)?
2. What community resources are available for the prevention and treatment of obesity in Ritzville, WA?
3. How do primary care providers manage obesity in women residing in the rural area of Ritzville, WA?

### **SYNTHESIS OF EVIDENCE**

#### **Theoretical Framework**

Quality improvement (QI) is a systematic and continuous action that leads to measurable improvement (U.S DHHS, 2011). The Affordable Care Act, established in 2010, emphasizes the development of QI strategies aimed at achieving better patient outcomes, and improving the delivery of healthcare services and the health of the US population (Zaccagnini & White, 2013). Improving care to rural populations is a high priority as well (IOM, 2005). In general, the smaller, poorer and more isolated a community is, the more difficult it becomes to obtain quality healthcare (IOM, 2005). This appears to be true for rurally dwelling women, of whom 23% suffer from obesity compared with only 16% of their urban counterparts (Befort, Nazir & Perri, 2012). An improvement in the quality of care offered to obese women residing in the rural setting is needed.

One quality improvement tool proven effective in clinical settings is the Plan-Do-Study-Act (PDSA) QI model (Gillam & Siriwardena, 2013; Grol, Bosch, Hulscher, Eccles, & Wensing,

2007; Langley, Nolan, Nolan, Norman, & Provost, 1996). The Model of Improvement expands on the PDSA by leading with three fundamental questions:

- 1) What are we trying to accomplish?
- 2) How will we know that a change is an improvement?
- 3) What changes can we make that will result in improvement? (Langley et al., 1996)

Answering these three questions provides insight to areas where improvement may be indicated and a plan for change can be fashioned. Developing, testing and implementing improvement can be carried out by rapid, small-scale changes and, after determining effectiveness, the changes can be applied on a larger scale (Gillam & Siriwardena, 2013). The latter is the design of the PDSA cycle.

To answer the first Model of Improvement question-“what are we trying to accomplish?”-research may help point to areas in need of improvement. Stakeholders may provide insight as well. These stakeholders may be healthcare providers such as physicians, nurse practitioners, physician assistants, nurses, medical assistants and office managers. Members outside of the clinic could also contribute. These may include clinic owners, patients and professional referrals such as pharmacists, dieticians, physical therapists, etc. (IHI, 2015). After a need is identified, quality improvement aims can address a variety of issues and, with input from key stakeholders, will begin to take form (Langley et al., 1996). In determining the need for improvement, it is important that I first understand current primary care providers’ assessment and management of obese women in the rural town of Ritzville, WA.

How will we know that a change is an improvement?, is the second question addressed. Once a need is recognized, valid and feasible measures need to be established to determine if a

specific change actually leads to improvement (Gillam & Siriwardena, 2013; IHI, How to Improve, 2015; Langlely et al., 1996). The Institute for Healthcare Improvement outlines three types of measures; outcomes measures, process measures and balancing measures (IHI; Measures, 2015). For example, an outcome of an effective weight loss program could be measured by BMI. A process measure for an obesity improvement initiative might be the percent of obese patients who received dietary counseling upon diagnosis. A balancing measure may be ensuring that time spent focusing on obesity does not affect outcomes of possible coexisting chronic diseases. For the purpose of this project, the type of measurement chosen is dependent on the need for improvement established in question one. Measurement data help to determine the effectiveness of the improvement and provide direction for the subsequent steps (Langlely et al., 1996).

The last Model of Improvement question asks, what changes can we make that will result in improvement? This is where the first two steps come together. Once a problem has been identified, goals have been set and appropriate measures assigned, it is time to implement the planned change in the PDSA testing cycle. Ideas for change could be influenced by those healthcare professionals working within the system, from the experience of others, from critical thinking, previous literature on the topic, or personal experiences, among others (IHI 2015; How To Improve, 2015). These ideas must then be carefully evaluated before introducing the change.

Once these questions have been adequately addressed, the PLAN phase of PDSA cycle is initiated by precisely stating the problem. This phase involves developing a plan for the change to be tested, including selecting an appropriate measure with which to evaluate the change. Based on this, a prediction should be made regarding its ability to result in improvement. Finally,

a plan to test the change will be designed in terms of who, what, when, where and why (Gillam & Siriwardena, 2013). The next step in the PDSA cycle is DO. During this phase, the plan will be tested on a small scale. Any unexpected observations or problems will be documented and analysis of the data will begin (IHI Testing, 2015). The STUDY phase requires careful reflection of the results. Analysis of the data should be completed at this step and compared with the original predictions (IHI Testing, 2015). Based on this data, it may be found that additional trials are necessary or perhaps a larger scale trial is needed. This leads to the final ACT phase, modifications are determined and plans for future testing initiated (Gillam & Siriwardena, 2013).

### **Concepts**

- **Obesity:** A medical condition where there is an accumulation of body fat that may create negative health effects (Mosby, 2013).
- **Rural Health:** The study of health and healthcare delivery to rural environments (Defining the Rural Population).
- **Rural:** Most commonly, an area is considered rural if it is ‘non-urban’ or lies outside of a ‘metropolitan statistical area (MSA).’ An area is urban if its territories, population, and housing units have a population density  $\geq 1000$  people per square mile and surrounding census blocks with an overall density of  $\geq 500$  people per square mile. An MSA must have one city with a population  $\geq 50,000$ . Rural can also be characterized by size, degree of urbanization, and proximity to an MSA. (US DHSS, Defining the Rural Population)
- **Comprehensive Lifestyle Intervention (CLI):** A weight loss intervention that incorporates behavioral, dietary and exercise components.
- **Diet:** the sum of food consumed by an individual (Fowler & Fowler, 2011).

- Exercise: an activity requiring physical effort, carried out to sustain or improve health and fitness (Fowler & Fowler, 2011).

### **Search Strategy**

Electronic searches were utilized to gather relevant articles. Databases included PubMed, Google Scholar and Clinical Key. The MeSH search terms used were obesity, rural population, rural nursing, rural health services, rural health and rural hospitals. The search yielded 1229 articles and nine guidelines which were further reduced by publication date (within the last 10 years), gender (female), age (19+ years) and language (English). Of the remaining 423 articles, 55 relevant articles and four guidelines were reviewed. Only guideline recommendations based on the highest quality evidence (level I or II) were included. Several themes arose from the literature including diagnosis of obesity, education, management (further broken down into physical activity, behavior and dietary intervention) and delivery.

### **Diagnosis**

A diagnosis of obesity can be made by determination of the body mass index (BMI). This is calculated by dividing a patient's weight (in kg) by their height (in m<sup>2</sup>). The obese patient is further classified according to their BMI: 30-34.5 kg/m<sup>2</sup> = obese class I; 35-39.9 kg/m<sup>2</sup> = obese class II; and >40kg/m<sup>2</sup> = obese class III. Studies have shown that waist circumference also can be used as an indicator of obesity. According to current US practice guidelines, a patient's BMI and waist circumference should be calculated annually and as needed for obesity management and a diagnosis of obesity added to the patient's chart (D'Onise, McDermott, & Campbell, 2013; Fitch et al., 2013; Jensen, Ryan, Apovian, Ard, Comuzzi, & Donato, 2014; Management of

Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013).

### **Education**

US guidelines advise healthcare providers to teach patients that an increase in BMI and waist circumference increases their risks for CVD, type 2 diabetes, and all-cause mortality. Encouraging the patient with CVD risk factors (HTN, hyperlipidemia, hyperglycemia) that a weight loss of 3-5% can produce meaningful benefits, is an effective weight loss strategy (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). Studies indicate that rurally dwelling women are sometimes unfamiliar with BMIs and weight categories, however. One such qualitative study indicated that rural women were more likely to lose weight if their provider took the time to explain the obesity diagnosis and develop a patient-provider relationship to address it (Buxton & Snethen, 2013). A finding indicating further need for education was rural women defined health based on their ability to perform activities rather than their BMI (Buxton & Snethen, 2013).

### **Management**

Guidelines recommend weight loss via a Comprehensive Lifestyle Intervention (CLI) that combines dietary and physical activity education as well as behavioral strategies (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). In the following paragraphs, different interventions within those categories will be discussed.

### **Dietary Approach**

In general, research supports offering any safe diet that produces a net caloric deficit of 500-1000 kcal per day, resulting in men consuming roughly 1500-1800 kcal per day and women 1200-1500 kcal. (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). In the rural setting, food choices may be limited, however, and healthful foods are difficult to obtain (IHI, 2005). Two recent studies address food choices and their effects on obesity. Dunn, Sharkey and Horel (2012) found that an increased availability of fast food correlated with an increase in obesity in nonwhite, rurally dwelling females. Another study recommends that rural supermarkets focus on availability, quality, variety and pieces of fruits, vegetables and meats in addressing obesity (Krukowski, Sparks, DiCarlo, McSweeney, & West, 2013). Decreasing fast food choices and improving healthy food options could potentially influence the food environment to support dietary changes and obesity prevention (Krukowski et al., 2013).

### **Physical Activity Approach**

Guidelines recommend a goal of participation in moderate intensity physical activity for 150-200 minutes per week (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). Studies show that many rural women fall short of these goals. To illustrate this, researchers in one study measured physical activity levels in a group of 303 rural women. According to their findings, none of the participants met the objectives (Hardorfer, Alcantara, Patil, Hotz, & Kegler, 2014). To address these shortfalls, researchers have developed interventions to promote physical activity in rural woman. Sherman, Gilliland, Speckman and Freund (2007) introduced a simple

intervention at the primary care level where patients received an exercise videotape, a pedometer and exercise counseling. At the end of a six-week interval, participants significantly increased the amount of steps they took per day by 2,573 ( $p < 0.001$ ). At the population level, Michimi and Wimberly (2012) show that increases in recreational opportunities (access to a gym, pool, biking trails, etc.) led to increases in physical activity. This information could guide policies and programs aimed at producing environments that facilitate physical activity, potentially decreasing the obesity burden.

### **Behavioral Approach**

Researchers agree that goal setting and self-monitoring are the two most significant behavioral components in weight loss. Current guidelines recommend goal setting as part of the CLI and encourage a weight loss goal of 0.5-2 lbs per week (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). This is also supported by the literature. Ries et al. (2014) determined that rural women who set goals were more likely to take action to lose weight than those that did not. Studies also showed a significant correlation with self-monitoring behavior and successful long-term weight maintenance (Milsom, Middleton, & Perri, 2011; Nothwehr & Peterson, 2005).

