EXERCISE FOR THE TREATMENT OF ANXIETY AND DEPRESSION:

A QUALITY IMPROVEMENT PROJECT

by

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A scholarly project submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Nursing Practice

in

Psychiatric Mental Health Nurse Practitioner

MONTANA STATE UNIVERSITY
Bozeman, Montana

May 2024

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ACKNOWLEDGEMENTS

I want to thank my lead faculty member, Dr. Benjamin Miller, for all your support and guidance throughout this process. I will be forever grateful for your mentorship. Another special thank you to my second chair, Dr. Jamie M. Nelson, for your support.

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ABSTRACT

Background: Anxiety and depression significantly impact global health, with rising prevalence rates among college students intensifying the necessity for effective treatment modalities. Traditional pharmacotherapy and psychotherapy, while fundamental to treatment, are limited by accessibility, cost, and side effects. **Local Problem:** This quality improvement (QI) project aimed to integrate exercise, a recommended but underutilized treatment option with evidence of comparable efficacy to standard treatments, into the mental health care plan for college students at a Northern Plains university.
Methods: Using the Iowa Model of Evidence-Based Practice, the project introduced an exercise prescription algorithm and provided a clinician education session within the university's health facility. The QI initiative targeted primary care providers, providing them with the tools to incorporate exercise recommendations using patient preference and available campus resources systematically into care plans for students presenting with symptoms of anxiety and depression.
Intervention: Pre- and post-intervention surveys assessed changes in provider prescribing behaviors, and students were surveyed to assess engagement with prescribed exercise regimens.
Results: Results demonstrated an increase in provider comfortability in recommending exercise for patients with anxiety and depression, though data from student surveys and chart audits, a relatively small sample, showed no indication that recommendations were made.
Conclusion: Further information would be necessary to determine if the change in provider comfortability and habits of recommending exercise for patients with anxiety and depression results in a change in patient adherence and improves outcomes.

CHAPTER ONE

REVIEW OF THE LITERATURE

Depression is a leading contributor to global disease burden (Singh et al., 2023; Lee et al., 2021; Heissel et al., 2023; Pearce et al., 2022), with estimates suggesting between 280 million and 300 million people suffer from depression worldwide (Pearce et al., 2022; Heissel et al., 2023). Lee et al. (2019) estimate one in five people will experience depression in their lifetime. Depression leads to dysfunction in social life, quality of life, mortality from other illnesses, and suicide (Lee et al., 2021; Pearce et al., 2022). Anxiety is the most prevalent mental health disorder and the sixth leading cause of years lived with a disability (McDowell et al., 2019; Singh et al., 2023). Anxiety's burden causes reduced psycho-social functioning and life satisfaction, impairment of relationships, stress, difficulty sleeping (Kavelaars et al., 2023), and has been linked to chronic diseases such as irritable bowel syndrome, asthma, cancer, chronic pain, cardiovascular disease, and premature death (McDowell et al., 2019). In the United States, the estimated economic burden of depression was $326 billion in 2018 (Greenberg et al., 2021), and the total cost estimate for anxiety disorders is greater than 30% of the total psychiatric disorder expenditures in the United States (Kavelaars et al., 2023). In the United States, pharmacotherapy and psychotherapy are the first-line treatments for anxiety and depression, yet despite the high prevalence, an estimated two-thirds of individuals diagnosed with depression remain untreated (Heissel et al., 2023) and as little as 18%-25% of depressed people being treated receive adequate pharmacological and/or psychotherapy treatment (Jazayeri et al., 2021), a trend exacerbated by the Covid-19 pandemic (Singh et al., 2023; Heissel et al., 2023). Among college students, depression and anxiety are especially

prevalent due to increased stress, new experiences, new living situations, increased independence, and new relationships, furthermore, common psychiatric conditions usually first appear in early adulthood (Liu et al., 2019). First-line treatments for anxiety and depression include pharmacotherapy such as selective serotonin reuptake inhibitors (SSRIs) but they can cause unintended side effects such as weight gain, decreased sexual function, nausea, insomnia, and poor compliance rates (Jazayeri et al., 2021), whereas psychotherapy only achieves 50% remission rates and is costly (Heissel et al., 2023), highlighting the need for adjunct treatments.

Exercise is recommended by the World Health Organization (WHO) and the National Institute for Health and Care Excellence (NICE) as an adjunct treatment for depression and anxiety (Heissel et al., 2023), yet current first-line treatments include pharmacotherapy and psychotherapy, and lifestyle management approaches are recommended, like exercise, only when first-line treatments fail (Singh et al., 2023). Evidence suggests exercise has similar, if not stronger, effect sizes as psychotherapy and pharmacotherapy for anxiety and depression with lower costs, decreased side effects, and additional health benefits and should be considered a first-line treatment for anxiety and depression (Singh et al., 2023). Exercise has been shown to alleviate symptoms of depression through regulation of the hypothalamic-pituitary-adrenal (HPA) axis and neurogenesis, improve corticotropin-releasing factor (CRF), and enhance hippocampal volume following exercise (Wen Sun et al., 2023). Yet, only one in three adults in the United States who see a primary provider reported being advised to exercise, and only 37% reported their mental health professional suggested exercise (Escobar-Roldan et al., 2021). Given the response rate of recommendations, side effect profiles, wait

lists for psychotherapy, and associated costs of medications and therapy, an alternative such as exercise, must be included in first-line treatment recommendations.

Project Objectives

The prevalence of anxiety and depression in the United States has increased, a trend exacerbated due to the COVID-19 pandemic. This review sought to explore the potential of exercise as a therapeutic treatment option for individuals suffering from anxiety and depression and to outline methods to integrate exercise into treatment regimens where appropriate.

Literature Review

The search was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement Guidelines (PRISMA) (Page et al., 2021). The literature search aimed to discover if exercise decreased symptoms of anxiety and depression and implementation strategies for incorporating exercise as a treatment recommendation. A systematic search for peer-reviewed literature was conducted with help from the MSU librarian in September 2023 including four databases: PubMed, CINAHL, Web of Science, and PsycInfo. The reference lists of systematic reviews retrieved from the search were also searched for eligibility criteria. Three additional references were obtained through a podcast discussing exercise and mental health disorders. Databases were searched for articles written between 2018-2023. Search terms and keywords included: “exercise” AND “anxiety” OR “depression”, “physical activity” AND “mental health”, “college students” AND “exercise” AND “mental health outcomes”, “exercise treatment for anxiety OR depression”, “exercise recommendation AND depression OR anxiety.”

Results were limited to peer-reviewed, English language, human subjects, and within the last five years.

Inclusion/Exclusion

Articles were included if they had exercise or physical activity as a plan of care or intervention in the last five years. Originally, the search was limited to systematic reviews and meta-analyses, however, due to the need for larger inclusion criteria, those limits were lifted. Titles and abstracts were reviewed for relevance. Studies were included if they measured the effects of exercise on symptoms of anxiety and/or depression, included adults >18 years old, and included the incorporation of exercise in a written plan of care. Studies were excluded if they did not include exercise as a measured variable.

Study Selection

Searching four databases produced 246 results. A total of 116 duplicates were removed, resulting in 130 articles available to screen. Screening included reading the title and if necessary, the abstracts. 15 articles were removed if the title or abstract revealed variables not being measured in the current search, resulting in 115 articles. Those articles were reviewed for relevance, and 82 were excluded based on variables measured or patient populations not meeting criteria. One article was requested from an interlibrary loan; however, it was never retrieved. The final 32 articles were stored in EndNote20 for review and possible inclusion. However, 18 were excluded for not meeting the criteria (see Fig. 1). An additional two articles were included from citation searching of systematic reviews, resulting in 12 articles in the review.

Results

Exercise for Depressive Symptoms

Five systematic reviews investigated the effects of exercise on symptoms of depression (Ashdown-Franks et al., 2020; Heissel et al., 2023; Jazayeri et al., 2021; Lee et al., 2021; Singh et al., 2023), and one randomized controlled trial (RTC) (Henriksson et al., 2022), while one systematic review examined the effects of exercise on the risk for depression (Pearce et al., 2022). Results of all systematic reviews and one RTC suggest exercise is effective in treating symptoms of depression, though the magnitude of effect varied from small (Jazayeri et al., 2021), and medium (Heissel et al., 2023; Henriksson et al., 2022; Lee et al., 2021; Singh et al., 2023), while Ashdown-Franks et al. (2020) did not include effect sizes but concluded exercise reduced symptoms of depression across age groups. Additionally, even half the recommended amount of exercise decreases the risk for depression, substantially if exercise reaches recommended levels (Pearce et al., 2022). Singh et al. (2023) reviewed 1,039 trials including more than 128,119 patients, and concluded exercise improved depression and depressive symptoms (median SMD=−0.43, IQR=−0.66 to –0.27), with a slightly better effect size than pharmacotherapy and psychotherapy. Heissel et al. (2023) reviewed data from 41 studies concluding a large effect of exercise on depressive symptoms with a pre-post correlation of 0.7 (SMD=−0.946, 95% CI −1.18 to −0.71, $p<0.001$, $I2=82.49$, $p<0.001$) and reported number needed to treat (NNT) as 2.8, suggesting for every 2.8 patients treated with exercise for their depressive symptoms, one patient's symptoms would remit. The high level of evidence in the literature reviewed concludes physical activity is an effective treatment for reducing depressive symptoms.

Exercise for Anxiety Symptoms

Four systematic reviews studied the effects of exercise on anxiety symptoms (Ashdown-Franks et al., 2020; Machado et al., 2022; McDowell et al., 2019; Singh et al., 2023), and one randomized controlled trial (RTC) similarly investigated the effects of exercise on anxiety symptoms (Henriksson et al., 2022). In their meta-analysis, Singh et al. (2023) concluded physical activity had a medium effect on reducing symptoms of anxiety across populations (SMD=−0.42, IQR=−0.66 to –0.26). The RTC conducted by Henrickson et al. (2022) concluded similar findings when Beck Anxiety Inventory (BAI) symptoms went from severe to mild pre/post exercise, respectively and the odds ratio (OR) for improved symptoms of anxiety for low-intensity exercise was 3.62 (CI 1.34–9.76) and for moderate/high intensity 4.88 (CI 1.66–14.39). A meta-review conducted by Ashdown-Franks et al. (2020) reviewed three RTCs involving exercise and anxiety and concluded exercise was effective vs. non-exercise interventions at reducing symptoms of anxiety, however, the sample of studies reviewing anxiety was small. Surprisingly, the meta-analyses conducted by Machado et al. (2022) and McDowell et al. (2019) reported inconclusive data due to challenges in current evidence with unclear study methods, a small body of literature, and limited reported exercise protocols, however, each study speaks of evidence suggesting physical activity protects against symptoms of anxiety.

