IMPROVING SCREENING OF EATING DISORDERS IN RURAL COMMUNITY ADOLESCENTS

by

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ABSTRACT

Eating disorders are the least likely to be screened for in adolescents aged 12 to 21 years. In many rural communities the only screening done is during a school physical questionnaire in which the child is asked if they are happy with their weight. Many clinicians are not comfortable investigating these concerns and are unsure what resources are available. A rural clinic was observed to have no formal screening tool in place for eating disorders among adolescents aged 12 to 21 years. This project sought to improve screening in the stated age group within the clinic setting. The SCOFF screening tool, consisting of five questions, was administered to adolescents during any clinic visit to any of three providers in the facility. Nursing staff offered the SCOFF tool during intake of the patients and prior to seeing the clinician. Out of 67 patients who were seen in an 8-week period, 19 were offered the SCOFF screening, equating to an overall 28.4% increase in screening. Plan-Do-Study-Act (PDSA) evaluations were done at 4-week intervals with the intention to further improve the number of screenings. This did improve screenings periodically throughout the project showing improvement in some weeks as high as 100%.

Keywords: eating disorders, adolescent, screening, SCOFF screening,

CHAPTER ONE

INTRODUCTION

Screening the Adolescent for Eating Disorders

Eating disorders (ED) are a hidden threat among adolescents aged 12 to 21 in the United States and many other countries. Pressures to be thin or a specific size are increasing with media access throughout the world. Negative body images accompanied by restrictive dieting are likely to be risk factors for EDs. Although the documented percentages for EDs in children appear low at 4.8%, the percentage of screening is also suboptimal (Campbell & Peebles, 2014). According to Lindvall, Dahlgren, and Wisting (2016), only around 30% of all individuals, including adults, are being screened for EDs in any given region. An increase in screening needs to be accomplished by providers in order to better serve our communities and improve outcomes of these young lives. The problem is that screening of adolescents is inconsistent or lacking completely, thus leading to the purpose of this project to increase screening of adolescents aged 12 to 21 to 50% of patients in a rural clinic.

Significance of Problem

The National Institute of Mental Health (NIMH, 2017) reports three major EDs including anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED). The lifetime prevalence of an ED among adolescents is 2.7% and twice as prevalent in females compared to males with peak age being 13 to 18 years (NIMH, 2017). The percentage rises as children age into adulthood. Comorbidities associated with rapid weight loss in relation to an ED include

hypothermia, arrhythmias, hypotension, and orthostasis, even at normal weight ranges (Golden, Schneider, Wood, Committee on Nutrition, & Committee on Adolescence and section on Obesity, 2016). Pancreatitis, gallstone formation, electrolyte disturbances, amenorrhea, and osteoporosis can also become issues with prolonged starvation or rapid weight loss (Golden, et al., 2016). Chronic purging may result in cardiomyopathy and patients with AN may suffer from mitral valve prolapse and pericardial effusion (Campbell & Peebles, 2014). Individuals hospitalized with an ED more often were also diagnosed with an additional mental health disorder. In a study of 2,400 patients with an ED, 94% were also diagnosed with a mood disorder, mainly major depression (NIMH, 2017). The mortality rate of AN in adolescents is 6% (Campbell et al., 2014). BN mortality rate is around 2% and has been linked to higher rates of suicide and suicide attempts (Campbell et al., 2014).

Vulnerable populations include Jewish females, who have ED rates at almost 50% higher than the general United States' diagnosed population (NIMH, 2017). Homosexual males are more likely to report fasting, vomiting, and trying laxatives or diet pills (NIMH, 2017). These men also are seven times more likely to report bingeing and 12 times more likely to report purging in comparison to heterosexual males (NIMH, 2017). Nonetheless, EDs are more prevalent in heterosexual males (NIMH, 2017). Although similar rates of prevalence are observed among non-Hispanic whites, Hispanics, African Americans, and Asians in the United States, the individuals of color were less likely to receive treatment for EDs (NIMH, 2017). African American and Hispanic teenagers suffer from bingeing and purging at a rate of 50% higher than non-Hispanic whites (NIMH, 2017). A teenage girl from a low-income family is reportedly more likely to have bulimic behaviors than a teenage girl from a wealthy family

(NIMH, 2017). Substance abuse is a problem for around half of diagnosed EDs and reportedly at a higher rate than the general population.

Hospitalizations for eating disorders have increased throughout the years. In those aged 45 to 65, hospitalizations increased by 88% in 10 years (NIMH, 2017). The number of men comprised a 53% increase in hospitalizations as well (NIMH, 2017). From 1999 to 2006, hospitalizations of children aged 12 and younger represented a 119% increase (Rosen & The Committee on Adolescence, 2010). The NIMH only budgets for thirty million dollars in research for all EDs combined (NIMH, 2017), which is concerning as these disorders seem to be progressively problematic. With increasing rates of identified EDs, healthcare costs are rising in response. A patient with identified concerns may seek treatment through primary care, then be referred to a mental health specialist or hospitalized for treatment. Not only is this process a financial burden, it is an inappropriately designed management of care if screening can provide early detection of disease.

Screening for EDs is done to identify risk for developing disease or in individuals who have a disorder but are not yet symptomatic, rather than used for specific diagnosis (Rindahl, 2017). Only 14 states have mandated programs to monitor students' body mass index (BMI) and these are not considered screenings for EDs, as there are no national standards for screening of EDs (Rindahl, 2017).

Clinics and patients in rural areas may suffer financially when there are too few professionals available to treat ED patients because some patients are referred to other locations, reducing local clinic revenue. For example, institutions that treat EDs may be as far as 250 miles away, thus creating not only a loss of service but financial burden for the patient. By screening

for EDs and utilizing the care offered in rural regions, costs can be reduced for the patient and revenue increased for the institution.

In addition, medication costs for patients may be substantial if being treated as an outpatient, as ED patients are treated for a coexisting condition. The most effective treatments observed are cognitive behavioral therapy (CBT) and family-based treatment (FBT) (Campbell et al., 2014). Revenue for clinics may substantially increase with both treatment options as neither contain a specified time frame and often are long-term treatment with multiple sessions per month.