### **Delivery**

Delivery of healthcare is an important factor in the rural setting. The geographic isolation of rural communities often makes frequent face-to-face interventions difficult. Research supports the use of telephone-based interventions and have found this to be a successful, cost effective approach to weight loss (Befort et al., 2014; Ely et al., 2008; Fitch et al., 2013; Jensen et al.,

2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013 Perri et al., 2008) Web-based interventions are advancing but lack empirical support at this time (Hageman, Pullen, Hertzog, Boeckner, & Walker, 2011). Group interventions have proven effective in the rural setting as well. For example, church-based interventions, work-based interventions (Small Steps are Easier Together), community interventions (Strong Women-Healthy Heart Program) and family based interventions have all illustrated significant weight reductions among participants. It is likely, given the epidemic of obesity and its deleterious effects, that there may be a need for a variety of interventions at many levels (Sherman et al., 2007).

### **Strengths and Weaknesses of the Literature**

It is clear that rurally dwelling women are disproportionately affected by obesity and carry with them a higher risk for associated chronic diseases. The number of weight loss interventions addressing obesity is encouraging. However, rural communities differ considerably from urban ones and may require a much different approach to intervention (Penney et al., 2014). Although there are a wide variety of interventions available in the US, there remains no gold standard in the rural setting and the priorities for implementation are unclear (IOM, 2005). To capture the unique nature of each rural community, intervention efforts are best preceded by a type of community needs assessment, addressing specific barriers and facilitators to weight loss within that environment (Penney et al., 2014). Research appears to lag in this area and the development of such an assessment is an important next step.

## **METHODS**

### **Planning the Study**

#### **Project Design**

This project is a quality improvement project which utilized a community needs assessment and quantitative retrospective chart review.

#### **Setting**

Ritzville is a small community in the rural, southeastern corner of Washington. Most recent census data indicates an approximate population of 1,679 (United States Census Bureau, 2010). It is home to Hometown Family Medicine (HTFM), the practice selected for this quality improvement project. The clinic is owned and managed by a physician and registered nurse partnership. It houses three small exam rooms and a procedure room, is staffed by one family physician, a registered nurse, a certified medical assistant and two, part-time medical receptionists. Together this staff cares for patients across the lifespan.

#### **Evaluation Process**

The needs assessment was conducted followed by a collection of data (from the sources listed below). A retrospective review of the EHR was obtained to evaluate the population and management of obesity in this setting. A review of 30 selected EHR was conducted. Inclusion criteria for selection was as follows: female patients aged 18 or older, with a BMI  $\geq 30$ , who obtain healthcare at HTFM. 1) All EHR from HTFM was first screened to identify women who are  $\geq 18$  years of age. 2) Of these, women with a BMI  $\geq 30$  kg/m<sup>2</sup> were identified. This data was used to determine the prevalence of obesity in this practice. 3) Thirty EHRs of women with a

BMI $\geq$ 30 kg/m<sup>2</sup> were then randomly selected and reviewed. Public and observational data were then obtained, helping to evaluate the setting.

### **Data Collection**

Data were obtained from several sources (listed below)

1. Archival Data: Data were abstracted from the electronic health records. Inclusion criteria for selection were female patients aged 18 or older, with a BMI  $\geq$  30, who obtain healthcare at HTFM. Following is a list of data collected (listed by the sections they are found in):
  - Patient dashboard: age, race, insurance status
  - Problem list: diagnoses (HTN, dyslipidemia, thyroid disease, CV, CAD, sleep apnea, glucose intolerance, DM type 2, cancer, osteoarthritis)
  - Health maintenance list: presence of dietary, exercise and behavioral counseling
  - Chart Notes: presence of dietary counseling, exercise counseling or behavioral counseling within the provider's notes that is not otherwise documented in the health maintenance list.
2. Public data: The following resources were evaluated for background data, rural classification and socio-demographic and health status data about Ritzville, WA, Adams County, Washington State and the US: Advameg, Inc at <http://www.city-data.com/city/Ritzville-Washington.html>; The United States Census Bureau at: <https://www.census.gov/>; and The United States Department of Agriculture Economic Research Service at <http://www.ers.usda.gov/topics/rural-economy-population/rural->

classifications.aspx; The Washington State Department of Health at <http://www.doh.wa.gov>.

3. **Observational Data:** A walking/window survey of the rural town of Ritzville, WA was assessed for the following: availability of healthy food, number and types of grocery stores, number and types of fast food restaurants, weight loss resources, number of activities accessible (exercise facilities, running/biking trails, golf courses, etc.), types of print media (billboards, advertisements, newspapers, magazines)- number of both healthy and unhealthy messages. This survey was developed by authors Elizabeth T. Anderson, DrPH, RN, RAAN and Judith McFarlane, DrPH, RN, FAAN. It has been a resource for undergraduate and graduate nursing programs for over 20 years. The survey is listed in Appendix B.

### **Ethical Considerations**

The University of Arizona, governed by federal regulations and in an effort to protect the rights and welfare of human research subjects, requires approval from the Human Subject Committee of the College of Nursing (CON) and the Institutional Review Board prior to conducting any research. The University of Arizona follows the ethical principles of 1) Respect for Persons, 2) Beneficence and 3) Justice, as outlined in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). This DNP project was defined by a retrospective review of de-identified electronic health records at the Hometown Family Medicine Clinic in Ritzville, WA. Although no interventions or interactions were carried out, there are still ethical principles to consider.

**Respect for Persons**

An individual has a right to privacy and protection of their health information. This study utilized protected health information (PHI) and, as such, required consent. The HIPPA Privacy Rule, however, addresses this and has established conditions under which PHI can be used without consent. In this case, PHI can be used if it has been de-identified. This can be accomplished by *coding* the data so that the information does not contain the identity of the individual, or by *de-identifying* the data so that all identifiers and codes have been stripped (Office for Human Research Protections [OHRP], 2015). Only de-identified patient data were recorded from the retrospective chart review. All patient EHRs were assigned a random identifier. The Excel database is kept on a password protected laptop in a secure location.

**Beneficence**

This ethical principle states that participants' decisions will be respected and it is my obligation, as a researcher, to protect participants from harm and promote their well-being (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Understanding the possible risks and benefits of participant involvement comes with that responsibility. For this project, the researcher anticipated harm from one major source, release of personal information. As mentioned above, all identifying information was removed or coded to avoid this.

**Justice**

This ethical principle asserts that all persons will be eligible to receive the benefits of research and bear its burdens (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979). Participants will not be excluded based on race,

ethnicity, income, education level or occupation. Not all groups may be represented equally but representation will be fair and selection of participants will be based on the associated research (Justice, 2014). In this study, the participants' EHR were randomly selected thus upholding the principle of justice.

### **IRB Approval**

Prior to conducting this study, IRB approval from the University of Arizona was sought. The University of Arizona IRB chair determined that this project met the criteria for approval (Appendix C). Permission was also obtained from Hometown Family Medicine (Appendix D). Patient confidentiality was preserved as only de-identified data was recorded. This remained on a password-protected laptop, located in a secure location. All data will be destroyed after the accepted 6 years duration

## **RESULTS**

### **Data Analysis**

Descriptive statistics were used to analyze study data utilizing Microsoft Excel. Data from the retrospective chart review informed the data analysis. Based on recommendations described in the current evidence-based guidelines, the following were determined:

TABLE 1. *Descriptive Statistics.*

Prevalence of obesity in the women residing in Ritzville, WA	# identified as obese (BMI $\geq$ 30 kg/m <sup>2</sup> ) $\div$ total # of women in the population x 100%
Percentage of obese women with comorbidities	# of obese women (BMI $\geq$ 30 kg/m <sup>2</sup> ) with $\geq$ 1 chronic illness diagnosis (HTN, dyslipidemia, thyroid disease, CV, CAD, sleep apnea, glucose intolerance, DM type 2, cancer) $\div$ total # of obese women x 100%
Percentage of obese women who have an obesity diagnosis documented in the chart	# of obese women (BMI $\geq$ 30 kg/m <sup>2</sup> ) with an obesity diagnosis (278.00 Obesity, unspecified, 278.01 morbid obesity) listed in the problem list $\div$ total # of obese women x 100%
Percentage of obese women who have dietary counseling documented under health maintenance or within the physician chart notes.	# of obese women (BMI $\geq$ 30 kg/m <sup>2</sup> ) who have documented dietary counseling $\div$ total # of obese women x 100%
Percentage of obese women who have exercise counseling documented under health maintenance or within the chart notes.	# of obese women (BMI $\geq$ 30 kg/m <sup>2</sup> ) who have documented exercise counseling $\div$ total # of obese women x 100%
Percentage of obese women who have behavioral counseling documented within the chart notes (these are not currently listed in the health maintenance record).	# of obese women (BMI $\geq$ 30 kg/m <sup>2</sup> ) who have documented behavioral weight loss counseling $\div$ total # of obese women x 100%.

Observational and public data were analyzed to determine the number of weight loss resources available and obtainable to the population of interest.

### **Public Data and Demographics**

This section presents public data, specifically demographics and health statistics starting at the state level and moving to the city level.

#### **Washington Demographics**

For Washingtonians, statistics show that over the past two decades, the prevalence of obesity in Washington has doubled (27 percent, up from 10 percent). Approximately one third are considered hypertensive, and over one third have hyperlipidemia. In 2013, cancer was one of the leading causes of death in Washington (24%), followed by heart disease (14%). (Washington State Department of Health, 2009).

### Adams County Demographics

Adams County is a small county in the rural, southeastern corner of Washington. Most recent United States census data (2010) indicates an approximate population of 18,728 residents. Adams County, Washington consists of two smaller communities, Othello (pop 7,631) and the county seat, Ritzville (pop 1,679) (United States Census Bureau, 2010). Current health statistics for the rural population in Adams County differ significantly from the state and national averages, indicating a higher prevalence of obesity, diabetes and hyperlipidemia. (Washington State Department of Health, 2015) Please refer to Table 2 below.

TABLE 2. *Comparing Health Statistics.*

	<b>Adams County Statistics (%)</b>	<b>Washington State Statistics (%)</b>	<b>United States Statistics (%)</b>
Obesity	34	27	35
Diabetes	16	9	8.5
Hypertension	30	30	30.3
Hyperlipidemia	44	38	27.9
Cancer	10	12	7.9
Cardiovascular	9	6	10.9
	(Washington State Department of Health, 2015)	(Washington State Department of Health, 2015)	(Center for Disease Control and Prevention (CDC), 2015)

### Ritzville Demographics

This study focuses on the town of Ritzville, residence to HTFM. It is a primarily Caucasian (91.6%), low-income community. According to the most recent data, approximately 18% of the population is below the federal poverty limits, with an average per capita income of less than \$17,000 per year (United States Census Bureau, 2010). Over 19% of the population has no health insurance and 22% report an inability to obtain healthcare due to cost (Washington State Department of Health, 2015). Please refer to Table 3 below.

