SCREENING ADOLESCENT FEMALES FOR EATING DISORDERS IN PRIMARY CARE

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Brooke Marie Thom

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By

Brooke Marie Thom

The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

DOCTOR OF NURSING PRACTICE

SUPERVISORY COMMITTEE:

Dean Gross, PhD
Chair

Allison Peltier, DNP

Tina Lundeen, DNP

Lisa Montplaisir, PhD

Approved:

2-22-2021
Date

Carla Gross, PhD
Department Chair

ABSTRACT

In recent decades, there has been an increased focus on the idealization of thinness and the pressure and expectancy to be thin, which contributes to a rising number of individuals that experience severe body dissatisfaction and body distortion, and in turn, eating disorders. Eating disorders are one of the most common chronic conditions within the youth population, approximately 13% of the adolescent youth population will suffer from at least one eating disorder by age 20, and a majority of those affected will be female. Rural health care providers encounter many health care disadvantages when detecting and treating eating disorders including physical location and distance to nearest healthcare or specialty service, ethnicity, and socioeconomic status. These disadvantages are often responsible for the inability of providers to prevent, screen for, identify, and treat eating disorders.

The focus of this practice improvement project (PIP) was to determine how primary care providers in a rural clinic perceived the implementation of the Screening for Disordered Eating (SDE) in adolescent females ages 11-19. During implementation, the providers were also to identify and refer those scoring 2 or greater to a counselor, mental health specialist, and/or eating disorder specialist. Implementation began with an educational meeting explaining eating disorders and their prevalence, as well as the introduction and explanation of the SDE tool. A survey was then completed by the providers to assess the relevance of the information provided to their practice. During the implementation period, providers were to screen all adolescent females ages 11-19 using the SDE tool and refer those scoring 2 or greater. Participating providers then completed a post-implementation survey assessing their perceptions on the ease, accuracy, and applicability of the SDE tool.

Overall, based on the post-implementation, providers believe screening for eating disorders is important and the SDE tool is easy and applicable to their practice. Screening for Disordered Eating completion rates (14.1%) and referral rates (17.4%) of those scoring 2 or greater were lower than expected. The prevalence of eating disorders continues to rise and continued use of the SDE tool in the primary care setting is strongly recommended.

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DEDICATION

I want to dedicate this dissertation to my dear friend and family member, Kenley Ann. Your struggle, but mostly your strength and perseverance, was the inspiration behind wanting to find a way to routinely detect eating disorders early in the adolescent female population. Your drive to recover, on both the good days and the bad, and the motivation to keep pushing forward is something we all can learn from. My hope for you is that you fulfill the successful, bright, and happy future that you are destined for. I will be here watching your success at every step and rooting for your health, strength, and happiness. You are stronger than you realize, more beautiful than you will ever see, and worthy of a life full of self-worth and self-love.

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To our child on the way: I entered graduate school solely for myself. I will exit graduate school knowing that this accomplishment was just as much for your father and you, as it was for me, I just did not know it at the time. I promise to teach you confidence and encourage your every dream. We cannot wait to meet you and guide you on this wild journey called life!

Lastly, I dedicate this dissertation to myself. I actually did it, and I could not be prouder!

TABLE OF CONTENTS

ABSTRACT iii

ACKNOWLEDGEMENTS v

DEDICATION vii

LIST OF TABLES xi

CHAPTER I. INTRODUCTION 1

Background and Significance 1

Eating Disorder Screening Tools 3

Screening for Disordered Eating 3

Problem Statement 4

Purpose of the Project 5

Objectives 5

CHAPTER II. LITERATURE REVIEW AND SYNTHESIS 6

Search Strategy 6

Diagnostic Criteria 6

Anorexia Nervosa 7

Bulimia Nervosa 8

Binge-Eating Disorder 8

Other Specified Feeding and Eating Disorders 9

Prevalence and Recurrence of Eating Disorders 11

Etiology and Contributing Factors 13

Identifying Eating Disorders 15

Health Concerns and Comorbidities 17

Screening Tools 20

Screening for Disordered Eating 21

Treatment 21
Challenges for Health Care Providers 25
Diffusion of Innovation Theory 27
Innovation Characteristics 29
CHAPTER III. METHODOLOGY 31
Project Design 31
Implementation Plan 31
Diffusion of Innovation over Time 31
Model for Evidence-Based Practice Change 32
Setting 35
Sample 36
Recruitment 36
Evaluation and Data Analysis 37
Data Collection and Analysis 38
Project Timeline 39
Resources 39
Institutional Review Board Anticipation 40
CHAPTER IV: RESULTS 41
Objective One: SDE Completion Rate 41
Objective Two: Referral Rate 42
Objective Three: Provider Feedback 44
CHAPTER V: DISCUSSION AND RECOMMENDATIONS 47
Interpretation of Results 48
Objective One Results 48
Objective Two Results 49

Objective Three Results 50
Limitations 52
Future Recommendations for Practice Improvement 53
Dissemination Strategies 55
Implications for Advanced Practice Nursing 56
REFERENCES 58
APPENDIX A. SCREEN FOR DISORDERED EATING 63
APPENDIX B. DISCRIMINATIVE ACCURACY OF EATING DISORDER SCREENING INSTRUMENTS 64
APPENDIX C. DIFFUSION OF INNOVATION THEORY 65
APPENDIX D. ADOPTION-DECISION STEPS 66
APPENDIX E. MODEL FOR EVIDENCE-BASED PRACTICE CHANGE 67
APPENDIX F. AGENCY LETTER OF SUPPORT 68
APPENDIX G. INFORMATIONAL MEETING CONTENT 69
APPENDIX H. VALUE OF EDUCATIONAL INSERVICE 70
APPENDIX I. VALUE OF EDUCATIONAL INSERVICE DATA ANALYSIS 71
APPENDIX J. SDE DATA COLLECTION SHEET 72
APPENDIX K. EASE, ACCURACY, AND APPLICABILITY OF SDE 73
APPENDIX L. STUDY DESIGN 74
APPENDIX M. PROJECT IMPLEMENTATION PLAN TIMELINE 75
APPENDIX N. ESTIMATED COSTS FOR PROJECT 77
APPENDIX O: IRB EXEMPT STATUS 78
APPENDIX P: EXECUTIVE SUMMARY 79

LIST OF TABLES

Table Page

1. Screening for Disordered Eating Tool Completion Rates 42

2. Screening for Disordered Eating Referral Rates..... 43

3. Rationale for No Referral Being Made..... 44

4. Provider Feedback on Ease, Accuracy and Applicability of SDE Tool 45

CHAPTER I. INTRODUCTION

Background and Significance

Eating disorders are psychiatric disorders in which sociocultural, psychological, and biological influences all contribute to the complexity and the severity of the disease (Culbert, Racine, & Klump, 2015; El-radhi, 2015). Eating disorders are marked with psychosocial, psychological, and somatic risk and contribute to multiple negative outcomes medically, cognitively, emotionally, and socially (Culbert et al., 2015; Schaumberg et al., 2017). Both somatic complications, which can occur in numerous organ systems, and psychiatric comorbidities such as depression, anxiety, substance abuse, relapse, and suicide ideation need to be considered when assessing and treating eating disorders (Dowst-Mayo, 2018; Schaumberg et al., 2017).

In recent decades, there has been an increased focus on the idealization of thinness and the pressure and expectancy to be thin, which contributes to a rising number of individuals that experience severe body dissatisfaction and body distortion, and in turn, eating disorders (Culbert et al., 2015; Dowst-Mayo, 2018). This is in large part due to media exposure and the standards laid out by today's culture (Culbert et al., 2015). Typically, eating disorders evolve during puberty and adolescence, and according to the National Institute of Health and Care Excellence (NICE), the highest risk is those between the ages of 13 and17 (Dowst-Mayo, 2018; NICE, 2017; Snyder, 2014). Adolescents are more vulnerable during puberty because that period is a crucial time for self-identity and development, making the 13 to 17 age window perilous for the occurrence of an eating disorder (Dowst-Mayo, 2018). Approximately 90% of those with eating disorders are female, and females with an eating disorder starting in adolescence versus adulthood experience greater functional deterioration, emotional distress, and risk of suicide

(Snyder, 2014; Southard, Bauer, & Kummerow, 2015). In addition, there is an increased chance that long-term mental health assessment and treatment will be needed in the future.

Early diagnosis of an eating disorder provides the opportunity for early intervention and treatment, resulting in a more favorable prognosis (Schaumberg et al., 2017). The somatic, psychosocial, and psychological symptoms associated with eating disorders may be unrecognizable to the symptomatic individual, family members, friends, and even experienced health care providers. Complications that arise from eating disorders are difficult to properly identify and some may even be misattributed to other causes, making it extremely important for providers to be conscious of the red flags indicating an eating disorder (Schaumberg et al., 2017; Snyder, 2014). The social stigma connected to eating disorders coupled with the fact eating disorders rarely present like other psychological diseases and are rarely discussed by the patient, makes appropriately detecting the disorders extremely difficult for providers (Dowst-Mayo, 2018; Snyder, 2014). Despite the difficulty in detection, providers in the primary care setting are at the front line for detecting and diagnosing eating disorders (Robinson & Fornari, 2017).

The critical role of initial detection is key, but primary care providers are also responsible for appropriate referral to eating disorder and psychiatric specialists, treating immediate medical complications that are currently present as a result of the eating disorder, collaborating with treatment teams, and the supervision of the medical status of their patients in outpatient treatment or remission (Robinson & Fornari, 2017). In addition, eating disorders are not routinely screened for in the rural primary care setting and late recognition can lead to more severe disease. Increased severity of malnutrition and medical complications can occur in those living in the rural setting because of the distance needed to travel to obtain specialty services (Alman et al., 2014). This reinforces the importance of screening for eating disorders in rural primary care

clinics because the earlier the disease is identified, the sooner the patient can be referred prior to the occurrence of severe malnutrition and medical complications.

Eating Disorder Screening Tools

There are various different screening tools available to help pinpoint those suffering from eating disorders, and even those who have an increased chance of developing one in the future (Schaeffer, 2016). Examples of well-validated screening tools available to be used within practice include the Eating Attitudes Test (EAT-26), the Eating Disorder Examination, and the Eating Disorders Inventory questionnaire. The downfall with the tools listed above is many of the tools can be quite lengthy and time consuming to complete.

Primary care settings are often busy and fast-moving and screening and early detection of eating disorders is important for positive outcomes; therefore, the screening tool used must be valid, quick, and easy to use (Maguen et al., 2018). The Eating Disorder Screen for Primary Care (EDS-PC) and the SCOFF are two examples of time efficient, straight forward tools that have successfully detected anorexia nervosa (AN) and bulimia nervosa (BN) and have been implemented in primary care. Though both the EDS-PC and the SCOFF are valid tools, Maugen et al. (2018) created a new screening tool, the Screening for Disordered Eating (SDE), which is inclusive of detecting binge eating disorder (BED) and had overall better detection rates in the research study the authors conducted.

Screening for Disordered Eating

The SDE tool was created with a goal of detecting the most common eating disorders of AN and BN, as well as newer eating disorders such as BED (Maguen et al., 2018). The EDS-PC or SCOFF was not designed to screen for BED, because those screening tools were already developed when BED was included in the Diagnostic and Statistical Manual of Mental

Disorders, Fifth Edition (DSM-5) (Maguen et al., 2018). The SDE consists of five questions, and each question is taken from a different, previously validated eating disorder screening tool (Appendix A). The SDE was developed for use in primary care, can be easily integrated into primary care settings, has shown to correctly screen for AN, BN, and BED, and can help facilitate the next step in the treatment process for those suffering from these conditions.

Problem Statement

Eating disorders and obesity are considered to be two of the three most common chronic conditions within the youth population (Herpertz-Dahlmann, Dempfle, Konrad, Klasen, & Ravens-Sieberer, 2015). Approximately 13% of the adolescent youth population will have at least one diagnosable eating disorder by age 20, and the majority of those affected will be female (Culbert et al., 2015; Stice, Gau, Rohde, & Shaw, 2016). Chronicity, possibility of relapse, distress, inability to function properly, risk for obesity in the future, and occurrence of depression, suicide, substance abuse, and death occur more often or with increased intensity in individuals with eating disorders (Stice et al., 2016).

Though recovery from an eating disorder without treatment is possible, early detection and intervention with subsequent initiation of treatment leads to a better prognosis and increased chances of full recovery (Schaumberg et al., 2017). Fear of embarrassment is often a reason that patients do not share eating disorder symptoms with their health care provider; therefore, the use of a screening tool can provide a gateway for discussion of the topic (Maguen et al., 2018). Primary care is one of the most important settings for early detection and treatment of eating disorders, and primary care practitioners could be an important factor in the detection and management of the disorders (Cadwallader, Godart, Chastang, Falissard, & Huas, 2016).

Purpose of the Project

The purpose of this practice improvement project is 1) to determine how primary care providers perceive the implementation of the Screening for Disordered Eating (SDE), an eating disorder screening tool, in adolescent females ages 11-19, and 2) to identify and refer those adolescent females that are screened with signs of eating disorders to a counselor, mental health specialist, and/or eating disorder specialist during a 5-month trial period in a primary care clinic. Therefore, the co-investigator will provide an educational session on the use of the SDE tool to health care providers. The health care providers can then correctly administer the screening tool to adolescent females ages 11-19 in a rural primary care clinic in North Dakota. Over a 5-month trial period, the co-investigator will assess the number of adolescent females screened for eating disorders, the number of eating disorder referrals, and the perception and evaluation of the SDE questionnaire by the participating primary care providers.