Scope of Problem in Community

According to the Superintendent of Schools in the area (personal communication, September 19, 2020), the total number of students in the region's public schools aged 12–18 is around 650 students, which could indicate at least 17 students with a possible eating disorder. Vulnerabilities of this population include living in a rural area, the heavy stigma of mental health disorders and treatment, and having no current screening methods or treatment protocols. Moreover, if screening is implemented, it could identify high risk behaviors that can be addressed early in life leading to improved outcomes. Prior to this project's implementation, none of three clinic providers performed screening for EDs. Subsequently, a needs-assessment and SWOT analysis were conducted (Figure 1).

Figure 1. SWOT Analysis

Strengths	**Weaknesses**
• Aligns with organizations' mission/values • Need for screening • No current standard for screening	• Research incomplete • Small patient sample • Narrow project timeframe
Opportunities	**Threats**
• Community engagement • Increased caseload • Decreased patient costs • Increased clinic revenue	• Community stigma of mental health disorders • Patient sample fear • Provider non-acceptance • Inconsistent screening

Prevalence of Screening—Problem

Screenings for EDs are not consistently performed, resulting in diseases that may be overlooked. Screening procedures range from interviews to self-reports, both of which can be quite lengthy and therefore cumbersome for an adolescent. The most frequently accessed clinic for adolescents in the region also has an involved behavioral health outpatient clinic. The population of this county services surrounding regions and has access to three pediatric providers, including two physicians and a nurse practitioner. The providers throughout the clinic have seen patients for EDs in small numbers. However, screening is not accomplished at any regular interval. Currently, sports physicals require students or parents to fill out a questionnaire

that includes a question on weight and if the student is happy with their weight. Under normal circumstances, sports physicals are done with haste and one-on-one time with students is not extensive; therefore, interviewing for EDs may be rushed. Due to the inconsistency of screening, EDs then may be overlooked by providers in this rural community. At the project site, there is not a standard for screening of adolescents for EDs and, in the past, they have been addressed when help is sought from parents. The pediatric providers do not use a standardized ED screening tool for adolescents, but instead use an interview process for determining risk only when physical signs are observed or parents report concern.

Purpose

The problem is that screening for EDs is not routinely conducted at the clinic; therefore, the purpose of this project was to improve screening of EDs by 50%. Aligning care of community members with the current mission and values of the clinic, referred to herein as Eastern Montana Clinic (EMC) can be done by adding a screening protocol to patient charts. Improvement of screening may lead to identification of disease processes creating an opportunity to treat patients early leading to improved outcomes.

Clinic Benefit

The clinic is located within and associated with a rural critical access hospital. The mission of this facility is stated as being committed to caring, healing, and a healthier community (EMC, 2019). The vision of this organization is to promote patient-centered care, achieve cost efficiency through progressive and effective resource management, and serve as a catalyst for a growing network of collaborative partners (EMC, 2019). Adding the screening to the rural

community members would further fulfill the mission to promote patient-centered care. Cost efficiency can be achieved by offering care through the clinic and reducing travel costs to patients. The clinic may not be able to manage severe ED cases; therefore. would seek out and utilize collaborative partners, such as the outpatient behavioral health clinic, which will add continuity of care. There is a unique opportunity to improve care for many surrounding counties as the clinic is the only one that offers a multidisciplinary team including behavioral health. As this is the only behavioral health clinic in this region with a staffed psychiatrist, it offers an increase in referrals if the screening can be implemented in counties just outside of the region.

As mentioned previously, the clinic may see an increase in revenue related to the treatment offered for EDs. To prevent delays in care, brief screening tools for EDs are available. Fortunately, the clinic has a behavioral health specialty clinic, which offers a local continuity of care option that may be appreciated by most individuals and families.

CHAPTER TWO

REVIEW OF LITERATURE

An extensive review of literature was performed to better understand the gravity of the disease processes and screening thereof. A variety of creditable organizations were searched including: American Academy of Pediatrics (AAP), National Eating Disorders Association (NEDA), National Institute of Mental Health (NIMH), American Academy of Family Physicians, Centers for Disease Control (CDC), and Medscape. In addition to these organizations, a search was conducted for peer-reviewed research utilizing the following databases: PubMed, Google Scholar, CINAHL, Web of Science, ProQuest, and Cochrane Databases. These databases were useful in locating research related to incidence, prevalence, screening recommendations, treatment, definitions of disease, and financial implications on practice.

Evidence shows that only a small percentage of EDs are accounted for, in part related to little screening being done of any age group. As EDs are considered to be mental health disorders according to DSM-V criteria, many individuals are not identified as having an ED in primary care (Campbell et al., 2014). Mental health disorders refer to any condition that affects mood, thinking, and behavior (NIMH, 2019). To better quantify the situation and include EDs among all mental health disorders, a review of all mental illnesses was done showing that less than 50% of individuals are even consulted for any mental health disease (NIMH, 2019). Screening and referrals to mental health professionals has improved, but still are lacking overall.

Data show that AN has the highest mortality rate of any mental health disorder (Campbell et al., 2014). Suicidality rates or suicide attempts in BN are much higher in comparison to other

EDs (Campbell et al., 2014). Comorbidities such as depression lead to further difficulties in recognition of EDs and treatment.

Johns, Taylor, John, and Tan (2019) discuss primary care settings as the first place patients go for any health-related concern, including EDs. However, general practitioners often feel unprepared to recognize and manage EDs, leaving these diseases up to specialists (Johns et al., 2019). Due to this deferring, patients may experience longer wait times, prolonged illness, and further difficulty of recovery from EDs (Johns et al., 2019). Johns et al. (2019) suggest more training and support for primary care providers as they may encounter EDs in general practice. Screening for EDs is the first step in identification and therefore a promising starting point for primary care providers.

Definition of Eating Disorders

Anorexia Nervosa

According to NEDA (2018), adolescents suffering from AN have 10 times the risk of dying compared to their peers. Individuals with AN have the conception of being overweight even when underweight. These individuals may starve themselves, binge, purge, exercise excessively, or use laxatives, but the hallmark of the disease is dangerously low weight.