TABLE 3. *Social and Economic Risk Factors at the Local, State and National Levels.*

	<b>Ritzville</b>	<b>Washington</b>	<b>United States of America</b>
Percentage of individuals with no health insurance (%)	19.5	11	10.4
Percentage of individuals with a college degree (%)	21.5	31.9	28.8
Percentage of individuals with income below poverty (%)	17.5	13.4	15.4
Median Household Income	\$36,563	\$59,478	\$53,046

### **Archival Data**

This section includes results for the archival data collection and statistical analysis of the following:

- Prevalence of obesity in the women residing in Ritzville, WA

A data query of the EHRs from patients receiving healthcare at HTFM was performed. There were over 3000 patients who received healthcare at HTFM this past year. The query selected for females and age ( $\geq 18$  years). There were found to be a total of 1543 individuals who fit these criteria. Of those 1543, individuals were further selected by BMI ( $\geq 30$  kg/m<sup>2</sup>). There were found to be 570 individuals who met these criteria. Prevalence was determined by the following equation: total # identified as obese (570)  $\div$  total # of women in the population (1543) x 100%. The prevalence of obesity in this population was determined to be 36.9% (Table 4). Compared with Adam's county, Washington state, and national statistics, this population has a considerably higher rate of obesity (CDC, 2015; Washington State Department of Health, 2015). See Figure 1.

TABLE 4. *Prevalence of Obesity at HTFM.*

Total # of female patients $\geq 18$ years of age	Total # of female patients that are obese (with BMI $\geq 30$ )	Prevalence: total # identified as obese $\div$ total # of women in the population $\times 100\%$ .
1543	570	36.9

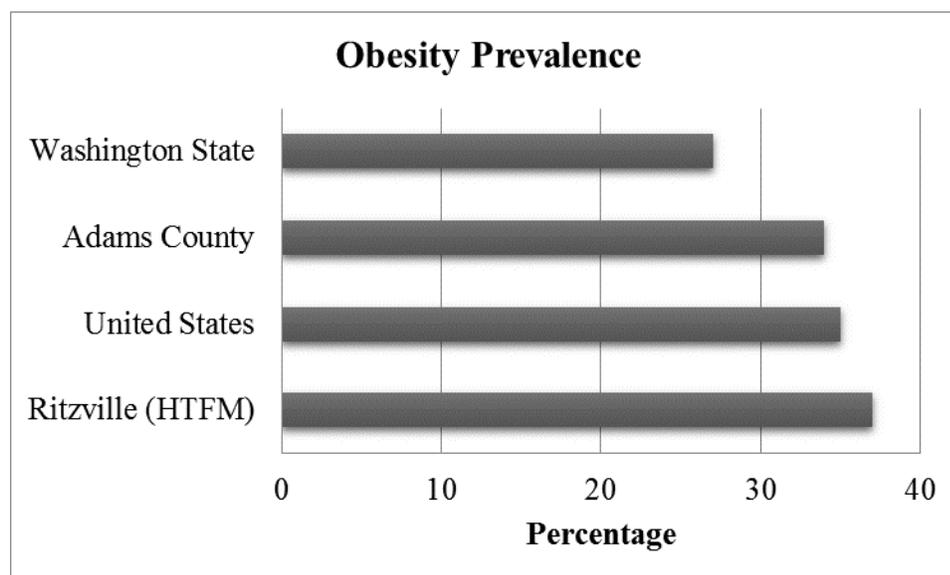


FIGURE 1. HTFM Obesity Prevalence Among Adult Females Compared with County, State and National Data.

Of the 570 individuals identified as being obese, thirty were selected at random, using a random number generator, and EHRs reviewed. Individuals ranged from 20 to 87 years of age, with an average age of 60 (SD $\pm$ 8). Most identified themselves as White/non-Hispanic (93.3%). The remaining individuals identified as Black/African American (3.33%) or American Indian (3.33%). Of the 30 females, three (10%) were un-insured, this is lower than both the state and national levels (Figure 2.) Of the remaining females, seven (23.3%) had private insurance, eight (26.7%) had public insurance or Medicaid, and twelve (40%) had Medicare (Table 5).

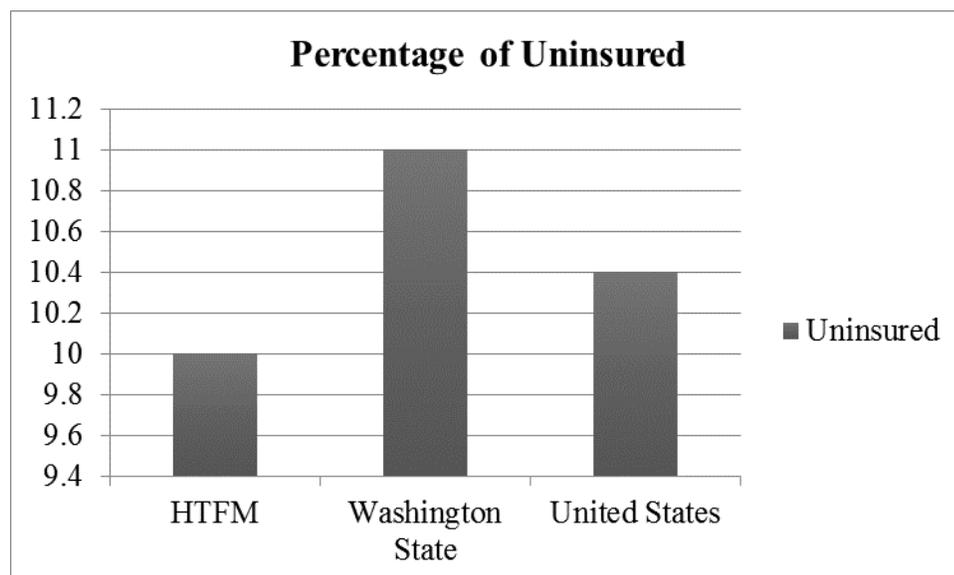


FIGURE 2. Percentage of Uninsured in the Population of Interest Compared with State and National Levels.

TABLE 5. *Socio-Demographic Characteristics (n=30)*

<b>Attribute</b>			
Race/Ethnicity		N	%
	White, non-Hispanic	28	93.3
	Black/African American	1	3.3
	Other/Unknown	1	3.3
Insurance Status			
	Medicare	12	40.0
	Public/Medicaid	8	26.7
	Private	7	23.3
	Uninsured	3	10.0

### Percentage of Obese Women with Chronic Illness

The problem list gave valuable information about the coexisting chronic illnesses within the population. The following chronic illnesses were recorded for the purpose of this study: hypertension, dyslipidemia, thyroid disease, cardiovascular disease (including coronary artery disease), sleep apnea, glucose intolerance, diabetes mellitus type 2, and cancer. Of the 30 EHRs

reviewed, 26 (87%) displayed a least one coexisting chronic illness, 22 (76%) had at least two, and 15 (50%) had three or more. Of the illnesses listed above, the most commonly occurring was hypertension (63.3%), followed by dyslipidemia (36.7%), and finally diabetes mellitus type 2 (33.3%) (Table 6).

TABLE 6. *Coexisting Chronic Illnesses.*

Chronic Illness	N	%
HTN	19	63.3
Dyslipidemia	11	36.7
DM type 2	10	33.3
CAD	7	23.3
Thyroid Disease	7	23.3
Glucose Intolerance	6	20.0
Sleep Apnea	4	13.3
Cancer	0	0.0

Compared with county, state and national averages, this population has significantly higher rates of hypertension, diabetes mellitus type 2, dyslipidemia, and cardiovascular disease (Figure 3).

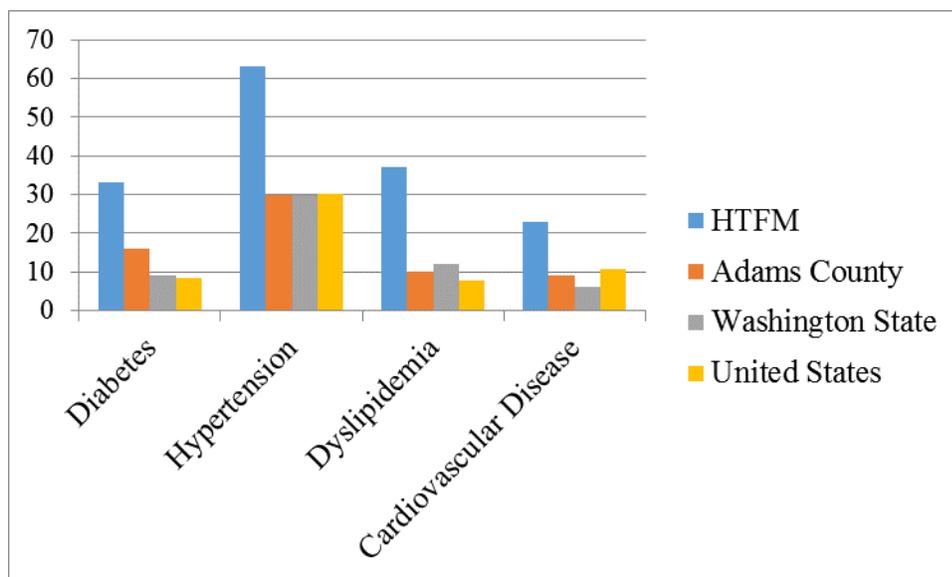


FIGURE 3. Chronic Disease Rates of HTFM Population (n=30) Compared with County, State and National Data.

- Percentage of obese women who have an obesity diagnosis documented in the chart.

Of the thirty EHRs investigated, thirteen (43.3%) had an obesity diagnosis documented in the problem list.

- Percentage of obese women who have dietary counseling documented under health maintenance or within the chart notes.

Dietary counseling was documented in the health maintenance sections of five (16.7%) of the EHRs reviewed. An additional two (6.6%) EHRs demonstrated clear counseling within the chart notes.

- Percentage of obese women who have exercise counseling documented under health maintenance or within the chart notes.

Exercise counseling was documented in the health summaries of three (10%) of the EHRs. There was no indication of exercise counseling within the chart notes reviewed.

- Percentage of obese women who have behavioral counseling documented within the chart notes (these are not currently listed in the health maintenance record).

One (3.3%) of the EHRs displayed clear documentation regarding behavioral counseling. This was located within the physician's chart notes and specifically discussed journaling techniques to aid with weight loss.

### **Observational Data**

A walking/window survey developed by Anderson and McFarlane (2006) was conducted in the rural town of Ritzville, WA (Appendix B).