Objectives

Clinical dissertation project objectives are:

1. The SDE tool will be implemented by primary care providers in a clinic evidenced by an SDE completion rate of greater than 50% in adolescent females ages 11-19 over a 5-month trial period.
2. Greater than 70% of all adolescent females screened with a score of two or more on the SDE tool are referred to a counselor, mental health specialist, and/or eating disorder specialist for further evaluation.
3. Primary care providers participating in the use of the SDE tool will provide feedback about the ease, accuracy, and applicability of the SDE tool.

CHAPTER II. LITERATURE REVIEW AND SYNTHESIS

Search Strategy

Guided by the purpose and objectives of this practice improvement project, a systematic literature search was conducted. The databases searched included Cumulative Index to Nursing and Allied Health Literature (CINAHL), Health Source-Nursing/Academic Edition (EBSCO), PubMed, PsycARTICLES, PsycINFO, Journal of Eating Disorders, and the Cochrane Library. Keywords and phrases used to conduct the searches include the following: *eating disorders, disordered eating, anorexia, bulimia, screening tools, primary care, adolescent, young adult, rural.* Each search was initiated with various combinations of the keywords and then inclusion and exclusion criteria were applied.

Inclusion criteria:

- Full text
- Peer reviewed
- English
- Published since 2014
- Included adolescent age group

Exclusion criteria

- Strictly about the male population

Diagnostic Criteria

The fifth edition of the Diagnostic and Statistical Manual (DSM-5) is the diagnostic system used to establish the criteria of the eating disorders discussed below (Robinson & Fornari, 2017). The DSM-5 is the widely accepted manual for adults and children and has recently undergone updates from the Diagnostic and Statistical Manual, fourth edition (DSM-

IV). The updates relevant to eating disorders made to the DSM-5 expanded the inclusion criteria for AN and BN with the aim to identify and treat these disorders earlier in the disease process.

Anorexia Nervosa

Anorexia nervosa occurs when an individual restricts food and energy consumption relative to the requirements needed for their age, gender, and physical health, causing a considerably low body weight (APA, 2017). Characteristics of individuals with AN are extreme fear of weight gain or becoming overweight even when significantly underweight, denial of hunger, obsession with the calorie and fat content of food and how the food is prepared, and endorsement of behaviors preventing weight gain (APA, 2017; El-radhi, 2015). Individuals that experience AN have a self-image that is exceptionally distorted and place extreme emphasis on their perceived weight, size, and shape regardless of the severity of their low weight.

Anorexia nervosa can be categorized into two types, restrictive and binge-eating/purging (APA, 2017). Restrictive AN is characterized by withholding or avoiding food intake without binging or purging behaviors such as making oneself vomit or misuse of laxatives and/or diuretics. The main behaviors to achieve weight loss in restrictive AN are extreme dieting, excessive exercise, and starvation. Binge-eating/purging AN occurs when the binging and purging behaviors listed above are being used to maintain or achieve low weight.

The DSM-5 severity ratings for AN are as follows (APA, 2017):

- Mild: BMI > 17
- Moderate: BMI 16-16.99
- Severe: BMI 15-15.99
- Extreme: BMI < 15

Bulimia Nervosa

Bulimia nervosa occurs when an individual is extremely preoccupied with weight, size, and shape and has repeated episodes of binge eating followed by periods of compensatory purging behaviors, such as vomiting or improper use of laxatives and/or diuretics (APA, 2017; El-radhi, 2015). Binge-eating is defined as consuming a large portion of food in a short period of time (i.e., 2 hours) compared to the normal consumption amount in a similar time period of healthy individuals and feelings of inability to control what and how much one is eating during a binge episode (APA, 2017). Those that suffer from bulimia and binge eat but do not participate in the purging action control weight by participating in inappropriate periods of starvation and excessive exercise (El-radhi, 2015).

The DSM-5 severity ratings for BN are as follows (APA, 2017):

- Mild: Improper compensatory weight control behaviors, on average, 1-3 times per week.
- Moderate: Improper compensatory weight control behaviors, on average, 4-7 times per week.
- Severe: Improper compensatory weight control behaviors, on average, 8-13 times per week.
- Extreme: Improper compensatory weight control behaviors, on average, 14 plus times per week.

Binge-Eating Disorder

Binge eating disorder is characterized by repeated occurrences of consuming a large portion of food in a short period of time (i.e., 2 hours) compared to the recommended consumption amount in a similar time period of healthy individuals and feelings of inability to

control what and how much one is eating during a binge episode (APA, 2017). Binge eating occurrences are linked to at least three of the following: eating extremely fast compared to normal, eating until miserably full, consuming a considerable amount of food when not hungry, consuming food alone due to feelings of embarrassment related to the amount of food being eaten, and feelings of guilt, depression, and distaste towards oneself after food consumption. Individuals suffering from BED do not participate in the purging weight control behaviors, and often, difficulty controlling weight gain and subsequent obesity become a problem (Dowst-Mayo, 2018).

The DSM-5 severity ratings for BED are as follows (APA, 2017):

- Mild: Occurrence of binge eating 1-3 times per week.
- Moderate: Occurrence of binge eating 4-7 time per week.
- Severe: Occurrence of binge eating 8-13 times per week.
- Extreme: Occurrence of binge eating 14 plus times per week.

Other Specified Feeding and Eating Disorders

Symptoms that are congruent with the above eating and feeding disorders and cause concern or deterioration in social, physical, mental, or occupational function, yet do not meet complete diagnostic criteria are classified as other specific feeding and eating disorders (OSFED) (APA, 2017). There are currently five OSFED categories which are discussed below.

Atypical Anorexia Nervosa

An individual experiences atypical AN if all AN diagnostic criterion is present, and regardless of extreme weight loss, their weight remains at or above expected for age, gender, and physical health (APA, 2017). This is more common in overweight individuals who have recently developed AN and show a significant decrease in weight, but friends, family, and practitioners

are often not concerned due to the current weight still being within the normal or above normal range.

Low Frequency and/or Limited Duration Bulimia Nervosa

Low frequency and/or limited duration BN occurs when all BN diagnostic criteria are present, although binge eating occurrences and subsequent purging and/or weight control behaviors take place less frequently than in BN (APA, 2017). On average, the binge eating, and subsequent purging and/or weight control behaviors occur once or less each week and for fewer than the previous 3 months.

Low Frequency and/or Limited Duration Binge-Eating Disorder

Low frequency and/or limited duration BED occurs when all BED diagnostic criteria are present, although binge eating takes place less frequently than in BED (APA, 2017). On average, the binge eating occurs once or less each week and for fewer than the previous 3 months.

Purging Disorder

Purging disorder (PD) is characterized by weight control behaviors such as self-induced vomiting and improper use of laxatives and diuretics as seen in BN (APA, 2017). However, in PD, the individuals do not engage in episodes of binge eating as seen in BN.

Night Eating Syndrome

Night eating is characterized by repeated occurrences of eating at night such as waking up in the middle of the night and eating or consuming extreme amounts of food after completion of supper (APA, 2017). Individuals experiencing night eating disorder remember consuming the food, and the eating cannot be attributed to other influences such as abnormal sleeping hours, cultural or social norms, BED, medication side effects, or other mental illnesses (i.e., substance abuse). The ability of one to function effectively is greatly influenced in night eating syndrome.

Avoidant/Restrictive Food Intake Disorder

Avoidant/restrictive food intake disorder (ARFID) is an eating disorder in which individuals exhibit issues with sensory characteristics of food, show little interest in eating, and express their dislike of the possible outcomes of food consumption (APA, 2017). Individuals with ARFID show signs of malnutrition, have lost a significant amount of weight, may rely on enteral or oral tube feedings to get nutritional requirements, and have obvious impairments in psychosocial interactions. The characteristics of ARFID are not attributed to other influences such as cultural practices, decreased food availability, and mental or medical conditions. Individuals with ARFID do not have misperceptions about weight, shape, or size, and do not have a diagnosis of AN or BN.

Prevalence and Recurrence of Eating Disorders

About 13% of the adolescent youth population will have at least one diagnosable eating disorder by age 20, and a majority are female with recovery frequently reliant on treatment from specialists (Alman et al, 2014; Culbert et al., 2015; Stice et al., 2016). A significant number (i.e., 15% to 47%) of youth practice eating thoughts and behaviors that are disordered and unhealthy (Culbert et al., 2015). Disordered eating practices of adolescents and young adults differ significantly between genders, as the prevalence is approximately 58% in females compared to 31% in males (Simone, Hooper, Eisenberg, & Neumark-Sztainer, 2019). Chronicity, possibility of relapse, distress, inability to function properly, risk for obesity in the future, occurrence of depression, suicide, substance abuse, and mortality are all issues that correlate with the occurrence of eating disorders (Stice et al., 2016).

Eating disorders have become more prevalent in the previous ten to 20 years, and though this is partially due to increased identification of the diseases, the focus on obesity, dieting,

weight control, and thinness in medical and social settings is also responsible (Snyder, 2014). Eating disorders can occur at any age and in either gender, yet continue to be most common in females and the adolescent population (American College of Obstetrician and Gynecologists [ACOG], 2018; Schaumberg et al., 2017; Snyder, 2014). Eating disorders are increasingly being diagnosed in children less than 12 years of age, which is exceptionally concerning because of the delays in mental, social, and physical development that can occur (Robinson & Fornari, 2017; Snyder, 2014). Eating disorders were once considered diseases that affected mostly Caucasian and middle to upper class people, but research now shows that the disorders affect those of all races, ethnicities, income levels, gender identities, and sexual preferences (Robinson & Fornari, 2017).

There is an estimated 4.6% cumulative lifetime chance that a person will suffer from AN, BN, or BED by the age of 80, with AN and BN being most prevalent (El-radhi, 2015; Schaumberg et al., 2017). An estimated 1 out of every 250 females will suffer from AN, and AN has become one of the most common psychiatric disorders in pubescent and adolescent females (Dowst-Mayo, 2018; El-radhi, 2015). Adolescent females experiencing AN have steep relapse rates, and multiple treatment attempts followed by subsequent relapses are common (Dowst-Mayo, 2018). Lower BMI at time of initial treatment is characterized by increased incidences of relapses and a poorer prognosis. Complete recovery between 5- and 7-years post treatment is estimated to be 35-85%, with 50% experiencing at least one relapse during the first year of recovery. The estimated percentage of individuals that will experience BN ranges from 0.5% to 1%, with approximately 90% of those suffering from the disease being female (El-radhi, 2015). An estimated one third of individuals experiencing AN will shift and subsequently suffer from BN, but a shift from BN to AN is much less common (Dowst-Mayo, 2018).

According to research, females tend to openly discuss body thoughts and issues with peers more often than boys, which could increase the sociocultural influence they experience (Nelson, Kling, Wängqvist, Frisén, & Syed, 2018). In addition, females are much more likely than males to compare their bodies with others and talk about their weight and the number on the scale. Females are at a greater risk for experiencing weight loss and a significant drop in appearance esteem in their adolescent years compared to males, and these same females may also suffer from identity confusion, psychological issues, and a decrease in identity coherence.

Etiology and Contributing Factors

The etiology of eating disorders is not linked to one specific cause, but a multitude of influences such as genetic, biological, psychological, personality, environmental, and sociocultural factors (Dowst-Mayo, 2018; Snyder, 2014). Disordered eating often surfaces during adolescent years where childhood characteristics and biological factors such as personality, psychosocial learning, and puberty play a role in the development of symptoms (Davis & Smith, 2018). During later adolescence, when puberty has occurred, and more importance is placed on dating, relationships with peers, and thin idealization, the risk of developing an eating pathology is heightened (Culbert et al., 2015). Societal expectations to be thin influence how female adolescents perceive their body, weight, and image, which contributes to the increase in incidence of dieting and eating disorders during puberty and adolescence (Dowst-Mayo, 2018; El-radhi, 2015). Psychological and sociocultural factors such as perfectionism, media exposure, thin-ideal internalization, and dissatisfaction with the body also contribute to the development of eating disorder symptomology (Culbert et al., 2015; Schaumberg et al., 2017).

Increased concerns about weight are common in the adolescent female population, and maladaptive eating practices are thought to be used to reduce and repress such concerns (Simone et al., 2019). Weight concerns often stem from the increasing occurrences of weight stigma within today's society. Simone et al. (2019) defines weight stigma as "victimization and bullying specifically as it relates to weight and size" (p. 65). Adolescent girls who already perceive themselves to have weight and shape problems often fall victim to weight stigma and will subsequently have worsening feelings about their weight and shape because their initial weight-related fears were confirmed by the weight stigma experienced. Thus, adolescent females who encounter weight stigma have a higher risk of experiencing an eating disorder as well as future substance abuse and mental health disorders.

Personality traits and disorders such as perfectionism, obsessiveness, anxiety, and depression have been linked to disordered eating and increased risk of developing an eating disorder (ACOG, 2018; El-radhi, 2015). Biological factors such as cognitive styles, brain structure and function, and altered regulation of brain neurotransmitters have also been connected the development of eating disorders (Schaumberg et al., 2017). Though the exact neurobiology in relation to eating disorders is not completely understood, positron emission tomography has shown altered regulation of the dopaminergic and serotonergic systems. This finding is important in those with eating disorders because the dopaminergic and serotonergic systems play a part in motivation, mood, satiety, and impulse management. Studies completed on individuals with eating disorders have shown differing brain structure and function compared to those without eating disorders. The structural and functional differences affect the reward pathways by altering and impairing control over emotions, appetite, and self-discipline.

Biological and personality risk factors that contribute to an eating disorder may also be linked to genetics and negative emotionality/neuroticism (Culbert et al., 2015).