Types of Exercise

Two meta-analyses and one RTC speak to different types of exercise; aerobic vs. resistance training vs. both (Heissel et al., 2023), resistance vs. endurance (Jazayeri et al., 2021), and high intensity vs. low intensity vs. control (Henriksson et al., 2022). While Heissel et al. (2023) found large effect sizes for aerobic exercise (SMD=−1.156) and resistance training

(SMD=−1.042) on symptoms of depression, they found only a small effect on the combination (SMD=−0.455). Additionally, Jazayeri et al. (2021) found small, significant effect sizes for endurance (aerobic) (SMD = − 0.163, p=0.00) and resistance training (SMD = − 0.139, p=0.00) in reducing depressive symptoms, yet negligible results with the combination of endurance and resistance training (SMD = − 0.014, p= 0.947). The RTC conducted by Henrickson et al. (2022) found high-intensity exercise was more effective than low-intensity exercise at reducing symptoms of anxiety and depression, but both high-intensity and low-intensity groups were significantly more effective than the control group. While the effect sizes for reduction in depressive symptoms varied, Heissel et al. (2023) and Jazayeri et al. (2021) found aerobic and resistance training separately decreased symptoms of depression more than the combination of both. Evidence suggests high-intensity exercise is more effective than low-intensity at reducing symptoms of anxiety and depression, yet each shows improvement in symptoms (Henriksson et al., 2022; Singh et al., 2023).

Exercise Prescribing

Three studies examined provider practices in prescribing exercise. Two cross-sectional studies surveyed provider characteristics, current practices, personal exercise routines, and barriers to prescribing exercise (Escobar-Roldan et al., 2021; Kleemann et al., 2020). Each study provided insight into the likelihood of mental health providers prescribing exercise, finding providers were more likely to prescribe exercise if they exercised regularly (Escobar-Roldan et al., 2021; Kleemann et al., 2020). Only 24% of providers provided written, detailed recommendations for exercise (Escobar-Roldan et al., 2021), and only 12% “always” prescribed exercise (Kleemann et al., 2020). Additionally, exercise was most frequently prescribed for

anxiety and depression and the biggest barrier to prescribing exercise was a lack of knowledge/training regarding exercise recommendations (Escobar-Roldan et al., 2021; Kleemann et al., 2020). One RTC examined the use of motivational interviewing and personalized exercise recommendations vs. standard, oral exercise recommendations on patient's adherence to physical activity recommendations (Riera-Sampol et al., 2021). Personalized, written exercise recommendations improved adherence to recommendations, though the study was conducted on patients with cardiovascular disease, not mental health conditions (Riera-Sampol et al., 2021).

Discussion

This review examined the evidence of exercise as a treatment option for patients with anxiety and depression and how to incorporate prescriptive exercise into a treatment plan when indicated. There is strong evidence concluding exercise is effective in reducing symptoms of anxiety and depression across age groups. There was considerable heterogeneity in the systematic reviews, suggesting a variation of methods and interventions across studies. Regardless, the eight systematic reviews and one RTC concluded exercise should be incorporated into the plan of care for patients with anxiety and depression. Exercise is free, relatively risk-free, offers additional health benefits, and should be considered a first-line adjunct treatment for patients presenting with symptoms of anxiety and depression.

Practice Implications

Exercise should be recommended for every patient who presents with symptoms of depression and anxiety. Additionally, exercise should be included as a viable first-line adjunct

treatment for anxiety and depression, including education for patients so they fully understand the benefits. Evidence suggests providers are more likely to prescribe exercise if they are exercising, providing a call to action for healthcare providers to incorporate exercise personally (Escobar-Roldan et al., 2021; Kleemann et al., 2020). Patients are more likely to adhere to exercise recommendations when they are written and personalized (Riera-Sampol et al., 2021), concluding exercise should be discussed with each patient, along with the patient's preferences, resources, and motivations, and written instructions provided to the patient.

Conclusion

The increasing prevalence of anxiety and depression, exacerbated by the COVID-19 pandemic, emphasizes the need for effective and accessible treatment options. Traditional methods such as pharmacotherapy and psychotherapy, while sometimes effective, are not always accessible because of high costs, wait lists, and potential side effects of pharmacotherapy. This review sheds light on exercise as a viable and valuable solution as an adjunct treatment for anxiety and depression.

The research highlights the efficacy of exercise in decreasing symptoms of both anxiety and depression, sometimes matching traditional interventions of psychotherapy and pharmacotherapy (Singh et al., 2023). Exercise is cost-effective and provides a range of additional health benefits without the typical side effects typically seen with pharmacological interventions. It is important to note that even moderate levels of exercise can have meaningful impacts on mental health.

While the evidence is compelling, there is a gap in clinical application. Only a minority of providers routinely prescribe exercise, and many cite a lack of knowledge or training

regarding exercise recommendations (Escobar-Roldan et al., 2021). There is a clear need for training and advocacy in this area. Personal beliefs and behaviors around exercise seem to influence clinicians' prescribing habits, indicating that personal and professional development in this area could have benefits (Escobar-Roldan et al., 2021).

Finally, the effectiveness of a treatment is only as good as its adherence. Strategies that enhance adherence to exercise, such as motivational interviewing and personalized recommendations, are critical. When prescribing exercise, healthcare providers should ensure that recommendations are tailored to the individual's preferences and resources, optimizing the chance for long-term adherence and, thus, therapeutic benefit (Escobar-Roldan et al., 2021).

In summary, given the mounting evidence on the benefits of exercise for mental health, healthcare systems, and providers should place greater emphasis on incorporating physical activity into treatment plans for those with anxiety and depression. Exercise not only addresses the symptoms of anxiety and depression but offers a holistic approach to overall well-being.

CHAPTER TWO

QUALITY IMPROVEMENT PROPOSAL

Approximately 280 million to 300 million people suffer from depression worldwide (Pearce et al., 2022; Heissel et al., 2023), while one in five people will experience depression in their lifetime (Lee et al., 2021). Depression leads to dysfunction in social life, quality of life, mortality from other illnesses, and suicide (Lee et al., 2021; Pearce et al., 2022). Anxiety is the most prevalent mental health disorder and the sixth leading cause of years lived with a disability (McDowell et al., 2019; Singh et al., 2023). Anxiety's burden causes reduced psycho-social functioning and life satisfaction, impairment of relationships, stress, and difficulty sleeping (Kavelaars et al., 2023), and has been linked to chronic diseases such as irritable bowel syndrome, asthma, cancer, chronic pain, cardiovascular disease, and premature death (McDowell et al., 2019). In the United States, the estimated economic burden of depression was $326 billion in 2018 (Greenberg et al., 2021), and anxiety disorders comprise more than 30 % of the total expenditures for psychiatric disorders in the United States (Kavelaars et al., 2023).

The Northern Plains ranks as some of the highest states in suicide rates, with approximately 35.1% of adults reporting symptoms of anxiety or depression and 17.9% reporting they are unable to get the counseling or therapy they need (National Alliance of Mental Illness, 2021).To exacerbate the problem, rural communities have limited affordable access to mental healthcare and a significant strain has been placed on the existing resources due to the increase in the prevalence of mental health disorders and an increase in population. College students in the Northern Plains are a vulnerable population where depression and anxiety are especially

prevalent due to increased stress, new experiences, new living situations, increased independence, and new relationships (Lie et al., 2019), a trend exacerbated by the COVID-19 pandemic.

While traditional therapies such as pharmacotherapy and psychotherapy remain essential, evidence suggests the potential for exercise to relieve symptoms of anxiety and depression. Singh et al. (2023) report exercise has similar, if not stronger, effect sizes as psychotherapy and pharmacotherapy for anxiety and depression with lower costs, decreased side effects, and additional health benefits. It should be considered a first-line adjunct treatment for anxiety and depression.

Problem Statement

The problem is despite the known benefits, exercise is underutilized as a treatment for depression and anxiety. This quality improvement project aims to introduce, standardize, and increase the utilization of exercise recommendations for the treatment of anxiety and depression among college students.

Organizational Microsystem Assessment: 5P's

A clear need for this project appeared after completing a comprehensive microsystem assessment of the site's health facility. Globally, depression and anxiety are prominent issues, with national and state data reflecting similar trends. These issues become even more pronounced at the university level, given the various challenges students face from academic pressures, changing environments, and personal life transitions.

Purpose

The setting for this quality improvement project is a college campus health facility in the Northern Plains. The student population consists of approximately 14,700 undergraduate students (average age 21) and 2, 200 graduate students (average age 31) in 2021 (Host University, n.d.). Tuition includes access to primary and acute care, psychiatric services, wellness coaches, counseling and psychological services, the gym, outdoor recreation, club and intramural sports, and various other services. Current data suggests mental health access in this region of the country is low, and the rates of anxiety and depression are higher than the US national average (National Alliance of Mental Illness, 2021), giving this university a unique opportunity to reach students who may be struggling with their mental health.

Patients

The total patient population consists of 16,841 students (Host University, n.d.). In 2018, the student health center performed over 17,800 medical visits, and over 1,900 people were seen for counseling services (Host University, n.d.). Mental health providers at the site report an increasing demand for their services with an escalating severity of mental health needs, such as suicidality.

Professionals

The student health center at the project site consists of acute care, primary care, psychiatric services, counseling and psychological services, integrated behavioral health, wellness coaches, nutritionists, and sports recreation. For the purpose of this quality improvement project, the key stakeholders include the psychiatrist (site representative), seven primary care providers, and sports recreation. The primary care providers were chosen for the

implementation of the project because of their availability to students and because they see many patients seeking new patient appointments for anxiety and depression.

Processes

The Patient Health Questionnaire (PHQ-9) is a nine-item tool used in primary care settings to screen for depression. The PHQ-9 has been identified as the most reliable and validated tool in primary care settings for screening for depression (Costantini et al., 2021) (See Table 2.1 for the full questionnaire with interpretation). The Generalized Anxiety Disorder scale-7 (GAD-7) is a seven-item, validated scale used to screen for generalized anxiety disorder in primary care settings (Sapra et al., 2020) (See Table 2.2 for the full questionnaire). At the project practice site, patients seeking new appointments, regardless of presenting concern, complete a PHQ-2 that cascades to a PHQ-9, if the PHQ-2 is greater than three, and a GAD-7. Additionally, any patient seeking care for mental health reasons is given a PHQ-9 and GAD-7. Patients following up for appointments regarding their mental health are given a PHQ-9 and GAD-7. Most patients complete their questionnaires and paperwork on the patient portal prior to their appointment. Exercise is assessed and recommended informally based on individual provider preference, without standardization or formal recommendations.

Patterns

The student health facility's existing patterns include standardized anxiety and depression screening for all new patients. The providers from all specialties meet monthly to discuss policies, workflows, and process improvement. Currently, a program called "Movement is Medicine (MIM)" is designed for people with mental health concerns who may benefit from exercise. This program is a referral-based program, occurring once weekly, for those whom a

provider has referred. The attendance for MIM attendance is low, suggesting either a lack of referral by the provider, lack of awareness of the student, or lack of student or provider motivation, and therefore underutilization of exercise as a treatment option. There has been a discussion in this facility about canceling the MIM program due to its low attendance.