## Community Core

### History, Demographics, Ethnicity, Values/Beliefs

Consistent with the demographics above, residential ethnicity appears to be primarily Caucasian. Upon evaluation, there are a variety of age groups represented as well as combinations of families and individuals. There were no noticeable homeless assemblies or groups to speak of. There are no other cultures evident during this survey, specifically no signs of culturally diverse residents, shops, or restaurants. The total population of Ritzville is 1,679.

The city of Ritzville takes great pride in caring for their churches and synagogues as evidenced by their well-kept appearances and their sheer numbers. There are nine different parishes representing six major religions. Historical buildings and sites are well marked and in good repair. The town's history is recorded on a plaque in two separate locations. It is visible for those visitors who wish to learn more about it.

### Subsystems

**Physical environment.** The town of Ritzville occupies 1.29 square miles and the population density is extremely low, only 1304 people per square mile (Onboard Informatics, 2015). This gives the environment a vast, quiet, and serene quality. Roadways and streets are considered adequately maintained with pavement or hard gravel. A main interstate runs parallel to the small town. There are multiple gravel roads beyond the city limits and the town is surrounded by fields of grain in every direction. At the center of the town are large grain elevators which are tied into the town's train system.

Approximately 60% of the streets inside the city limits had adequately maintained sidewalks. The majority were not well lit. Sidewalks tended to be located on the major city

streets where businesses reside. Many of them terminate as you approach residential areas. There were no marked or distinct places for walkers, joggers or bikers.

Average speed limits varied from 20 miles per hour in the school zones to 35 miles per hour on the main streets. Many of the smaller streets did not have speed limits posted, but contained frequent yield and stop signs for speed control. Ritzville does not contain any stop lights.

The homes appear to be a combination of well maintained, with large fenced yards, gardens, trees and flowers and poorly maintained, with peeling paint, trashed yards, broken windows, and un-mowed lawns. As you approach town, there are several large, well-kept farms.

The air was without smog or industrial pollutants. Located in the southeastern corner of Washington, the climate varies. Precipitation is dispersed evenly throughout the year, approximately 1-2 inches per month. The months of November and December see the most precipitation, often in the form of snow. During the spring and fall months, maximum temperatures reach 70-80 degrees. During the summer months, highs reach into the high 90s and 100s, increasing the danger for heat exhaustion, sunburn, and heat stroke. During the winter months, temperatures range from 10-30 degrees and there is often rain, ice, snow, and foggy conditions. (Onboard Informatics, 2015)

**Health and social services.** There are a few health services available to the residents of Ritzville. Within the city limits, there is one primary health clinic (HTFM), one rural hospital, one long-term care facility, one pharmacy and two chiropractic offices. HTFM is home to the only primary care physician available. The rural hospital contains twenty beds and has several rotating hospitalists. The long-term care facility is a small, for-profit nursing home with fifty

available beds. There is one ambulance in the area, which is staffed by volunteer EMTs. There is one local funeral home. The county's health department lies 52 miles to the south, in Othello, WA. The nearest major hospital is over an hour's drive away, 57 miles east of Ritzville. There are no local mental health services. A senior center provides activities to local seniors three days per week.

**Economy.** Despite its rural nature, the town of Ritzville appears to have a thriving economy with a variety of employment opportunities. Because of its proximity to the interstate, there are six local gas stations, all with attached convenience stores. There are five fast-food restaurants immediately visible from the freeway and two coffee shops (one local and one Starbucks). Aside from these, the majority of the businesses are geared towards farming. There are nine businesses related to farming in town. They sell anything from seed to fertilizer to parts, and even tractors. The next largest industry, with five businesses, is the machine-tool industry.

Apart from the large farming and tool industries in town, there are also some smaller, quaint establishments. For example, there are several downtown historical buildings that serve as beauty shops, antique stores, flower shops, and even a local pub and distillery. There are a couple of tastefully designed sit-down diners and a newly renovated historic hotel.

The only grocery store lies on the outskirts of town and appears to be well maintained. It offers a wide variety of foods, mostly non-perishable packaged foods. There is a small produce isle that contains fresh fruits and vegetables and a small deli isle with fresh meats and cheeses. Employment can be found in other areas as well. There are five local banks, two law offices, three water and utility companies, seven hotels, and one insurance agency in town. The city has a

small, one-screen movie theater, a four-lane bowling alley and a nine-hole golf course that provides entertainment for the residents of Ritzville.

**Transportation and safety.** Transportation seems to be fairly limited. The majority of people were seen riding in personal vehicles, walking or riding a bicycle. There are no public transportation systems in town and no taxi companies. A large train system runs through the center of the city, but it appears to function as freight train, hauling only bulk materials, namely grain.

Safety appears to be a top priority in this small town. There is a local police station and two fire stations within the city limits. In 2013, there were four full-time officers serving the town, with approximately two officers per thousand residents (Onboard Informatics, 2015). Although they do not have jurisdiction over the city of Ritzville, the Washington State Patrol also has an office located just outside of town. They are available in case of an emergency situation. According to recent data, the crime rate in Ritzville falls well below the national average, with the most common crime committed being theft (Onboard Informatics, 2015).

**Politics and government.** It was difficult to glean information regarding the city's governmental structure during this survey. There were no political posters or fliers visible. There were several city buildings, including Ritzville City Hall, Adam's County Office and the Ritzville Fire Department. Because Ritzville is the county seat, the county courthouse is also located here.

**Communication.** The majority of people seemed to be gathered around one of two locations. The first is the historic downtown. Residents were coming in and out of shops and restaurants all afternoon. The second place was the local school, where parents and children were

eagerly departing after the day's end. There were several groups of people found visiting and laughing in both locations. It is clear that the town puts a considerable amount of focus on the educational and sports programs in Ritzville. Many businesses have the local mascot and team banners up in their windows. There is one local newspaper, which can be purchased at almost any business in town. Advertisements are scarce and the majority of them promote unhealthy messages from the local fast food establishments.

**Education.** There is only one public school system in Ritzville. It consists of one grade school, one junior high, and one high school. According to the 2012 enrollment figures, there are approximately 330 students in grades K-12 and 24 teachers on staff. Individual classrooms are limited to 28 students, with an average class size of 23. The school offers a variety of sports including football, volleyball, basketball, wrestling, cheerleading, track and field, baseball, softball, tennis, and golf. (Ritzville Area Chamber of Commerce, 2014)

In addition to the school system, there is one public library. The hours of operation are Monday through Thursday, 11 am to 8 pm; Friday, 11 am to 5 pm; and Saturday, 10 am to 2 pm. Internet services are available at this location, free of charge.

**Recreation.** The city of Ritzville supports two, small parks. The first is simply titled, "Little League Park." The park provides residents with play equipment, soft grass, a picnic table, a basketball court, a baseball field, and a designated skating area. It is open to the public and free of charge. The park is unsupervised without sidewalks or designated trails.

The second park, named, "The Water Park," has one outdoor public pool with a small water-slide and diving board. The pool is open from 12 pm until 8 pm in the months of June, July and August. The cost to use the pool is \$2.50 per day. However, they do offer discounts on

summer passes. Lifeguards are available during operation and there is an hour every evening designated for lap swimming. The park also provides a large, grassy area with picnic tables and public tennis courts.

In addition to the parks, Ritzville offers one nine-hole golf course. It includes grass, hills, and one pond. A fair and rodeo arena accommodates an annual town fair and several, small rodeos throughout the summer months. There is also a bowling alley available for those who enjoy the sport.

Ritzville does not offer a public exercise/physical activity facility. There are no apparent fitness programs, classes or certified trainers available to the public. There was a flier inviting women, interested in playing softball, onto a local town team. There are no designated running, biking, or walking trails. The main streets did, however, provide a safe and accessible environment for such free or low cost activities.

## **DISCUSSION**

### **Summary and Recommendations**

Rural health systems in general are more isolated, with a lack of healthcare resources including quality providers, technology, and public health services (IOM, 2009). This is true of Ritzville, WA where the rural healthcare providers who practice here are challenged with not only improving health at the individual level, but at the population level as well, doing so with little resources. There is a high prevalence of obesity and the chronic illnesses associated with it. Actions need to be taken immediately or the burden of chronic disease will continue to climb.

This study set out to answer three questions:

1. What proportion of adult women who receive care at HTFM are obese (BMI  $\geq 30$  kg/m<sup>2</sup>)?

The rate of obesity in adult women receiving care at HTFM was 36.9%. Chronic diseases, specifically hypertension, diabetes, dyslipidemia, and cardiovascular disease were significantly higher in this population. After assessing this small practice, the community, and the environment in which it exists, it is apparent that there may be several factors contributing to these increased rates.

## **Environmental Factors**

### **Geographic Barriers**

There are approximately 3000 patients who receive care at HTFM, located in the rural town of Ritzville, WA. The population itself only consists of 1,679 residents. That means that there are over 1300 people who reside in areas outside of the city limits. It has also been established that there are limited forms of transportation available to this population. This suggests that a large portion of the population is geographically isolated from the town and clinic, making access to healthcare services problematic.

### **Weather**

There are six months of the year where Ritzville experiences extreme temperature changes. High heat, snow, ice and foggy conditions may further limit access to essential health resources, such as recreational activities that promote weight loss.

## **Location**

### **Lack of Healthcare Access**

Due to the rural nature of the town, specialty healthcare services are not supported. Therefore, there is a lack of healthcare services and providers, at the primary and community levels. Specifically, there is no access to a weight loss specialist or any other treatment modalities such as dietitians, counselors, hypnotists, exercise physiologists, support groups, etc.

### **Lack of Access to Healthy Foods**

Diet is a key component to any weight management program. Ritzville, unfortunately, has little to offer along the lines of healthy food options. There is only one grocery store and the majority of available foods fall under the category of packaged or non-perishable. To add to this, the grocery store is outnumbered by five fast food establishments and six convenience stores. There are few health message boards, but the ones that are present, display messages related to unhealthy food options, building on the problem of obesity here.

### **Lack of Access to Exercise Activities**

There are several barriers to exercise that need to be mentioned. First, there are no designated areas (lanes or trails) established for residents to walk, run or bike. Second, sidewalks are adequately maintained and suitable for such activities, but they are not well lit. This makes exercise challenging and dangerous during times of the year when daylight is minimal or when weather conditions are extreme. Third, residents have no access to fitness/exercise facilities or licensed physical trainers. These conditions yield significant barriers to healthy exercise habits, which could decrease obesity.

## **Socio-Economic Factors**

### **Age**

The prevalence of chronic disease significantly increases as we age (Burch et al., 2014). Within the population of interest, over 75% were found to be above the age of fifty. Age may be an influencing factor for the high chronic disease rates seen in this study.

