Implementation of Provider Education Regarding Exercise as Adjunctive Treatment for Common Mental Health Diagnoses

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree

Of Doctor of Nursing Practice

By

Lauren Grace Martin

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October 2022

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Scholarly Project Chair Approval:

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Abstract

Mental and physical health are inextricably linked. The advent of the Covid-19 pandemic reduced physical activity levels while worsening mental health symptoms. Pharmacological treatments are frequently used to treat mental health conditions; however, side effects can worsen metabolic issues. There is significant evidence that exercise can improve mental health conditions. The purpose of this project was to utilize provider education as an intervention to increase the use of exercise as an adjunctive treatment in the psychiatric treatment plan. This project was implemented at Nevada Mental Health, an outpatient behavioral health clinic in Las Vegas, Nevada. The investigator conducted a chart review of 100 patient encounters to establish baseline data to determine the frequency with which providers recommended exercise to their patients. The intervention phase was a two-week period during which providers were given education via meetings, video, handouts, and email regarding the importance of utilizing exercise as an adjunctive treatment for mental health conditions. At the end of a 6-week post-test phase, a chart review of 100 randomly selected patient encounters was selected to determine if the providers used exercise as a recommendation in the treatment plan. The researcher compared the data samples and found that the provider education intervention successfully increased the use of exercise in the psychiatric treatment plan.

Keywords: provider education, exercise, mental health, non-pharmacological interventions, obesity, physical activity.

Dedication

This project is dedicated to my family: Brandon, Emma, Eli, and Juliet. Without your love and care, I would not have been able to complete this study. I love you 3,000.

Acknowledgements

I would like to thank my chair, Dr. Sherri Walker, for selflessly contributing countless hours of time and effort to this project. I could not have asked for a better mentor. I would like to acknowledge my preceptor, Dr. Sapandeep Khurana, and all the staff at Nevada Mental Health for embracing this project wholeheartedly and supporting it through all phases. A special shout-out to the IT department for running reports and providing access to all the necessary data! I would like to thank my ever-supportive family, parents, and friends for all the encouragement, meals, diet cokes, hugs, and friendship! I am blessed beyond measure that there are too many of you to name individually. Your belief in me helped me to believe in myself. Lastly, I would like to acknowledge Jesus Christ, as all things are possible through Him.

Implementation of Provider Education Regarding Exercise as Adjunctive Treatment for Common Mental Health Diagnoses

Patient education is a crucial component in improving health care outcomes. Providers must improve patient health literacy by spending time conducting relevant patient education. It has been proven that healthcare outcomes improve when providers take the time to use lifestyle interventions and patient education in the treatment plan (Paterick et al., 2017). Patient education regarding lifestyle interventions, like exercise, is now part of the standard of care for medical and mental health treatment (Piercy et al., 2018).

Mental health and physical health are inextricably linked. With the advent of the coronavirus, decreases in physical activity, and increases in sedentary lifestyles, it has never been more imperative to ensure evidence-based exercise recommendations are being used in clinical practice (Racine et al., 2021; Small & Aplasca, 2016). There is significant evidence that mental health diagnoses in adult and pediatric populations are improved by exercise (Aylett et al., 2018; Gourgouvelis et al., 2018; Suarez-Manzano et al., 2018). Obesity and co-morbid health conditions negatively impact mental health (Menon & Rajan, 2017). The purpose of this project was to educate psychiatric providers in an outpatient clinic regarding the importance of including specific evidence-based exercise recommendations in the psychiatric treatment plan as part of the standard of care. The providers received verbal instruction, instruction, emails, presentations, videos, and handouts to learn more about evidence-based exercise recommendations. Providing this education was to raise the standard of care at the project site. By providing evidence-based education regarding exercise to the providers, they had the necessary information to incorporate exercise recommendations into treatment planning. Mental health outcomes improve as the

standard of care increases to include collaborative and lifestyle treatment models like exercise (Lake & Turner, 2017).

Before the project, the site did not utilize any specific exercise recommendations for patients in treatment planning. This project was designed to increase the standard of care at Nevada Mental Health and benefit the physical and mental health of the patient populations seen at the location (Lake & Turner, 2017). The urgent need for improved comprehensive mental health care has been shown through evidence-based research. Current standards that do not include lifestyle modifications (like exercise) have not been successful in the global treatment and reduction of mental illness (Lake & Turner, 2017). Future implications for organizational stakeholders may include improved patient care, increased standard of care, improved patient satisfaction, the projected decrease in co-morbid conditions, improved weight management, and a potential decrease in no-show rates (Lake & Turner, 2017; Small & Aplasca, 2016).

Background

Obesity is a significant issue in the United States (U.S.). According to the Centers for Disease Control and Prevention [CDC] (2022), 19.7% of children and 41.9% of adults in the U.S. are obese. Obesity is the cause of numerous co-morbid health conditions. Over the last 30 years, child obesity has risen so dramatically that it is now considered at epidemic proportions in the U.S. (Small & Aplasca, 2016). Children with obesity are more likely to have depressive and anxiety disorders, be at higher risk for eating disorders, experience weight-related bullying, behavioral issues like hyperactivity, and decreased self-esteem (Small & Aplasca, 2016). While psychotropic medications and therapeutic modalities like cognitive behavioral therapy are beneficial in children with psychiatric diagnoses, psychotropic medications can contribute to significant weight gain and risk of diabetes. Exercise has been shown to improve mental health

with no adverse metabolic side effects (Small & Aplasca, 2016). Exercise has also been shown to reduce mental health symptoms in adult populations, particularly those with anxiety and depressive disorders (Aylett et al., 2018; de Oliveira et al., 2017).

Mental illness affects a significant proportion of the U.S. population. In 2020, 21% of adults and nearly 17% of youth in the U.S. experienced some form of mental illness, and 5.6% or 14.2 million adults experienced severe mental illness (National Alliance on Mental Illness [NAMI], 2022). Anxiety disorders, post-traumatic stress disorders, and depressive disorders are the most common diagnoses in adults. Persons with depression are 40% more likely to develop metabolic and cardiac diseases than the general U.S. population, which is why exercise is critical as an adjunctive treatment tool (NAMI, 2022). There are far-reaching effects of untreated or poorly managed mental illness. High school students with depressive symptoms are twice as likely to drop out of school, and the adult unemployment rate is higher for those with symptoms of mental illness (NAMI, 2022). There are also serious economic consequences for undertreated mental illness, with an average of over $193 billion yearly lost earnings caused by severe mental illness symptoms. One of every eight emergency room visits is for mental illness, and these individuals are typically under 45 years of age. Mood disorders are the most common cause of hospitalizations (NAMI, 2022).

The Covid-19 pandemic began in 2020 and has seriously affected pediatric and adult mental health. The global incidence of pediatric anxiety and depression symptoms doubled, adult mental health symptoms increased, and utilization of emergency rooms for adult mental health complaints increased between 2020 and 2021 (Anderson et al., 2022; Racine et al., 2021). Ettman et al. (2022) found that prior to the pandemic, depression levels in adults in the U.S. averaged 8.5% of the population. During the first phase of the pandemic in 2020, U.S. adult

depression levels rose to 27.8%. Depression levels continued to rise in 2021, with 32.8% of U.S. adults experiencing depression symptoms (Ettman et al., 2022).