Diagnostic criteria specific to DSM-V of AN includes restriction of calorie intake relative to requirements needed leading to a significantly low body weight for age, sex, developmental trajectory, and physical health (Substance Abuse and Mental Health Services Administration, 2016). Furthermore, criteria include an intense fear of weight gain or persistent behavior to avoid weight gain, a body image disturbance, and lack of recognition of low body weight (Substance Abuse and Mental Health Services Administration, 2016). Specific definitions exist for rating

severity of AN using the patient body mass index (BMI). Mild rating includes a BMI of greater than or equal to 17 kg/m^2, moderate is a BMI of 16 to 16.99 kg/m^2, severe is a BMI of 15 to 15.99 kg/m^2, and extreme rating involves a patient with a BMI lower than 15 kg/m^2.

Bulimia Nervosa

This disease is characterized by short periods of binge eating with a sense of inability to stop eating (NEDA, 2018). Individuals will then try to prevent weight gain by inducing vomiting, misusing laxatives, medications, fasting, or excessive exercise. These actions must be present once weekly for at least three months to be qualified for diagnosis. Signs and symptoms pertinent to the disease include: uncomfortable eating around others, development of food rituals, skipping meals, disappearing after eating, unusual swelling in cheek or jaw area, calluses on backs of hands, tooth discoloration, socially withdrawn, bloating from fluid retention, frequent dieting, and extreme mood swings (NEDA, 2018).

DSM-V criteria for BN include objective binge eating within a 2-hour period, which is defined as a larger amount of food intake in comparison to most people (Allen et al., 2013). Added to that is a sense of loss of control or inability to stop eating in that time period (Substance Abuse and Mental Health Services Administration, 2016). Additionally, compensatory behaviors may include self-induced vomiting, laxative abuse, medication use, fasting, or excessive exercise (Allen et al., 2013). Over-evaluation of weight with heightened importance and a BMI over 10th percentile for age and sex (Allen et al., 2013). The Substance Abuse and Mental Health Services Administration (2016) also notes severity of disease, including mild, which is defined as one to three episodes of compensatory behaviors per week. A moderate-severity case is defined as an average of four to seven episodes of compensatory

behaviors per week, and the most severe case is defined as eight to 13 episodes of compensatory behaviors per week (Substance Abuse and Mental Health Services Administration, 2016).

Binge Eating Disorder

BED involves eating a large amount of food in a short period of time, sensation of loss of control, eating rapidly, eating until physically uncomfortable, eating when not hungry, eating alone related to embarrassment, marked distress about bingeing (NIMH, 2019). Warning signs of the disease include: disappearance of large amounts of food, discomfort eating around others, frequent attempts at fad diets, stealing or hoarding food, withdrawing to make time for bingeing, extreme concern about perceived physical flaws, feelings of guilt or disgust with self, fluctuations in weight, and low self-esteem (NIMH, 2019). Other physical symptoms may include stomach cramps and difficulty concentrating (NIMH, 2019). This particular ED presents confoundingly because it mimics depression in many ways and the individual does not present physically in a particular way.

Criteria for diagnosis of BED according to DSM-V include five criteria and are then rated as mild, moderate, severe, or extreme (Berkman, Brownley, Peat, Lohr, Cullen, Morgan, Bann, Wallace, & Bulik, 2015). Criterion one includes both eating a larger amount of food than most people would eat in a discrete period of time and a sense of loss of control over eating in that discrete time period (Berkman et al., 2015). Criterion two must contain three or more of the following: eating more rapidly than normal, eating until uncomfortably full, eating large amounts when not physically hungry, eating alone due to embarrassment in the amount of food intake, and feeling disgusted, depressed, or guilty after overeating (Berkman et al., 2015). Criterion three involves marked distress over binge eating (Berkman et al., 2015). Criterion four discusses

occurrence of behaviors of either at least two days a week for six months or one day a week for three months (Berkman et al., 2015). Lastly, criterion five establishes that no compensatory mechanisms are used, such as vomiting, laxatives ,or excessive exercise, during the interval of binge eating (Berkman et al., 2015).

Obesity

Obesity in adolescence is determined by the body mass index (BMI) being at or above the 95th percentile of the same sex and age (CDC, 2018). In regard to addressing obesity among adolescents, misinterpretation of healthy weight recommended by professionals and other sources can lead to EDs while the teen pursues a healthy weight. Furthermore, if a goal weight is achieved via ED the child subsequently becomes obsessed with weight loss and may develop further image distortion (Golden, et al., 2016).

Screening Methods and Overview of Tools

SCOFF Tool

The SCOFF questionnaire was designed in 1999 to be simple and memorable (Morgan, Reed, & Lacey, 2000). Initially, this tool was designed to expose AN and BN in primary care. However, because of the dichotomous response options and direct nature of the tool, it can be used to investigate other ED concerns (Morgan et al., 2000). The five questions follow the acronym as follows: sick, control, one, fat, and food (Appendix E). Sick seeks to determine if the individual makes themself sick because they feel uncomfortably full. Control is related to a loss of control during eating. One corresponds to loss of one stone, or 14 pounds, in a three-month

period. Fat explores whether the individual perceives themself as fat when others refer to them as thin. Lastly, food looks into whether the individual consistently thinks about food.

Patients respond “yes” or “no” to each question, and one point is allotted to each “yes” response. If the score is greater than 2, further investigation of an ED is warranted as the risk for an ED presents. Garcia, Grigioni, Allais, Houy-Durand, Thibaut, and Dechelotte (2011) showed that, when compared to a structured interview, the SCOFF tool had a specificity of 94.7% and sensitivity of 94.6%. The literature shows variability in the sensitivity and specificity of the SCOFF tool, but it has been shown to be effective at diagnosing more EDs other than AN and BN (Rindahl, 2017). Final results of a meta-analysis showed a pooled sensitivity of 86% and specificity of 83% resulting in a high validity in use of the SCOFF tool (Kutz, Marsh, Gunderson, Maguen, & Masheb, 2020).

Other Tools

There are numerous tools that have been shown to successfully screen for risk of EDs, including Eating Attitudes Test-26 (EAT-26), the Eating Disorder Examination (EDE-Q), Eating Disorder Diagnostic Scale (EDDS), and NEDA (Fitzsimmons-Craft, Karam, Monterubio, Taylor, & Wilfley, 2019).