### **Insurance**

Studies have shown that insurance status directly correlates to health outcomes. Those persons that are uninsured are less likely to have access to quality health services and more likely to suffer from higher rates of morbidity, mortality, disabilities, functional limitations, and chronic illnesses (IOM, 2009). The percentage of those who are uninsured within the population of interest is 10%. Lack of insurance could be adversely affecting health outcomes in this population.

### **Income**

Income may provide some insight into the high prevalence of obesity in this population. Studies have found that the risk of obesity increases as income decreases. In Washington state, statistics show that households making less than \$35,000 are 44% more likely to be obese, and those making \$35,000 - \$75,000 are 26% more likely to be obese, than those making greater than \$75,000 (Washington State Department of Health, 2009). In this rural town, the average per capita income is less than \$17,000 and the percentage of those that fall below the poverty level is 17.5% (United States Census Bureau, 2010). The low-income nature of this population puts them at a much greater risk for obesity and the chronic diseases associated with it.

## **Education**

The prevalence of obesity is higher in those with less education. Adults without a college degree are 52% more likely to be obese than those who have earned a degree (Washington State Department of Health, 2009). Within the town of Ritzville, it is estimated that only 21.5% of its residents have earned a college degree, increasing their risk for obesity (Onboard Informatics, 2015).

2. What community resources are available for the prevention and treatment of obesity in Ritzville, WA?

Although several barriers to weight loss and health disparities exist within this community, there are many resources to speak of as well. The most obvious resource available is HTFM. The staff here is compassionate and cares for the community they serve. This is evidenced by their willingness to subject their practices to evaluation and critique. HTFM may be the first and only exposure some patients have to healthcare and education. Obesity treatment and prevention has to start here.

The use of EHRs is another important resource. EHRs can be enhanced to include care alerts and decision aids catered to the population it serves. This has the potential to enhance patient care, facilitate desired health outcomes, and provide the basis for population-based research, as demonstrated in this study (Estabrooks et al., 2012).

The town of Ritzville also appears to have a strong sense of community. Studies have shown that a sense of community strength is associated with feelings of wellbeing, security, and increased participation in community activities (Francis, Giles-Corti, Wood, & Knuiiman, 2012). Community-based weight loss interventions have proven effective in the rural settings,

specifically in women (Strong Women-Healthy Heart Program). Exploiting this strength may be beneficial in promoting healthy behaviors.

There are a number of churches and synagogues within the town, indicating that religion may play a vital role in this community. Research has established that church-based weight loss programs have been successful in rural populations (Small Steps are Easier Together). Utilizing this community's considerable religious base may well prove beneficial.

Similarly, the Ritzville School District may be a valuable resource for weight loss services. The buildings could provide meeting places for weight loss courses. The gymnasium and fitness facility could provide additional opportunities for exercise. Prevention of obesity could be addressed in using a family-based approach with young children attending school.

Internet is a fundamental resource in the rural setting. Internet is essential for interventions such as telemedicine services, electronic or media based education, participation in online weight loss programs, and participation in internet-based support groups. Access to internet services creates the potential for a number of weight loss resources. Local and state health departments, the CDC and the World Health Organization (WHO), all accessible via internet, contain avenues for weight loss education.

Another considerable resource is the environment. Ritzville sits in the middle of vast, fertile farmland. The capacity for outdoor activities and gardening is enormous. Community strengths are listed below (Table 7).

TABLE 7. *Community Strengths.*

HTFM-rural health clinic	Strong sense of community
Access to electronic health records	Religion
Access to internet	Potential for gardening
Environment	Ritzville school district

## **Recommendations**

To address geographic and transportation barriers, it may be helpful for patients to use a carpool system to transport to and from healthcare appointments. Extending office hours may also allow for adequate transportation. Incorporating different types of exercise that exploit the extreme temperatures may increase activity levels during extreme weather conditions. For example, promoting cross-country skiing or sledding during the winter, and swimming during the summer months. If possible, this population could benefit from the creation of a water aerobics class as well.

Access to healthcare, specifically specialty care surrounding weight loss, could be improved by the use of telemedicine interventions. Video-based conferencing technologies allow the patient to connect with various specialties without ever leaving the comfort of their home. The clinic could partner with specialty groups, such as dietitians, that would be willing to provide this service, with the potential to decrease obesity rates within this population. Web-based support groups could be suggested. The community could also start its own weight loss group. This community could also benefit from partnering with county and state health departments to create positions for traveling health coaches, dietitians, or nurses to address health risk factors.

Increasing healthy food choices starts with education. Development of a community or church-based education program to communicate the benefits of diet in preventing and/or decreasing obesity may be a logical step. This program should include tips on reading food labels and avoiding harmful foods. Another way to increase the number of healthy food options, such as fresh fruit and vegetables, is to grow them yourself. Groups, such as the American

Community Gardening Association, help communities learn how to start and maintain community gardens (<https://communitygarden.org/>). Local farmers could provide input as well.

Increasing access to recreational and exercise activities may require petitioning at the county and state levels for funding to support the development of designated trails and fitness facilities for residents. In the meantime, organizing groups walks or public exercise classes at a local school or church, could increase activity levels.

3. How do primary care providers manage obesity in women residing in the rural area of Ritzville, WA?

Current evidenced-based guidelines outline the essential components of obesity management. The first step in management is recognizing the obese patient by carefully documenting a BMI at least annually and adding the diagnosis of obesity to the patient's chart (Fitch et al., 2013; Jensen et al., 2014; Management of Overweight and Obesity Working Group, 2014; Michigan Quality Improvement Consortium, 2013). This is especially important at HTFM. The electronic health records used here include care prompts specific to the diagnoses listed. For example, if the provider adds a diagnosis of obesity, the system prompts them to assess BMI, and offer both exercise and dietary counseling. If the diagnosis is not included, the care prompts will not reach the provider. In this study, only 43.3% of the EHRs reviewed contained an obesity diagnosis, and therefore missed opportunities for treatment.

The second step to obesity management involves introducing and encouraging patients to adopt lifestyle modifications to reduce their weight. This includes counseling each patient on the dietary, exercise, and behavioral changes needed to accomplish the task. This study revealed that

23% of patients had documented encounters where dietary counseling was provided, 10% where exercise counseling was provided, and 3% where behavior was addressed.

There may be several factors contributing to these findings. The most obvious reason is due to oversight. Most patients do not schedule an appointment to see their provider for obesity. They usually present for a chronic or acute illness. Addressing obesity may not be the top priority in those visits. The provider may also worry about a negative reaction from a patient after learning of their obesity diagnosis. Billing could be a factor. Reimbursement for services related to obesity may be financially inadequate in supporting a small clinic. Findings showed that the majority of patients studied (approximately 66%) relied on Medicare or Medicaid services, which reimburse at decreased rates.

Lack of staff may also have an impact. There is only one provider at HTFM, who cares for approximately 3000 patients. It is possible that time constraints may not allow him to document as thoroughly as may be needed. Currently, there is a section within the chart note where the provider can easily check if dietary and exercise counseling was provided. No section exists for behavioral counseling; therefore, he is limited to documenting this under assessment and plan. It is possible that counseling is being provided but is not adequately documented.

There may also be a lack of knowledge among staff regarding the current evidence-based guidelines for obesity management, which this study did not evaluate. Education directed towards guidelines may be necessary.

### **Recommendations**

Work with the IT department and EHR vendor and develop ways in which to customize the system to enable a more efficient encounter. For example, the nurse within this care model is

responsible for obtaining a BMI prior to the patient's visit. IT may be able to direct a prompt to the provider to add the obesity diagnosis when the patient's BMI is found to be  $\geq 30\text{kg/m}^2$ . It is also possible to customize the EHR to include additional care prompts. Developing the care prompt and check box for behavioral counseling would be a logical next step.

In an attempt to save time, it may also be beneficial to involve the RN in portions of the counseling. This may be accomplished with a face-to-face intervention, or perhaps with electronic or written documents outlining the counseling. Patients could review this while they wait for the provider and ask questions as needed.

Finally, familiarizing staff with the current evidence-based guidelines and creating procedures for the care of obese patients, may facilitate more efficient encounters. It would also improve accountability and reduce the probability of overlooking essential care. Scheduling more frequent follow-ups may help to improve management of obesity and compliance to treatment.

### **Limitations**

There were several study limitations. This study examined 30 obese patients and was limited to only one primary care practice, the female gender, and adult age group. Subsequently, results may not be generalizable to other settings, genders or ages. Future studies including a larger number of patients, age groups and genders, would increase the power and generalizability of the study. Bias may have been introduced due to convenience sampling. The patients represented in the study may be more likely to obtain healthcare due to insurance access and willingness to change health behaviors. Studying groups outside of this clinic's reach, to include

those without insurance and who do not receive healthcare, may provide a more detailed examination of the obesity epidemic.

Another limitation comes from the observational portion. Anderson and McFarlane's (2006) windshield survey is intended to be much more comprehensive to include both observational and respondent data. Due to the nature of this project, respondent data was not obtained. In the future, evaluation and analysis of respondent data could add valuable insight.

A major limitation was a lack of data available for the rural town of Ritzville, WA. A survey that addresses social, demographic and economic factors would have been valuable to this project. In the future, a more detailed look at these factors would provide insight into the health disparities that exist.

### **Role of the Rural Advanced Practice Nurse**

Nurse practitioners working in the rural settings have the potential to make huge impacts in the communities they serve. Nurses have a unique knowledge base and background. They are trained to focus on more than just the scientific basis of disease. Nurses place more emphasis on the individuals, families, communities and environments they serve. This makes the nurse practitioner particularly qualified to recognize and address the disparities that affect health outcomes in these rural settings.

DNP prepared nurses possess the knowledge and ability to employ quality improvement within their practice. In regards to the management of obesity, nurse practitioners can help to redesign health care delivery processes in the rural settings to include evidence-based interventions. The DNP nurse leader is ultimately prepared to lead innovative change to improve

patient and system-level outcomes (Montgomery, 2011). This may include partnering with local, state, and governmental agencies to petition for needed resources.

### **Conclusion**

This evaluation of HTFM provides an assessment of the clinic's management of obesity in the target population, adult women residing in the rural setting. Interventions have been recommended based on the needs of this specific, rural population. Individual, community, clinical and state/national level suggestions were made. The findings of this project have been presented to the HTFM staff in the format of an executive summary (Appendix E). The needs assessment and retrospective chart review helped to inform resource allocation by determining the best use of limited resources in this rural setting. In future studies, interventions could be developed, implemented, and tested on a small scale, using PDSA cycles. The DNP prepared nurse practitioner is uniquely qualified to oversee this.