Physical activity levels of children, adolescents, and adults are variable and multifactorial. Rossi et al. (2021) found that during the Covid-19 pandemic, children and adolescents' average daily physical activity level decreased by 91 minutes. It was also found, in some instances, physical activity in adults decreased by over 48% during the height of the lockdowns (Tison et al., 2020). Exercise has been shown to improve the symptoms of attention deficit hyperactivity disorder (ADHD), anxiety, and depression (Aguinago et al., 2018; Gourgouvelis et al., 2018; Ligeza et al., 2019; Zhang et al., 2020). Physical activity has been shown to have direct neurobiological effects by increasing brain activity, boosting brain-derived neurotrophic factor (BDNF), generating new neurons, and increasing serotonin levels (Dewar, 2021; Ryu et al., 2020). As seen by the crippling effects of the Covid-19 pandemic on mental health, it has never been more critical to raise the standard of care and provide multiple modalities of effective treatments to patients (Ettman et al., 2022).

Nevada Mental Health (NMH) is an outpatient mental health clinic that serves patients across their lifespans. Despite the benefits of exercise on mental health, there was no standardized exercise resource or program available for providers to recommend prior to this project. The Covid-19 pandemic resulted in increased mental health needs and decreased physical activity (Racine et al., 2021; Rossi et al., 2021; Tison et al., 2020). This environment triggered this quality improvement project to implement provider education regarding evidence-based exercise recommendations at Nevada Mental Health to raise the standard of care. Provider education is an effective intervention in increasing the use of exercise in the psychiatric

treatment plan and was used to implement the intervention for this project (Kyei-Frimpong et al., 2021).

Problem Statement

The underutilization of exercise recommendations to augment psychiatric treatment plans at Nevada Mental Health has been identified through a chart review of electronic health records. The site did not have standard recommendations for utilizing exercise in the care plan in the electronic health record's templated psychiatric follow-up, intake, or appointment checkout forms. It has been shown that providers must consistently recommend exercise in the treatment plan to adult or pediatric patients. It has been established through evidence-based research that mental health conditions like ADHD, anxiety disorders, depressive disorders, and other psychiatric diagnoses can be improved by utilizing weekly exercise regimens (Aguinago et al., 2018; Gourgouvelis et al., 2018; Ligeza et al., 2019; Zhang et al., 2020). This is a key component in the comprehensive treatment and standard of care for mental health (Lake & Turner, 2017). Addressing exercise as an adjunctive treatment option was necessary for the clinic as its mission statement focuses on providing the highest quality of care possible. This was important in raising the standard of care at the clinic, given the evidence-based benefits of exercise on mental health and health risks associated with mental health diagnoses (Piercy et al., 2018). Additional benefits that may be seen in the future are improved patient health, patient satisfaction, and weight control. Provider education was used as the intervention to increase the use of exercise in the psychiatric treatment plan.

The Covid-19 pandemic negatively impacted the pediatric and adult populations resulting in decreased physical activity and increased mental health needs (Racine et al., 2021; Rossi et al., 2021). This measurable quality improvement project may have long-term implications in

improving the community's mental health and potentially reducing the adjacent socio-economic effects by providing increased treatment options and standards of care with exercise recommendations. It has been shown that mental illness impacts communities and healthcare systems significantly, particularly in the wake of the Covid-19 pandemic (Ettman et al., 2022; NAMI, 2022). With more than a third of American adults reporting depression symptoms, this is a critical problem that can be aided with adjunctive treatments like exercise (Ettman et al., 2022). Mental health issues that impact communities directly impact the project site, and therefore this project was very relevant in creating a higher standard of care for the patients served there.

Purpose of the Project

The purpose of this project was to increase the frequency of psychiatric providers recommending evidence-based exercise recommendations in the psychiatric treatment plan to augment current pharmacological treatments by providing provider education and handouts. The goal was to increase the standard of care at the project site. The Covid-19 pandemic resulted in many patients being more sedentary due to home school, working from home, lockdown restrictions, and increased screen time (Rossi et al., 2021; Tison et al., 2020). Common psychotropic medications' side effects include weight gain and metabolic impacts (Libowitz & Nurmi, 2021).

The project's expected outcome was that a significant number of providers would utilize evidence-based exercise recommendations in the psychiatric treatment plan and complete patient education, which could increase the standard of care for the organization. It is anticipated that long-term outcomes of this project may include improved physical health, improved mental health, continued increased standard of care provided at Nevada Mental Health (NHM), and increased patient satisfaction. Nevada consistently ranks among the nation's lowest for mental

health and available services. Nevada has the 12th highest suicide rate in the nation as of 2020, and suicide is the leading cause of death for Nevadans (Nevada Department of Health and Human Services, 2022). Showing that provider education can impact mental health treatment planning can directly impact an underserved and undertreated community like Nevada. This project directly impacted the project site, as they are committed to providing the best mental health care possible and improving mental health services in Nevada (NMH, 2020).

Clinical Question

In order to increase the standard of care, can a provider education intervention regarding the use of evidence-based exercise recommendations for mental health treatment successfully increase the frequency of exercise being recommended to patients across the lifespan in the psychiatric treatment plan at an outpatient psychiatric clinic?

Section Two: Literature Review

Search Strategy

A literature search was conducted using multiple search engines. These search engines include the Journal of the American Medical Association (JAMA), the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and EBSCO. The researcher also used Boolean search terms and keywords to research this problem. The keywords included exercise, psychiatry, ADHD, anxiety, post-traumatic stress disorder, depression, pediatric mental health, adult mental health, obesity, mental health, exercise program, exercise, provider education, education, exercise recommendations, standard of care, and physical activity. Search parameters included articles published within the last five years and in English. Initially, 65 articles were assessed for possible inclusion in the project. Studies were excluded if they were not higher than a level four on Melnyk's level of evidence chart (Melnyk, 2016). Seventeen articles were included in the literature matrix for use in this project. All studies used were level four evidence or higher, with particular focus paid to level one evidence and clinical guidelines based on level one evidence.

Critical Appraisal

Seventeen articles were selected for this project. The articles were all published within the last five years, and nine were published in the last three years. Of the 17 articles chosen, seven were level one evidence (systemic reviews, meta-analysis, or clinical guidelines), five were level two evidence (randomized-controlled trials), one was level three evidence (quasi-experimental design), and four were level four evidence (cross-sectional studies). All exercise-focused studies except one found evidence of improved mental health or stress reduction with varying exercise regimens. Identified weaknesses included small sample sizes of under 100

participants; these weaknesses were found in three studies. Another weakness was that studies only focused on adult or pediatric populations, but not both. Strengths include that there were over 200 study participants in the remaining 14 studies. A table of evidence can be found in Appendix A.