Though genetics alone do not predispose an individual for the development of an eating disorder, genetics, family history of an eating disorder, and the environment in which one lives are all contributing factors (Dowst-Mayo, 2018; Schaumberg et al., 2017). Researchers have found that eating disorders can run in families and while the risk of developing an eating disorder increases if a family member suffers from one, eating disorders do not follow Mendelian inheritance patterns and no single gene or group of genes are responsible for the disease (Schaumberg et al., 2017). There is no evidence that there is genetic predisposition or a single genetic trait that is responsible for an eating disorder, but instead the interplay that occurs between genetics, the environment, coping skills, and exposure to an eating disorder in a family member or close friend. Environmental risk factors such as frequent dieting, the increase in accepted portion size, overeating, bullying, and participation in sports where thinness is ideal can all contribute to the development of an eating disorder. However, only a relatively small number of those exposed to these types of environmental triggers will actually develop an eating disorder. Eating disorders are complex, multifactorial disorders in which genetic and environmental traits work together to increase the likelihood of eating disorder development in this vulnerable population. The development of eating disorders can also be sporadic, with no known family history, no biological link, and minimal environmental risk factors.

Identifying Eating Disorders

Though anyone can suffer from an eating disorder, there are some red flags to look for that can help identify the presence of disordered eating. Signs that should alarm providers are marked reduction or increase in weight, frequent mood changes or irritability, irregular or absent

menstrual cycles, obsession with exercising, bowel issues, social withdrawal, use of laxatives or dieting pills, and parental concern about finding hidden food or food packages in their child's room (Snyder, 2014). Caregivers of adolescents with eating disorders may express concerns about their child such as skipping meals often or stating they have already eaten, increased use of the bathroom immediately after mealtime, new onset of frequent complaints about their weight, the use of websites pertaining to dieting, and the obsession of only eating healthy, low-calorie foods (Dowst-Mayo, 2018; El-radhi, 2015). Eating disorders can be present regardless of a patient's BMI, so assessing for not only weight loss, but weight gain and fluctuations in weight is very important (ACOG, 2018).

Other diseases that can cause extreme weight and appetite loss should be considered before diagnosing AN such as hypopituitarism, hyperthyroidism, malignancy, and gastrointestinal problems such as celiac or Crohn's disease (El-radhi, 2015). Common clinical findings of individuals experiencing AN are caused by malnutrition. Clinical findings congruent with AN are weight for age falling below the third percentile, hypotension, bradycardia or heart arrhythmias, decreased temperature, dry skin, problems with sleep, constipation, amenorrhea, osteopenia, and anemia (El-radhi, 2015; Robinson & Fornari, 2017; Southard et al., 2015). A physical exam, the collection of labs to assess for anemia, thyroid problems, and electrolyte imbalances, and talking with the patient about feelings related to body, weight, food, and exercise are all essential when diagnosing an eating disorder (ACOG, 2018; Robinson & Fornari, 2017).

Amenorrhea is no longer required by the DSM-5 in order to diagnose any of the identified eating disorders, but menstrual irregularity or amenorrhea could signal the presence of disturbed eating patterns (ACOG, 2018). Gynecological concerns aside from amenorrhea such as

pelvic discomfort, atrophic vaginitis, and decreasing breast size can also occur. Bone mineral density (BMD) can be reduced in individuals with AN, and the age at onset combined with the duration of the eating disorder plays a significant role in the magnitude of osteopenia.

Providers should assess patients suspected to have BN or AN, purging type, for Russell's sign, which is callus formation on the dorsal part of the hand as a result of abrasions from the teeth during self-induced vomiting (Dowst-Mayo, 2018). Decalcification and enamel erosion of the teeth are also common with BN and AN, purging type, because of frequent exposure of acidic stomach contents. Patients with eating disorders, especially adolescents, can also be affected cognitively, so extreme importance is placed on providers to assess for cognitive changes at school and at home such as memory troubles or new struggles in school subjects (ACOG, 2018). The medical workup that the clinician chooses should be based on the suspected eating disorder and the resulting medical complications that have arisen (Robinson & Fornari, 2017).

Health Concerns and Comorbidities

Eating disorders are very serious psychiatric diseases, but those that suffer from eating disorders also experience negative somatic, social, and emotional outcomes (Culbert et al., 2015). The adolescent population experiencing eating disorders spikes increased concern because of the severe complications that can arise, for instance, stunted growth, slowed mental, functional, and physical development, and serious medical concerns (Alman et al., 2014; Schaumberg et al., 2017). Compared to other psychiatric illnesses, eating disorders have higher incidences of premature death resulting from suicide and physical complications (Alman et al., 2014; Schaumberg et al., 2017; Southard et al., 2015)

Medical comorbidities such as type 1 or 2 diabetes, polycystic ovarian syndrome, irritable bowel syndrome, food sensitivities, and patients that underwent weight loss surgery are common, and patients exhibiting any of these comorbidities should be monitored closely for eating disorders (Schaeffer, 2016). Anorexia nervosa can cause alterations in sex, thyroid, and stress hormones, decreased bone marrow production leading to anemia and thrombocytopenia, amenorrhea, infertility, kidney issues, dehydration, dizziness, fainting, and constant fatigue (Dowst-Mayo, 2018; Schaeffer, 2016). Common problems that accompany BN are irregular menses, abdominal pain, bloating, edema, trouble sleeping, gastroesophageal reflux disease, constipation, and trouble sensing hunger versus satiety.

Eating disorders can affect a large number of the organ systems throughout the body and are responsible for the development of serious somatic complications within those systems (Schaumberg et al., 2017). These complications are the result of the body's hypometabolic state created when more energy is used than consumed (Robinson & Fornari, 2017). Cardiovascular complications are often caused by alterations in electrolytes and malnutrition. Electrolyte imbalances such as hypokalemia, hypochloremia, hypernatremia, and hyponatremia are common in AN and BN because of excessive vomiting, laxative or diuretic misuse, and too much or too little fluid intake. Malnutrition and electrolyte imbalances can cause serious complications such as cardiac arrythmias, bradycardia, orthostatic hypotension, heart muscle deterioration, seizures, and sudden death.

The musculoskeletal, endocrine, and gastrointestinal, systems can also be severely altered by disordered eating (Robinson & Fornari, 2017; Schaumberg et al., 2017). The amenorrhea experienced in those with AN is caused by a decrease in the amount of estradiol, luteinizing hormone, and follicle stimulating hormone, which subsequently contributes to osteopenia and/or

osteoporosis. The body is not creating enough bone mineral because of the lack of hormones; therefore, bone mineral density does not increase as it should in adolescence, but instead decreases as would be seen in menopause. Decreased bone mineral density is of serious concern because the peak amount may never be reached, which causes a lifelong risk of fractures and stunted growth (ACOG, 2018; Robinson & Fornari, 2017; Snyder, 2014). Alterations in the gastrointestinal systems are most common in those with BN because of the frequent self-induced vomiting (Robinson & Fornari, 2017). Repeated exposure of acidic gastric contents causes esophageal discomfort and inflammation which leads to increased risk of squamous cell dysplasia, esophageal cancer, and esophageal rupture from Mallory Weiss tears.

Depression, anxiety, post-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), personality disorders, and substance abuse are all psychiatric comorbidities linked to eating disorders (Dowst-Mayo, 2018). Self-harm practices, including suicide, are common across all eating disorders; however, the risk of suicide is highest in AN (ACOG, 2018; Dowst-Mayo, 2018; Schaumberg et al., 2017). The most prevalent comorbidities associated with AN are depression, anxiety, alcohol abuse and suicide, and suicide occurs in approximately 20% of those with severe anorexia (Dowst-Mayo, 2018; Schaumberg et al., 2017). The severity of AN and BN is directly related to the mortality risk, whereas the disease severity increases the risk of death from the disease (Schaumberg et al., 2017). Individuals with BN are more commonly impulsive and have increased emotional and social issues in relation to individuals without the disorder (El-radhi, 2015). Like individuals with BN, individuals with BED are also impulsive; however, no vomiting occurs in BED, so the large amounts of food consumed as a result of emotional eating lead to obesity and further emotional stress (Dowst-Mayo, 2018).

Screening Tools

Three options of tools used to screen for eating disorders that have proven to be valid and used in health care include the Eating Attitudes Test (EAT-26), the Eating Disorder Examination, and the Eating Disorders Inventory questionnaire. The EAT-26 is an online, self-report screening tool made up of 26 statements that are answered ranked on a six-point scale ranging from "always" to "never." A score of 20 or above indicates issues with food thoughts and behavior and the need for professional help. The Eating Disorder Examination evaluates the realm and severity of eating disorder symptoms and behaviors to figure out if an eating disorder diagnosis can be made according to the DMS-5. The Eating Disorders Inventory questionnaire is used to ascertain eating behaviors, feelings towards food, and psychological characteristics that could be indicative of an eating disorder. Unfortunately, the length of time needed to complete. makes the screening tools impractical to use in the primary care setting (Snyder, 2014).

Two additional well-validated eating disorder screening tools that are quicker to use, and therefore, more practical for use in the fast-paced primary care setting are the Eating Disorder Screening for Primary Care (EDS-PC) and the SCOFF questionnaire. The EDS-PC is a four-item tool while the SCOFF is a five-item tool, and a "yes" on two or more of the questions for either screening tools signifies likelihood of AN and/or BN. Both screening tools have been validated in English clinics and universities in England using patients and students of low to normal weight. Though the EDS-PC and SCOFF tools have shown to be helpful in the past, there is a new screening tool, the Screening for Disordered Eating (SDE), that has been developed by Maugen et al. (2018) to screen for not only AN and BN, but also for BED.

Screening for Disordered Eating

The SDE (Appendix A) is composed of five different questions, each of which was taken from other eating disorder screening tools that have been validated. The five other screening tools from which the questions were pulled from include the Dutch Eating Behaviors Questionnaire (DEBQ), Patient Health Questionnaire (PHQ), Minnesota Eating Behaviors Survey (MEBS), EAT-26, and the SCOFF questionnaire. If a person answers "yes" to two or more items on the SDE, he or she screens positive for an eating disorder.

The study completed by Maugen et al. (2018) was the first to compare three different eating disorder screening tools, the EDS-PC, the SCOFF, and the SDE, using numerous discriminative accuracy statistics (i.e., specificity, sensitivity, and receiver operating characteristic curve), as well as being inclusive of BED screening in the primary care setting. Standalone screening tools, such as the EDS-PC and SCOFF, often over or under predicted patients with eating disorders, but the SDE proved to provide a balance.

The EDS-PC was shown to have better sensitivity than the SDE and the SCOFF, and the SCOFF was shown to determine non-cases more accurately than either the SDE or the EDS-PC. However, the SDE had higher specificity and outperformed the EDS-PC and the SCOFF overall, as the screening tool detected true cases more accurately than the SCOFF, detected true non-cases more accurately than the EDS-PC, and was able to determine more precisely true cases and non-cases of AN, BN, and BED than the EDS-PC. A statistical discriminative accuracy table comparing the three eating disorder screening tools can be found in Appendix B.

Treatment

The earlier an eating disorder is recognized, and subsequent treatment is started, the better the long-term prognosis is (Robinson & Fornari, 2017; Schaumberg et al., 2017; Snyder,

2014). Complete recovery from an eating disorder is attainable, though the route to full recovery is different for each patient and relapse can be common (Schaumberg et al., 2017; Southard et al., 2015). In order for successful treatment to occur, the patient, the patient's family and support system, and all specialty providers must be involved and effectively communicate (ACOG, 2018; Robinson & Fornari, 2017; Schaumberg et al., 2017). A patient's team of specialty providers may include a primary care provider, an eating disorder specialist, a psychiatrist or behavioral health specialist, a nutritionist, and a counselor or therapist.

Treatment options vary depending on the individual and the eating disorder (Sokkary & Oelschlager, 2018). The less restrictive a treatment plan is, the more successful the outcome, so whether treatment is inpatient, outpatient, or intensive day treatment and consists of family-based therapy (FBT), cognitive behavioral therapy (CBT), or pharmacotherapy should be based on each individual case (ACOG, 2018; Steiger, 2017). The initial goal of any treatment plan is to restore an individual's nutritional status, and once adequate nutrition has been reached then the underlying psychiatric issues can be addressed (ACOG, 2018; Dowst-Mayo, 2018). A promising indicator that a female's nutritional status and weight have been restored is the return of her regular menses and is a sign of forward-moving progress.

The process of regaining normal eating habits and reaching maintenance weight in a severely malnourished individual must be monitored closely, because serious complications can occur with refeeding and rehydrating patients (ACOG, 2018; El-radhi, 2015; Robinson & Fornari, 2017). Rehydrating a patient quickly is not recommended due to possibe fluid overload, edema, and cardiac complications such as congestive heart failure (CHF) (Robinson & Fornari, 2017). Food should also be introduced slowly, with servings being initially quite small and increasing over time to avoid the occurrence of refeeding syndrome (El-radhi, 2015). Refeeding

syndrome can be deadly in some cases and is marked by hazardous fluid and electrolyte shifts causing metabolic issues and subsequent compromise of the cardiac and respiratory systems (Robinson & Fornari, 2017). Because of the severe adverse outcomes associated with rehydration and refeeding, the hospital is the safest setting for both to occur in individuals that are less than 75% of the optimal body weight or if the heart rate is 40 beats per minute or less.

There are few pharmacological options that are approved for the treatment of eating disorders. Olanzapine, an antipsychotic, is not approved by the Food and Drug Administration (FDA) for the treatment of AN but has shown to be beneficial in the acute stage of the disease (Robinson & Fornari, 2017; Snyder, 2014). Fluoxetine, a selective serotonin reuptake inhibitor (SSRI), has shown promising results in decreasing the number of occurrences of binging and purging in those suffering from BN and is the sole medication approved by the FDA for treatment of the disease (Dowst-Mayo, 2018; Robinson & Fornari, 2017; Snyder, 2014). Instead, most pharmacological treatment is aimed to address the underlying psychiatric conditions. Psychiatric conditions that often accompany eating disorders such as OCD, anxiety, and depression are often controlled with SSRIs (Snyder, 2014; Southard et al., 2015). In addition, pharmacological treatment with combined oral contraceptives (COC) is discouraged by the American College of Obstetricians and Gynecologists (ACOG) in those with amenorrhea resulting from an eating disorder (ACOG, 2018).