APPENDIX A:  
EVIDENCE SYNTHESIS TABLE

Author/Article	Qual: Concepts or phenomena Quan: Key Variables Hypothesis Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/tools)	Findings
<p>Befort, C. A., Klemp, J. R., Fabian, C., Perri, M. G., Sullivan, D. K., Schmitz, K. H., . . . Shireman, T. (2014). Protocol and recruitment results from a randomized controlled trial comparing group phone-based versus newsletter interventions for weight loss maintenance among rural breast cancer survivors. <i>Contemporary Clinical Trials</i>, 37(2), 261-271. doi:10.1016/j.cct.2014.01.010 [doi]</p>	<p>Quantitative-Compares delivery of weight loss intervention on long term success: phone based vs newsletter</p>	<p>None noted</p>	<p>RCT-3 phases I: 6 month wt loss via phone II: 12 month maintenance phase where participants are randomized into control (newsletters) and intervention (phone session continued) III: No contact</p>	<p>210 post-menopausal women, BMI=27-45, CA dx 0-IIIc in the past 10 years, reside in a rural area in Kansas, Nebraska or Iowa</p>	<p>Measures: Anthropometrics: BMI, Waist cirm; Diet: 24 hr dietary recall w/ dietician; PA: self report (Paffenberger PA questionnaire) and objective (wear GT3X+ Actigraph Accelerometer to measure activity levels</p>	<p>No findings-this is a proposed study.</p>
<p>Befort, C. A., Nazir, N., &amp; Perri, M. G. (2012). Prevalence of obesity among adults from rural and urban areas of the united states: Findings from NHANES (2005-2008). <i>The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association</i>, 28(4), 392-397. doi:10.1111/j.1748-0361.2012.00411.x [doi]</p>	<p>Quantitative Obesity defined as BMI &gt;30</p>	<p>N/A</p>	<p>Cross sectional design</p>	<p>N = 8,815, 20-75 yoa</p>	<p>SAS, SUDAAN, wald chi squared or t-tests  Prevalence of obesity in rural area 39.6% (SE =1.5) vs 33.4% (SE 1.1) in urbanized areas This is statistically significant (p = 0.006)</p>	<p>Prevalence of obesity in rural areas (39.6% (SE =1.5)) is significantly greater than that of its urban counterparts (33.4% (SE =1.1)) p = 0.006.  “greater attention needs to be focused on dissemination of effective programs to rural areas which contain some of the largest medically underserved communities in the nation” (p. 5).</p>
<p>Buxton, B. K., &amp; Sneath, J. (2013). Obese women's perceptions and experiences of healthcare and primary</p>	<p>Qualitative – describe the experiences and</p>	<p>Colaizzi method</p>	<p>Phenomenological design</p>	<p>26 women, 27-66 yoa, BM &gt;30,</p>	<p>In depth, recorded, semi-structured interviews</p>	<p>Women do not base their health on their BMI but rather on their</p>

care providers: A phenomenological study. <i>Nursing Research</i> , 62(4), 252-259. doi:10.1097/NNR.0b013e318299a6ba [doi]	perceptions of obese women in regards to healthcare and their relationship with their providers			residing in rural NE Pennsylvania with diverse ethnicity		ability to do desired activities. They are more motivated to lose weight if they feel that their PCP is supportive and willing to take the time to foster a relationship.
D'Onise, K., McDermott, R. A., & Campbell, S. K. (2013). Benefits of modest weight or waist circumference loss in a remote north queensland indigenous population. <i>Australian and New Zealand Journal of Public Health</i> , 37(4), 345-349. doi:10.1111/1753-6405.12082 [doi]	Quantitative study-measured weight, waist circ, fasting glucose, GGT, lipids and BP at baseline (1998-2000) and years later (2004-2007)	None noted	Cohort Study	2,538 participants from 19 different rural communities in Australia	Used standards to measure before mentioned	Majority of the participants (over 80%) gained weight with an increased waist circumference. Of those, there were significant increases seen in the other measures (BP especially). Of the 20% who maintained or lost weight/waist circumference, a lowering of measures were seen, suggesting the benefits of weight loss on lowering BP, GGT, lipid and fasting glucose levels.
Dunn, R. A., Sharkey, J. R., & Horel, S. (2012). The effect of fast-food availability on fast-food consumption and obesity among rural residents: An analysis by race/ethnicity. <i>Economics and Human Biology</i> , 10(1), 1-13. doi:10.1016/j.ehb.2011.09.005 [doi]	Quantitative	N/A	Descriptive	N = 1019, residents in rural Texas, majority female	Data analysis using Probit regression, data collected from mail survey Fast Food restaurant + address of survey participant yields 3 measures: 1. distance to nearest ff 2. # ff in 1 mile radius 3. # ff in 3 mile radius	Effect of ff availability had no effect on ff consumption or obesity in white, but correlated strongly with both in nonwhites.
Ely, A. C., Banitt, A., Befort, C., Hou, Q., Rhode, P. C., Grund, C., . . . Ellerbeck, E. (2008). Kansas primary care weighs in: A pilot randomized trial	Quantitative Weight loss Control vs treatment		RCT pilot study	N= 107, residing in rural Kansas, majority	Significantly weight loss seen at day 180 in the treatment arm	Phone based counseling was effective at reducing weight in this population. However,

of a chronic care model program for obesity in 3 rural kansas primary care practices. The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association, 24(2), 125-132. doi:10.1111/j.1748-0361.2008.00148.x [doi]	(CCM-phone based counseling regimen)			women (77%)		attrition was low suggesting that the program may need to be adjusted in this population to encourage completion.
Fitch A, Everling L, Fox C, Goldberg J, Heim C, Johnson K, Kaufman T, Kennedy E, Kestenbaum C, Lano M, Leslie D, Newell T, O'Connor P, Slusarek B, Spaniol A, Stovitz S, Webb B. Prevention and management of obesity for adults. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2013 May. 99 p. [161 references]	Guideline	Used only recs from the highest level of evidence	Systematic review or RCTs	Varies depending on the source	Systematic review	These guidelines describe evaluation/screening, appropriate teaching and general treatment principles for obese patients.
Folta, S. C., Lichtenstein, A. H., Seguin, R. A., Goldberg, J. P., Kuder, J. F., & Nelson, M. E. (2009). The StrongWomen-healthy hearts program: Reducing cardiovascular disease risk factors in rural sedentary, overweight, and obese midlife and older women. American Journal of Public Health, 99(7), 1271-1277. doi:10.2105/AJPH.2008.145581 [doi]	Quantitative Intervention-community based Strong Women-Healthy Hearts Program		RCT	N=85, women residing in rural Kansas and Arkansas with BMI >24, 40+ yoa	Chi-squared, t-tests, regression models Measured weight and waist circumference; diet with 3 days food records, PA with pedometer; self efficacy with questionnaire	The intervention group had significant decreases in food intake and significant increases in SE and physical activity. Weight and waist circumference were also significantly lowered. The Strong Women-Healthy Heart Program is effective in reducing weight in rural women.
Haardorfer, R., Alcantara, I. C., Patil, D., Hotz, J., & Kegler, M. C. (2014). Physical activity profiles of overweight and obese women in rural georgia. JAMA Internal Medicine, 174(1), 148-149. doi:10.1001/jamainternmed.2013.11571 [doi]	Quantitative	None noted	Participants wore accelerometers x 7 consecutive days to determine PA levels	303 overweight or obese women, 35-65 yoa, mostly AA, residing in rural areas (FQHC) in Georgia	Accelerometers and BMI	Participants in rural areas lead sedentary lifestyles. No participant met the US Dept of Health and Human Services PA guideline recommendations.
Hageman, P. A., Pullen, C. H., Hertzog, M., Boeckner, L. S., & Walker, S. N. (2011). Web-based interventions for	Protocol for quantitative research	Based on Health Promotion	RCT	Need 76 women, dwelling in	Outcomes include: weight, BP, diet and PA questionnaires +	This is a promising protocol for a web-based intervention in

weight loss and weight maintenance among rural midlife and older women: Protocol for a randomized controlled trial. <i>BMC Public Health</i> , 11, 521-2458-11-521. doi:10.1186/1471-2458-11-521 [doi]		Model and Social Cognitive Theory		rural Midwestern state, ages 45-69 with BMI 28-45	actigraph accelerometer for objective measurement, % of women who lose 5-10% body weight	the rural setting.
Jackson, J. E., Doescher, M. P., Jerant, A. F., & Hart, L. G. (2005). A national study of obesity prevalence and trends by type of rural county. <i>The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association</i> , 21(2), 140-148.	Quantitative		Cross Sectional	N = 385,384	Analysis of data from the Behavioral Risk Factor Surveillance System	Rural counties suffer from higher rates of obesity than their urban counterparts
Jensen, M. D., Ryan, D. H., Apovian, C. M., Ard, J. D., Comuzzie, A. G., Donato, K. A., . . . Obesity Society. (2014). 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the american college of Cardiology/American heart association task force on practice guidelines and the obesity society. <i>Journal of the American College of Cardiology</i> , 63(25 Pt B), 2985-3023. doi:10.1016/j.jacc.2013.11.004 [doi]	Guideline					<b>Screening/Diagnosis:</b> 1. BMI and waist circumference should be calculated annually and as needed for obesity management. 2. A diagnosis can be determined from the following: BMI 25-29.9 = overweight; 30-34.5 = obese class I; 35-39.9 = obese class II; >40 = obese class III Waist circumference >40 in (102 cm) in men and >35 in (88cm) in women is considered obese as well.
Krukowski, R. A., Sparks, C., DiCarlo, M., McSweeney, J., & West, D. S. (2013). There's more to food store choice than proximity: A questionnaire development study. <i>BMC Public Health</i> , 13, 586-2458-13-586. doi:10.1186/1471-2458-13-586 [doi]	Quantitative		Questionnaire	100 shoppers in rural and urban Arkansas, of which 93% were female	Descriptive Statistics (frequency, mean, SDs)	<b>Stores should focus on availability, quality, variety and pieces of fruits, vegetables and meats. Understanding the primary reasons for store choice may help guide policies/programs aimed at improving</b>