Synthesis

The evidence provided in the literature review supported the need for exercise recommendations to be included in psychiatric treatment planning. Multiple studies showed that exercise reduced depression symptoms in differing populations and improved mood and stress responses (Aguinago et al., 2018; Gourgouvelis et al., 2018; Ligeza et al., 2019). Studies focusing on ADHD found that daily exercise for 20-30 minutes significantly improved ADHD symptoms and motor function (Suarez-Manzano et al., 2018; Zhang et al., 2020). Neurobiological effects were also seen with exercise, including the elevation of serum endocannabinoids post-workout (Meyer et al., 2019). These results all have major implications in the adjunctive treatment of mental health. These findings supported the introduction of an evidence-based exercise program at the project site to improve mental health care and delivery. Improving mental health symptoms with exercise has far-reaching implications, as exercise is safe and has minimal risks or side effects.

Provider education is critical in successfully implementing exercise into psychiatric treatment planning. Combining education with provider tools has been shown to create sustainability with education interventions. Kyei-Frimpong et al. (2021) found that multiple sessions of provider education combined with provider tools led to a sustainable increase in providers utilizing exercise in the treatment plan. Furthermore, it was still sustainable three months post-intervention. Rowe et al. (2021) found that the most effective means of providing

education include educational outreach and in-service training. Provider trainings for NMH included educational tools like exercise handouts and updated checkout sheets, educational videos, presentations, and multiple in-service and educational outreach appointments.

Conceptual Framework

The conceptual model used for this project is known as the Iowa model. The Iowa model was created by a team of nurses at the University of Iowa in the early 1990s (Buckwalter et al., 2017). This model aims to create a framework for evidence-based quality improvement projects in healthcare. The model is popular and has been used successfully in all 50 states and internationally. It has been translated into Japanese, German, and Portuguese (Buckwalter et al., 2017). Permission to use this model must be sought before initiating an evidence-based project. Permission has been granted for the use of this model in this project. The letter of approval can be found in the appendices.

The Iowa model is unique because it utilizes three hinge points in its 13-step process. The hinge points allow the student to assess and revise the project as needed prior to moving forward without starting over (Buckwalter et al., 2017). The Iowa model was used to implement an evidence-based exercise program at NMH. First, triggers were identified for the project. Macro triggers were identified as the obesity epidemic, underutilization of exercise in mental health treatment plans, and effects of exercise on mental health. Organizational triggers for this project included the organizational mission statement to provide the best quality mental healthcare and the organization not utilizing exercise recommendations for psychiatric treatment frequently. The organization aims to increase the standard of care offered due to persistently low rankings of mental outcomes and services in Nevada (NMH, 2020). The problem statement focused on the lack of evidence-based exercise programs or recommendations given to patients at NMH. The

investigator created the patient/population, intervention, comparison, outcomes (PICO) and statement of purpose, which the scholarly project chair approved. The next step using the Iowa model included assembling a team consisting of the student, project chair, preceptor, and administrative staff at the project site. A literature search was completed, and the highest-level evidence was compiled into a literature matrix. The evidence found was used as the foundation of the exercise handout and provider education tools. This was a hinge point in the Iowa model. Sufficient evidence was found to support the project, and an additional literature search for evidence-based exercise recommendations was not needed. However, more evidence was needed to support provider education, and two additional resources were found and added to the literature matrix. Once sufficient evidence for the project was gathered, the exercise recommendations were compiled in a handout made available to providers and medical assistants electronically by PDF, email, and in the electronic health record InSync. Physical copies were available at the front desk, medical assistants' offices, and providers' offices. The project was piloted in the office, and another hinge point in the model was reached. It was determined that the project was appropriate for further implementation in the organization. This was done by provider surveys and tracking program use through a chart review. Plans for further dissemination of the project are being made with the help of the medical director. In addition, the researcher created a process for the project to be sustainable in the workflow and organization. Dissemination of the program to NMH's sister companies like Healthy Minds is being considered.

Summary

The literature review showed that exercise aids in the improvement of mental health symptoms. This was seen by improvements in motor function, ADHD functioning and scores,

improved mood and distress tolerance, decreased depression and anxiety symptoms, and increased serum endocannabinoid levels post-workout (Aguinago et al., 2018; Gourgouvelis et al., 2018; Ligeza et al., 2019; Meyer et al., 2019; Suarez-Manzano et al., 2018; Zhang et al., 2020). These findings supported the scholarly project by providing evidence-based exercise recommendations and findings that were translated into exercise recommendations and a handout to be implemented at the project site via provider education. The purpose of this project was to increase the frequency of psychiatric providers recommending evidence-based exercise recommendations to mental health patients by using provider education as an intervention. Provider education regarding exercise has increased the frequency of psychiatric providers prescribing exercise to patients as part of the treatment plan. Kyei-Frimpong et al. (2021) found 20% of providers recommended exercise in the treatment plan pre-education intervention, and 78% recommended exercise post-education intervention. Providing tools to providers is useful in sustaining the education intervention. Provider education can make a difference in exercise being continually recommended (Kyei-Frimpong et al., 2021).

Section Three: Methodology

Design

This project is an evidence-based practice project. The project used the Iowa model as a conceptual framework. The evidence-based project was piloted at Nevada Mental Health (NHM), an outpatient psychiatric clinic in Las Vegas, Nevada. The project was quasi-experimental and utilized a post-test pre-test design (Boswell & Cannon, 2020). The goal of the project was to increase the frequency of psychiatric providers recommending evidence-based exercise recommendations in the psychiatric treatment plan to improve the standard of care at the clinic (Piercy et al., 2018; Teychenne et al., 2020). The project used a quasi-experimental approach by conducting 100 randomly selected chart reviews before implementing provider education regarding exercise as part of the mental health treatment plan. Providers had education sessions and were given a handout to pass out to patients containing the exercise recommendations. An additional review of 100 randomly selected charts occurred six weeks after the implementation of the intervention. The data were compared to determine if the provider education intervention effectively increased providers' recommendations of specific evidence-based exercise for mental health treatment plans.

It was hypothesized that provider recommendations could increase after the education intervention and raise the standard of care at the project site. There were no randomizations or control groups within the study population. This study design was best suited to the project as the clinic is small and only has 18 medical providers. Larger sample sizes of 100 were used for chart reviews to improve validity and data outcomes. All patients seen within a set time frame had their charts included in the random sampling for pre and post-test data. All providers received the same intervention, which was the standardized exercise recommendation education and handout.

Providers could access the exercise handouts in person, online, and through medical assistants through a check box on the patient checkout sheet.

Measurable Outcomes

The measurable outcome for the proposed project was the change in frequency of providers utilizing exercise recommendations in the psychiatric treatment plan after the implementation of the exercise intervention. This was measured during pre and post-test reviews of 100 randomly selected charts. Data was collected, compared, and statistically analyzed using Microsoft Excel.

For this project, the measurable outcomes focused on provider education and the impact this made on their usage of exercise recommendations in psychiatric treatment plans. Baseline data was collected by doing a review of 100 charts. The charts were accessed to view the psychiatric notes, assessment, plan, and checkout sheets. It was determined and noted in the Excel spreadsheet if the providers were recommending exercise as part of the psychiatric treatment plan. This process was for the pre-test data set. The measurable outcome focuses on the provider education's impact on the frequency of recommending exercise as an adjunctive treatment for mental health. Kyei-Frimpong et al. (2021) found that provider education effectively increased the frequency of recommending exercise to patients in the treatment plan. In the pre-test data of Kyei-Frimpong et al.'s (2021) study, exercise was recommended 20% of the time prior to the education intervention. The baseline data from NHM providers gives a good snapshot of how the overall clinic meets the standard of care, which should include exercise in treatment planning (Lake & Turner, 2017; Piercy et al., 2018). The researcher anticipated that the pre-test data for the project site could mirror Kyei-Frimpong et al.'s (2021) study.