Quality Improvement Framework

The framework for this quality improvement initiative follows the Iowa Model. The Iowa Model is an evidence-based framework used to guide healthcare professionals through a decision-making process when integrating process improvement into practice (University of Iowa Healthcare, 2015). (See Figure 2.1).

Step 1: Identify Triggering Issues/Opportunities:

First, there was recognition of anxiety and depression in the college student population. Despite exercise as a viable adjunct treatment to decrease symptoms of anxiety and depression, recommendations for exercise are underutilized and not standardized among providers at this site. The uniqueness of this population is that the patients seen at the student health center have access to multiple resources for exercise, such as the gym, outdoor recreation, and intramural sports, which have already been paid for with tuition.

Step 2: Question or Purpose

The purpose of this quality improvement project initiative is to increase the utilization of exercise recommendation practices for patients with anxiety and depression on a college campus.

Step 3: Form a Team

The team consists of seven primary care providers, one psychiatrist, and a sports recreation personal trainer. The psychiatrist and the project lead will develop an exercise

recommendation algorithm with the help of sports recreation to be utilized by the seven primary care providers during new patient mental health visits. The psychiatrist and project lead are responsible for gathering pre/post-survey data regarding provider utilization of exercise recommendations and student surveys regarding recommendations and utilization. The site representative will review student charts for the provider's formalized exercise recommendations as part of the student's treatment for anxiety and depression. The project lead will analyze the data using descriptive statistics.

Step 4: Assemble, Appraise, and Synthesize the Body of Evidence

A systematic scoping review was conducted for the benefits of exercise and exercise recommendations in the treatment of anxiety and depression. Sufficient evidence exists regarding the efficacy of exercise in decreasing symptoms of anxiety and depression.

Step 5: Feasibility, Importance, and Appropriateness of Change

Tuition to this university covers access to the gym, gym classes, outdoor recreation rentals, personal trainers, and intramural and club sports. The plethora of resources available to students provides a unique opportunity to recommend exercise, eliminating the barrier of cost and access to exercise options. The project created a streamlined exercise recommendation algorithm for providers utilizing the resources available to eliminate time barriers on the provider's end. While the project aims increased providers' exercise recommendation patterns, secondary outcomes aim to improve the overall mental health of patients on campus.

Step 6: Design and Pilot the Practice Change

The project team engaged stakeholders in the project aims, including fitness resources across campus. The project lead developed an exercise recommendation algorithm based on

student preferences for exercise, for example, alone or with others, at home, inside, or outside, or if competition is a motivator or not. All patients at new patient mental health visits for anxiety and depression were asked about their current exercise habits and preferences. The protocol consisted of an algorithm leading a provider to an individualized recommendation based on patient preferences, utilizing local/campus resources. Prior to implementation, the education of providers occurred during a provider meeting, preparing providers for implementation and providing materials, such as the algorithm. Providers were given a survey pre- and post-implementation of the protocol to gauge current practices vs. provider practices after implementation. Data collected by the survey had no identifiers and was stored online at the site. Another survey was given to students who were following up on their anxiety and/or depression. Survey data measured if exercise was recommended as part of their treatment plan and if they utilized exercise. No patient identifiers were collected for the patient survey. Additionally, the site representative conducted chart reviews to determine if providers are formally recommending exercise as part of their treatment plan for anxiety and depression. Data analysis consisted of descriptive statistics. The project goal was to increase exercise-recommending practices in students with anxiety and depression by 25%.

Step 7: Integrate and Sustain the Practice Change

The project team and key stakeholders were a fraction of the healthcare providers at this university campus. The seven primary care providers are the pilot team. Their input was vital in terms of barriers and potential improvements to the project. With their input, sustained change will come from the widespread implementation of counseling and psychological services. The long-term goals include exercise being assessed like a vital sign, all patients who are appropriate

for exercise recommendation receiving one, integration of exercise questions and algorithm into the EHR, decreased prevalence of anxiety and depression, and collaboration with sports recreation for an exercise class specific to people with anxiety and depression.

Step 8: Disseminate Results

The project's results will be disseminated during a provider meeting of the key stakeholders and the defense of this project.

Specific Aims/ Purpose Statement

The purpose of this quality improvement project is to increase the utilization of exercise recommendation practices for patients with anxiety and depression on a college campus. Students on this college campus have abundant resources available for exercise without the barrier of costs, as resources have been paid for in their tuition. Despite the known benefits and official recommendations, exercise is underutilized as a treatment for depression and anxiety.

Short-term Aims

The project's short-term aims include increased provider confidence in recommending exercise for symptoms of anxiety and depression through an educational staff meeting, gathering data regarding available campus resources, and evaluating providers' baseline recommending practices through a provider survey. The project's short-term goals are to be completed in January 2024.

Medium-term Aims

Next, the intermediate aims include implementing the exercise recommendation algorithm in primary care for new patient depression and anxiety appointments. The project will

be considered successful if providers' exercise recommendations for patients with anxiety and depression increase by 25% by the end of the three-week implementation.

Long-term Aims

The long-term aims of this quality improvement project include incorporating exercise as a vital sign in primary care, incorporating exercise algorithm questions into the student health EHR for patients to answer before appointments, decreasing the prevalence of anxiety and depression on campus, and integrating classes with campus recreation to provide classes specifically for people with anxiety and depression.

Table 2.1. Smart Goals

Smart Goal # 1: Evaluate baseline recommendation patterns of providers		
• Provider survey given through Qualtrics prior to project implementation (See Figure 2 for questions) • Survey given in January 2024		
Data to be collected	Method of collection, who is responsible	Planned data analysis
Demographics of providers and exercise prescribing practices, exercise prescribing confidence	Project lead will collect survey results. No identifying information will be asked	Descriptive statistics and baseline data
Smart Goal #2: Increase provider confidence in recommending exercise		
• Education session during a provider meeting • February 2024		
Data to be collected	Method of collection, who is responsible	Planned data analysis
Provider discussion and pre-surveys regarding recommending exercise	Site representative and project lead through feedback and pre-survey	Provider demographics, descriptive statistics, baseline data
Smart Goal #3: Develop exercise algorithm for recommendations		

Table 2.1. Smart Goals Continued

• Assess campus resources for various exercise methods, ie: alone vs. with others, indoor vs. outside vs. at home, competition vs. no competition • October 2023-November 2023		
Data to be collected	Method of collection, who is responsible	Planned data analysis
Campus resources, meet with outdoor rec and sports recreation	Site representative and project lead will gather data, develop algorithm questions	Development of algorithm, with staff discussions regarding thoroughness
Smart Goal #4: 25% increase in prescribed exercise for new patients with anxiety and depression		
• Staff surveys via Qualtrics pre/post-intervention. • Pre: January 2024; Post: March 2024		
Data to be collected	Method of collection, who is responsible	Planned data analysis
Staff survey after three weeks of implemented intervention	Project lead is responsible for sending survey and collecting answers. Survey does not ask identifiers. To be stored at facility	Descriptive statistics

Intervention and Implementation

IRB Query

The proposed intervention aims to implement and evaluate the practice of recommending exercise for treating symptoms of anxiety and depression among college students at a college campus in the Northern Plains. The project will be implemented within the university health facility, focusing on the primary care providers. The project will introduce an exercise algorithm (See Figure 2.2), including resources available to students and include patient preferences such as alone or with someone, indoors vs. outdoors, competition vs. no competition, and lead the provider to an exercise recommendation for patients presenting for new patient appointments for

anxiety or depression. Key measures include provider education regarding exercise benefits and resources available to students, methods of recommending exercise through an individualized, yet standardized exercise algorithm, and incorporation of an exercise recommendation algorithm for the treatment of anxiety and depression for college students. Outcomes will be measured through provider surveys (See Survey in Figure 2.3) pre and post-intervention and patient surveys (See Survey in Figure 2.4) given at follow-up appointments. Over three weeks, the goal is to increase the frequency and consistency of exercise recommendations by 25% for patients seen with anxiety and depression. Long-term outcomes include improved symptoms of anxiety and depression throughout the college campus.

Detailed Plan

Development of Algorithm. The project lead and site representative have developed questions for an algorithm for providers to use when recommending exercise. The algorithm includes questions regarding alone vs. with others, indoor vs. outdoor vs. at home, and competition vs. no competition. The algorithm will lead to individualized exercise recommendations based on the campus resources. It will be completed and ready for use by November 2024.

Provider Education. The project lead and site representatives will meet with primary care providers during the monthly provider meeting to educate them on recommending exercise, campus resources, and the evidence behind exercise as a treatment to reduce symptoms of anxiety and depression. Key stakeholders are aware of project development and have provided insight into workflows and anticipated barriers/successes of the project. The first provider education session will occur in mid-February 2024.

Development of Surveys. The project will be measured using staff surveys pre and post-intervention and patient surveys evaluating if exercise was recommended as part of their treatment and if they exercised following the recommendation. The provider survey aims to gauge provider comfortability and practice of recommending exercise. The patient survey aims to determine if patients receive exercise recommendations and if they implemented those recommendations. The project will be evaluated using descriptive statistics to analyze provider recommendation practices and patient adherence. Staff surveys will be completed prior to implementation in January 2024 and after three weeks of implementation in March 2024. Patient surveys will be given to patients at follow-up appointments for anxiety and depression in the three-week implementation period.

Analyze and Compile Data. Data from the provider and patient surveys will be analyzed using descriptive statistics. The site representative will review charts of patients seen for anxiety and depression to determine if their provider recommended exercise. The analysis will reveal the efficacy of changing providers' exercise-recommending practices at the site and patient adherence to exercise recommendations. Data analysis will occur in April 2024.

Budget. There is no budget for this quality improvement project. The exercise algorithm will be sent electronically to providers. Currently, the providers conduct a monthly meeting at this site, so education regarding project implementation will be free of additional training hours. The long-term outcomes include the integration of the exercise algorithm into the existing EHR, which will require a budget to pay the informatics team to build this change. An additional long-term outcome includes the integration of an exercise program at sports recreation for a class for students with anxiety and depression, which would require an additional budget.

Data Confidentiality. The project will be measured through provider surveys pre- and post-intervention and patient surveys at follow-up appointments. The surveys will not obtain any identifying information from the providers or patients. Data obtained from the surveys will be stored at the site. The site representative will review EHRs to maintain the confidentiality and integrity of student data.

Barriers/Challenges. Anticipated challenges include the provider's lack of time and provider resistance to augment a workflow. The challenge of providers' lack of time is being addressed through a streamlined algorithm of exercise recommendations that should take no longer than two to five minutes to administer. Addressing provider resistance occurs through provider education in the monthly meeting.

Evaluation and Analysis

Evaluation Frequency & Mechanism

The providers, the site representative, and the project lead evaluated processes during provider meetings before implementation and three weeks after implementation. Process evaluation will continue after implementation and is vital for continued process improvement.

Instruments and Procedures

Descriptive statistics will be utilized to analyze data. Quantitative data will include the provider's pre/post surveys, student surveys, and information gathered from the site representative's chart reviews. This numerical data can be statistically analyzed using descriptive statistics.