The EAT-26 is a 26-item questionnaire that addresses general eating disorders; if 20 of 26 items are present, this identifies problematic behaviors with eating (Fitzsimmons-Craft et al., 2019). The questionnaire is a self-report and answers are measured by a 6-point rating scale from never to always (Fitzsimmons-Craft et al., 2019). However, questions that focus on preoccupation with food or thinness are not part of this questionnaire and should have more emphasis when screening adolescents (Rindahl, 2017).

The EDE-Q involves a clinician interview and may be considered the method of choice for ED-specific diagnosis (Fitzsimmons-Craft et al., 2019). The scoring system is moderately complex and measured by frequency of behaviors rated from 0 to 6, as well as a write-in response (Fitzsimmons-Craft et al., 2019). This screening tool can take a considerable amount of time relating to the 36 items and write-in response.

The EDDS is a 22-item questionnaire and is designed for individuals suspected of AN, BN, and BED (Fitzsimmons-Craft et al., 2019). The questionnaire uses a 7-point rating system, "yes" and "no" responses, and behaviors specific to ED measured on a 0–14 frequency scale (Fitzsimmons-Craft et al., 2019). The scoring system of this tool is moderately complex and time-consuming (Fitzsimmons-Craft et al., 2019).

The NEDA questionnaire is applicable to ages 13 and older (NEDA, 2018). The questionnaire is taken on the NEDA website and refers the user to seek treatment if screening indicates a potential for an ED. Although there are links associated for the user to explore once the questionnaire is completed, it is lengthy and does not happen in a clinical setting for monitored treatment and care.

Strengths and Limitations of Literature to Planned Practice Change

The literature repeatedly suggests that the SCOFF tool is easily applied and effective for adolescents, but is not yet validated in this age group designed for the family practice setting (Campbell et al., 2014). Follow up of screenings is observed to be a weakness and may account for variable specificity and sensitivity of screening tools (Rindahl, 2017).

Strengths include that many of the studies utilizing the SCOFF tool have a sufficient number of participants adding power to the research. The American Academy of Pediatrics (AAP) recommends using the SCOFF tool in many publications, thus showing the applicability of the tool among pediatric patients (Campbell et al., 2014). Morgan, Reed, and Lacey (2000) studied individuals diagnosed with an ED and included ages 18–40 years with false positive rates at only 12.5% and a 100% sensitivity.

Barriers of screening found among the literature are reported as time constraints, that the SCOFF tool has not been studied to generalize gender and cultures, and inexperience of use among screening tools (Rindahl. 2017). Many health professionals desire a well-validated, universal screening protocol for EDs in primary care, yet one does not exist (Johns, et al., 2019).

Summary of Practice Change

Of importance to this project is that currently no screening was being done, and utilizing a brief and easily applied screening tool would help identify risk of EDs otherwise being neglected. It appears as though screening for EDs in adolescents is lacking and, therefore, unrecognized and managed in primary care settings (Campbell et al., 2014). NEDA (2018) states the negative consequences of EDs and outlines the importance of early identification and treatment to improve outcomes. Important to note is that EDs in adolescents often carry over to adulthood with repeated behaviors and potential for further risk (NEDA, 2018). Barriers to consider in the rural primary care setting include the current approach to EDs, if any, decreased comfort of screening for both provider and patients, and gaps in recommendations for treatment.

As this rural practice has the ability to offer follow-up and treatment within the community, screening is necessary to offer these services. Multiple clinical guidelines offered by

the AAP, American Psychological Association (APA), and American Academy of Family Physicians are synergistic, and two of three specifically recommend the SCOFF tool for screening.

CHAPTER THREE

METHODOLOGY

Theoretical Framework

The Stages of Change Model is one that focuses on readiness to change at an individual level. The model was applied to this project due to the lack of current screening. The change behavior occurs in five stages that include pre-contemplation, contemplation, preparation, action, and maintenance (Zimmerman, Olsen, & Bosworth, 2000). In the precontemplation stage, individuals do not seek change for a number of reasons, including denial. Contemplation brings ambivalence and they start to evaluate obstacles and advantages. Preparation is undertaken when the individual chooses to make progress toward change, even if done through experimentation. The action phase then is the actual demonstration of change with consistency. Lastly, maintenance happens when there is effort toward preventing a relapse to any prior stage and the change becomes established.

Education in screening for EDs of the individuals involved in delivery of the screening tool will assist in the behavioral changes necessary to increase screening for EDs. The Stages of Change Model will also move any individuals from a point of apprehension about the screening into a decision to apply the change effectively.

Agency Description

The clinic was in a rural region of Montana and currently employs three providers who offer care to adolescents. Each provider is supplemented with an individual nurse who assists in

managing their practice. The nurse is responsible for preparing each patient for an exam, which presented a favorable time to initiate screening. All patients seen by the pediatric providers are checked in through the family practice suite. The suite usually contains two patient access representatives to accommodate patient check-in.

Current Screening Method at Site

At the clinic, a nurse most often rooms a patient and could easily administer the screening questionnaire at that time. The Stages of Change Model was utilized to drive this implementation as it offers education, increased motivation, and communication for the clinic staff.

Project Design

Participants included 12- to 21-year-old patients who are seen in the family practice suite by the three providers stated previously. It was recommended that all visits, including well child exams and acute visits, be utilized for screening. A packet was designed and given to the three providers and nurses including the SCOFF screening tool, instructions for scoring, and information to assist in care management. The behavioral health outpatient clinic was contacted and willing to manage referrals if EDs were identified. The nurses in the clinic were informed of the SCOFF screening tool in order to account for when staff nurses were out on leave.

SMART Goals

The objective of this improvement project was to increase the amount of screening in adolescents aged 12–21 years in a rural setting. Screening was done utilizing the SCOFF tool and was monitored weekly over an 8-week period. These objectives were monitored weekly for

improvement and, every four weeks, a plan-do-study-act (PDSA) cycle was completed in order to achieve an outcome of increased screenings to 50%. The final evaluation of improvement in ED screening was done at eight weeks by measuring total visits divided by SCOFF screened individuals.

Project Methods

Providers reported not screening patients prior to the induction of this project, which prompted a need for improvement in screening. Current literature was appraised to support the use of the SCOFF screening tool. The SCOFF screening tool was chosen because of its broad identification for disorders as well as succinct and simplistic questionnaire. The SCOFF screening tool was originally intended for family practice screening and was found in the literature to be successfully utilized on the adolescent population.