The intervention was provider education on evidence-based exercise recommendations for mental health improvement. Patient education handouts were introduced and made available to psychiatric providers. The intervention phase was a two-week period during which providers were educated on the evidence-based guidelines for exercise and standard of care (Piercy et al., 2018; Teychenne et al., 2020). Provider education took place via in-person staff meetings where verbal instruction was given through various channels. Providers were also educated on the change made to the checkout sheet used after patient appointments. This sheet is attached to each patient encounter. The provider fills it out to alert medical assistants of the follow-up appointment time, any referrals or labs ordered, tests needed, medication changes, and billing codes.

All providers use a patient checkout sheet in the electronic health record at the end of each psychiatric visit. After the implementation of the project, the checkout sheet now had an added check box the provider could use to alert the medical assistant or office staff to give the patient the exercise handout. The providers were educated on the importance of discussing specific exercise recommendations with their patients. An emphasis was placed on bringing current clinical practice up to the best standard of care possible, which included exercise in the psychiatric treatment plan (Lake & Turner, 2017; Piercy et al., 2018). This change helps the clinic as they are a training site for fellowship and residency psychiatrists to provide the best evidence-based recommendations for psychiatric care. Kyei-Frimpong et al. (2021) found that using provider education as an intervention increased the percentage of providers recommending exercise to mental health patients from 20% to 78%. Provider education is an impactful intervention, and an additional chart review of 100 randomly selected charts was conducted after

the implementation of the intervention. The large data set was analyzed for statistical significance.

Setting

NMH is an outpatient mental health clinic that serves pediatric and adult patients across the life span in Las Vegas, Nevada. NMH employs 18 psychiatric providers, 2 medical assistants, multiple therapists, administrative members, executive team, information technology (IT), and quality improvement staff (NMH, 2020). NMH has associated with sister companies Healthy Minds and the non-profit Community Solutions. These three companies are all under the Lark Management, PLLC umbrella. Between the three companies, they share approximately 90 employees.

NMH recognizes that mental health is underserved in Nevada. Its mission statement is to "provide mental health services with the patience and attention we would expect for our own family" (NMH, 2020). NMH serves patients with multiple private insurances, cash pay options, Medicare, and Medicaid. NMH strives to improve mental health care in Nevada by providing longer visit times than the average 45 to 60-minute initial appointments and 20 to 30-minute follow-up appointments [the U.S. average is 15 to 20 minutes] (Cruz et al., 2013; NMH, 2020). NMH serves 1371 patients, and the number seen each month varies widely.

Exercise is an integral part of the standard of care for mental health treatment (Lake & Turner, 2017; Piercy et al., 2018; Teychenne et al., 2020). A trigger for this project was the lack of standardized exercise recommendations for use at the project site and the desire of the clinic to raise the level of care provided to the underserved community in Nevada. NMH desires to treat patients at the highest levels and standards of care (NMH, 2020). There were no patient handouts or readily available evidence-based exercise recommendations to the providers or patients prior

to this project. There was no section in the standardized charting template that addressed exercise, and providers frequently did not address exercise or include it in the treatment plan. The site strives for excellence and wants to improve the quality of mental health care in Nevada. Improving the standard of care for psychiatric visits by focusing on provider education regarding the use of exercise in the treatment plan aligns with the organization's goals. A letter of support from the site was obtained and is included in the appendices of this project.

Population

For this project, there is one key study population. The population that received the intervention was the psychiatric providers at NMH. NMH employs two psychiatric nurse practitioners and five attending physicians who are either doctors of osteopathic medicine (D.O.) or allopathic medicine (M.D.). Starting on July 1, 2022, NMH had 11 resident and fellowship physicians. Each provider works a different number of hours weekly. One of the nurse practitioners only sees adults, and the remainder of the providers see children, adolescents, and adult populations. All providers working at the clinic as of July 1, 2022 were included in the convenience sample. The rationale for using all the providers was that the sample size was smaller, with n = 18. Data quality improves as sample sizes become larger (Suchmacher & Geller, 2021). Another rationale was that the governing bodies for these differing provider types address the standards of care for practice. For example, the American Association of Nurse Practitioners (AANP) has published guidelines of what the expected standards of care of nurse practitioner practice should include. In these guidelines, comprehensive treatment planning is expected and should include non-pharmacological treatments (like exercise), promote optimal health, and be based on evidence-based knowledge (AANP, 2019).

The inclusion criteria for this project were all psychiatric providers at NMH actively serving patients as of July 1, 2022. The exclusion criteria included therapy providers, any providers that were leaving the clinic before the end of the project, and any providers that started at the clinic after the project had commenced. Recruitment strategies included discussing the proposed project with the clinic's medical director, presenting the ideas for implementation, and the importance of the project to the psychiatric providers. The rationale for including all providers in the project was presented. It was agreed that the project would be rolled out to all psychiatric providers, and pre and post-test data would be collected via a random sampling of all the completed charted encounters during a specified period. The data was gathered via randomly sampled charts pre-and-post intervention. The data were statistically analyzed using Microsoft Excel to determine if there was an increase in the frequency of providers recommending exercise in the treatment plan.

Ethical Considerations

Protecting human subjects is important in maintaining ethical integrity during research (Roush, 2019). For this purpose, the investigator has completed research ethics training to ensure that human research subjects are protected. The certificates from this training can be found in the appendices of this paper. The project was submitted for approval by the Liberty University Institutional Review Board (IRB). IRB approval was granted and may be found in the appendices. Human subjects in this project only received educational materials as an intervention. Due to this, there were few risks or safety concerns for this project. There was no need for obtaining consent, as the data was collected via chart reviews. All patient and provider data were kept confidential. Randomized chart selection was conducted via medical record numbers, and no protected health information was used or included in this manuscript.

Data Collection

The data collection for the proposed project occurred in two phases. The first set of data was collected in the pre-test phase. There were 18 psychiatric providers that were seeing patients weekly by July 1, 2022. They all used the same electronic health record system and templated psychiatric intake, follow-up notes, and appointment checkout sheets. A random sampling of 100 patient charts within a six-week period from July 1, 2022 to August 12, 2022 was taken. Charts of patients seen during that time were selected via a random number generator created in Microsoft Excel. Medical record numbers were used for the random selection, and no other patient identifiers were used.

Once 100 charts for the pre-test data were identified, the data was extracted from charts individually. An Excel spreadsheet was used to compile and analyze the data. The psychiatric notes and checkout sheets for the psychiatric visit of that assigned medical record number were reviewed to determine if exercise recommendations were included in the psychiatric treatment plan. This data was analyzed using statistical analysis to determine the frequency of providers already meeting the standard of care and recommending exercise in the treatment plan.