Data Collection

The project lead will collect data through surveys conducted pre/post-project implementation. A patient survey will be given out at the front desk to patients following up on anxiety and depression. The project lead and site representatives will collect and keep the surveys at the site. The site representative will review charts of patients seen for anxiety and depression and determine if exercise was formally recommended as part of their treatment plan. The project lead will analyze survey data with the site representative to ensure completeness and accuracy of data.

Data Analysis

Quantitative: Descriptive statistics will be used to analyze the pre/post-provider survey, the patient survey, and the site representative's review of patient charts.

Data Collection Tool

Data will be tallied in an Excel spreadsheet kept at the project site. Provider surveys will be collected via Qualtrics. Results will only be available to the project lead and site representative through password-protected log-ins.

Safety and Confidentiality

Confidentiality and Security of Data

Data for this quality improvement project includes non-identified provider and patient surveys. Surveys will be kept in a locked room at the site, only the site representative and project lead will have access. Only the site representative will be looking in the EHR to determine if providers formally recommended exercise in their treatment plan to ensure patient

confidentiality. Only primary data will be collected through provider surveys. The collected data will include no personally identifiable information (PII) and protected health information (PHI). Any data that needs to be transmitted will be encrypted and sent through secure channels. Upon the conclusion of the project, all data will be either returned to the clinic or destroyed based on the clinic's policies and preferences. Any digital copies will be permanently deleted, and any paper copies will be shredded.

Participant Risks

As this is a Quality Improvement (QI) project, it is designed to have no increased risk beyond the regular care that patients are already receiving.

Support from Stakeholders and Institutional Review

Stakeholders at the project site are supportive of this project, recognizing its potential benefits. An IRB application was submitted, and approval was received prior to project implementation.

CHAPTER THREE

EXERCISE AS TREATMENT FOR ANXIETY AND DEPRESSION

Contribution of Authors and Co-Authors

Manuscript in Chapter: 1

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Contributions: Project lead, data collection, data analysis, writer, editor.

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Contributions: Served as project chair and editor.

Co-Author: Jamie M. Nelson

Contributions: Served as second faculty and editor.

Manuscript Information

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Journal of the American Association of Nurse Practitioners

Status of Manuscript:
☒ Prepared for submission to a peer-reviewed journal
☐ Officially submitted to a peer-reviewed journal
☐ Accepted by a peer-reviewed journal
☐ Published in a peer-reviewed journal

Approximately one in five people will experience depression in their lifetime (Lee et al., 2021), while anxiety is the most prevalent mental health disorder in the United States (McDowell et al., 2019; Singh et al., 2023), each representing significant global health challenges and causing profound impacts on social functioning, quality of life, and economic burden. In the Northern Plains, the disease burden of anxiety and depression is especially acute, with suicide rates above the national average and limited access to mental healthcare, exacerbating the problem (National Alliance of Mental Illness, 2021). The COVID-19 pandemic further strained already sparse resources, adversely impacting vulnerable populations such as college students. While pharmacotherapy and psychotherapy play essential roles in mental health treatment, evidence suggests exercise, with comparable and sometimes superior efficacy, lower costs, and additional health benefits, is underutilized as a first-line adjunct treatment for depression and anxiety (Heissel et al., 2023; Singh et al., 2023). This highlights a crucial need for integrating exercise into standard treatment protocols to effectively and efficiently address the widespread and growing burden of anxiety and depression, a stance supported by the World Health Organization and the National Institute for Health and Care Excellence (NICE) (Heissel et al., 2023).

Clinical Problem

The clinical problem extends beyond the global and national prevalence of depression and anxiety, reaching rural communities in the Northern Plains. College students represent a particularly vulnerable demographic due to increased stress, life transitions, and the exacerbated impact of the COVID-19 pandemic, which have led to heightened levels of anxiety and depression within this population. The Northern Plains, considered a rural part of the country,

faces significant healthcare delivery challenges, notably in mental health services. This setting reveals the urgent need for accessible, effective treatment alternatives.

Review of the Literature

A scoping review of the literature highlights the efficacy of exercise as an adjunctive therapy for managing symptoms of anxiety and depression, challenging traditional treatments of pharmacotherapy and psychotherapy due to its comparably favorable effect sizes, cost-effectiveness, and broader health benefits (Heissel et al., 2023; Singh et al., 2023). The review highlighted findings from multiple systematic reviews and randomized controlled trials (RCTs), which consistently demonstrated the positive impact of exercise on reducing symptoms of depression and anxiety. Most notably, studies by Singh et al. (2023) and Heissel et al. (2023) suggest that exercise can match or even exceed the effects of psychotherapy or pharmacotherapy treatments, with evidence highlighting significant clinical improvements and a compelling number needed to treat (NNT) ratio of two that highlights its efficiency (Heissel et al., 2023). Despite this strong evidence base, exercise remains underutilized in clinical practice, revealing a significant gap between evidence-based research findings and their application in treatment recommendations.

Addressing this gap requires a closer examination of the types of exercise, their specific effects on mental health, and the barriers to prescribing exercise as a treatment modality. Research comparing different exercise modalities, such as aerobic versus resistance training, indicates varying degrees of effectiveness in alleviating symptoms of depression and anxiety, though all show significant impact (Henriksson et al., 2022; Jazayeri et al., 2021; Lee et al., 2021; Machado et al., 2022; Singh et al., 2023), suggesting the need for personalized exercise

recommendations tailored to individual patient needs and preferences. However, studies on healthcare providers' practices reveal a reluctance to prescribe exercise due to factors such as a lack of personal exercise habits among providers and insufficient knowledge about how to effectively incorporate exercise recommendations into treatment plans (Escobar-Roldan et al., 2021; Kleemann et al., 2020). This highlights a critical need for enhancing education and training for healthcare professionals regarding the benefits of exercise and the best practices for prescribing it as part of a comprehensive treatment plan for anxiety and depression.

Conceptual Framework

This quality improvement initiative, guided by the Iowa Model, an evidence-based framework used to guide healthcare professionals through a decision-making process when integrating a process improvement into practice (University of Iowa Healthcare, 2015), aimed to strengthen the utilization of exercise recommendations for college students experiencing anxiety and depression. Recognition of the underuse of exercise as a treatment, despite its efficacy, and the unique access students have to exercise resources through their tuition, the project set out to standardize exercise recommendations among healthcare providers and increase their comfortability in recommending exercise based on patient preference and available campus resources. The team, including the project lead, a psychiatrist, wellness coaches, and sports recreation personal trainers, developed an exercise recommendation algorithm tailored to student preferences and campus resources. The project lead conducted a systematic review to investigate the benefits of exercise in treating anxiety and depression. By designing a pilot practice change of only seven primary care providers, the project hoped for a 25% increase in exercise-recommending practices, increased provider comfortability with recommending exercise based

on patient preference and available resources, and long-term goals of integrating exercise assessment into routine care, decreasing the prevalence of anxiety and depression, and promoting collaboration with sports recreation for targeted exercise classes for students with mental health needs. The results will be shared among healthcare providers and stakeholders to ensure sustained change and widespread counseling and psychological services implementation.

Aims/Purpose

The primary aim of this quality improvement initiative was to increase the utilization of exercise as a first-line adjunct treatment for anxiety and depression among college students. By utilizing existing campus resources and eliminating cost barriers, the project sought to standardize exercise recommendations using patient preference, ultimately improving mental health outcomes for this student population.

Methods

Context

The organizational microsystem assessment of the campus health facility in the Northern Plains, serving a combined student body of nearly 17,000 undergraduates and graduates (Host University, n.d.), revealed an opportunity for a quality improvement project focused on mental health, particularly anxiety and depression. Despite a range of services included in tuition, from primary and psychiatric care to wellness and recreational activities, mental health issues are notably prevalent, with local rates surpassing the national average (Host City-County Health Department, 2018). The health facility, staffed by a team of healthcare professionals and addressing over 17,800 medical and 1,900 counseling visits annually (Host University, n.d.),

faces challenges in meeting the escalating severity of mental health needs among students. Current processes involve standardized screening for depression and anxiety but lack formalized, standardized recommendations for exercise as a treatment, evidenced by the existence of the "Movement is Medicine" program, which was put on hold because of low participation due to various reasons. This context reveals the necessity for this quality improvement project to enhance mental health service delivery, particularly by prioritizing exercise as a therapeutic modality.

Intervention / Practice Change

The site representative and project lead consulted with campus resources, including personal trainers in the gym, campus recreation, wellness coaches, the behavioral health consultant, registered dieticians, interns, and the health coordinator to get an understanding of what services were offered on campus for students through tuition or a minimal additional cost. Building alliances throughout campus promoted input from not only the different services but also speaking with the interns, provided a student perspective on barriers to accessing campus resources. The project lead and site representative developed an algorithm to aid primary care providers in recommending exercise for patients with anxiety and depression based on the patient’s personal preference and available campus resources. For instance, if a student prefers to exercise with people and inside, they might be offered information about the campus gym classes compared to a student who prefers to exercise outside alone might be provided information regarding the outdoor recreation department or provided a trail map of the area. The algorithm was intended to be a quick and easy way for providers to connect students to exercise based on their preference, as well as enlighten providers and students about the resources that already exist

on campus, ultimately increasing the utilization of exercise as a treatment for anxiety and depression.

Provider education was the essential intervention used to update providers on current evidence-based practice regarding exercise in the treatment of anxiety and depression, as well as to provide guidance on how to use the algorithm during their appointments, share campus resources, and provide education regarding the use of the campus websites. Additional interventions included uploading resources onto the providers' shared files to provide easy access to the algorithm, trail maps, home exercises, campus recreation, and campus maps. Finally, meetings with the health information program manager resulted in plans to integrate the resources into the facility's electronic health record, which will be completed after the project's implementation period.

The project lead and site representative developed the pre-and post-implementation provider survey and the patient survey based on the available literature, clinical experience, and expert opinion of the site representative who has worked at the site with this specific population for years. The surveys are non-validated tools developed for university students, presenting a unique set of challenges. Using these surveys in a larger population would determine the validity of the surveys if this project were to be replicated in the future.

Measures

Key measures included a pre-implementation survey to determine provider demographics and baseline comfort in recommending exercise for patients with anxiety and depression. A provider education session took place in February 2024 regarding exercise benefits and resources available to students, methods of recommending exercise through an individualized yet

standardized exercise algorithm, and incorporation of an exercise recommendation algorithm for the treatment of anxiety and depression for college students. A post-intervention survey was given in the weeks following the provider education session to determine any changes in provider comfortability of recommending practices related to exercise. Patients received a survey when following up on anxiety and depression to determine their level of satisfaction with their treatment recommendations, whether they received exercise recommendations, and if they adhered. Chart audits were completed to determine if providers documented in new patient visits whether they had recommended exercise for patients with anxiety and depression.