Aside from possible pharmacologic treatment options, the next step after reaching an acceptable nutrition status is psychiatric evidence-based treatments. Evidence-based treatments that have “earned their stripes” in the area of eating disorders are enhanced CBT for individuals suffering from BN as well as AN, integrated cognitive affective therapy (ICAT) for those with

BN and BED, and family-based therapy (FBT) for the adolescent population that suffers from AN or BN (Robinson & Fornari, 2017; Southard et al., 2015; Steiger, 2017).

Cognitive behavioral therapy targets the individuals thought process relating to the unrealistic perception of the body and aims to help guide them away from a harsh body image and refusal to gain weight (El-radhi, 2015; Southard et al., 2015). The extent of the CBT that one receives is based more on the severity of the disease and the progression of improved thought process and feelings about themselves then it is on age or gender. Family based therapy is shown to be quite successful in the adolescent population and occurs when a family member, usually the parent, takes over control of the adolescent's eating schedule. Eventually, once the adolescent has started to recover and gained appropriate weight, he/she is able to slowly regain control over the eating habits and schedule. Family based therapy also elicits important discussions between the adolescent and the care givers pertaining to body perception, problematic topics, and what is normal and expected in the developmental process (Southard et al., 2015). Other promising treatments are dialectical behavior therapy (DBT) for those with BN, BED, AN, and BN with a borderline personality diagnosis, and interpersonal psychotherapy (IPT) for AN, BN, and BED (Steiger, 2017). Creating a treatment plan in which the patient has a voice and his/her progress directs the next steps that are taken is important.

Full recovery is not achieved until physical health, psychological health, and behavioral health have all been attained (Schaumberg et al., 2017). By having a better understanding of why patients decide changing their behaviors related to disordered eating is needed, clinicians are able to better tackle the difficult task of treating individuals successfully (Ålgars et al., 2015). Though determining the medical necessity of treatment is extremely important, determining the readiness and motivation for change that a person has must occur in order to assess if a specific treatment

will be beneficial with a positive outcome at the time being. Patients may benefit more from their treatment if their uncertainty about recovery is addressed, especially those that are extremely worried about their shape and weight and have severe dissatisfaction with their body.

Challenges for Health Care Providers

Rarely do individuals with disordered eating express concerns about body-image or the weight control practices that are occurring, so health care providers should be aware of signs and symptoms that could signify an eating disorder as well as the age, gender, and somatic and psychiatric comorbidities that accompany the disease (Schaumberg et al., 2017; Snyder, 2014). Unfortunately, eating disorders do not present as obviously as some other mental health diseases do, and families often choose to keep the eating disorders hidden, believing the disease can be dealt with privately within the home (Dowst-Mayo, 2018). Keeping the disease hidden, minimal to no disclosure of eating habits and body image issues which are occurring, and the lack of consistent and obvious manifestations of eating disorders make recognition by primary care providers extremely challenging.

In addition to the diagnostic challenges for all primary care providers discussed above, rural health care providers encounter even more barriers when detecting, diagnosing, and treating eating disorders. The U.S. Census Bureau defines “urban” as having a population of at least 50,000 or as a clustered community or town with a population of 2,500-50,000 located right outside a city that is considered urban (HRSA, 2018). The U.S. Census Bureau does not give an exact definition of rural, but instead considers “rural” to be the land, housing, and population that does not fall under the stipulations that would be classified as urban. There is minimal completed research comparing the burden of access to health care and mental services in relation to severity of eating disorders between rural and urban populations (Alman et al., 2014). A study completed

by Alman et al. (2014) over a ten-year period researched the connection between health service availability and clinical signs, symptoms, and complications of children and adolescents at the start of specialty treatment for eating disorders. The research suggested, upon initiation of eating disorder treatment, adolescents and children from rural areas with less access to health care and screening had lower BMI scores, more prominent somatic problems, and increased physical morbidity rates. Known health disparities in rural areas are physical location and distance to nearest health care or specialty service, ethnicity, health literacy, and socioeconomic status. Rural disparities are often responsible for the inability of providers to prevent, screen for, identify, and treat eating disorders. When prevention of and screening for eating disorders is unable to routinely occur, the number of eating disorders present that could have been detected earlier increases, as well as a delay in treatment.

Rural health care is often provided by primary care providers and nurses, while specialty practitioners and facilities tend to be located hundreds of miles away in urban areas (Alman et al., 2014). Close access to specialty care and facilities becomes problematic, especially in the treatment of adolescents and children. Treatment of eating disorders often takes months to years and involves multiple practitioners, specialty facilities, and family members. Being a great distance from these services often causes issues, as some families do not have the resources available to travel and obtain the necessary treatment. One solution to the barriers in rural health may be the use of telemedicine to access the necessary eating disorder specialist from the rural location (ACOG, 2018). Although telemedicine is used for treatment of eating disorders in some locations, a discussion with various providers elicited that this is not currently an option in many rural areas.

Discussions about eating disorders can be difficult to start, but health care providers should become comfortable recognizing, discussing, and screening for the diseases (ACOG, 2018). Questions regarding eating and exercise habits, menstrual regularity, weight fluctuations, and thoughts relating to self-image, body perception, and body satisfaction should be asked by primary care providers (Snyder, 2014; Southard et al., 2015). Having a screening tool in place to use on patients that are suspected to have an eating disorder can be extremely helpful with opening the doors of communication in relation to the disease. Patients often fail to discuss concerns regarding eating and body image due to fear of being judged or embarrassed, and an eating disorder screening tool is a great way to facilitate communication of the topic (Maguen et al., 2018). Implementation of screening tools can also benefit the health care providers, because aside from alerting them of individuals who may need further evaluation and treatment, the screening tools can also be used as an educational and preventive lesson for patients.

Diffusion of Innovation Theory

E.M. Rogers created the Diffusion of Innovation (DOI) Theory in 1962 (LaMorte, 2019). The theory was developed to show how ideas and practice techniques gain trust and popularity with successful use, are accepted and implemented by others, and diffused through populations and organizations. The theory explains that acceptance and implementation of an idea or practice technique does not just simply happen, but that acceptance and implementation is a process in which some individuals accept and implement the idea sooner and more willingly than others. Individuals that accept and implement an innovation more willingly and sooner than others exhibit different characteristics than the latter.

When working to implement and gain acceptance of an idea or practice, importance is placed on recognizing that there is a difference in the characteristics of those that are willing to

do so and those that are more hesitant (LaMorte, 2019). Five categories exist in which the characteristics of those adopting the implementation or idea fall into. In order to successfully gain acceptance and implement an idea or practice, one must understand the population that is being targeted and use various strategies to get each of the five categories on board. Each of the five categories are listed below, and a model is provided in Appendix C.

1. Innovators: These individuals are risk takers and willing and interested to implement and accept new ideas and practices without much, if any, convincing.
2. Early Adopters: These individuals are aware that changes in practice and new ideas are needed. Providing proper tools for change and explanation of how to implement the tools will lead to adoption of the recommended practice.
3. Early Majority: These individuals resemble early adopters, but in addition to being provided the proper tools for change and the explanation of how to implement the tools, evidence of success and improved outcomes in other settings and organizations must be provided before adoption of the recommended practice occurs.
4. Late Majority: These individuals are not routinely open to change and seem to only adopt the recommended idea or practice change after shown evidence on the majority numbers of successful adoption and implementation.
5. Laggards: These individuals are the last and most challenging to convince that adoption and implementation of an idea or practice change is necessary and beneficial. Statistics on success and pressure from other organizations and populations are necessary for the adoption of ideas and practice change in this group.

When trying to implement the use of the SDE tool in primary care, assessment of which adopter category the individual that is being convinced to use and diffuse the implementation

practice is in is crucial (LaMorte, 2019). By recognizing the category that each provider falls into, the choice of which strategy to use to gain their agreeance to adopt the SDE tool can be chosen and used. Each provider needs to be aware of the need for eating disorder screening in the female adolescent population, choose whether to accept or reject the implementation of the SDE tool, agree to trial the use of the SDE tool in each adolescent female age 11 to 19 seen in clinic, and choose whether the use of the SDE tool is beneficial and crucial enough to continue to use in primary care practice.

Innovation Characteristics

The process that takes place when adopting, and thereby diffusing, an innovation consists of recognizing the need for innovation, choosing whether or not to adopt the proposed innovation, initial implementation and testing of the innovation, and continual use of the innovation moving forward based on test results (LaMorte, 2019). The innovation characteristics listed below will play a pivotal role in successful adoption of the SDE screening tool in primary care, as well as contribute in different ways to each possible adopter based on the adoption category that they fall into.

1. Relative Advantage: There is no current eating disorder screening tool in place at the Sanford Health Clinic in Jamestown; therefore, there is no data or product to compare the advantage of the SDE screening tool to.
2. Relative Complexity: The SDE screening tool is an easy tool to use that consists of five straightforward questions.
3. Compatibility: The extent of how compatible the SDE screening tool is to the values and patient population of each provider was determined based on the providers that agreed to trial implementation.

4. Reliability: Reliability was determined when the providers implemented the SDE screening tool and determined whether or not the tool was reliable at detecting disordered eating thoughts and habits in their patients.
5. Observability/Trialability: The SDE screening tool was implemented by those providers that chose to in the Sanford Health Clinic in Jamestown. A trial period occurred before the providers choose to commit to adopting the SDE screening tool, and the choice to adopt or reject will be based on observable results from the trial period.
6. Familiarity: Familiarity cannot be determined until providers have implemented the SDE screening tool, become familiar with advantages and disadvantages of the tool, and form their own opinions about need for further use.

CHAPTER III. METHODOLOGY

Project Design

The review of literature discussed above provides clear evidence about the growing issue of eating disorders in the adolescent population and the necessity for detection early in the disease. After discussion with various Sanford Clinic providers in Jamestown, no process was currently in place for detecting disordered eating behaviors and habits early on, a practice improvement project was developed to help providers identify signs of the various types of eating disorders. The practice improvement project aimed to improve patient outcomes by partnering with the providers at Sanford Clinic in Jamestown to implement the use of the SDE tool and evaluate the tool's ease, accuracy, and applicability.

Implementation Plan

Diffusion of Innovation over Time

Diffusion of innovation amongst individuals and/or groups of people occurs over time, and the choice of whether an individual or group chooses to accept or reject the innovation at hand can be explained using a five-step process (Singer, 2016). E.M. Rogers created a process, which includes knowledge, persuasion, decision, implementation, and confirmation, to aid in decreasing skepticism about accepting and implementing new innovations. The five-step process discussed below can be successfully completed as designed, or if needed, in a different order than what is listed. Appendix D describes how adoption and decision steps were used for the diffusion of the implementation of the SDE screening tool over time.

1. Knowledge: The individual or group is enlightened on the creation of an innovation and seeks to learn more about the innovation.

2. Persuasion: The individual or group creates an opinion about the innovation based on what has been heard or seen regarding the innovation.
3. Decision: The individual or group decides for or against the adoption of the innovation based on the opinion that was previously created.
4. Implementation: The individual or group begins using the innovation and can adapt the innovation based on problems that arise. Successful adaptations of the innovation decrease skepticism of innovation failure.
5. Confirmation: Once the innovation has been adopted and implemented, the individual or group continues to gather data on the success of the innovation. If newly adopted innovation becomes unsuccessful, the individual or group may decide against further implementation.

Model for Evidence-Based Practice Change

The evidence-based practice model used to guide the implementation of this practice improvement project was the Model for Evidence-Based Practice Change. Rosswurm and Larabee created the original model; however, after Larabee gained extensive experience in teaching and guiding nurses in applying the original model in the hospital and quality improvement setting, a newer model containing revised steps was created (Melnyck & Fineout-Overholt, 2015). The Model for Evidence-Based Practice Change consists of six steps to follow when creating an evidence-based change to practice and can be found in Appendix E.

Step 1: Assess the Need for Change in Practice

The first step in the Model for Evidence-Based Practice Change is to assess the need for change within practice (Melnyck & Fineout-Overholt, 2015). When discussing eating disorders with primary care providers at the clinic, they expressed that eating disorders were not screened

for and were usually only discussed if there was obvious evidence that a patient was suffering from one. Often signs and symptoms of disordered eating are difficult to identify, which may further lead to delays in treatment. Primary care providers also specified that routine discussion about body perception and self-esteem is rarely done with female adolescent patients.

Because there was no current eating disorder screening tool in place at Sanford Clinic in Jamestown, there was no internal data to suggest the need for improvement. However, research from a variety of sources provides external data stating 13% of the adolescent youth population will meet criteria for at least one eating disorder by age 20, and a majority of those affected will be female (Alman et al., 2014; Culbert et al., 2015; Stice et al., 2016). The lack of discussion between providers and adolescent female patients about disordered eating thoughts, body perception, and self-esteem in the adolescent female population provided evidence for an opportunity to improve practice.

Step 2: Locate the Best Evidence

The second step in the Model for Evidence-Based Practice Change is to locate the best evidence (Melnyck & Fineout-Overholt, 2015). The PICOT research question that was created to structure the search, "In adolescent females (P), how does the use of an eating disorder screening tool (I) compared to the use of no screening tool (C) affect the occurrence of eating disorders (O) in their adolescent years (T)? The scholarly databases used to locate the best evidence used to guide this practice improvement project included Cumulative Index to Nursing and Allied Health Literature (CINAHL), Health Source-Nursing/Academic Edition (EBSCO), PubMed, PsycARTICLES, PsycINFO, Journal of Eating Disorders, and the Cochrane Library. The key words and phrases that were used, as well as the inclusion and exclusion criteria are established at the beginning of the literature review.