After the pre-test data was retrieved, the project was implemented. All psychiatric providers at NMH were educated on evidence-based exercise recommendations for mental health treatment. This process was done through presentations in meetings and a standardized handout available to providers to give to their patients in various ways, including email and printed copies. Providers were educated on the importance of exercise as a standard of care for the psychiatric visit and treatment plan. The standardized exercise recommendation handout was also introduced to providers. Providers had the option to check a box in the electronic health

record (EHR) checkout sheet, prompting the medical assistants to email or physically give patients the exercise recommendations. Six weeks post-intervention, an additional random sampling of 100 charts of patients seen within that time frame was gathered. The charts were again data-mined, looking for the use of the exercise recommendation in the psychiatric notes and the checkout sheet. Data was collected in the Excel spreadsheet. This data was the post-test data set. Pre- and post-data sets were compared for statistical significance and frequency.

Tools

Evidence-based exercise guidelines to improve mental health were used as a tool to create the exercise handout that was distributed to providers at NMH. A literature search was conducted to find evidence-based guidelines for using exercise to improve mental health. Only research of a level four and higher was included for use in the exercise recommendations handout (Melnyk, 2016). Clinical guidelines of level one evidence from the literature review were used in the development of the handout. The Physical Activity Guidelines for Americans were used for exercise frequency recommendations (Piercy et al., 2018). Evidence from the literature review was used in creating the handout, provider education meetings, and training video. The exercise recommendation handout can be found in the appendix section.

Intervention

The intervention for this project was provider education in the form of verbal and visual instruction via meetings, email, Zoom chat, PowerPoint presentations, video, and handouts. This intervention empowered providers with information they could share with their patients containing evidence-based exercise recommendations. The purpose of the proposed intervention was to ensure that exercise is included in the psychiatric treatment plans as part of meeting the standard of care (Buppert, 2022; Piercy et al., 2018; Teychenne et al., 2020). Provider education

is an effective intervention in increasing provider utilization of exercise in the psychiatric treatment plan (Kyei-Frimpong et al., 2021). Rowe et al. (2021) found that educational outreach visits followed by in-services were the most effective means of provider education. The intervention was delivered via educational outreach in individual supervision sessions and in-service trainings during medical staff meetings. The educational materials were available on shared drives and through email, further reinforcing the intervention.

The project's first phase included the project proposal and approval from the program chair and the site. The first step was to identify a need at NMH. The need was identified after reviewing chart templates, provider notes, and literature available to patients on the website and in the lobby. The idea to focus on provider education and provide evidence-based exercise recommendations for the providers to use in their treatment planning was then identified. This idea was presented to key stakeholders at NMH, such as the medical director and clinic owners. After seeing the need for the project at the site, approval was given. The investigator completed ethics in human research training. IRB approval for the project was obtained prior to the implementation of the project.

Various meetings were held with various departments that were affected by the project. The IT and quality improvement departments assisted in securing full access to the InSync EHR. These two departments also assisted by running reports on the number of active patients at the clinic and providing medical record numbers for patients seen within the pre- and post-time periods. This procedure was crucial during the data collection phases.

The intervention was implemented during a two-week period from August 12 to August 26, 2022. During this two-week education phase, all the psychiatric providers at NMH were educated on the logistics of where to find the exercise handout and how to use the exercise

handout check box on the appointment checkout form. PowerPoints and a video were presented during educational meetings, highlighting the exercise recommendations and standards of care. The handout with evidence-based exercise guidelines was made available via paper handouts, email, in the electronic medical record (EMR), and in the SharePoint NMH folder electronically. Providers were seeing patients in-person in the clinic and via telehealth. Therefore, there was a need for physical and electronic copies of the exercise recommendations.

The medical assistants were educated on the project as well. One of their job duties at NMH is to ensure that all components of the appointment checkout sheet are completed. The checkout sheet was revised to include a check box for the exercise handout. When a provider marked "yes" on the "Give Exercise Handout" option on the checkout sheet, this alerted the medical assistant that they needed to provide a physical or email a copy to the patient or guardian.

In the post-test data collection phase, data was once again collected with chart randomization using medical record numbers. The pre and post-test data were collected using Microsoft Excel, and the statistical analysis was also run through this program. The desired outcome was that the frequency of providers recommending evidence-based exercise guidelines as part of the psychiatric treatment plan increased significantly. This is important for the clinic because including exercise and physical activity in the psychiatric treatment plan is part of the standard of care. Findings were presented to the project chair and key stakeholders at NMH. Plans were created to permanently adopt the project at the site.

Timeline

The total time for the proposed project at the site was approximately 14-15 weeks. Pre-test data was collected over six weeks starting July 1, 2022. This date was chosen due to new

fellow and resident physicians starting at NMH on July 1. This provided the most accurate pre and post-test data. Pre-test data collection ended on August 12, 2022. Following the six-week pre-test period, there was a two-week educational period where providers were educated on the importance of exercise in the psychiatric treatment plan to meet the standard of care. They were also educated on specific evidence-based recommendations and on the exercise handout. Once sufficient education was completed, the proposed roll-out of the intervention began. The post-test data timeframe was from August 26, 2002, to October 7, 2022. Chart randomization and data mining for post-test data and data analysis occurred the week of October 9, 2022. The final analysis, write-ups, and meetings with the chair occurred after this date as preparations for the defense of the scholarly project were made.

Feasibility Analysis

This project required technology, personnel, time, and financial resources to be implemented correctly. The resource of time was the biggest constraint. The exercise recommendation tool needed to be user-friendly and manageable for the providers to utilize. Providers are frequently booked with back-to-back appointments and only have a short time to devote to additional work. With the evidence-based recommendations already created, all medical assistants had to do was give the patients the handout built into the checkout form. The providers already use the form; this prevented time from being too much of a burden for the providers. There was also a need for time during the two-week provider education and implementation phase. The education took place during scheduled meetings to minimize disruption in provider schedules. PowerPoint presentations and videos were kept brief (3-4 slides and under 5 minutes) to minimize schedule disruptions.

Personnel resources were the most intensely utilized resource for the proposed project. There needed to be interdisciplinary involvement to launch the pilot successfully. Meetings needed to be held with key stakeholders and preceptors to review the project design and gain approval for each stage. IT and quality improvement departments assisted with data collection. They ran reports on which medical record numbers were seen during the pre and post-test phase and added the new check box on the appointment checkout sheets for the handout in the EHR. The psychiatric providers were also utilized as they are the key population of focus. They were the ones to implement the recommendations into the psychiatric treatment plans and complete the corresponding documentation. They also engaged in the education components. Medical assistants and office administrators assisted in provider requests on the checkout sheet and were used as a staffing resource. They were responsible for ensuring the patients received the handout if the provider checked the box on the checkout form.

The biggest technology resource that was utilized was the EHR. This provided the data for analysis via chart reviews for pre and post-test data and housing the checkout sheets with the newly added check box for exercise recommendations. Computers and copy machines were the two technical devices used most frequently, as some meetings took place over Zoom, and handouts were distributed through email or made on copy machines.