A SCOFF screening was provided to all individuals aged 12 to 21 at all visits encountered by three providers in the clinic. The nurse of each provider offered the screening and allowed patients to either fill it out on their own or with a parent. Because of minimal improvement at four weeks into the project, reception also offered the SCOFF screening upon the check in process to increase the rate of screening. The completed screenings were delivered either directly to this author or to a specified collection bin in the clinic.

Patients only provided limited demographic data including date, gender, and age. No other patient identifiers were collected in order to protect privacy. The Montana State Investigational Review Board (IRB) exempted the project from full review.

At the outset of the project, the clinic nursing staff were approached to begin initiation of the project. General information of the project was presented regarding screening, how to

administer, and where to file screening forms. Once approval from the IRB was granted, each nurse supplementing the providers in the clinic were individually approached and asked to begin offering the screening forms. The IT department at the clinic was informed of the need for reports containing only pertinent information of the patients seen by the providers included in this project. A mock report of dates, gender, type of appointment and provider was generated to assure no identifying patient data were exposed. The nursing staff reported offering the screening tool and had no concerns or questions regarding screening. Every Monday, a report was generated from the organization's IT department and sent via email to this author who entered the descriptive statistics and SCOFF screenings into an Excel spreadsheet. Information entered into the Excel spreadsheet included date, whether screening was offered, gender, score, appointment type, and age of patient. The Excel spreadsheet was saved in a personal computer with a lock access feature to provide security of screening results. A process map was designed to show the projects method (Appendix E).

CHAPTER FOUR

OUTCOMES

This improvement project sought to increase screening of EDs in adolescents aged 12–21 years in a rural setting. All patients in the age group were eligible to be screened, and the screening was accomplished by two providers' nursing staff. This improvement project was essential because of the lack of screening done in this region.

Evaluation

PDSA cycles are performed for planning to test a change, carry out testing, study the progress or lack thereof, and act on what can be improved (IHI, 2021). This tool was chosen to reflect on the process of the ED screening and to make improvements to the project outcomes. The Plan stage helped to choose the best method of offering the SCOFF tool. The Do stage tested at what frequency the nursing staff was offering the SCOFF tool. The Study phase measured how often screening was being administered, and the Act stage provided the opportunity to improve the percent of individuals screened.

Screening forms were gathered weekly and PDSA cycles were executed for further evaluation every four weeks. In the first 4-week period, the goal was not met and the PDSA cycle revealed a variance in percentage of screening from week to week, as well as no screening in week two. A revised implementation plan was accomplished that allowed screenings to be offered by reception staff as well as nursing staff. Reception management and staff were agreeable to offer screenings during the check-in process. Data were then reevaluated via the PDSA cycle after another four weeks. Because the goal of 50% screening increase was achieved

at some of the weekly intervals, no additional adjustments were made. Also to note, the project reached a termination date at eight weeks. As depicted in Table 1, weekly screening rate was variable, but 100% was achieved twice in the final three weeks of implementation, suggesting an upward trend in compliance.

Screening

Data were collected over an 8-week period and revealed a 28.4% overall screening rate via the SCOFF screening tool of adolescents aged 12–21 years. A total of 67 individuals within the age range were seen in the clinic including 24 males and 43 females. Of the male patients, five were screened (20.8%), and of the female patients, 13 were screened (30.2%) with the SCOFF questionnaire. One 12-year-old female refused to fill out the SCOFF screening form; however, this was counted into the screening percentage because the SCOFF was offered. Table 1 and Figures 2 and 3 offer graphic representations of the patients screened and variance in percentage from week to week.

Fourteen individuals scored a zero total on the SCOFF screening, three scored a 1 and one individual scored a 2. Of the screenings that scored above a zero, three individuals marked “yes” to question 4 relating to feeling fat although others tell them they are not. The individual who scored 2 marked “yes” on questions 1 and 3. Two females who scored a zero had previously marked “yes” to question 2, which states a loss of control over their eating, and then scratched out the “yes” answer.