Step 3: Critically Analyze the Evidence

The third step in the Model for Evidence-Based Practice Change was to critically analyze the evidence (Melnyck & Fineout-Overholt, 2015). Research and journal articles were rigorously appraised and analyzed, and if relevant and contributive to the practice improvement project, labeled with the topic and content of the article. Articles with the same topics and content were then combined, synthesized, and placed in the appropriate section of the literature review. "Screen for Disordered Eating: Improving the accuracy of eating disorder screening in primary care" by Maugen et al. (2018) was the article that was critically analyzed and used when choosing the SDE as the screening tool of choice for this practice improvement project. Evidence provided by the review of literature that was completed reinforced the importance of early detection of eating disorders and the need for this new practice within the primary care setting.

Step 4: Design Practice Change

The fourth step in the Model for Evidence-Based Practice Change was to design practice change (Melnyck & Fineout-Overholt, 2015). The practice change being implemented was the use of the SDE tool for adolescent females in the primary care setting. The sensitivity, specificity, and comparison of the SDE screening tool to other eating disorder screening tools is discussed in the literature review. Specific resources required to implement the practice change include paper, printing materials, and the primary care personnel at the Sanford Clinic in Jamestown. An educational session for the primary care providers teaching them about the prevalence of eating disorders, the need for frequent screening, and the use of the SDE tool occurred prior to the implementation of the project.

Step 5: Implement and Evaluate Change in Practice

The fifth step in the Model for Evidence-Based Practice Change was to implement and evaluate change in practice (Melnyck & Fineout-Overholt, 2015). In this step of the practice improvement project, the implementation of the SDE tool occurred. The SDE tool was implemented over a five-month period, data was gathered monthly during that time, and upon completion of that that month's data were compiled and analyzed. The results of the compiled data, along with any recommendations that were received during the implementation period were combined, and suggestions for adaptations were made to better accommodate the participating facility and providers with hopes that adoption of the SDE tool will occur in the future.

Step 6: Integrate and Maintain Change in Practice

The sixth step in the Model for Evidence-Based Practice Change was to integrate and maintain change in practice (Melnyck & Fineout-Overholt, 2015). Dissemination of the results of the practice improvement project to all participating primary care physicians and nurse practitioners at Sanford in Jamestown, other personnel that helped implement the project, and the administration of the facility occurred during the final step. Recommendations given by each provider, as well as those given by the co-investigator, were also included in the dissemination of the results. During this meeting, the participating primary care providers were also able to verbalize their thoughts on the ease, accuracy, and applicability of the SDE tool and their opinions on implementing the tool as a new standard of care at the Sanford Clinic in Jamestown.

Setting

This practice improvement project was implemented at Sanford Health Clinic in Jamestown, North Dakota, which is a primary care clinic that offers services in family medicine, occupational medicine, behavioral medicine, and surgery. Sanford Jamestown clinic is

comprised of 14 family practice providers, three behavioral health specialists, a general surgeon, and one occupational medicine provider who provide services to people of all ages (Sanford Health, 2018). The Sanford Health Clinic serves residents residing in Jamestown, as well as residents within the county residing in smaller, surrounding towns. Stutsman County is home to 20,917 residents, and 15,387 of those residents reside in Jamestown (U.S. Census Bureau, 2018). People under the age of 18 make up 20% of the population of Stutsman County, and 48.6% of Stutsman County is comprised of women.

Sample

The nonrandom convenience sample for this practice improvement project consisted of the 14 family practice providers at the Sanford Health Clinic in Jamestown. All 14 family practice providers agreed to the implementation of the SDE tool over a 5-month period making the exact sample size of this practice improvement project 14. Inclusion criteria were primary care providers at Sanford Health Clinic in Jamestown with scheduled appointments seeing adolescent females ages 11 to 19 without a diagnosed preexisting eating disorder that agreed to implement the SDE tool. Exclusion criteria included adolescent females ages 11 to 19 that were being seen by a provider that had not agreed to implement the SDE tool.

Recruitment

Recruitment for the practice improvement project took place with the help of Dr. Sarah Schatz, the managing physician partner at Sanford Clinic in Jamestown. Dr. Schatz provided the co-investigator with verbal approval of her support for implementing this practice improvement project, and she wrote and signed a letter of project approval (Appendix F). Dr. Schatz helped the co-investigator reach out via e-mail to all the primary care providers at Sanford Clinic in Jamestown. The e-mail gave a brief explanation of the implementation of the SDE tool to

adolescent females in primary care and invited them to an informational meeting to further explain what the practice improvement project entailed. The informational meeting took place over the lunch hour and providers were able to ask any questions about the implementation of the SDE tool. An outline of the content provided for the informational meeting can be found in Appendix G. At the conclusion of the meeting, the family practice providers were asked to sign the content form which confirmed their willingness to participate in the practice improvement project. Providers who agreed to participate were then given the SDE tool to start using in practice. The family practice providers that attended the informational meeting, regardless of willingness to participate in implementation of this practice improvement project, were also asked to complete a survey on how valuable they perceived the information received at the educational session to be to their practice (Appendix H). The results are in bar graph form located in Appendix I.

Evaluation and Data Analysis

The measurable objectives for this project were to implement the use of the SDE screening tool by primary care providers in clinic evidenced by an SDE completion rate of greater than 50% by adolescent females ages 11 to 19 with appointments in primary care over the 5-month trial period, and that greater than 70% of adolescent females scoring a two or more on the SDE tool were referred to a counselor, mental health specialist, and/or eating disorder specialist for further evaluation. After the trial period was over, a meeting with all primary care providers that participated took place over the noon hour at Sanford Clinic to gather their feedback on the effectiveness of the SDE tool. The completion rate of the SDE tool and the referral rate of those scoring a two or more were the variables being measured. Provider

feedback was also used to gauge the ease, accuracy, and applicability of the implementation of the SDE tool.

Data Collection and Analysis

The data were internal and were obtained by reviewing paper copies of the completed SDE tools. For analysis of this project, the provider's name, the date, the age of the adolescent completing the SDE tool, and the score obtained were documented on a separate, data collection sheet that went with each completed tool. The separate data collection sheet can be found in Appendix J. The completed screening tool and data collection sheet was then placed in a secure location and collected monthly for review and analysis by the co-investigator. If a provider had a patient that scored a 2 or higher on the SDE tool, that provider also wrote if a referral was made, and to where, on the data collection sheet that correlated with the screening tool. If a patient scored a 2 or higher and a referral was not made, then the provider's reasoning was also recorded on the data collection sheet as part of data collection and further analyzed. Each month of the implementation period, the co-investigator used the electronic health record system (EHR), Epic, to easily access the number of adolescent females ages 11 to 19 seen by the participating providers to compare to the number of SDE tools that were completed. Upon completion of the 5-month trial period, provider feedback pertaining to the ease, accuracy, and applicability of the SDE tool was gathered over a lunch hour via a written survey and collaborative discussion. The survey the providers were asked to complete is located in Appendix K. Analysis of the data gathered was then completed. See Appendix L for further description of study design and data analysis.

Project Timeline

The work to develop this implementation project began in May of 2019 with the creation of a dissertation committee and approval of the dissertation topic. Subsequently, work to create a solid proposal took place and the co-investigator proposed the dissertation in February of 2020. From that point, the implementation project went through the IRB approval process and was accepted by consenting providers to implement within the Sanford Clinic in Jamestown. The practice improvement project was implemented for a period of 5 months, after which, the data were collected, analyzed, and dispersed and feedback from participating providers was obtained. All project information was then presented and explained during the dissertation final defense in early 2021. See Appendix M for full project implementation plan timeline.

Resources

Personnel

Implementation of the SDE tool required the help of multiple health care personnel. The family practice practitioners at Sanford Clinic in Jamestown were extremely important to successful implementation because they were receiving and interpreting results, as well as making referrals when necessary. The clinic nursing staff helped ensure that the screening tool was given to the patient and completed for the practitioner to interpret and provide further action if necessary. The chair of my dissertation committee, Doctor of Nursing Practice professors, and the graduate appointee at North Dakota State University (NDSU), were fundamental in guiding me throughout the project.

Technology

The main sources of technology that were used for this practice improvement project are Microsoft PowerPoint, Microsoft Excel software, and the EHR. Microsoft PowerPoint was

utilized to create the presentation given to the providers about the need for eating disorder screening in primary care and the SDE tool. The EHR was accessed each month by a member of the Sanford research team to assess the number of adolescent females ages 11 to 19 that were seen by each provider within that month. The results of that report were then sent to me monthly. Data analysis was organized and interpreted using Microsoft excel software. No patient identifying information was transferred during data analysis. After organization and interpretation of data was completed, the results were formatted in a spreadsheet for data dissemination.

Budget

The expenses for the implementation of this project were minimal. The staff that participated in this implementation project were already employed at Sanford Clinic in Jamestown; therefore, training and recruitment costs did not apply. The printing of the SDE tool was one of the main costs. There was also food and beverages offered to the participating staff during the educational in-service and the provider feedback meeting. The estimated costs for printing and food were $40 and $120, respectively. In total, the estimated cost for the implementation of an eating disorder screening tool was $160. See Appendix N for the estimated cost of this project.

Institutional Review Board Anticipation

The practice improvement project, Screening Adolescent Females for Eating Disorders in Primary Care, was submitted to the North Dakota State University institutional review board (IRB) after collaboration with the research committee at Sanford Health. An exempt status was given and can be found in Appendix O.

CHAPTER IV: RESULTS

The results of objectives one, two, and three were evaluated upon completion of the implementation period and are discussed in this chapter. To interpret the results of this practice improvement project, both quantitative and qualitative data were analyzed. Each objective and the correlating results are discussed in separate sections and include the SDE completion rate, the referral rate of those scoring a two or more on the SDE tool, and the provider feedback about the ease, accuracy, and applicability of the SDE tool. Due to the short implementation period of five months, the completion and referral rates were low.

Objective One: SDE Completion Rate

Objective one consisted of having the primary care providers that agreed to participate in this PIP implement the SDE tool within their practice to help identify female adolescents ages 11-19 that may be suffering from an eating disorder. The results of objective one are presented in table format which shows the number of adolescent females ages 11-19 seen, the number of completed SDE tools, and the completion rate for each month of the trial period which went from June 8, 2020 to November 8, 2020. The cumulative total for all five months is listed in the last row of the table.

Table 1

Screening for Disordered Eating Tool Completion Rates

Month	Adolescent Females Age 11-19 Seen	Completed SDE Tools	Completion Rate
June: 6/08/20-6/30/20	83	9	10.8%
July: 7/01/20-7/31/20	109	22	20.2%
August: 8/01/20-8/31/20	144	31	21.5%
September: 9/01/20-9/30-20	99	4	4.0%
October: 10/01/20-10/31/20	111	11	9.9%
November: 11/01/20-11/08/20	28	4	14.3%
Overall Total	574	81	14.1%

The project implementation period was over 5 months, listed above are five rolling months of data. The implementation period started on June 8, 2020. The 5-month implementation period concluded on November 8, 2020.

Objective Two: Referral Rate

Objective two entailed having the participating primary care providers refer any female adolescents ages 11-19 scoring a 2 or greater on the SDE tool to a counselor, mental health specialist, and/or eating disorder specialist for further evaluation. The results of objective two are presented in table format which shows the number of adolescent females ages 11-19 scoring a 2 or more on the SDE tool, the number of referrals, and the referral rate for each month of the trial period. The cumulative totals for all five months are listed in the last row of the table.

Table 2

Screening for Disordered Eating Referral Rates

Month	Score of 2 or more on SDE Tool	Adolescent Referrals	Referral Rate
June: 6/08/20-6/30/20	5	1	20.0%
July: 7/01/20-7/31/20	3	1	33.3%
August: 8/01/20-8/31/20	12	2	16.7%
September: 9/01/20-9/30-20	0	0	N/A
October: 10/01/20-10/31/20	2	0	0%
November: 11/01/20-11/08/20	1	0	0%
Overall Total	23	4	17.4%

As discussed for the previous objective, data for six different months are shown for objective two in order to meet the 5-month implementation period. Out of 23 total SDE tools with a score of 2 or greater, 4 individuals were referred on mental health specialists or EDI professionals. Two of the individuals were referred to the Sanford Eating Disorder clinic in Fargo, North Dakota, one individual was referred to a counselor in Jamestown to address underlying and prominent anxiety and perfectionism, and one individual was shown to have been referred on, but the provider did not specify a location.

Aside from indicating place of referral, the participating providers were also to specify on the data collection sheet that went along with each SDE tool the rationale for a referral not being placed when an individual scored a 2 or greater on the screening tool. Listed in table format below are various rationale for why a referral was not made and the number of times this reasoning occurred.

Table 3

Rationale for No Referral Being Made

Number	Rationale
5	Patient refusal.
5	Patient and/or provider deemed referral unnecessary.
3	Parental decline with plan to monitor status at home and follow up with provider.
3	Addressing bigger concerns first.
3	No specification or provider stated they forgot to ask patient about a referral.

Patient refusal and patient and/or provider deemed referral unnecessary tied for the two most common reasons that a referral was not made. Examples listed of why the patient and/or provider deemed a referral unnecessary are the patient had a rationale thought process related to eating and weight, the patient had a healthy body mass index (BMI), the patient reported "feeling fine," and the patient responses were mostly "sometimes" instead of a definitive yes or no. Parental decline with verbal agreeance to monitor their adolescent at home moving forward and the need to address bigger concerns before addressing any disordered eating habits were also frequently stated rationale for not putting in a referral. Anxiety and depression were the underlying concerns mentioned that needed to first be addressed. Lack of time during an appointment and the provider forgetting to address the SDE score were also listed rationale.

Objective Three: Provider Feedback

Objective three required primary care providers participating in the use of the SDE tool to provide feedback about the ease, accuracy, and applicability of the SDE tool. Post-implementation surveys about the ease, accuracy, and applicability of the SDE tool were presented to the participating providers at the weekly provider's meeting held on December 28,

2020. The results of the post-implementation survey are presented in the table below. The mean response score for each question is presented in the last column of the table.