						<b>food environments to support dietary changes and prevent obesity.</b>
Management of Overweight and Obesity Working Group. VA/DoD clinical practice guideline for screening and management of overweight and obesity. Washington (DC): Department of Veterans Affairs, Department of Defense; 2014. 178 p. [283 references]	Guideline	Same as above				<p><b>Evaluation</b> Assess for factors contributing to obesity and obesity related conditions. Obtain BP, glucose levels, A1C as indicated, lipid levels and determine if sleep apnea or DJD may be present.</p> <p><b>Teaching</b> Advise patient that an increase in BMI and waist circumference increases their risks for CVD, type 2 DM and all-cause mortality. Counsel the patient with CVD risk factors (HTN, hyperlipidemia, hyperglycemia) that weight loss of 3-5% can produce meaningful benefits.</p> <p><b>Treatment</b> Offer a Comprehensive Lifestyle Intervention (CLI) with the primary goal of weight loss to improve BP, glucose control, lipid levels and decrease the effects of obstructive sleep apnea and joint degeneration. Intervention should include goal setting related to diet and physical activity. The CLI should combine dietary, physical</p>

						activity and behavioral strategies. A net deficit of 500-1000 calories/day should be reached with a weight loss goal of 0.5-2
Michigan Quality Improvement Consortium. Management of overweight and obesity in the adult. Southfield (MI): Michigan Quality Improvement Consortium; 2013 Mar. 1 p.	Guideline	Same as above				<p><b>Dietary Approach-</b> Offer any diet this is safe and effective and produces calorie deficit (DASH, low-carb, low-fat). For men 1500-1800 kcal/day and for women 1200-1500 kcal/day.</p> <p><b>Physical Activity-</b> Participate in moderate intensity PA for at least 150 min/week, including short intermittent intervals (at least 10 min) and longer intervals if tolerated.</p> <p><b>Behavior/Lifestyle-</b> Offer CLI as a group or individually and for at least 6 months or greater in duration. Telephone- based CLI may be offered as an alternative or adjunct to face-to-face intervention</p> <p><b>Maintenance:</b> For maintenance of weight loss, offer a face-to-face or telephone based program with regular (monthly) contact. Continue to monitor weight, physical activity levels and consumption of lower-calorie diet.</p>

						<p><b>Pharmacotherapy-</b> If CLI is not effective at reducing weight, offer phentermine/topiramate, orlistat or lorcaserin to the following: patients with BMI &gt;30 or patients with BMI &gt;27 and obesity related conditions.</p> <p><b>Surgical Options-</b> Offer bariatric surgery with CLI for patients with BMI&gt;40 and those with obesity related conditions and BMI 35-39.9.</p>
Michimi, A., & Wimberly, M. C. (2012). Natural environments, obesity, and physical activity in nonmetropolitan areas of the united states. <i>The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association</i> , 28(4), 398-407. doi:10.1111/j.1748-0361.2012.00413.x [doi]	Quantitative		Cross Sectional	N = 457,820 and 473,296, adults 18+ yoa	Looked at recreational opportunity and natural amenity indices from the BRFS	Those communities with more recreational opportunities and natural amenities produce environments that facilitate PA and could potentially decrease obesity burden.
Milsom, V. A., Middleton, K. M., & Perri, M. G. (2011). Successful long-term weight loss maintenance in a rural population. <i>Clinical Interventions in Aging</i> , 6, 303-309. doi:10.2147/CIA.S25389 [doi]	Quantitative	N/A	Cross sectional design	110 obese women, ages 60-75 years, living in rural and medically underserved areas	From the TOURS intervention group (see above)- in person evaluation of weight and weight management strategies (questionnaire) Chi-squared and t-tests, ANOVA	41.8% of rural women were able to maintain at least 5% of their weight loss 3.5 years later. Of those who were successful, self-monitoring of weight, intake, and calories was prevalent
Nam, S. (2013). Effects of social support and spirituality on weight loss for rural african-american women. <i>The ABNF Journal : Official Journal of the Association of Black Nursing Faculty in Higher Education, Inc</i> , 24(3), 71-76.	Quantitative Spiritual vs Nonspiritual wt loss intervention Spiritual included religious	None noted	Pretest-Post test design	48 AA women residing in rural South Carolina	Weight, BMI Used MantelHaenszel hypothesis test; Fischer's Exact Test and Paired T test	Participants in the intervention group had significantly lower BMIs and weight after 10 weeks

	components such as health r/t meditation and increased social support					
Nothwehr, F., & Peterson, N. A. (2005). Healthy eating and exercise: Strategies for weight management in the rural midwest. <i>Health Education &amp; Behavior : The Official Publication of the Society for Public Health Education</i> , 32(2), 253-263. doi:32/2/253 [pii]	Quantitative	SCT	Population based prospective cross sectional design	N = 109, rural Iowa residents, mostly women	Recruited from RIDE project. Data was collected for surveys addressing self efficacy, diet and exercise behavior	Those individuals that were attempting to lose weight showed increased self-monitoring bx, more dissatisfaction with their current weight, increased social support and engaged in goal setting.
Penney, T. L., Rainham, D. G., Dummer, T. J., & Kirk, S. F. (2014). A spatial analysis of community level overweight and obesity. <i>Journal of Human Nutrition and Dietetics : The Official Journal of the British Dietetic Association</i> , 27 Suppl 2, 65-74. doi:10.1111/jhn.12055 [doi]	Quantitative-BMI-height and weight		Cross sectional population based secondary data analysis	N = 10,054, 12+, yoa	Collected from national database in Canada (CCHS)	There are higher rates of obesity in the rural setting as well as higher variations in obesity rates. Females are also disproportionately affected compared with their male counterparts. "Given the potential for determinants of weight status to vary by community, population health intervention efforts should be preceded by a type of community health needs assessment related to environmental barriers and facilitators for weight status" (p. 70) "Specifically, prevention and intervention efforts should consider that rural areas have a varied aetiology for community weight status compared to urban areas and

						therefore may need a different approach to intervention” (p. 72) public health nutrition efforts for community level food environments in rural areas should ensure an individualized approach is used” (p. 72) “The development of a community needs assessment that captures robust measures of the population-level food environment (e.g. grocery stores, supermarkets and fast food outlets) would be an important next step” (p. 72)
Perri, M. G., Limacher, M. C., Durning, P. E., Janicke, D. M., Lutes, L. D., Bobroff, L. B., . . . Martin, A. D. (2008). Extended-care programs for weight management in rural communities: The treatment of obesity in underserved rural settings (TOURS) randomized trial. <i>Archives of Internal Medicine</i> , 168(21), 2347-2354. doi:10.1001/archinte.168.21.2347 [doi]	Quantitative Intervention: 6 month weight loss intervention then into treatment arm which included extended care biweekly counseling via phone or face to face vs biweekly newsletters	N/A	RCT	N = 234, women, 50-75 yoa, residing in rural communities in Florida	1 outcomes: body weight and BMI 2 outcomes: BP, lipid and glucose levels, bx adherence via survey	The treatment arm regained significantly less weight and maintained BMIs as compared with the control arms. The treatment group also displayed increased adherence to bx management strategies.
Ries, A. V., Blackman, L. T., Page, R. A., Gizlice, Z., Benedict, S., Barnes, K., . . . Carter-Edwards, L. (2014). Goal setting for health behavior change: Evidence from an obesity intervention for rural low-income women. <i>Rural and Remote Health</i> , 14, 2682. doi:2682 [pii]	Intervention: bi-weekly group meetings x 6 months addressing the topics of healthy eating, physical activity, weight control, stress	Causal Steps Baron and Kenny	Quasi-experimental design	485 women, 18+ yoa, living in rural North Carolina	Self-administered surveys at baseline and 6 months; Chi-Squared; data came from HOPEworks research project	Intervention compared to comparison participants were more likely to move from contemplation to action/maintenance for the goals of improving diet (58% intervention, 44% comparison, p=

	<p>management, education, and job skills. Meetings provided social support, taught strategies for weight management, and helped women set and make progress towards reaching health and life goals. Participants set goals and were partnered with another participant who provided support. They also received monthly newsletters tailored r/t weight loss. The control group received monthly newsletter unrelated to weight loss.</p>					0.04) and physical activity (56% intervention, 31% comparison, $p \leq 0.0001$ ).
<p>Schwartz, R., Powell, L., &amp; Keifer, M. (2013). Family-based risk reduction of obesity and metabolic syndrome: An overview and outcomes of the idaho partnership for hispanic health. <i>Journal of Health Care for the Poor and Underserved</i>, 24(2 Suppl), 129-144. doi:10.1353/hpu.2013.0106 [doi]</p>	<p>Quantitative Intervention: family based weight loss intervention- 12 weeks in duration</p>		<p>Intent to treat</p>	<p>N= 450, Hispanic 18-84 yoa, 61.4% female</p>	<p>Measurements include: BMI, waist/hip circumference, BP, lipids, glucose, A1c Used paired t-tests and ANOVA to test pre-post-and one year f/u</p>	<p>Participants showed a significant decrease in weight, BMI, and waist/hip circumference after the intervention and at one year f/u (<math>p &lt; 0.05</math>) indicating long and short-term effectiveness.</p>
<p>Sherman, B. J., Gilliland, G., Speckman, J. L., &amp; Freund, K. M.</p>	<p>Quantitative Intervention:</p>		<p>RCT-intent to treat</p>	<p>Women, 22-64 yoa living</p>	<p>Amount of steps walked per day</p>	<p>Participants significantly increased</p>

(2007). The effect of a primary care exercise intervention for rural women. <i>Preventive Medicine</i> , 44(3), 198-201. doi:S0091-7435(06)00458-0 [pii]	participants given a exercise video, pedometer and exercise counseling x 5			in rural Missouri, BMI average 30.6, 78% of participants overweight or obese	measured by a pedometer	their steps/day by 2573 (p<.001); “Given the epidemic of obesity in this country, and its medical sequelae, there is a need for multiple interventions at the individual, group and community level” (p.200)
Tussing-Humphreys, L., Thomson, J. L., Mayo, T., & Edmond, E. (2013). A church-based diet and physical activity intervention for rural, lower mississippi delta african american adults: Delta body and soul effectiveness study, 2010-2011. <i>Preventing Chronic Disease</i> , 10, E92. doi:10.5888/pcd10.120286 [doi]	Quantitative-see measures under data collection  Intervention: 6 month church based weight loss intervention based on Delta Body and Soul	Delta Body and Soul	Quasi-experimental Design	403 adult women who reside in rural Mississippi, mostly AA	Diet-FFQ PA-self survey and podometers (not consistently used and dropped later) Anthropometrics: BP, BMI (weight/height), lipids and glucose levels Chi-squared, Fisher’s Exact, McNemar’s Test, mixed-model regression analysis	Diet quality improved in both groups following monthly dietary education sessions; There were no significant improvements noted in anthropometric measurements
Warren, B. S., Maley, M., Sugarwala, L. J., Wells, M. T., & Devine, C. M. (2010). Small steps are easier together: A goal-based ecological intervention to increase walking by women in rural worksites. <i>Preventive Medicine</i> , 50(5-6), 230-234. doi:10.1016/j.ypmed.2010.02.006 [doi]	Quantitative Intervention: Small Steps Are Easier Together-work/community leader leads walking group Participants given pedometers and make personalized daily/weekly step goals with the ultimate goal of increasing steps by 2000/day		Quasi-experimental Pre-and post-test with f/u intervention	Women, 18+ yoa dwelling in NY state	Pedometer readings were recorded throughout the intervention and compared with baseline data	There was a mean increase of 1503 steps/day which was statistically significant (p<.01)