Analysis

Quantitative data included the provider's pre/post surveys, patient surveys, and information gathered from the site representative's chart reviews. This numerical data was analyzed using descriptive statistics. The project lead collected data through provider surveys conducted pre/post-project implementation. A patient survey was given out at the front desk to patients following up on anxiety and depression. Surveys were collected by the project lead and site representatives and kept at the site. The site representative reviewed charts of new patients seen for anxiety and depression and determined if exercise was formally recommended as part of their treatment plan. The project lead analyzed survey data with the site representative to ensure completeness and accuracy of data.

Ethical Considerations

This project was submitted to Montana State University's Institutional Review Board for review and approval before the project was initiated.

Results

A survey was distributed to the primary care providers at the clinic pre-and post-intervention. The provider survey aimed to gauge provider comfortability, the practice of recommending exercise, and demographic information. The pre-implementation survey had six respondents (86%), and the post-implementation survey had three respondents (43%). The ages of the clinicians ranged from 30 to 60+ years old. Most clinicians had more than ten years of experience (n=5 or 83%). Most clinicians reported they see new patients with anxiety or depression daily (n=4 or 67%). The clinicians' perceived importance of exercise in the treatment of anxiety and depression was split evenly between "quite important" (n=3) and "extremely important" (n=3). The clinicians' own exercise habits ranged from "rarely" to "daily." Most clinicians (n=4) reported they recommend exercise to patients with anxiety and depression "often." Most clinicians (n=4) reported they see new patients for anxiety and depression "daily." Comfortability regarding provider's assessment, campus resources, and patient preference were assessed using a Likert scale. During the pre-intervention assessment, provider comfort was variable. However, a trend for increasing comfort in exercise prescribing practices was notable in the post-intervention assessment. See Table 3.1 for a full list of provider demographics. See Figure 3.1 and Figure 3.2 for changes in provider comfortability.

Anonymous patient surveys were given to patients at anxiety and depression follow-up appointments to gauge their level of satisfaction with medication, psychotherapy, and exercise recommendations in hopes of determining if there was a discrepancy between each recommendation or if exercise was being missed as a pillar of treatment. Additionally, the patient survey aimed to determine if patients received exercise recommendations, if they implemented

those recommendations, and if so, what activity they completed. Five surveys were returned at the end of the implementation period. All of the surveys (n=5) reported “No” when asked whether they received formalized exercise recommendations based on their preference and campus resources. Of the patients who completed the surveys, 40% indicated they exercised despite receiving no formal recommendations from their provider, suggesting either the patient discussed their current exercise routine with their provider and the provider concluded they were exercising adequately, or the patient was exercising independently and the discussion with the provider never occurred. All survey respondents (n=5) indicated they were “quite satisfied” with their provider’s medication recommendations. 60% of survey respondents indicated they were “neutral” regarding their level of satisfaction with psychotherapy recommendations and exercise recommendations. 40% indicated they were “quite satisfied” with psychotherapy recommendations, while only 20% indicated they were “quite satisfied” with exercise recommendations. One survey respondent did not answer the question regarding their level of satisfaction with exercise recommendations. Interestingly, 20% of the patients surveyed indicated they were “quite satisfied” with their provider’s exercise recommendations but also answered “No” when asked whether they received tailored exercise recommendations based on their preference and campus resources. See Table 3.2 for patient survey results.

Chart audits were conducted for three weeks during the implementation period after the provider education to determine if the providers recommended exercise formally and subsequently documented the recommendations. Six chart audits were completed on new patient primary care visits for anxiety and depression. However, none of the charts indicated exercise was recommended based on patient preference or campus resources or recommended at all,

though it may have been discussed and not documented. One of the six charts noted the patient was exercising adequately and to “continue regular exercise.”

Discussion

This was a small project with a short implementation period. The aim of the project was to increase the utilization of exercise as a first-line adjunct treatment for anxiety and depression among college students. Information gathered from the pre-and post-provider survey indicates an improved trend in provider comfortability in recommending exercise for patients with anxiety and depression based on the patient’s preference and available campus resources, though the small sample size and deidentified provider surveys limit the ability to determine whether there was a net change in recommendation habits. Based on the initial chart audits and patient surveys, there is no indication that the providers are recommending exercise and patients are not hearing those recommendations, as all the chart audits and patient surveys indicate that the provider never formally recommended exercise. As seen with previous studies (Escobar-Roldan et al., 2021), there was no correlation seen in this initial sample to conclude that the provider’s exercise habits positively correlate with increased frequency of exercise recommendations.

With the small sample size, it is possible that the patients surveyed and whose charts were audited were already adequately exercising, and the recommendations were not necessary. A longer implementation period would provide additional data with a more inclusive data set. Further information could be gathered from the provider’s perspective on whether these patients were excluded from exercise recommendations based on acuity or another reason.

The pre-and post-intervention provider survey indicated providers recommend exercise for patients with anxiety and depression either “often” or “daily,” indicating the initial data

collected during the short implementation period may have been an anomaly or may indicate providers are not recommending exercise as often as they think, or they recommend exercise informally. Additionally, the initial sample investigated new patient appointments, and further investigation into subsequent appointments might reveal formalized recommendations more frequently.

Several patients who received formalized exercise recommendations based on their preference and campus resources outside of primary care have reported having begun implementing exercise into their lives. Campus recreation at this site has utilized the exercise algorithm to secure additional funding for patients who would otherwise be unable to pay to receive personal training sessions.

Limitations

The project was initially intended to cover a six-week implementation period, however, due to the extraneous constraints in an academic system, the project implementation and evaluation phase was limited to three weeks. A longer implementation and evaluation phase may provide more robust data in terms of patient data and chart audits. Additionally, more baseline data would be required to understand the full implications of exercise in this student population. Gathering pre-post implementation Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) scores along with exercise habits might provide additional information regarding the long-term impact of exercise on symptoms of anxiety and depression. Another limitation is the providers' years of clinical experience. Clinicians at this site have developed patterns based on their experience, and changing practice patterns requires time and frequent reminders, which were not available during the short implementation period. Typically,

we would expect a change in provider habits to take time and would need a longer period of study to extrapolate appropriate information regarding the project's efficacy.

Future Recommendations

An evident gap exists between current evidence regarding exercise's utility in treating anxiety and depression and formal recommendations in practice. While individualized recommendations based on patient preference and available resources may improve adherence to exercise, further investigation through more extended implementation periods is warranted. A future follow-up project to continue evaluation would provide a greater understanding of this project's implications.

Conclusion

The increasing prevalence of anxiety and depression, exacerbated by factors like the COVID-19 pandemic, emphasizes the need for effective and accessible treatment options. Exercise is a viable solution as an adjunct treatment for anxiety and depression, and the population of study has unique access to exercise through their tuition or at a markedly reduced cost. Early intervention with a treatment modality like exercise, with its additional health benefits, provides a holistic approach to mental health care that should not be overlooked. Strategies such as utilizing patient preference and available resources could ultimately increase adherence and improve outcomes. Though the data collected during this project was inconclusive in determining the efficacy of providing formalized exercise recommendations, future projects using prescriptive methods of exercise as a pillar of treatment for anxiety and depression would provide a greater understanding in guiding future practice.

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CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

DNP Essentials

The DNP essentials are the cornerstone of advanced nursing education, providing a framework to prepare students in the discipline of nursing (American Association of Colleges of Nursing, 2021). Throughout the last four years of professional development, the essentials have been met through various projects, assignments, applied clinical experience, and the implementation and dissemination of our final DNP project.

Essential II: Person-Centered Care

Person-centered care is essential to advanced practice nursing. The American Association of Colleges of Nursing (2021) describes person-centered care as focusing on the individual but recognizing they are part of a complex system of family, friends, and environment, and treating them holistically with compassionate, personalized, evidence-based care that is developmentally appropriate. Throughout my clinical experience, I have worked with patients across the lifespan in various settings. My first rotation at the forensic hospital provided a unique setting to provide care within the context of the law. This experience allowed me to recognize the complexities of humans in relation to their environments. I experienced the importance of treating every person justly, without judgment, with compassion and understanding. Going further in my clinical experience, I obtained a better understanding that each patient has a unique set of circumstances that brings them to where they are now, and to fully understand and ultimately help them to heal, we must understand the context in which they live. This was abundantly clear when I completed

hours at a residential unit for adolescents. Most adolescents had a complicated family system requiring care coordination between not only the family, but often times guardians, court systems, and case managers. Working with children and adolescents taught me the patient is often the entire family, and to help the adolescent or child heal, we must help the family heal.

Essential III: Population Health

In NRSG 614, Vulnerable Populations, we explored and identified the vulnerabilities of a specific population. My group studied the homeless population throughout Montana. Through our group work, we analyzed the healthcare system as it relates to our homeless/homeless population and how the healthcare system itself leads to further vulnerabilities. We identified the resources available in our community and throughout Montana to use in our further practice. We conducted a windshield survey and ABCDE assessment and identified areas of vulnerability in our community and Montana. We identified areas where we could influence health policy to address the needs of the most marginalized in our communities. We also identified how rurality creates vulnerability, which will undoubtedly influence my future practice. Our final projects gave me a better understanding of integrating multiple aspects of vulnerability into a concise and focused assessment of a specific population.

Essential V: Quality and Safety

During the course of our DNP education, we created a hypothetical program to improve the quality and safety of care provided at a specific site. The purpose of the program I created was to increase the identification of patients with harmful alcohol-related behaviors and alcohol use disorders. The idea was that implementation of the AUDIT-C in annual wellness visits would lead to improved patient outcomes by reducing the number of alcohol-related harms, reducing

long-term alcohol-related complications, and providing early intervention for patients with alcohol use disorders. This project encouraged interdisciplinary collaboration with integrated behavioral health services as well as community resources. It taught me how to determine reliable and valid tools that can be used quickly, as most providers do not have time to administer arduous screening tools. Additionally, I was able to identify how the implementation of something as simple as the AUDIT-C could improve outcomes for patients who may be experiencing harmful alcohol use first through early identification but then by getting them to the proper resources. This project shed light on the role of advanced nursing in identifying evidence-based practices to implement in practice settings to improve the quality and safety of patient care. Additionally, the information I learned during this project has been pivotal in my work as a psychiatric nurse practitioner student, as screening for alcohol use in my discipline is essential to ensure the best patient outcomes and make proper diagnoses.

Essential IV: Scholarship for Nursing Discipline

Another project during our DNP education involved a literature review and practice implications based on current evidence of a specific treatment. For this project, my group looked at prolonged exposure (PE) therapy for the treatment of post-traumatic stress disorder (PTSD) in combat veterans. We conducted a review of the literature and created an evidence table, examining the level of evidence for each resource and identifying how the level of evidence could guide future practice and future research. We discovered a low percentage of veterans with PTSD being treated with evidence-based treatments like PE due to the lack of approval for use when comorbidities are present. Most studies and treatment guidelines we found excluded veterans with traumatic brain injuries or substance use disorders, even if the individual also has

PTSD. However, some of the studies included in our review examined specific comorbidities and found that PE is successful in treating veterans with PTSD even if comorbidities such as traumatic brain injuries or substance use disorders were also present. We concluded that expanding the eligibility of veterans for treatment may decrease the prevalence of untreated PTSD among veterans. This project helped develop my education by synthesizing information from evidence-based literature, applying it to nursing practice and real scenarios, and how nurses can change practice through scholarly discipline. This project helped me understand how to critically appraise evidence going forward and provided a foundation for the literature I have reviewed since this project. Additionally, I have been able to advocate for prolonged exposure therapy for patients with PTSD when I see them in practice, particularly veterans with combat-related PTSD.