Table 4

Provider Feedback on Ease, Accuracy and Applicability of SDE Tool

	Number of Respondents (N=14)					
	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean Response Score
I see adolescent females in my practice at least weekly.		3	1	8	2	3.64
The SDE tool is easy to administer and interpret the results.			2	7	5	4.21
The SDE tool accurately screening adolescent females struggling with disordered eating thoughts and patterns.			4	9	1	3.79
The SDE tool helped identify those adolescent females that would benefit from a referral to a counselor, mental health specialist, and/or eating disorder specialist because of their eating thoughts and patterns.			4	7	3	3.93
The implementation of the SDE screening tool is beneficial to my practice.			6	4	4	3.86

Fourteen family practice providers participated in this PIP and completed the post-implementation survey regarding the ease, accuracy, and applicability of the SDE tool. Ten of the providers see adolescent females in their practice at least weekly, while four do not or are neutral (mean response score of 3.64). Twelve providers agreed that the SDE tool is easy to administer in their practice and interpret the results (mean response score of 4.21). Ten providers do believe that the SDE tool accurately screens adolescent females that may be struggling with disordered eating thoughts and patterns (mean response sore of 3.79) and helps identify

adolescent females that would benefit from a referral to address the disordered eating thoughts and patterns (mean response score of 3.93), while four providers remain neutral on the accuracy of the tool and benefit of a referral. Overall, the majority of providers agree that the implementation of the SDE tool would be beneficial to their practice, but six providers appear neutral or indifferent on the benefit of the SDE tool to their practice (mean response score of 3.86).

CHAPTER V: DISCUSSION AND RECOMMENDATIONS

According to completed research in various areas of health care such as mental health, family science, and epidemiology, there is a distinct connection between eating disorders and anxiety and depression issues (Hicks-White & Snyder, 2018). Furthermore, the presence of body dissatisfaction among adolescent females in the Western countries that could lead to eating disorders is on the rise, with an estimated 34.1% to 61.8% suffering from dissatisfaction with their bodies (Bornioli, Lewis-Smith, Slater, & Bray, 2020). Adolescents experiencing body dissatisfaction and disordered eating habits are more likely to struggle with anxiety, depression, and substance abuse, and if they were to meet diagnostic criteria for an eating disorder, are at an increased risk of having greater severity of symptoms (Hicks-White & Snyder, 2018).

The Office of Disease Prevention and Health Promotion (ODPHP) recently published the Healthy People 2030 guidelines and many of the guidelines focus on prevention, screening, assessment, and treatment of mental disorders and behavioral concerns in the adolescent population (ODPHP, 2020). Examples of such guidelines are increasing the number of adolescents screened for depression at their yearly visits with their primary care providers and increasing the number of adolescents who are diagnosed with anxiety or depression that receive the appropriate treatment. Identifying and treating depression and anxiety early in adolescents can have a profound impact on their future and curb comorbid conditions such as substance use and abuse, eating disorders, and suicidal ideations.

Mental health disorders have been determined to affect people of all ages, incomes, and racial and ethnic backgrounds (Ali et al., 2020). Eating disorders are considered a psychiatric disorder with a prevalence in the adolescent population similar to anxiety and depression. Eating disorders and anxiety and depression are shown to often be concomitant illnesses. Importance is

placed on primary care providers to continue to screen adolescent patients for anxiety and depression, as well as for eating disorders, while offering the appropriate treatment for all conditions.

Interpretation of Results

Objective One Results

The first objective of the implementation of the SDE tool by primary care providers in the clinic evidenced by an SDE completion rate of greater than 50% in adolescent females ages 11-19 over a 5-month trial period was not met. From June 8, 2020 to November 8, 2020 there were a cumulative of 574 adolescent females ages 11-19 seen by the 14 participating family practice providers. Over that time, there were a total of 81 SDE tools filled out, yielding a completion rate of 14.1%.

The Model for Evidence-Based Practice Change was used to pilot the implementation of this practice improvement project and evaluate the impact. The six steps within the Model for Evidence-Based Practice Change began with assessing the need for change within the current practice, which was paramount for identifying the topic (Melnyck & Fineout-Overholt, 2015). The Model for Evidence-Based Practice Change also guided the process of locating and critically analyzing the best supporting evidence on screening for adolescent eating disorders in primary care, designing and evaluating the implementation of the SDE tool in practice, and assessing ways in which such practice change can be successfully implemented and maintained in the future. The Model for Evidence-Based Practice Change was followed closely to guide the framework of this practice improvement project, worked as anticipated, and lead to successful implementation and completion. Future use of this evidence-based practice model to guide implementation processes is recommended. Sarah Schatz, managing physician partner, as well as

the other 13 participating providers and the nursing staff were all essential for the administration of the SDE tool and scheduling of both the informational and provider feedback meetings.

Objective Two Results

The second objective of having greater than 70% of all adolescent females screened with a score of two or more on the SDE tool referred to a counselor, mental health specialist, and/or eating disorder specialist for further evaluation was not met. Out of the 81 SDE tools completed, 23 had a recorded score of two or more. Of the 23 SDE patient with scores of two or more, four were referred to a counselor, mental health specialist, and/or eating disorder specialist for further evaluation, yielding a referral rate of approximately 17.4%.

Each of the 19 SDE tools scoring a two or greater that did not receive a referral included provider rationale as to why a referral was not placed written in the appropriate area of the data collection sheet attached to each SDE tool. The rationale included patient refusal, provider felt it unnecessary, parental decline with agreement to monitor condition, and addressing other concerns first were documented as rationale of 16 SDE tools that warranted a referral and did not receive one. The remaining three SDE tool cases that should have received a referral but did not were due to either no rationale given by the provider or the provider forgot to address the score with the patient.

The need to address other concerns such as anxiety, depression, and perfectionism prior to addressing the possible eating disorder is congruent with common comorbid conditions seen in those with eating disorders (Culbert, Racine, & Klump, 2015; El-radhi, 2015; Schaumberg et al., 2017). However, whether the eating disorder or the mood disorder appears more prominent to a provider can change based on the patient's mood and presentation when at the visit (DeSocio, 2019). Comorbid eating disorders and mood disorders have symptoms that frequently overlap,

making exact identification of a disorder hard and the screening for all adolescents very important.

One provider verbalized that she attempted to place a referral to an eating disorder specialist located in Fargo, North Dakota for a patient exhibiting binge eating behaviors. The eating disorder specialist recommended that the patient start by seeing the eating disorder clinic's registered dietician and move forward with an appropriate treatment plan from there. However, the patient's parent verbalized that they would not travel over 100 miles just to see a dietician not knowing if anything would come of the visit. This further reinforces the barriers, such as distance, that both patients and health care providers face in the rural setting when trying to detect and treat eating disorders (Alman et al., 2014).

Objective Three Results

The objective that primary care providers participating in the use of the SDE tool will provide feedback about the ease, accuracy, and applicability of the SDE tool was obtained. On December 28, 2020, the results of the first two objectives were presented to the participating primary care providers at a meeting, and all that attended completed the survey. The results and survey were sent via e-mail to the 5 participating providers unable to attend the meeting and all 5 of those providers returned the survey.

Post-implementation surveys regarding the ease, accuracy, and applicability of the SDE tool were completed by all 14 primary care providers that participated in the PIP. The mean response score was 3.64 for the statement, *I see adolescent females in my practice at least weekly.* The mean score falls between neutral (3) and agree (4), meaning that the majority of the participating providers do see adolescent females weekly. However, there were three providers that responded with disagree (2), which impacted the results of the next three statements. These

providers chose neutral (3) for most, but not all, of their responses on the following three statements of the survey as they were not given ample opportunities to administer the SDE tool in order to feel confident addressing its ease, accuracy, and applicability based on their patient population.

Regarding ease of the SDE tool, there was a mean response score of 4.21 for the statement, *The SDE tool is easy to administer and interpret the results*. These results indicate that providers feel that the SDE tool was easy to use, as the mean score fell between agree (4) and strongly agree (5). The mean response scores were 3.79 and 3.93, respectively, for the statements, *The SDE tool accurately screens adolescent females struggling with disordered eating thoughts and patterns,* and *The SDE tool helped identify those adolescent females that would benefit from a referral to a counselor, mental health specialist, and/or eating disorder specialist because of their eating thoughts and patterns.* The mean scores fell between neutral (3) and agree (4) for these statements, but closest to agree (4). This shows that the majority of providers agree that the SDE tool accurately identifies those adolescent females with disordered eating issues and that would benefit from a referral, but a few providers did feel neutral on this topic. The mean response score was 3.86 for the statement, *The implementation of the SDE screening tool is beneficial to my practice.* The mean score fell between neutral (3) and agree (4) for this statement, but closest to agree (4). This indicates that most of the providers agree that the SDE tool is applicable to their practice; however, some providers do feel indifferent or neutral about the applicability of the tool.

Though no other literature to date has studied providers' thoughts on the ease, accuracy, and applicability of the SDE tool, the study completed by Maugen et al. (2018) that was discussed previously in the review of literature did compare the SDE tool to the SCOFF

questionnaire and the Eating Disorder Screening for Primary Care (EDS-PC). The study's results showed that the SDE had higher specificity rates than the EDS-PC and the SCOFF, which aligns with the provider's feedback of the SDE tool. The response scores of the providers fell closest to agree (4) on the questions pertaining to the accuracy and help in identifying those adolescents that would benefit from referrals, eliciting that, they too, believe the SDE tool has high specificity, or accuracy.

Limitations

This project had several limitations. The timing of this practice improvement project coincided with the significant decrease in clinic visits secondary to the 2020 coronavirus pandemic. The initial start date for the implementation of the SDE tool was planned for May 4, 2020. However, the weekly staff meetings during the end of April and May 2020 were entirely filled with discussions relating to the coronavirus pandemic and the continual changes occurring to regulations and requirements for both the facility and the providers in the clinic. Because of this, presentation of the project, what the project entailed, and the project's importance was not able to occur at the end of April. Instead, the project, including the project details, were presented during a weekly staff meeting at the end of May, and the implementation of the SDE tool started on June 8, 2020. This obstacle also contributed to the 5-month implementation period instead of 6-months, as originally planned.

Aside from influencing the start date of the project, the coronavirus pandemic likely also contributed to the lower-than-expected completion rates of the SDE tool. The participating providers were responsible for keeping up with the daily changes in health care relating to the pandemic, answering endless questions about the virus from their patients, and testing and stating quarantine guidelines for those patients that became ill (T. Boom, personal

communication, November 6, 2020). The duties expected of them as health care providers during the coronavirus pandemic likely inhibited participation, and perhaps motivation, in the implementation of the SDE tool as their efforts were focused elsewhere.

An additional limitation to the implementation of the SDE tool is that clinic nurses were not present during the initial SDE educational meeting explaining what the project entailed and the importance of the project. After completion of the SDE educational meeting, the co-investigator did distribute the SDE tools and their corresponding data collection sheets to each group of providers and their nurses. During this time, the project was briefly explained to the nurses and a demonstration of how to fill out the SDE tool and data collection sheet was given. All nurses verbalized their understanding and were made aware of exactly where the SDE tool was being stored for distribution.

After completion of the project, the co-investigator realized that having the nursing staff present at the initial educational meeting would have been very beneficial as they were the main personnel distributing the SDE tool to their provider's patients. The nurses would have benefited from being a part of the entire explanation of the project and the project's importance which was given at the educational meeting. Though the nurses did not interpret or assist with completion of the SDE tool or placing a referral, they were responsible for distributing the SDE tool to each female adolescent age 11-19 that their assigned provider was seeing in the clinic. With better understanding of the project and the project's importance, the nursing staff probably would have contributed to a higher completion rate of SDE tools.

Future Recommendations for Practice Improvement

Though the project had several limitations, continued use of the SDE tool in the primary care setting is recommended. In accordance with findings discussed in chapters one and two,

research continues to be published highlighting the prevalence of eating disorders. Approximately 9%, or 28.8 million, people living in the United States will develop an eating disorder within their lifespan, and females are twice as likely than males to have an eating disorder (Deloitte Access Economics, 2020). The prevalence of eating disorders is also estimated to jump 5% in the next ten years, which is not surprising, as there will be an expectation in primary care to better screen and treat anxiety and depression in the adolescent population.

Primary care providers screening for eating disorders and observing and assessing for signs and symptoms continues to be exceptionally important for early identification of disorders. Eating disorders are estimated to cost the U.S. economy approximately $65 billion each year, and around $48.6 billion of that is a result of lost productivity by those afflicted (Deloitte Access Economics, 2020). As a result of eating disorders, in the fiscal year 2018 to 2019, there were an estimated 54,000 emergency room encounters and over 23,500 inpatient hospital admissions costing approximately $29 million and $209 million, respectively. In that same fiscal year, around 10,200 people lost their lives as a direct result of suffering from an eating disorder (Deloitte Access Economics, 2020).

There is no surprise that the coronavirus pandemic also contributed to an increase in eating disorders, just as it did anxiety and depression (Deloitte Access Economics, 2020). The prevalence of eating disorders continues to rise as the pandemic carries on, and due to overexertion of the health care system, treatment for eating disorders is proving to be harder to receive. In addition, people experiencing eating disorders are estimated to have a 23 times higher likelihood of suicide, which continues to be exceptionally alarming as suicide rates are already on the rise as a result of the pandemic (Deloitte Access Economics, 2020).