There was some financial burden to the researcher and site to implement this project. It was decided that each provider's office should have 20 copies of the handout, the front desk 50 copies, and each medical assistant should have 50 copies. Copies were made in color utilizing standard A4 paper. The investigator assumed the cost of the printing and distribution of the handout. The cost to the researcher was approximately $100 to produce and print the necessary handouts. Other ancillary costs were the cost of gas when driving to the clinic for provider

education. The electricity and internet service required to run the computer during telehealth meetings, the cost of food for lunch meetings with the medical assistants and working with the IT department were some of the other costs. These costs were variable due to fluctuating prices of gas and energy. A copy of the project budget was placed in the appendix. Based on this analysis and the site's support, the project was feasible for this site.

Data Analysis

The data for this project consisted of two separate data sets. The data was collected and stored in a Microsoft Excel spreadsheet. There were pre-test and post-test data, and each data set had 100 entries. Statistical analysis was conducted using mathematical functions in Excel. The frequency of exercise recommendations being made in the psychiatric treatment plan was compared pre and post-test. Descriptive statistics and chi-square tests were used to determine statistical significance.

Section Four: Results

Data Analysis

The pre-test phase was conducted from July 1, 2022 through August 12, 2022. After completing this phase, the researcher collected all patient encounters seen during this time through the EHR via a sorting feature. The medical record numbers (MRN) were all entered in an excel spreadsheet under an assigned pre-test tab. All MRNs were assigned a random number through a random number generator formula in Microsoft Excel. The MRNs were sorted via the random number generator, and the first 100 were selected. Charts were excluded if the encounter note was not completed and the next randomly assigned chart was used.

Only the psychiatric encounters during the assigned time were reviewed. Data were extracted from the plan section of the note. Two data sets were collected using yes or no as the codified identifiers. The first data set measured if the psychiatric provider mentioned or recommended exercise to their patients in the treatment plan. A value of "yes" or "no" was recorded. It was found that 64% of the charts reviewed needed to have exercise mentioned or recommended in the plan section of the chart. It was also found that 36% of the charts had exercise recommended to the patients in the treatment plan.

The second data set looked at whether the provider recommended specific exercise recommendations to the patients by reviewing the treatment plan section of the note. This was taken from the same 100 charts, and it was found that no provider recommended specific exercise activities or exercise durations to patients in the treatment plan.

The post-test data phase was completed on October 7, 2022. The post-test phase started after the two-week intervention period and was from August 26, 2022 to October 7, 2022. After this phase, 100 charts were randomly sampled using the same random number generator in

Microsoft Excel. The data was sorted via codified "yes" or "no" values if exercise was recommended in the treatment plan. The charts were also reviewed for specific exercise recommendations and durations. This data was compared using descriptive statistics, and the two groups were compared using chi-square to determine the statistical significance of the intervention.

It was found that there was a large increase in the treatment plan from the pre-test to the post-test data. The pre-test data showed that 36% of the charts had exercise recommendations in the treatment plan, and the post-test data showed that 65% had exercise recommendations in the treatment plan. Of the charts with exercise recommendations in the plan, 66% gave specific exercise recommendations, durations, or gave the exercise handout to the patient.

The chi-square data analysis yielded statistically significant results for both data groups analyzed. When comparing the pre and post-test data for whether exercise was recommended, the data was statistically significant at $p<.01$. The chi-square results were X^2 (1, N=100) = 16.822, p=0.000041, significant at $p<.01$. This means that the post-test group was significantly more likely to recommend exercise in the psychiatric treatment plan and that the intervention was effective. When comparing data for specific exercise recommendations, it was found that X^2 (1, N=100) = 53.018, $p<0.00001$; significant at $p<.01$. This means that the post-test group was significantly more likely to recommend specific exercises or durations in the psychiatric treatment plan and that the intervention was effective.

Section Five: Discussion

Implications for Practice

Provider education is an extremely important part of sustaining practice change. Improving the quality of patient care is a primary goal of the Doctor of Nursing Practice (DNP) prepared nurse practitioner (AACN, 2006). This project has statistically significant results, and the implications for practice are multi-factorial. Providers recommending exercise more frequently to patients can result in improved mental and physical health (Aguinago et al., 2018; Gourgouvelis et al., 2018; Ligeza et al., 2019). There is a substantial body of evidence to support the use of exercise to augment the treatment of various mental health conditions. NMH has a goal to treat patients using the best standards of care. Implications for this project include elevating the standard of care provided, resulting in improved patient satisfaction, improved mental health, improved physical health, reduced no-show rates, and increased referrals to the office.

Sustainability

This project is easily sustainable when considering the workflow of the providers at NMH. A specific checkbox already built into the checkout form alerts the medical assistants to send the exercise handout to patients. When providers are in the habit of recommending exercise to their patients, this practice may build into their charting templates. There is little cost to continuing this program at NMH except for printing fees if the clinic continues to hand out paper copies of the exercise handout during in-person visits. At the time of this study, most visits were still being conducted through telehealth, and patients were receiving the handouts via email.

Dissemination Plan

NMH has two sister clinics operated under Lark Management. Many of the providers work at all the clinics. The medical director proposes that the project be implemented at the remaining sites. This initiative would occur via provider education in the same way as this project: through meetings, emails, educational videos, and handouts. The IT department would be utilized to update the EHR checkout sheet for the other clinics so that providers may check the box to use the exercise handout for their patients. The exercise handout would be updated to include the individual clinic names.

Section Six: Conclusion

Mental health outcomes can be improved with the addition of exercise to the psychiatric treatment plan. Using evidence-based exercise recommendations may have positive short- and long-term implications for mental and physical health, provider and patient satisfaction, and improved overall healthcare. Provider education is an effective means to increase provider utilization of this tool. Integrating provider education regarding exercise through videos, in-services, telehealth and in-person meetings, and by providing evidence-based educational materials can significantly improve providers recommending exercise to their patients.

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Appendix

A. Strength of Evidence Table

B. CITI training Certificate

C. Permission to use Iowa Model

D. Site Letter of Support

E. Exercise Handout

F. IRB Approval

G. Project Budget

APPENDIX A:

STRENGTH OF EVIDENCE TABLE

Article Title, Author, etc. (Current APA Format)	Study Purpose	Sample (Characteristics of the Sample: Demographics, etc.)	Methods	Study Results	Level of Evidence (Use Melnyk Framework)	Study Limitations	Would Use as Evidence to Support a Change? (Yes or No) Provide Rationale.
Chan, J. S., Liu, G., Liang, D., Deng, K., Wu, J., & Yan, J. H. (2018). Special issue – therapeutic benefits of physical activity for mood: A systematic review on the effects of exercise intensity, duration, and modality. *The Journal of Psychology*, *153*(1), 102–125. https://doi.org/10.1080/00223980.2018.1470487	To determine the effect on mood of exercise duration, intensity, type of exercise	38 articles were used Articles were experimental designs	Systematic review of 38 experimental studies. Researchers use the Preferred Reporting Items for Systematic Reviews and Meta-Analyses	10-15 min of exercises is sufficient to provide improvement in mood No real findings regarding intensity Anaerobic, aerobic, and mindfulness exercises can all provide benefits	Level 1 Systematic Review	Not possible to blind participants to using exercise as an intervention	Yes Strong evidence and results, used highest level of evidence in systematic review Good sample size
Grasdalsmoen, M., Eriksen, H. R., Lønning, K. J., & Sivertsen, B. (2020). Physical exercise,	To determine the effect of	50,054 college	Cross sectional design	Mental health was impacted	Level 4	College students	Yes

mental health problems, and suicide attempts in university students. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-020-02583-3	exercise on mental health and suicide attempts	students aged 18-35	using three different self-reporting standardized questionnaires	on all measurements with increases in exercise. The more frequent the exercise the biggest effect. Women with low activity levels were three times more likely to score on psychological distress scales	Cross sectional design	only sampled	Results may not be fully generalizable to all populations as they only sampled college students Large sample size.
Goldstein, E., Topitzes, J., Brown, R. L., & Barrett, B. (2018). Mediational pathways of meditation and exercise on mental health and perceived stress: A randomized controlled trial. *Journal of Health Psychology*, *25*(12), 1816–1830. https://doi.org/10.1177/1359105318772608	To determine effects of meditation and exercise on mental health and stress	413 adults in a community setting, randomized into three groups	Randomized controlled trial-three groups-control, meditation only, exercise only.	Mediation and exercise groups showed improvement mental health symptoms	Level 2 Randomized controlled study	Two variables-meditation and exercise	Yes, significant results, good sample size and study design.

Chen, X., Zhao, L., Liu, Y., Zhou, Z., Zhang, H., Wei, D., Chen, J., Li, Y., Ou, J., Huang, J., Yang, X., & Ma, C. (2021). Otago Exercise Programme for physical function and mental health among older adults with cognitive frailty during COVID-19: A randomized controlled trial. *Journal of Clinical Nursing*. https://doi.org/10.1111/jocn.15964	To determine if a prescribed exercise program can improve mental and physical health in elderly patients	Two groups of 31 patients assigned to control or exercise groups. Participants were from a nursing home in China.	Randomized controlled trial- exercise group and control group	Exercise group show significant reduction in health complaints and mental health symptoms	Level 2 Randomized controlled study	Elderly population only	Yes High level of evidence
Lobelo, F., Muth, N. D., Hanson, S., Nemeth, B. A., LaBella, C. R., Brooks, M. A., Canty, G., Diamond, A. B., Hennrikus, W., Logan, K., Moffatt, K., Pengel, K. B., Peterson, A. R., Stricker, P. R., Bolling, C. F., Armstrong, S., Haemer, M. A., Rausch, J., Rogers, V., & Walsh, S. M. (2020). Physical activity assessment and counseling in pediatric clinical settings. *Pediatrics*, *145*(3). https://doi.org/10.1542/peds.2019-3992	To provide guidance on physical activity and counseling for pediatric patients	No sample size used	This article is a compilation of exercise guidelines by the American Academy of Pediatrics	This article gives evidence-based activity level and exercise recommendations for pediatric and adolescent patients	Level 1- clinical guidelines based on highest level 1 evidence (Melnyk, 2016)	Targeted towards pediatric populations only	Yes. Highest level of evidence. Recommendations are relevant for pediatric population only.
Ligeza, T. S., Kałamała, P., Tarnawczyk, O., Maciejczyk, M., & Wyczesany, M. (2019).	Determine if increased exercise	A convenience sample of	Women divided into two	Being physically active	Level 4	Small sample size	Yes

Frequent physical exercise is associated with better ability to regulate negative emotions in adult women: The electrophysiological evidence. *Mental Health and Physical Activity, 17,* 100294. https://doi.org/10.1016/j.mhpa.2019.100294	causes women to regulate negative emotions better	56 women in Poland were recruited via advertising and initial self-reported survey	groups: physically active and inactive. 3 surveys, EEG and V02 max cardio testing was completed, and women were shown negative pictures.	correlates with improved ability to regulate negative emotions when faced with negative stimuli	Correlational design, cross sectional study	Women only	Could use this to support increased exercise for women only
Mendoza-Vasconez, A. S., Marquez, B., Linke, S., Arredondo, E. M., & Marcus, B. H. (2019). Effect of physical activity on depression symptoms and perceived stress in Latinas: A mediation analysis. *Mental Health and Physical Activity, 16,* 31–37. https://doi.org/10.1016/j.mhpa.2019.03.001	Effects of a 12 month by mail physical activity program on depression in Latinas in the USA	Convenience sample of 266 Latina women in the USA ages 18-65 taken from a different sample in an adjacent RCT. Women were randomized and	2 randomized groups- 12 month mailed PA program sent to intervention group. Surveys and questionaires complete	Did not find that exercise mediate or decreased depression symptoms	Level 2 Randomized Controlled trial	Only women Only one ethnicity Participants from same geographic location Potential of noncompliance with	Results were not significant therefore would not use in project but the interventions were well done and may use those in developing scholarly

		placed into control or intervention groups	d with both groups at quarterly intervals			PA program	project program
Aylett, E., Small, N., & Bower, P. (2018). Exercise in the treatment of clinical anxiety in general practice – a systematic review and meta-analysis. *BMC Health Services Research*, *18*(1). https://doi.org/10.1186/s12913-018-3313-5	To assess effects of low and high impact aerobics on anxiety	Systematic review of 15 randomized controlled trials Total participants in all trials were n=675	Validated rating scales used to measure anxiety amongst the various studies	Exercise found statistically significant in reducing anxiety	Level one evidence: Systematic Review (Melnyk, 2016)	Small number of trials examined Various exercises and intensity levels	Yes High level of evidence and significant results
Suarez-Manzano, S., Ruiz-Ariza, A., De La Torre-Cruz, M., & Martínez-López, E. J. (2018). Acute and chronic effect of physical activity on cognition and behaviour in young people with ADHD: A systematic review of intervention studies. *Research in Developmental Disabilities*, *77*, 12–23. https://doi.org/10.1016/j.ridd.2018.03.015	To determine effects of short- and long-term physical activity on ADHD symptoms	Systematic review. Included 16 experimental studies testing effects of exercise on ADHD symptoms in children	Systematic review design using 16 experimental studies. Search engines were used to find studies	Daily exercise found significant in reduction of ADHD symptoms. Average exercise 20-30 minutes per day.	Systematic Review Level one evidence (Melnyk, 2016)	Small number of studies used Confounding variables not addressed in majority of studies	Yes Highest level of evidence Findings support scholarly project