Final DNP Project

Our final DNP project, a quality improvement initiative, incorporated all the DNP essentials. Over the course of two semesters, we identified a practice problem at a specific site in hopes of improving the quality of care for a specific population. This project involved collaboration with a multitude of disciplines to improve care at a systems level. For instance, with my specific project, I collaborated with sports recreation, primary care, wellness coaches, nutritionists, a behavioral health consultant, and outdoor recreation in order to meet the needs of the population of the study. My project involves a holistic approach to mental health care by incorporating exercise as a pillar of treatment for anxiety and depression. A scoping review of the literature identified evidence-based practice regarding my target intervention and included the generation, synthesis, translation, and application of the nursing discipline (American

Association of Colleges of Nursing, 2021). The exercise algorithm created for this quality improvement initiative used patient preference as a principle in determining exercise recommendations. Person-centered care is at the heart of our DNP education, is a cornerstone of nursing practice, and was foundational in the development of my quality improvement initiative.

This project aided my personal, professional, and leadership development through working with a diverse population of healthcare professionals while overcoming barriers to an ever-changing timeline that often accompanies healthcare. I created smart goals for this project that were not conclusively met. For instance, I had a goal of increasing exercise recommendations by 25% and increasing provider comfortability in recommending exercise; however, at the end of the project, there was too little data from a small sample size to say whether this goal was met or not. This has taught me resilience regarding process improvements and to self-reflect on how I might do things differently in my next project.

I believe building alliances and getting buy-in from the entire team, not just medical, enhanced professionalism and was instrumental in developing this project, something I will take into my future advanced practice career. I met several times with the healthcare informatics team to understand how we could incorporate our algorithm and additional resources into the electronic health record, which is still in the works but looks to be completed within the next few weeks. Another way I collaborated with interdisciplinary teams was through the campus recreation department. Campus recreation at this site has utilized the exercise algorithm to secure additional funding for patients who would otherwise be unable to pay to receive personal training sessions. This additional funding allows the healthcare team to provide equitable care to all patients regardless of their ability to pay.

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APPENDICES

APPENDIX A

TABLES

Table 2.2 Patient Health Questionnaire-9 (PHQ-9) with interpretation

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

Interpretation:

- Total scores of 5, 10, 15, and 20 represent cutpoints for mild, moderate, moderately severe and severe depression, respectively.
- Note: Question 9 is a single screening question on suicide risk. A patient who answers yes to question 9 needs further assessment for suicide risk by an individual who is competent to assess this risk.

Interpretation

Provisional Diagnosis and Proposed Treatment Actions		
PHQ-9 Score	**Depression Severity**	**Proposed Treatment Actions**
0 – 4	None-minimal	None
5 – 9	Mild	Watchful waiting; repeat PHQ-9 at follow-up
10 – 14	Moderate	Treatment plan, considering counseling, follow-up and/or pharmacotherapy
15 – 19	Moderately Severe	Active treatment with pharmacotherapy and/or psychotherapy
20 – 27	Severe	Immediate initiation of pharmacotherapy and, if severe impairment or poor response to therapy, expedited referral to a mental health specialist for psychotherapy and/or collaborative management

Table 2.3 Generalized Anxiety Disorder scale-7 (GAD-7)

The GAD-7 Scale [18]

Generalized Anxiety Disorder 7- item (GAD-7)				
Over the last 2 weeks, how often have you been bothered by the following problems	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
GAD-7 score obtained by adding score for each question (total points).				
A score of 8 points or higher is a reasonable is the cut-off for needing further identifying evaluation to determine presence and type of anxiety disorder [23, 24]				
The following cut-offs correlate with level of anxiety severity:				
Score 0-4	: Minimal Anxiety			
Score 5-9	: Mild Anxiety			
Score 10-14:	: Moderate Anxiety			
Score 15 or greater	: Severe Anxiety			

Table 3.1. Provider Demographics

	Frequency (Initial Survey)	Frequency (Follow-up survey)
Respondents, N (%)	6 (86%)	3 (43%)
Age, Years, N (%)		
30-39	2 (33%)	0
40-49	1 (17%)	1 (33%)
50-59	1 (17%)	1 (33%)
60+	2 (33%)	1 (33%)
Years as Clinician, N (%)		
0-3	1 (17%)	0
10+	5 (83%)	3 (100%)
Clinician Exercise Habits, N (%)		
Rarely	1 (17%)	
Occasionally	1 (17%)	
Sometimes	1 (17%)	
Often	1 (17%)	2 (66%)
Daily	2 (33%)	1 (33%)
Clinician Perceived Importance of Exercise in the Treatment of Anxiety and Depression, N(%)		
Quite Important	3 (50%)	
Extremely Important	3 (50%)	3 (100%)
How often do clinicians see new patients with anxiety and depression, N(%)		
Sometimes	1 (17%)	
Often	1 (17%)	1 (33%)
Daily	4 (67%)	2 (66%)
How often do you recommend exercise for patients with anxiety and depression, N(%)		
Often	4 (67%)	1 (33%)
Daily	2 (33%)	2 (66%)

Table 3.2. Patient Survey Data

ID	Satisfaction with medication	Satisfaction with psychotherapy	Satisfaction with exercise	Recommended Exercise (Y/N)	Frequency 0-5	Gym	Classes	Outdoor equip	Sports	Home Ex.	PT	Other (Specify)
01	4	3	3	N		X		X				"run"
02	4	4	-	N		X						
03	4	3	3	N								
04	4	3	4	N								
05	4	4	3	N								

Key for Satisfaction:
- 0 - Not at all
- 1 – Slightly satisfied
- 2 – Somewhat satisfied
- 3 - Neutral
- 4 – Quite satisfied
- 5 – Extremely satisfied

Key for Frequency:
- 0 - Not at all
- 1 - Once
- 2 - Twice
- 3 - Three times
- 4 - Four to six times
- 5 - More than seven times

Activity Key:
- Gym: Work out at the gym
- Classes: Workout classes
- Outdoor Equip.: Rented outdoor rec equipment
- Sports: Club or intramural sports
- Home Ex.: Home exercises
-PT: Personal trainer

APPENDIX B

FIGURES

Figure 1.1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement guidelines (PRISMA) of a review of exercise interventions for the treatment of anxiety and depression.