Many that suffer from eating disorders choose to do so alone and never get the treatment needed due to lack of access or inadequate training of providers. Importance continues to be placed on the need for providers, mental health specialists, and counselors to receive proper training related to eating disorders and fully understand the reasons that many do not seek treatment (Ali et al., 2020). Several common reasons that those experiencing eating disorders do not seek treatment include denial, being unaware of how severe their eating disorder is, fear of no longer controlling their weight or food intake, feelings of embarrassment or that others will believe these disorders are not present, and believing they should deal with the disorders alone to avoid burdening others. The earlier eating disorders are detected, and treatment started, the less the U.S. economy and health care system will be affected, but most importantly, the better the prognosis for the patient throughout the rest of their life.

Dissemination Strategies

In the spring of 2021, the Doctor of Nursing Practice dissertation projects will be presented in the form of posters at North Dakota State University. The posters will outline the purpose and objectives of the project, guiding theoretical framework, design, data analysis, and overall findings. The poster presentation event will allow those in attendance to ask the presenter questions pertaining to their doctoral dissertation project. An electronic poster was also presented at the North Dakota Nurse Practitioner Association pharmacology conference in September 2020. This poster contained the purpose and objectives of the project, guiding theoretical framework, design, plans for future data analysis, and update on the status of the project at that time. There was time set aside during the conference that allowed for attendees to ask the presenters questions about the project.

The results of objectives one and two, the SDE completion rate and the referral rate of those adolescent females age 11-19 scoring a two or greater on the SDE tool, were presented to the participating providers at the post-implementation meeting. A copy of the results was also available to the providers upon request. The completed dissertation project has been submitted to the North Dakota State University graduate school for publication on the graduate school website. Lastly, the co-investigator has made initial inquiries about journal submission to various journals such as The Nurse Practitioner and Nursing for Women's Health with co-investigator plans to submit by 2022, allowing a year for the submission process.

Implications for Advanced Practice Nursing

The need for Advanced Practice Registered Nurses (APRNs) and their skill set continues to be on the rise. States across the country continue to advocate to eliminate the barriers that nurse practitioners face in the health care setting and allow them to practice to the full extent of their education and training. The co-investigator has found nurse practitioners are often recognized by their patients as being knowledgeable in their field, providing safe and effective care, explaining directions thoroughly, and taking the time necessary to make sure their patients are comfortable and ensure all questions are answered.

Adolescent females require special needs and education, especially during the time in which they are transitioning into adulthood and experiencing extreme changes in their mood, emotions, and body (Tenfelde & Garfield, 2020). Nurse practitioners have a crucial and unique role in caring for this population and have the opportunity to provide preventative care and teach healthy habits that will last throughout their lifetime. Importance should be placed on screening for disorders such as anxiety and depression, as it is known that eating disorders and attention deficit/hyperactivity disorders often accompany them. Nurse practitioners should recognize that

signs of anxiety, depression, and eating disorders may not be recognized by the adolescent themselves, and noticing these signs and symptoms and offering appropriate treatment will have a positive impact on their health for the rest of their life.

Adolescent females are a unique population requiring age and gender sensitive education and care (Tenfelde & Garfield, 2020). Educating this population on the expected changes their body will go through is pivotal, along with instilling them with proper self-esteem, body perception, and eating and exercise habits. Providing education to families in order to decrease stigma related to weight helps ensure that families will create healthy habits, accept all shapes and sizes, and avoid frequent conversation about weight and dieting (Hornberger & Lane, 2021). Recommending that families have meals together more often and normalize healthy, frequent food intake can help prevent talk or teasing about weight. Most importantly, nurse practitioners need to be a safe person where the adolescent female population can turn to knowing that there is always an open line of communication and that their health and needs are most important.

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APPENDIX A. SCREEN FOR DISORDERED EATING

1. Do you often feel the desire to eat when you are emotionally upset or stressed? (DEBQ)
2. Do you often feel that you can't control what or how much you eat? (PHQ)
3. Do you sometimes make yourself throw up (vomit) to control your weight? (MEBS)
4. Are you often preoccupied with a desire to be thinner? (EAT-26)
5. Do you believe yourself to be fat when others say you are thin? (SCOFF)

2+ "yes" responses = positive screen

From "Screen for Disordered Eating: Improving the Accuracy of Eating Disorder Screening in Primary Care," by Maugen et al., 2018, *General Hospital Psychiatry*, *50*, p. 20–25. Reprinted with permission.

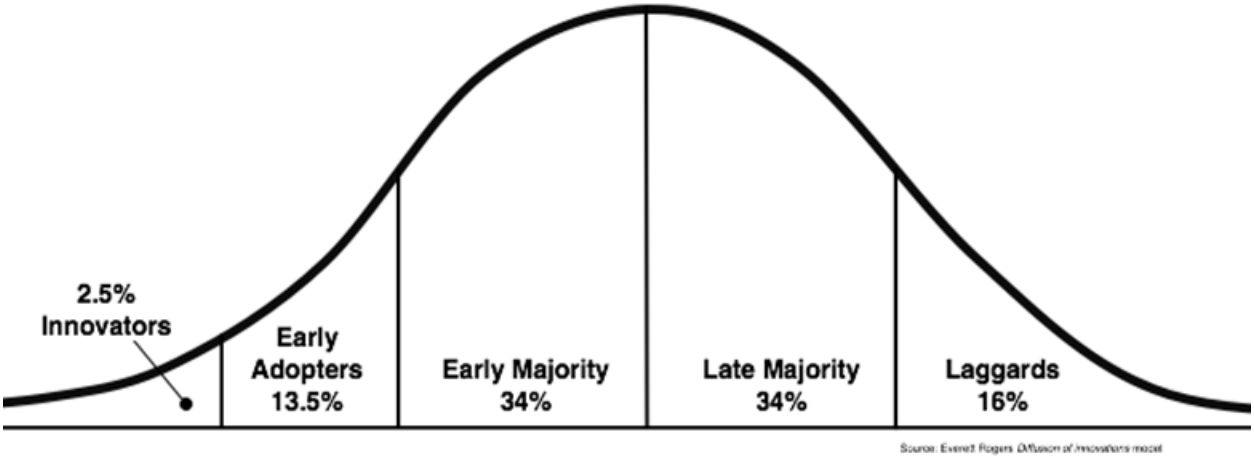
APPENDIX B. DISCRIMINATIVE ACCURACY OF EATING DISORDER SCREENING INSTRUMENTS

Prevalence	BED (with 95% CI)	BN (with 95% CI)	AN (with 95% CI)
	12.0% (8.7%–15.2%)	2.2% (1.0%–4.2%)	2.0% (0.9%–3.9%)
SDE			
Sensitivity	87.2% (74.3%–95.2%)	100% (66.4%–100%)	100% (63.1%–100%)
Specificity	54.9% (49.6%–60.2%)	51.0% (46.0%–56.0%)	50.8% (45.7%–55.8%)
AUC	0.711 (0.656–0.766)	0.755 (0.730–0.780)	0.754 (0.729–0.778)
PPV	20.4% (15.1%–26.6%)	4.43% (2.1%–8.3%)	3.92% (1.7%–7.6%)
NPV	97.0% (93.6%–98.9%)	100% (98.2%–100%)	100% (98.2%–100%)
EDS PC			
Sensitivity	100% (92.1%–100%)	100% (63.1%–100%)	66.7% (22.3%–95.7%)
Specificity	39.2% (34.1%–44.6%)	35.2% (30.4%–40.2%)	34.5% (29.7%–39.4%)
AUC	0.696 (0.670–0.722)	0.676 (0.652–0.700)	0.506 (0.298–0.714)
PPV	17.7% (13.2%–23.0%)	3.11% (1.4%–6.0%)	1.56% (0.4%–3.9%)
NPV	100% (97.3%–100%)	100% (97.3%–100%)	98.5% (94.8%–99.8%)
SCOFF			
Sensitivity	69.6% (54.2%–82.3%)	77.8% (40.0%–97.2%)	37.5% (8.5%–75.5%)
Specificity	78.2% (73.6%–82.4%)	73.6% (69.0%–77.9%)	72.5% (67.8%–76.8%)
AUC	0.739 (0.668–0.810)	0.757 (0.611–0.903)	0.550 (0.369–0.731)
PPV	29.4% (21%–38.8%)	6.31% (2.6%–12.6%)	2.68% (0.6%–7.6%)
NPV	95.2% (92.1%–97.3%)	99.3% (97.5%–99.9%)	98.3% (96.0%–99.4%)

Note: PPV = positive predictive value; NPV = negative predictive value; BED = Binge Eating Disorder; BN = Bulimia Nervosa; AN = Anorexia Nervosa; SDE = Screen for Disordered Eating.

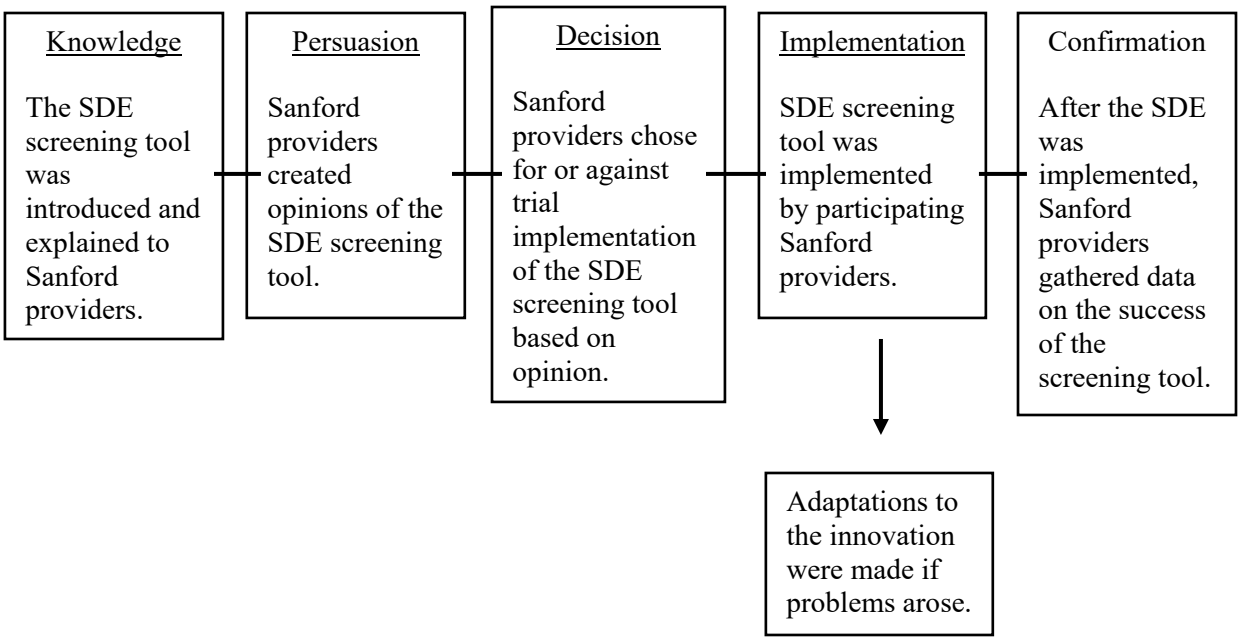
From “Screen for Disordered Eating: Improving the Accuracy of Eating Disorder Screening in Primary Care,” by Maugen et al., 2018, *General Hospital Psychiatry*, *50*, p. 20–25. Reprinted with permission.

APPENDIX C. DIFFUSION OF INNOVATION THEORY

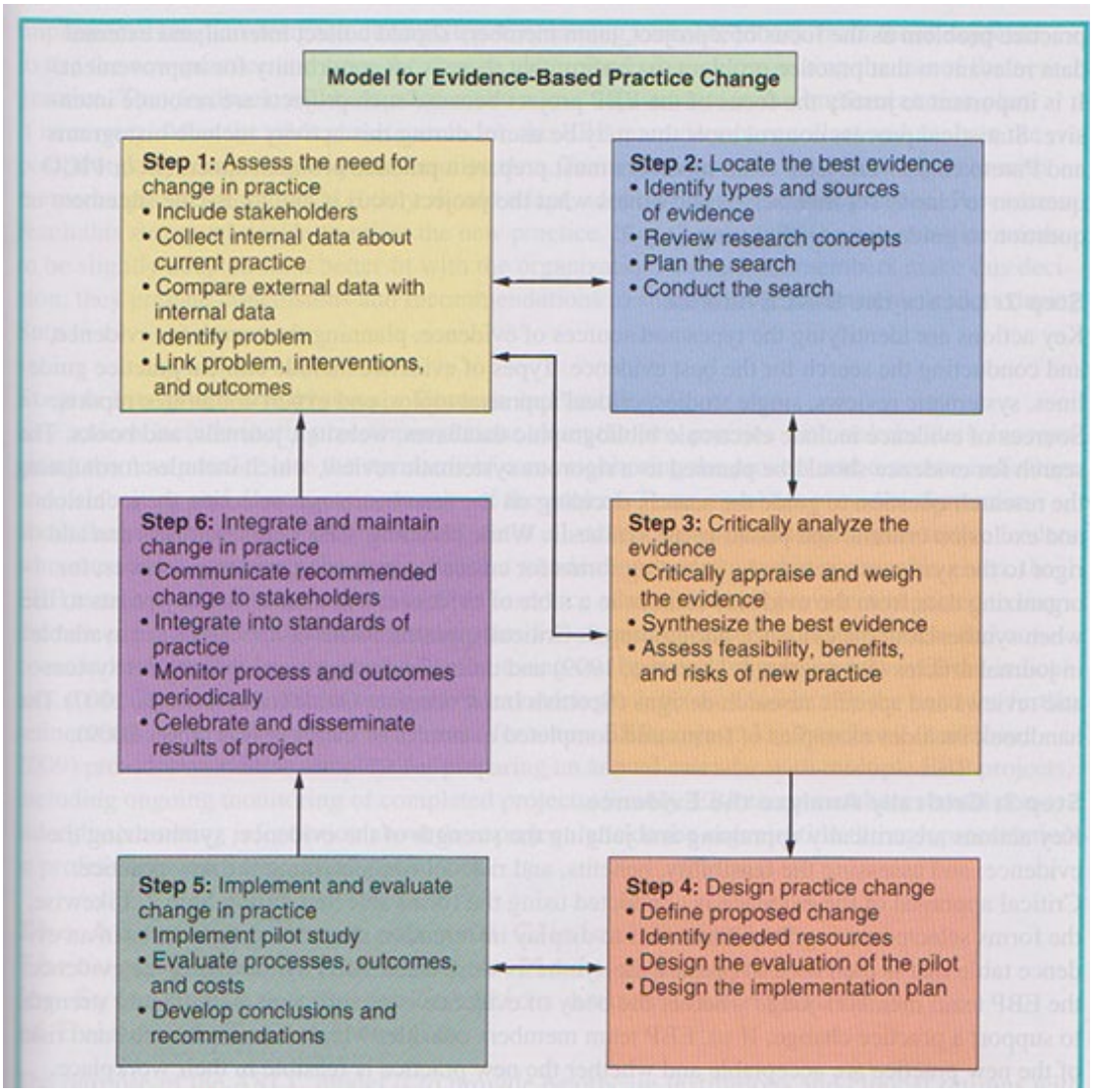


(LaMorte, 2019).