Figure 2. Screened Visits

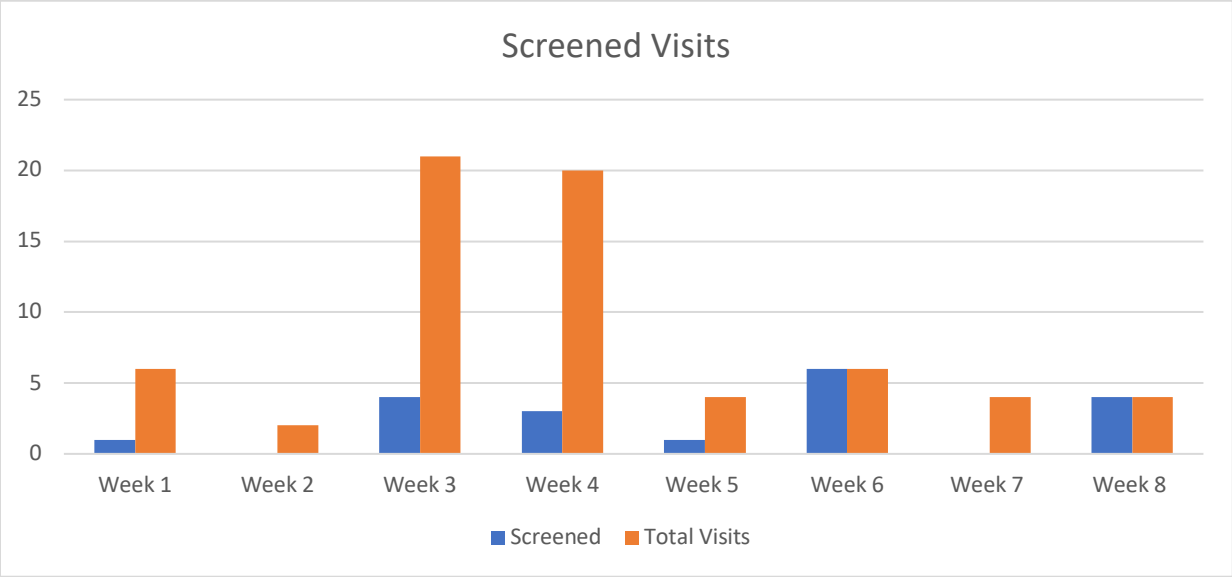
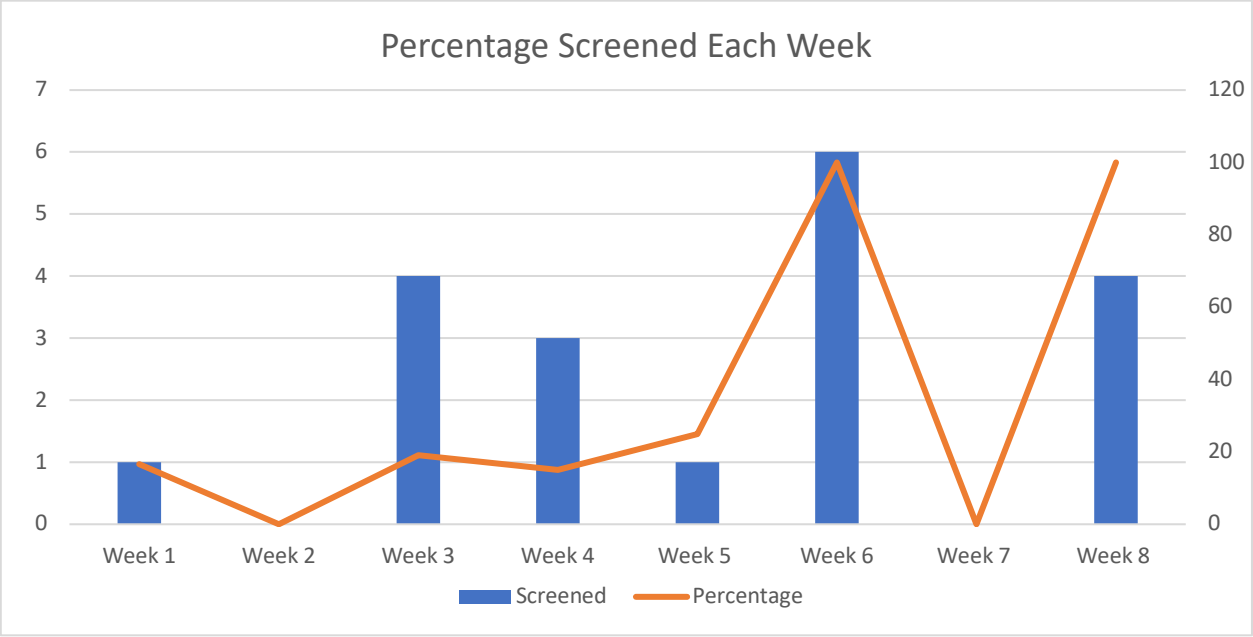


Figure 3. Percentage Screened Each Week



Nursing staff who offered the questionnaire to patients were interviewed separately after the 8-week project was completed. One medical assistant (MA) reported having difficulty remembering to offer the screening tool and, therefore, reported missing opportunities. One nurse did not have any patients in the age group screened and, therefore, did not participate in this project. The last nurse who saw the majority of the patients in the age group screened reported easy use of the tool, but had trouble remembering since she was training other staff and often had nursing students, which made it difficult to complete screening.

Table 1. Variable Screening Rates

	Screened Cases	Total Visits	Percent Screened
Week 1	1	6	16.7%
Week 2	0	2	0%
Week 3	4	21	19%
Week 4	3	20	15%
Week 5	1	4	25%
Week 6	6	6	100%
Week 7	0	4	0%
Week 8	4	4	100%

CHAPTER FIVE

DISCUSSION

The primary aim of this project was to increase screening of EDs among adolescents aged 12 to 21 years in a rural clinic setting. The SCOFF screening tool for EDs was administered by nursing staff at a rural clinic to improve screening, which had not been occurring prior to the project. There was an overall 28.4% screening rate compared to no previous screening performed for eating disorders with the SCOFF screening tool. As discussed in data analysis, one of the nurses reported easy use of the screening tool, which reflected the literature as well. The goal of 50% screening was not met overall, but was seen in two weeks out of eight during the span of the project.

Practice Impact

The evidence of EDs having a direct impact on financial, mental, and physical repercussions is discussed heavily in the literature. Campbell et al. (2014) discuss preferred treatment of patients in the home, goals of treatment to provide psychological recovery, and prevention of physical repercussions of disease. There is a lack of ED screening in the family practice setting, which is where most adolescents are seen by clinicians. Obvious barriers that clinicians face in regard to screening include time, education, comfortability, and necessity.

The majority of screening completed in this project was negative for EDs. Just under 30% of those eligible were screened and four (22.2%) of those scored 1 or above. One patient scored a 2 indicating the risk for potential ED. This finding mirrored the literature as only a small fraction of individuals may be affected with an ED and only around 30% are being screened. A

concern of the result is the number of individuals not screened, which equated to 71.6% of total visits. If the rate of positive screenings were to remain consistent among those who were not screened, it is possible that an additional nine potential EDs might have been identified. The SCOFF questionnaire proved to be a succinct tool for nursing staff and could be applied easily by a clinician during the interview process.

Another concern is individuals not being screened in the community due to the lack of clinical visits. For example, during an interview with a mother in the rural community. it was revealed that her son has made persistent restrictions to his diet in order to comply with the other student's expectations and, in one summer, lost over 25 pounds (Anonymous, personal communication, September 19, 2020). These behaviors warrant investigation, which is withheld because of stigma related to mental health diagnoses, rural community bullying, and parental concern of causing distress on the child. Unfortunately, these cases go without inquiry because the child is not brought into the clinic and the mother is afraid of behavioral consequences or further progression of ED. School nurses and counselors offer another avenue to screen adolescents for EDs and can refer to the behavioral health outpatient clinic without a primary care visit.

Behavioral health professionals were at the ready for any patients during this improvement project and, thankfully, were not needed. However, it is important to highlight the importance of their role in follow-up of patients with EDs. The addition of this specialty offers continuity of care to help the patient reach a maintenance phase through collaborative care.