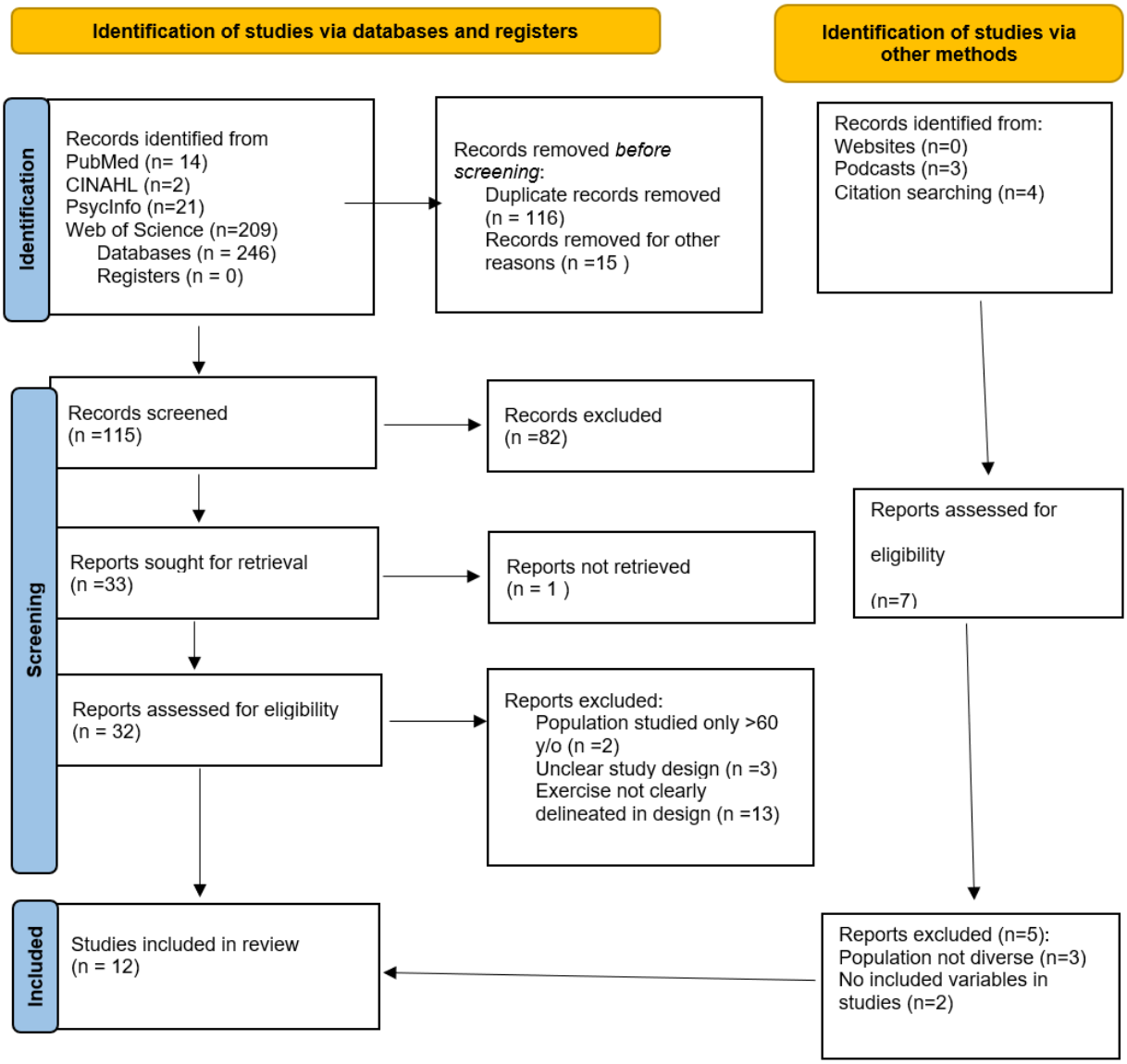


Figure 2.1. Iowa Model

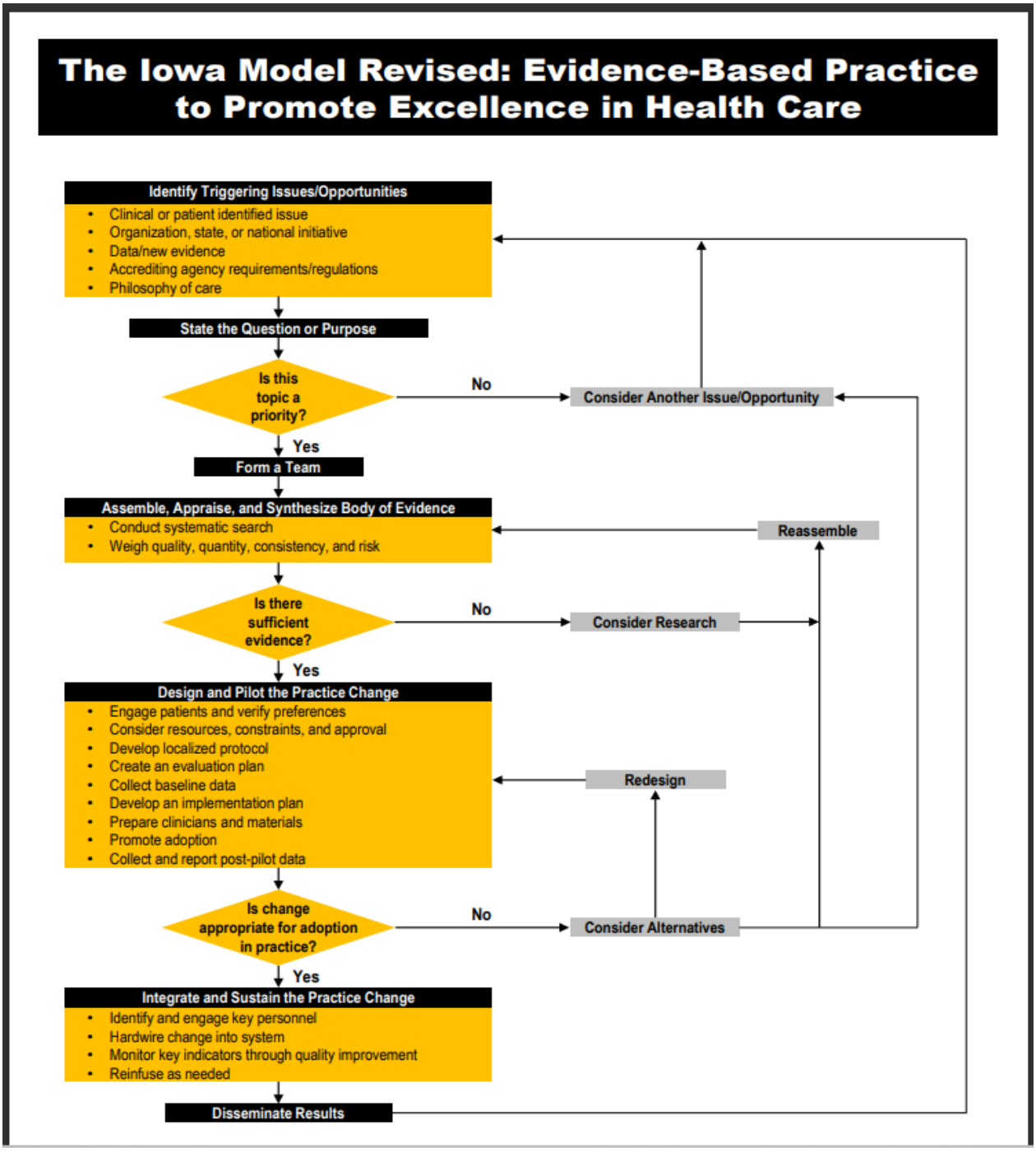
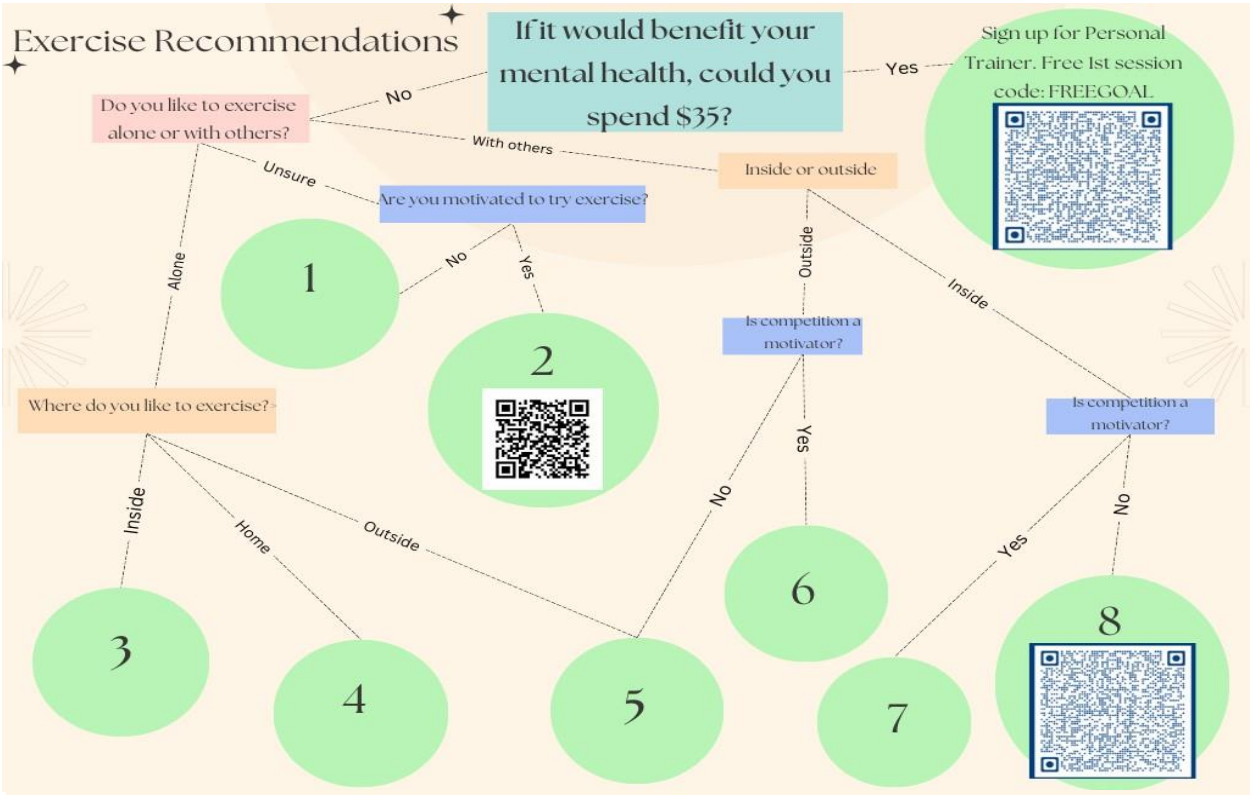


Figure 2.2. Exercise Algorithm



1.
Patient may not be ready, reconsider at another time

2.
Consider Wellness Coaching. Schedule through email, patient portal or call the front desk at student health.

3.
Gym equipment includes: Treadmill, elliptical, bicycle, stair stepper, weights
*Consider free personal training session. Email jocelyn.larson@montana.edu
*Gym space in most dorms except Julia Martin and the Quads

4.
Email Jocelyn about home exercises: jocelyn.larson@montana.edu
Consider App: Sworkit, Nike Fitness, 7-minute workout, Strava, or patient preferred App
*Gym space in most dorms except Julia Martin and the Quads

5.
Do alone or with someone:
Outdoor rec rentals:
Summer:
Bike:
Bikes and equipment
Climbing:
Ice climbing gear
Mountaineering gear
Rock climbing gear
Fishing:
Nets
Fishing rods
Waders
Boots
Fishing packages
Hike:
Stoves for hiking/camping
Backpacks for hiking
Bear safety gear for hiking
Clothing for hiking
Hiking accessories
Water:
Canoes
Kayaks
Stand Up Paddleboards (SUPs)
Rafts
Water activity accessories
Water activity packages

Winter:
- Snowboards
- Downhill skis
- Snowshoes
Cross-country skis
- Tubes
- Ice skates
- Splitboards

Swim
Outdoor recreation clinics
**Walk/Run outside: FIT paths, GVLT trail maps

6.
Intramurals:
Soccer
Flag football
Spikeball
Ultimate frisbee
Club:
Alpine Skiing
Baseball
Hockey
Lacrosse
Nordic Skiing
Rugby
Running
Soccer
Tennis
Triathlon
Ultimate

*Look at schedule

**Independent of where they land on algorithm, motivated in spite of not being successful= wellness coaching.

7.
Intramurals:
Basketball
Volleyball
Club:
Boxing
Polo
Racquetball
Swim
Taekwondo
Volleyball

*Look at schedule

For credit activity classes (could be students from different spots on algorithm):

8.
Gym Classes : ALL LEVELS WELCOME
Please note: Classes are constantly changing so use QR code to get a list of current classes--ALL FREE!

Yoga: . Our yoga classes combine strength, mobility, and mindfulness to help support your wellbeing.
Core and Restore: The class will focus on functional core and mobility exercises.
Cycle: Fun and fast paced cardio workout
Functional Strength: This class will utilize a balance of strength and power to help you feel confident and strong in your daily movements.
-Dance Cardio: A high energy class is designed to increase cardio, enhance fitness and get you having fun.
HIIT Fit: With integrated rest intervals, this class will encourage you to find your best self.

Figure 2.3. Pre/Post Provider Survey

1. How old are you?
- 20-29
- 30-39
- 40-49
- 50-59
- 60+

2. How many years as a clinician?
- 0-3 years
- 3-5 years
- 5-7 years
- 7-9 years
- 10+

Likert Scale:

3. How often do you see new patients with anxiety and/or depression?
- 0 Never
- 1 Rarely
- 2 Occasionally
- 3 Sometimes
- 4 Often
- 5 Daily

4. How often do you recommend exercise for patients with anxiety and depression?
- 0 Never
- 1 Rarely
- 2 Occasionally
- 3 Sometimes
- 4 Often
- 5 Daily

5. How comfortable are you assessing patient preferences for exercise?
- 0 Not comfortable at all
- 1 Slightly comfortable
- 2 Somewhat comfortable
- 3 Neutral
- 4 Quite comfortable
- 5 Extremely comfortable

6. How comfortable are you prescribing exercise using patient preferences?
- 0 Not comfortable at all
- 1 Slightly comfortable
- 2 Somewhat comfortable
- 3 Neutral
- 4 Quite comfortable
- 5 Extremely comfortable

7. How comfortable are you prescribing exercise using campus resources?
- 0 Not comfortable at all
- 1 Slightly comfortable
- 2 Somewhat comfortable
- 3 Neutral
- 4 Quite comfortable
- 5 Extremely comfortable

8. How important do you think exercise is as a treatment for anxiety and depression?
- 0 Not important at all
- 1 Slightly important
- 2 Somewhat important
- 3 Neutral
- 4 Quite Important
- 5 Extremely important

9. How often do you exercise?
- 0 Not at all
- 1 Rarely
- 2 Occasionally
- 3 Sometimes
- 4 Often
- 5 Daily

Figure 2.4. Patient Survey

Patient Survey on Exercise as Treatment

Section 1: Treatment Satisfaction

1. Medication Recommendations
- How satisfied are you with your provider's medication recommendations?
  - [ ] 0 - Not at all
  - [ ] 1 - Slightly satisfied
  - [ ] 2 - Somewhat satisfied
  - [ ] 3 - Neutral
  - [ ] 4 - Quite satisfied
  - [ ] 5 - Extremely satisfied

2. Psychotherapy Recommendations
- How satisfied are you with your provider's psychotherapy recommendations?
  - [ ] 0 - Not at all
  - [ ] 1 - Slightly satisfied
  - [ ] 2 - Somewhat satisfied
  - [ ] 3 - Neutral
  - [ ] 4 - Quite satisfied
  - [ ] 5 - Extremely satisfied

3. Exercise Recommendations
- How satisfied are you with your provider's exercise recommendations?
  - [ ] 0 - Not at all
  - [ ] 1 - Slightly satisfied
  - [ ] 2 - Somewhat satisfied
  - [ ] 3 - Neutral
  - [ ] 4 - Quite satisfied
  - [ ] 5 - Extremely satisfied

Section 2: Tailored Exercise Recommendations

4. Tailored Exercise Plan
- Did your provider recommend tailored exercise based on your preferences and available resources?
  - [ ] Yes
  - [ ] No

Please proceed to the next question if you answered "Yes" to the above question.