APPENDIX B:  
WINDSHIELD SURVEY

<b>Appendix B</b>		
<b>Windshield Survey*</b>		
	<b>OBSERVATIONS</b>	<b>DATA</b>
<b>I. Community Core</b>		
1. History—What can you glean by looking (e.g., old, established neighborhoods; new subdivision)? Ask people willing to talk: How long have you lived here? Has the area changed? As you talk, ask if there is an “old-timer” who knows the history of the area.		
2. Demographics—What sorts of people do you see? Young? Old? Homeless? Alone? Families? What races do you see? Is the population homogeneous?		
3. Ethnicity—Do you note indicators of different ethnic groups (e.g., restaurants, festivals)? What signs do you see of different cultural groups?		
4. Values and Beliefs—Are there churches, mosques, temples? Does it appear homogeneous? Are the lawns cared for? With flowers? Gardens? Signs of art? Culture? Heritage? Historical markers?		
<b>II. Subsystems</b>		
1. Physical Environment—How does the community look? What do you note about air quality, flora, housing, zoning, space, green areas, animals, people, human-made structures, natural beauty, water, climate? Can you find or develop a map of the area? What is the size (e.g., square miles, blocks)?		
2. Health & Social Services—Evidence of acute or chronic conditions? Shelters? “Traditional” healers (e.g., <i>curanderos</i> , herbalists)? Are there clinics, hospitals, practitioners’ offices, public health services, home health agencies, emergency centers, nursing homes, social service facilities, mental health services? Are there resources outside the community but accessible to them?		
3. Economy—Is it a “thriving” community or does it feel “seedy?” Are there industries, stores and places for employment? Where do people shop? Are there signs that food stamps are used/accepted? What types of food choices do they offer? What is the unemployment rate?		

<p>4. Transportation and Safety—How do people get around? What type of private and public transportation is available? Do you see buses, bicycles, taxis? Are there sidewalks, bike trails? Is getting around in the community possible for people with disabilities? What types of protective services are there (e.g., fire, police, sanitation)? Is air quality monitored? What types of crimes are committed? Do people feel safe?</p>		
<p>5. Politics and Government—Are there signs of political activity (e.g., posters, meetings)? What party affiliation predominates? What is the governmental jurisdiction of the community (e.g., elected mayor, city council with single member districts)? Are people involved in decision making in their local governmental unit?</p>		
<p>6. Communication—Are there “common areas” where people gather? What newspapers do you see in the stands? Do people have TVs and radios? What do they watch/listen to? What are the formal and informal means of communication? What types of advertisement do you see? Do they display healthy or unhealthy messages?</p>		
<p>7. Education—Are there schools in the area? How do they look? Are there libraries? Is there a local board of education? How does it function? What is the reputation of the school(s)? What are major educational issues? What are the dropout rates? Are extracurricular activities available? Are they used? Is there a school health service? A school nurse?</p>		
<p>8. Recreation—Where do children play? What are the major forms of recreation? Who participates? What facilities for recreation do you see? Are there parks, fitness centers, pools, running trails, etc?</p>		

\*Anderson, E. T. and McFarlane, J. M. (2006). Community as partner: Theory and practice in nursing. Lippincott, Williams & Wilkins.

APPENDIX C:  
IRB APPROVAL LETTER



This submission meets the criteria for approval under 45 CFR 46.110, 45 CFR 46.111 and/or 21 CFR 50 and 21 CFR 56. This project has been reviewed and approved by an IRB Chair or designee.

- No changes to a project may be made prior to IRB approval except to eliminate apparent immediate hazard to subjects.
- The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).
- All research procedures should be conducted in full accordance with all applicable sections of the Investigator Manual.
- The current consent with the IRB approval stamp must be used to consent subjects.
- The Principal Investigator should notify the IRB immediately of any proposed changes that affect the protocol and report any unanticipated problems involving risks to participants or others.
- For projects that wish to continue after the expiration date listed above please submit an F212, Continuing Review Progress Report, **forty-five (45) days** before the expiration date to ensure timely review of the project.
- All documents referenced in this submission have been reviewed and approved. Documents are filed with the HSPP Office. If subjects will be consented the approved consent(s) are attached to the approval notification from the HSPP Office.

APPENDIX D:  
SITE AUTHORIZATION LETTER



APPENDIX E:  
EXECUTIVE SUMMARY

**To: The Staff at Hometown Family Medicine**  
**From: Ashley M. Jones**  
**Subject: Improving the Management of Obesity in a Rural Community**  
**Date: October 28, 2015**

### **Executive Summary**

The purpose of this quality improvement project was to assess how obesity is managed in adult, female patients receiving care at Hometown Family Medicine (HTFM). Thirty electronic health records from patients receiving care at HTFM were reviewed to determine the following: 1) Prevalence of obesity and chronic disease and 2) The management of obesity compared with current evidence-based guidelines. This was followed by a community assessment to determine the resources available for the prevention and treatment of obesity.

**Results:** The prevalence of obesity and chronic diseases in this population were found to be significantly higher than both state and national averages. Due to a lack of resources, management of obesity does not meet the standards set by current guidelines. Primary health care may be the only opportunity to promote healthy behaviors and improve health outcomes in this vulnerable population. Action needs to be taken or the burden of obesity will continue to rise.

### **Background**

- Obesity, defined by a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup>, is an escalating problem, with more than 1.4 billion affected worldwide.<sup>16</sup>
- Amid those who suffer from obesity in the US, rural populations appear to be more susceptible, specifically women.<sup>14</sup> One study revealed that 23% of women residing in rural areas were obese compared with 16% of those in the urban setting.<sup>4</sup>

### **Issues**

- Along with the increasing numbers of obese adults come escalating health burdens. It is estimated that over 3.4 million people die every year in US as a result of being obese.<sup>2,16</sup>
- Obesity is a known risk factor for many chronic diseases, e.g., cancer, cardiovascular disease, joint degeneration, type 2 diabetes and depression, among others<sup>1,2,9,13,16</sup>
- The economic burden of obesity includes billions of dollars per year in healthcare costs. For example, in 2013, obesity related expenses in the US exceeded \$254 billion dollars. Researchers believe that if this trend continues, costs could reach upwards of \$957 billion dollars in the next 15 years, accounting for 18% of all US expenditures.<sup>2,16</sup>

### **Findings**

- The prevalence of obesity in the population studied was found to be 36.9%. This is higher than county, state and national averages.

- Un-insurance rates were lower than state and national averages.
- Compared with county, state and national averages, this population has significantly higher rates of hypertension, diabetes mellitus type 2, dyslipidemia, and cardiovascular disease.
- Obesity management did not meet current evidence-based standards. An obesity diagnosis was included in 43.3% of the EHRs reviewed. The following types of counseling were included within EHRs examined: dietary 25%, exercise 10%, and behavior 3%.
- There are several factors that may contribute to the high rates of obesity and chronic disease in this population.
  1. Geographic barriers
  2. Extreme weather
  3. Lack of healthcare services, namely specialty care related to weight loss
  4. Lack of access to healthy food options
  5. Lack of access to exercise activities
  6. Age
  7. Lack of insurance
  8. Income
  9. Education
- Within HTFM, several clinical barriers prevent staff from providing current, evidence-based treatment for obesity.
  1. Oversight
  2. Reimbursement limitations
  3. Lack of staff
  4. Lack of knowledge regarding current guidelines
  5. Time constraints
  6. Inefficient use of electronic health records

### Options

- Weight loss has been proven to reduce or even eliminate many of the comorbidities associated with obesity.<sup>2</sup> Studies suggest three main foci to weight loss including diet, exercise and behavior.<sup>9</sup>
- Guidelines<sup>5,7,8,10,11</sup> suggest the following for treatment and prevention of obesity:
  1. A patient's BMI and waist circumference should be calculated annually and as needed for obesity management and a diagnosis of obesity added to the patient's chart.
  2. Healthcare providers need to teach each obese patient that an increase in BMI and waist circumference increases their risks for CVD, type 2 diabetes, and all-cause mortality. Encourage patients with CVD risk factors (HTN, hyperlipidemia, hyperglycemia) that a weight loss of 3-5% can produce meaningful benefits.
  3. Offer any safe diet that produces a net caloric deficit of 500-1000 kcal per day, with men consuming roughly 1500-1800 kcal per day while consumption for women ranges from 1200-1500 kcal.
  4. Recommend a goal of participation in moderate intensity physical activity for 150-200 minutes per week.
  5. Researchers agree that goal setting and self-monitoring are the two most significant behavioral components in weight loss. Current guidelines recommend goal setting as part of the CLI and encourage a weight loss goal of 0.5-2 lbs per week.
- Research supports the use of telephone and web-based interventions and have found this to be a successful, cost effective approach to weight loss.<sup>3,6,7,11,12</sup>
- Group interventions have also proven effective in the rural setting as well. Church-based interventions, work-based interventions, community interventions, and family based interventions have all illustrated significant weight reductions among participants.<sup>10,11</sup>

### Recommendations

- It is likely, given the epidemic of obesity and its ill effects, that there may be a need for a variety of interventions at many levels.<sup>15</sup>
- Utilize community strengths to better manage weight loss.
- Encourage and/or have signs-ups available for patients to participate in carpooling in order to allow for transportation to and from necessary appointments.

- Offer extended office hours to allow for transportation.
- Encourage activities such as sledding, cross-country skiing and swimming during weather extremes; advocate for a water aerobics class.
- Partner with other specialties and advocate for the use of video-based telemedicine to offer weight loss services not currently provided.
- Promote web-based weight loss support groups and/or programs.
- Utilize church and community-based weight loss interventions. For example, organize a local walking or cycling club. Develop an educational program to address prevention and management of obesity.
- Partner with local farmers or groups such as the American Community Gardening Association to teach basics about starting and maintaining gardens.
- Work together with IT to customize and improve electronic health records catered to the population you serve.
- Delegate appropriate counseling to other staff members or develop a written/electronic method for counseling.
- Familiarize staff with current evidence-based guidelines.
- Create clinical policies and procedures that address obesity treatment.
- Schedule more frequent follow-ups for the obese patient.

Partner with local, state, and government policy makers to discuss options for development of a designated walking/cycling trail, a fitness facility, positions for traveling nurses/dietitians/etc.

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