Challenges

This project was implemented in a clinic in which this author works, and potentially resulted in a laissez-fare response to screening. All providers' nurses were educated individually about the screening project. Monthly meetings were not used for educating staff on ED screening due to the use of virtual meetings and lack of access to microphones and cameras through interface models. Utilizing a monthly meeting setting may have added increased consistency in screening as more staff would have been educated on screening. Meetings also were not easily organized due to social distancing and time constraints. Acute visits to the clinic were reduced in comparison to the year prior to the pandemic. Additionally, there was a lack of consistency among nursing staff as reported due to training of new staff to cover positions, precepting student nurses at variable shifts, and an increase in adult patient visits related to clinicians leaving the practice. This increase in adult patient visits limited the appointment availability for pediatric visits. Although a PDSA cycle was done at week 4 to offer SCOFF screening during the check-in process, reception staff reported forgetting to ask any patients to fill out the screenings. Unfortunately, this could be due to lack of training or additional workload and further distraction.

Information Technology (IT)

Reports were provided via the organization's IT team, but duplications were identified in the reports. Initially, this was thought to have been appropriately managed, but further investigation demonstrated continued duplication of visits. This was discovered after a report was generated showing no visits in week 3, yet completed screenings were collected for that week. A concern then became that appointments may have been no show, cancelled, or

rescheduled and been populated into the reports. The IT staff was unable to mitigate the problem and this author had to manually investigate each visit. Each clinic visit was investigated during the 8-week time period to evaluate if the IT-provided reports were accurate and what adjustments needed to be made. To assure the veracity of this reconciliation, another staff member duplicated the process and verified the final list. The result reported in this document was based on the final list.

Strengths and Limitations

A strength of this project was the adolescent's willingness to be screened, which yielded useful screening information. Only one out of 19 refused screening, and most screenings were negative, which was consistent with the literature. Also, a variety of males and females were able to be screened.

The ED screening was implemented at a small, rural community and outcomes may not reflect other communities. The total eligible for screening included 67 out of an estimated 900 adolescents in the community. More time to complete PDSA cycles and evaluate lack of screening may have added value to this project. This improvement project lasted only eight weeks and was hoped to go longer to further the change process, which may have yielded different results.

Lessons Learned

Education for improvements is imperative to establish buy-in and keep progressing toward outcomes. The Stages of Change Model directly addresses the steps necessary to create the buy-in needed and improve outcomes. By approaching staff one-on-one, the number of staff

who could offer the screening was limited and prevented a collaborative opportunity for voicing questions or concerns. A solution to this could have been a presentation during a monthly meeting with a small gathering of nursing staff to encourage progress.

Fewer patients were being seen in the clinic due to the pandemic and time of year. It would have been helpful to lengthen the project to at least a 12-week period in order to implement two to three PDSA cycles and potentially gain further improvement in screening. Also, it may have been an option to expand use of the screening tool to the Urgent Care Clinic and the Emergency department to increase opportunities for screening.

Doctor of Nursing Practice (DNP) Essentials

The primary DNP Essential addressed in this project is Number II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking. This Essential encompasses dissemination of research into practice, developing clinical practice guidelines, and evaluating practice outcomes (AACN, 2006). The literature review was completed to ensure the capture of this Essential and revolved around simple use of a tool to apply in a family practice setting in regard to EDs. This project was implemented to monitor and improve healthcare outcomes in an adolescent population with potential EDs.

DNP Essential VI is Inter-professional Collaboration for Improving Patient and Population Health Outcomes. Essential VI focuses on leadership through effective communication and collaboration skills (AACN, 2006). This project sought to improve a standard of care for adolescents who are vulnerable to EDs and were not being screened prior to this project. The clinicians and nursing staff providing care to the adolescent population were approached and very willing to participate in implementing a practice change.

Conclusion

The SCOFF questionnaire is a simple and quickly applied method of screening for EDs. The SCOFF tool is succinct enough for nursing staff to use during intake of patients and was applied and well accepted in this manner. Staff already have numerous tasks to perform in their daily routines and adding this questionnaire in a non-obstructive manner appeared unchallenging. Adolescents are not consistently seen in one specific area of the clinic even for well-child exams; thus, it was found to be of most value to offer the SCOFF screening at each primary-care visit.

Screening for EDs in any community is necessary for early treatment and success. It was beyond the scope of this project to investigate any positive screenings and would be precipitous to assume they were confirmed ED cases. However, the one positive screening was taken into careful consideration and investigated by the attending clinician. Although the aim of this project was a 50% increase in screening, and only 28.4% was reached, an improvement in screening was achieved. Providing education for staff in screening for EDs beyond this project has been accomplished.

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APPENDICES

APPENDIX A

EVIDENCE TABLE

Evidence Table

Citation:	Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses])
Author, Year, Title	**Theoretical basis for study – if none say NA or NONE**	**RCT? Correlation? Meta Analysis ? Also, what's the hypothesis/research question**	**Number, Characteristics, Attrition rate & why?**	**Independent variables (e.g., IV1 = IV2 =)** **Dependent variables (e.g., DV =)**	**What scales were used to measure the outcome variables (e.g., name of scale, author, reliability info [e.g., Cronbach alphas])**	**What stats were used to answer the clinical question (i.e., all stats do not need to be put into the table)**	**Statistical findings or qualitative findings (i.e., for every statistical test you have in the data analysis column, you should have a finding)**	**• Strengths and limitations of the study** **• Risk or harm if study intervention or findings implemented** • **Feasibility of use in your practice** • **Remember: level of evidence + quality of evidence = strength of evidence & confidence to act** **• Use the USPSTF grading schema http://www.ahrq.gov/clinic/3rduspstf/ratings.ht m**
1.	None	Informative	Multiple studies compiled to show prevalence	None.				This is a website that follows the eating disorders and prevalence.
2.		Systematic review	63 studies ranged good	Current facilitators	PRISMA checklist,	Descriptive stats,	All papers were	Level 1