5. Frequency of Exercise
- Following your provider's recommendation, how frequently did you engage in exercise?
  - [ ] 0 - Not at all
  - [ ] 1 - Once
  - [ ] 2 - Twice
  - [ ] 3 - Three times
  - [ ] 4 - Four to six times
  - [ ] 5 - More than seven times

6. Types of Activity
- Which types of exercise activities did you participate in? (Select all that apply)
  - [ ] Work out at the gym
  - [ ] Workout classes (e.g., cycle, HIIT)
  - [ ] Rented outdoor recreation equipment for activity
  - [ ] Club or intramural sports
  - [ ] Home exercises (e.g., online workout apps)
  - [ ] Other (please specify):

_____

Figure 3.1. Pre-Intervention Provider Comfortability

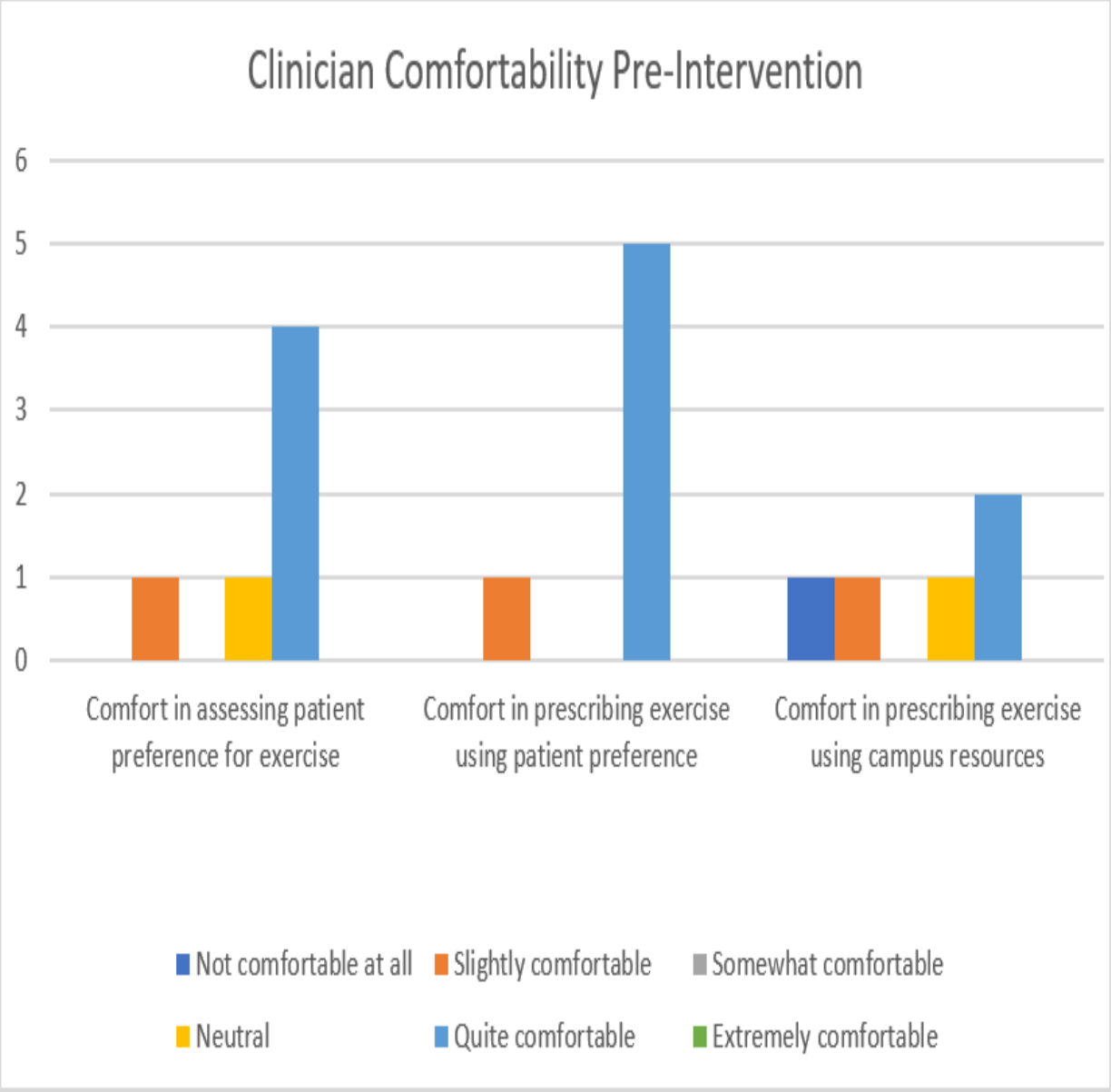
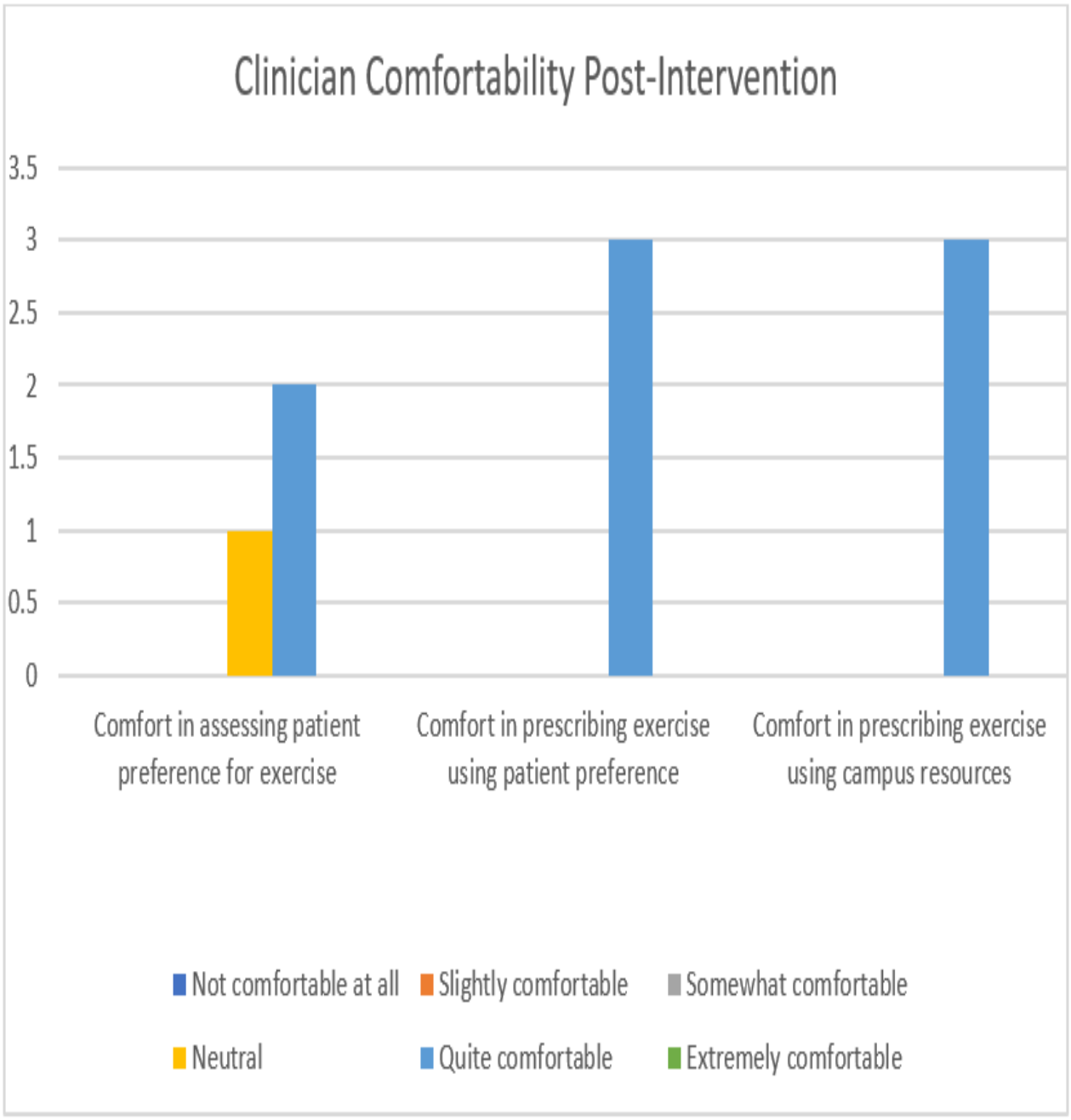


Figure 3.2. Post-Implementation Provider Comfortability



APPENDIX C

PERMISSIONS

K

Kimberly Jordan - University of Iowa Hospitals and Clinics
<survey-bounce@survey.uiowa.edu>

To: You

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IRB Not HSR Determination - Application #1077

Hello Micklewright, Alexandra,

The IRB has evaluated the following application and determined that it does not meet the definition of Human Subjects Research under federal regulations (45 CFR 46). See more information at https://www.montana.edu/orc/irb/human_subjects_research.html.

Application Title: EXERCISE AS TREATMENT FOR ANXIETY AND DEPRESSION: A QUALITY IMPROVEMENT PROJECT

Application Reference #: 1077

Applicant: Micklewright, Alexandra

Reason: DNP - Clinical Quality Improvement/Assessment only

The work as proposed does not require IRB oversight, approval, or exemption. Feel free to proceed with your project. Do not refer to this project or outcomes as "human subjects research."

Please submit a new request if there are changes that might affect this determination.

Institutional Review Board for the Protection of Human Subjects

Office of Research Compliance

Montana State University