APPENDIX D. ADOPTION-DECISION STEPS



APPENDIX E. MODEL FOR EVIDENCE-BASED PRACTICE CHANGE



(Melnyck & Fineout-Overholt, 2015)

APPENDIX F. AGENCY LETTER OF SUPPORT

February 12, 2020

North Dakota State University
Institutional Review Board

To whom it may concern:

Sanford Health Clinic in Jamestown is writing to express their support for the proposed practice improvement project by Brooke Thom, NDSU DNP graduate student. Her proposed project is titled: Screening Adolescent Females for Eating Disorders in Primary Care. We will assist Ms. Thom with the recruitment of primary care providers to participate in her practice improvement project. The approval of the Sanford research committee will be obtained prior to implementation of the project.

If there is any additional information that I can provide you with or questions that I can answer, please contact Sanford Health Clinic in Jamestown at 701-251-6000.

Sincerely,

Sarah Schatz, MD
Managing Physician Partner
Sanford Health Clinic

APPENDIX G. INFORMATIONAL MEETING CONTENT

Slide 1:
Introduction of Self
Title of Implementation Project

Slide 2:
Brief presentation of professional background and why I am interested in this topic.

Slide 3:
Presented research about eating disorders such as prevalence, recurrence, and etiology.

Slide 4:
Discussed signs and symptoms of eating disorders to help better identify the diseases, as well as comorbidities that often occur in those with eating disorders.

Slide 5:
Discussed the challenges health care providers face when identifying eating disorders, especially those in the rural setting.

Slide 6:
Presented the purpose of the practice improvement project.
Introduced the SDE tool and explained how it is used.

Slide 7:
Explained how the implementation of the SDE tool would occur, to which population, and how to move forward with the score that was received.

Slide 8:
Provided referral options for those scoring 2 or more on the SDE tool.

Slide 9:
Explained where the completed SDE tools should be placed and how I would evaluate the results.

Slide 10:
Discussed the measurable objectives of the practice improvement project.

Slide 11:
Allowed time for questions and provided the providers with my contact information.

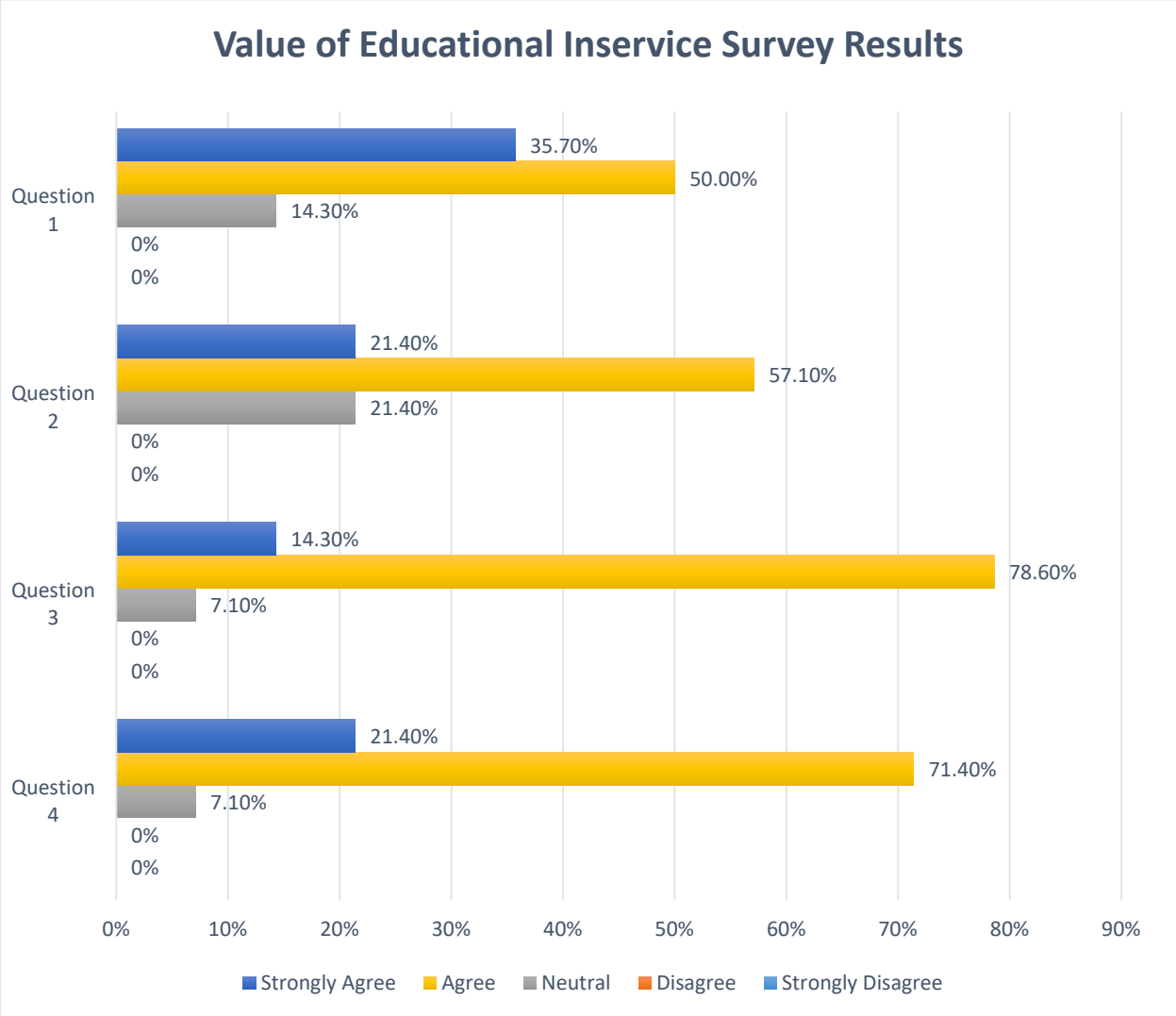
Slide 12:
References

APPENDIX H. VALUE OF EDUCATIONAL INSERVICE

Please circle the number that most closely corresponds with your response to each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
This educational session provided me with information about eating disorders that I did not know.	1	2	3	4	5
I am now more aware of the signs and symptoms to watch for when assessing for an eating disorder.	1	2	3	4	5
I have dealt with the discussed challenges that health care providers face when identifying eating disorders and making the necessary referrals.	1	2	3	4	5
I think using the SDE screening tool will help me identify disordered eating thoughts and habits in my practice.	1	2	3	4	5

APPENDIX I. VALUE OF EDUCATIONAL INSERVICE DATA ANALYSIS



N=14

Question 1: This educational session provided me with information about eating disorders that I did not know.

Question 2: I am now more aware of the signs and symptoms to watch for when assessing for an eating disorder.

Question 3: I have dealt with the discussed challenges that health care providers face when identifying eating disorders and making the necessary referrals.

Question 4: I think using the SDE screening tool will help me identify disordered eating thoughts and habits in my practice.

APPENDIX J. SDE DATA COLLECTION SHEET

Provider Name: _____

Date: _____

Age of adolescent: _____

SDE Score: _____

Referral placed if score 2 or greater: Yes/No

Which facility/specialist was referral made to: _____

If no referral placed, state why: _____

APPENDIX K. EASE, ACCURACY, AND APPLICABILITY OF SDE

Please circle the number that most closely corresponds with your response to each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I see adolescent females in my practice at least weekly.	1	2	3	4	5
The SDE tool is easy to administer and interpret the results.	1	2	3	4	5
The SDE tool accurately screening adolescent females struggling with disordered eating thoughts and patterns.	1	2	3	4	5
The SDE tool helped identify those adolescent females that would benefit from a referral to a counselor, mental health specialist, and/or eating disorder specialist because of their eating thoughts and patterns.	1	2	3	4	5
The implementation of the SDE screening tool is beneficial to my practice.	1	2	3	4	5

APPENDIX L. STUDY DESIGN

	Intervention (5 months)	Postintervention (2 months to gather/analyze data)
All adolescent females meeting inclusion criteria being seen by a primary care provider.	Implementation of SDE screening tool.	Measurement of all females meeting inclusion criteria seen by primary care providers compared to the number that completed the SDE screening tool.
Adolescent females scoring a 2 or more on the SDE screening tool.	Referral to a specialist if score of two or more.	Measurement of those scoring a 2 or more on the SDE screening tool compared to those that were referred on to a specialist.
Perception of implementation of SDE screening tool by primary care providers.	Implementation of SDE screening tool.	Evaluation of primary care providers feedback on the ease, accuracy, and applicability of the SDE screening tool.

APPENDIX M. PROJECT IMPLEMENTATION PLAN TIMELINE

Completion Date	Pre-Implementation	Implementation	Evaluation
May 2019	Identified dissertation committee chair and committee members.		
May-December 2019	Developed dissertation proposal.		
February 2020	NDSU Committee dissertation proposal.		
February 2020	Obtained Sanford research committee approval.		
May 2020	Began NDSU IRB approval process.		
May 2020		Held educational in-service for Sanford practitioners and other staff about the SDE screening tool, how to administer it and to who, and how it is interpreted. Confirmed agreeance to participate by those practitioners willing to do so.	
June 2020		Implemented SDE screening tool to correct population for a 5-month period.	

Completion Date	Pre-Implementation	Implementation	Evaluation
June 8-November 8, 2020			Reviewed data of correct patient population that were seen by participating practitioners and collected SDE completion and referral rates.
November 2020			Analyzed monthly reports from Sanford research committee showing number of female patients ages 11-19 seen by participating providers.
December 2020			Disseminated results and sought feedback from participating providers about ease, accuracy, and applicability of screening tool.
February 2021			NDSU Committee dissertation final defense.

APPENDIX N. ESTIMATED COSTS FOR PROJECT

Activity/Materials	Cost per Unit	Estimated Time/Number	Totals
Printing	$0.10/page	400	$40
Food/Beverage	$60	2	$120
Total			$160

APPENDIX O: IRB EXEMPT STATUS

NDSU NORTH DAKOTA STATE UNIVERSITY

May 19, 2020

Dr. Dean Gross
Nursing

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #PH20262, "Screening Adolescent Females for Eating Disorders in Primary Care"

NDSU Co-investigator(s) and research team: Brooke Thom
Date of Exempt Determination: 5/19/2020 Expiration Date: 5/18/2023
Study site(s): Sanford Jamestown Clinic Funding Agency: n/a
The above referenced human subjects research project has been determined exempt (category 1, 2(i), 4) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the revised protocol received 5/15/2020.

Please also note the following:
• If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
• The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
• Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
• Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.
Sincerely,

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult https://www.ndsu.edu/research/for_researchers/research_integrity_and_compliance/institutional_review_board_irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

APPENDIX P: EXECUTIVE SUMMARY

Executive Summary:

Screening Adolescent Females for Eating Disorders in Primary Care

Approximately 13% of the adolescent population will suffer from at least one eating disorder by age 20, and a majority of those affected are female. These disorders typically evolve during puberty and adolescence, with the highest risk being those between the ages of 13 and 17. Eating disorders are considered to be one of the most common chronic conditions within the adolescent population, and these disorders are not routinely screened for in primary care. The earlier an eating disorder is detected and treated, the better the prognosis is. Those suffering from eating disorders often do not discuss the issue openly, which reinforces the importance of screening for and openly discussing these disorders by primary care providers at each visit.

Purpose

Determine how primary care providers perceived the implementation of the Screening for Disordered Eating (SDE), an evidence-based eating disorder screening tool. The tool targets adolescent females, and affords providers using the screening tool to identify and refer adolescents with signs of eating disorders to a counselor, mental health specialist, or eating disorder specialist.

Results and Conclusion

A group of rural primary care providers found:

- The SDE tool was determined by providers to be easy for their patients to understand and complete.
- Providers were able to interpret the SDE tool quickly and determine if further action was necessary.
- Providers felt the SDE tool was helpful in identifying those adolescent females who would benefit from a referral to a counselor, mental health specialist, and/or eating disorder specialist.
- Providers agreed that the implementation of the SDE was beneficial and accurately identifies those with disordered eating thoughts and patterns.
- Regardless of a positive or negative screening, the SDE tool opens the door for providers to discuss healthy body-image and self-esteem thought processes with their patients.

Recommendations

- The SDE tool, when used with adolescent females in the primary care setting, will benefit clinics by appropriately alerting providers when referrals should be made and meeting the unique needs of this patient population.
- Primary care providers must always watch for signs and symptoms of eating disorders and continue to start conversations with their patients about body perception and healthy habits.
- Increasing competence of identifying and managing/treating eating disorders, along with adequate training for family practice providers is essential.