			to fair, rated high for design, methodology, recruitment, analysis and overall	and barriers to eating disorder healthcare services and what conclusion can be drawn to make improvements.	Critical appraisal skills program list		scored 17 or higher, only one being a 17.	Strengths-wide range of perspectives and experiences researched. Weaknesses-lack of primary papers that focused on gaps in interface.
3.	None	RCT	191 adolescents aged 11-20. Danish primary high schools.	IV-psychometric properties of tool DV-SCOFF screening tool	Pearson correlation between SCOFF and EDI-subscales. Cronbachs alpha	ANOVA, CHI square	P=0.001, Pearsons r = 0.71 thinness, 0.57 bulimia, 0.64 body dissatisfaction; alpha=0.64 in total sample, 0.54 in Eds and 0.37 in healthy pts.	Level 2 Strengths – High reliability and validity in testing. Decent number of participants but could be considered small as well. IV was fulfilled for these participants. Limitations – could not follow up with some potential false negative/positives.
4.	None.	Systematic review	74 studies from 1996-2015. 39 Studies used	Assessment of EDs and prevalence were	PRISMA checklist and flow followed,	Two-stage design with point prevalence	Prevalence ratings were 1%-22/7% in	Level 1 Strengths = many studies used which contributed to over 40 different types of

			from 1000-5000 participants.	measured in studies reviewed.	verified ED screening methods evaluate for reliability	, interviews, 40 different screening tools used.	females. 0.3% to 0.6% in males. Point prevalence 1.1%-13.4%	screening instruments used. Large number of participants in many studies. Two studies used including child specific instrument. Weaknesses = only one database, Pubmed, was used to search for studies.
5.	None	Case report series. Reporting of prevalence of eating disorders and can clinical significance be identified.	5191 students in New South Wales Australia aged 11-19. 119 excluded because completed <10% of survey or other. 49.2% male, 48.4% female, 2.4% other	IV=eating disorder prevalence DV=no ED	McDonalds omega,	X^2 tests w/Bonferroni adjusted post hoc tests, binary multivariate logistic regressions, descriptive analysis	McDonalds omega 0.86/0.87 for physical functioning scale girls/boys and 0.9/0.91 for psychosocial functioning subscale. AOR for underweight, overweight and obese ranged 0.2-3.2	Level 5 Strengths- very little studies done to show prevalence in adolescents, this is most recent albeit in Australia. 1 in 5 adolescents met criteria for any DSM-5 eating disorder diagnoses. Very large sample and response rate, broad range of symptoms measured. Weaknesses-self reporting measures, studies show higher prevalence in self report versus interview. Students were asked to report over last one month, but diagnostic assignment requires 3 months. Distress and impairment were measured with generic versus disease specific.
6.	None.	Critically appraised review/rec	149 studies used to make review	None.	CPG like Not stated	CPG like not stated		Level 2 Strengths = statistics reviewed by body

		ommendations						system, recommendations from AANP suggested for prevention, treatment, and screening. Weaknesses = Variety of articles reviewed but not clearly distinguished as to how information gathered or specific validity and reliability.
7.	None	Systematic review/MA	25 studies with a total of 11, 531 study participants. Includes Europe, North America, Asia and South American regions	None, Systematic review/MA	PRISMA-DTA, PROS-PERO registered	QUADAS-2, risk of bias/applicability performed. Case controlled studies to evaluate specificity and sensitivity	Diagnostic Accuracy $p<0.001$-0.05. pooled sensitivity 0.86 and sensitivity 0.91. Heterogeneity sensitivity $I^2=98.22$ and specificity $I^2=98.22$.	Strengths= 25 studies reviewed with overall large study group of individuals. Limitations=unable to generalize results d/t most of studies were performed on young women. Highest sensitivity and specificity ratings were found in studies done on women already diagnosed with AN or BN

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8.

***Prompts for each column – **please do not repeat the headings, just provide the data**

APPENDIX B

REVIEW OF LITERATURE

Review of Literature

Databases

PubMed, Web of Science, Google Scholar, CatSearch, ProQuest Central

Keywords

eating disorders, adolescent, screening, SCOFF screening, prevalence of eating disorders, rural eating disorders

Needs

More information/research regarding rural adolescent screening eating disorders.

Options for care of patients with eating disorders to have ready for team to apply if necessary.

Solid CPG of best tools for screening and treatment guidelines as mentioned previously. https://pediatrics.aappublications.org/content/126/6/1240

Intro to the Literature being reviewed

Evidence table above notes articles already being utilized

Strengths and limitations identified in evidence table

Summary/Discussion of why practice change is appropriate

i. The current setting does not utilize any screening tools for eating disorders among adolescents. As the Behavioral Health clinic does see a number of adolescents they also are currently not using a screening tool and do not have experience with eating disorders of any age (I may have to really have my ducks in a row as these patients will be referred to our psychiatrist and social worker). As the prevalence of eating disorders has increased among adolescents it is necessary to screen children and help patients to develop healthy eating habits and image of self.

APPENDIX C

SCOFF QUESTIONNAIRE

SCOFF Questionnaire

Date:_____ Age:_____ Gender:_____

1) Do you make yourself Sick because you feel uncomfortably full?	YES/NO
2) Do you worry that you have lost Control over how much you eat?	YES/NO
3) Have you recently lost more than One stone (14 lb) in a 3-month period?	YES/NO
4) Do you believe yourself to be Fat when others say you are too thin?	YES/NO
5) Would you say that Food dominates your life?	YES/NO

Note: Morgan, J. F., Reid, F., & Lacey, J. H. (2000). The SCOFF questionnaire: A new screening tool for eating disorders. Western Journal of Medicine, 172(3), 164-165.

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL

INSTITUTIONAL REVIEW BOARD
For the Protection of Human Subjects
FWA 00000165

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MEMORANDUM

TO:

FROM: Mark Quinn CHP
tional Review Board for th

DATE: December 16, 2020

RE: *"Improving Screening in the Adolescent of a Rural Community for Eating Disorders" [RS121620-EX]*

The above research described in your submission of December 10, 2020, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, section 101. The specific paragraph which applies to your research is:

____ (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

__X__ (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation; and (iii) the information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by section 16.111(a)(7).

____ (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

____ (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.

____ (b) (5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

____ (b) (6) Taste and food quality evaluation and consumer acceptance studies: (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.

Ryann Smelser and Susan Luparell

Mark Quinn
Chair, Institutional Review Board for the Protection of Human Subjects

APPENDIX E

PROJECT METHODS PROCESS MAP

Project Methods Process Map