Piercy, K. L., Troiano, R. P., Ballard, R. M., Carlson, S. A., Fulton, J. E., Galuska, D. A., George, S. M., & Olson, R. D. (2018). The physical activity guidelines for Americans. *JAMA*, *320*(19), 2020. https://doi.org/10.1001/jama.2018.14854	To provide physical activity recommendations	Systematic Review and Evidence-based clinical guidelines	38 questions and 104 subquestions were used when examining high level research and evidence to create the guidelines	Evidence based physical activity guidelines were created	Level 1 Evidence (Melnyk, 2016)	Guidelines targeted towards American population only	Yes Highest level of evidence
de Oliveira, G. D., Oancea, S. C., Nucci, L. B., & Vogeltanz-Holm, N. (2017). The association between physical activity and depression among individuals residing in Brazil. *Social Psychiatry and Psychiatric Epidemiology*, *53*(4), 373–383. https://doi.org/10.1007/s00127-017-1441-6	Determine effects of physical activity on depression symptoms in Brazilian adults	Convenience sample of 59, 399 persons, over half were female. Data was gathered through a national health survey and individual interviews	Data was collected from a national health survey then household were contacted and interview by researcher. Diagnoses were	Physical activity found to be statistically significant in being protective against depression symptoms for men but not women	Level 4 Correlational design: cross-sectional study (Melnyk, 2016)	Results not significant for women Level of evidence Not generalizable to other countries or cultures without accountin	Yes Large sample size, finding is significant for male gender

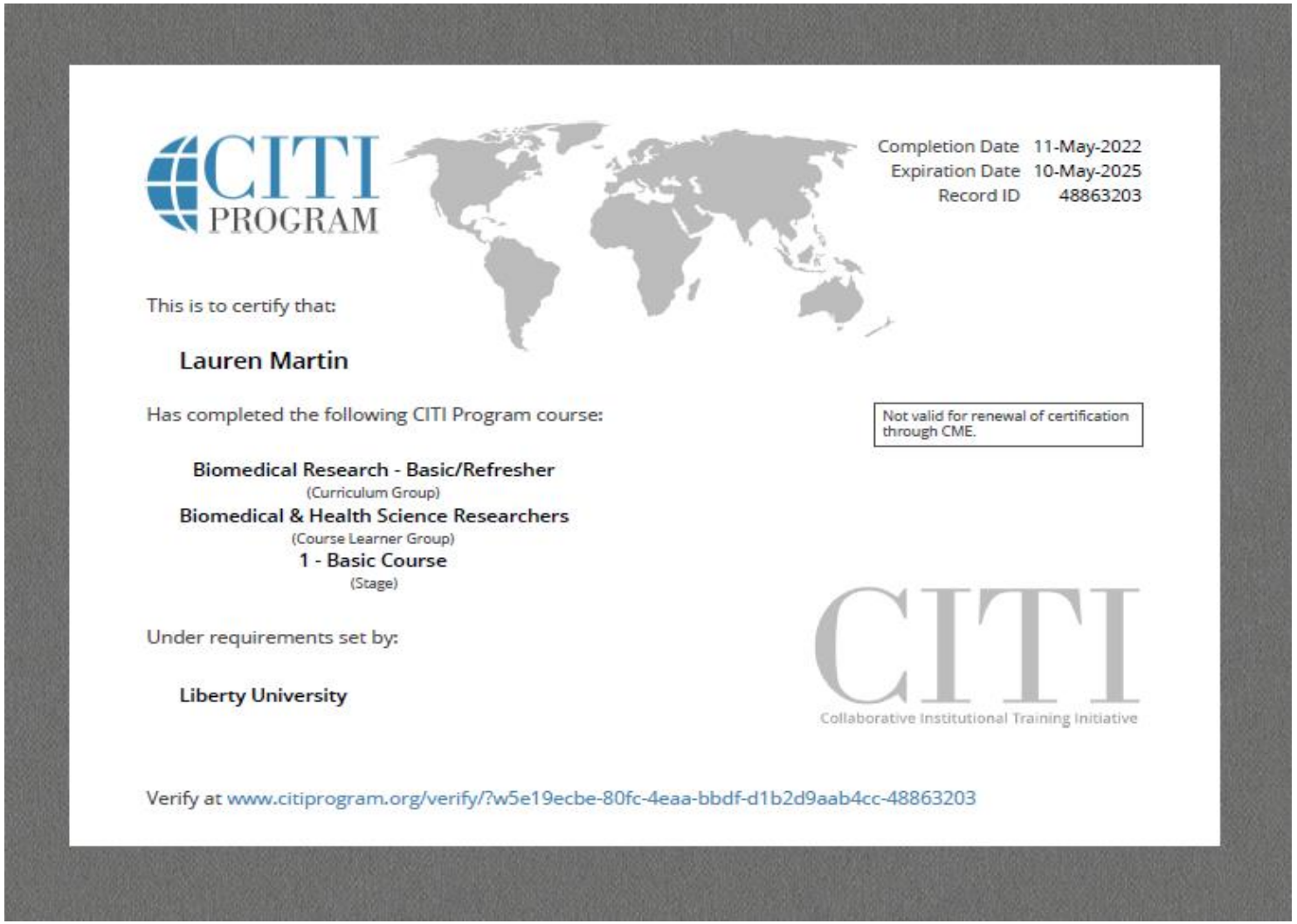
			self-reported			g for cultural variables	
Aguiñaga, S., Ehlers, D. K., Salerno, E. A., Fanning, J., Motl, R. W., & McAuley, E. (2018). Home-Based Physical Activity Program Improves Depression and Anxiety in Older Adults. *Journal of Physical Activity and Health, 15*(9), 692–696. https://doi.org/10.1123/jpah.2017-0390	Effects of home-based exercise program on depression and anxiety symptoms of older adults	N=307 older adults	Participants randomized into intervention and control groups. Intervention group received at home DVD exercise program- 6 months in duration. Baseline and follow up questionnaires.	Physical activity found to be significant in reducing anxiety and depression symptoms as compared to the control group	Level 2 evidence, Randomized controlled trial (Melnyk, 2016)	Older adults only Possible issues with self-reported compliance with exercise program	Yes Findings are significant and will
Meyer, J. D., Crombie, K. M., Cook, D. B., Hillard, C. J., & Koltyn, K. F. (2019). Serum Endocannabinoid and Mood Changes after Exercise in Major Depressive Disorder. *Medicine & Science in Sports*	To examine effects of exercise on serum endocannabinoid levels and self-	Convenience sample of N=17 women Ages 20-60	Prospective Cohort Study design. Women exercised twice for	Statistically significant improvements in mood and serum endocannabinoid levels	Prospective Cohort Study Level 4 evidence	Small sample size Not randomized	Yes Small sample size but results were significant

& Exercise, 51(9), 1909–1917. https://doi.org/10.1249/mss.0000000000002006	reported mood in women with MDD		twenty minutes duration. Serum blood levels were drawn pre and post workout and mood were rated.	were found post workout when compared to pre-workout levels and reports.	(Melnyk, 2016)		
Gourgouvelis, J., Yielder, P., Clarke, S. T., Behbahani, H., & Murphy, B. A. (2018). Exercise Leads to Better Clinical Outcomes in Those Receiving Medication Plus Cognitive Behavioral Therapy for Major Depressive Disorder. *Frontiers in Psychiatry, 9*. https://doi.org/10.3389/fpsyt.2018.00037	To examine the effects of exercise on MDD in patients already receiving therapy and taking psychotropic medication	Sample size of 16 persons with MDD randomly assigned to intervention and control groups. A healthy participant group of 22 persons was also included for comparison	Groups were randomized into therapy only for the control and therapy and exercise as the intervention group.	Significant reduction in depression symptoms in the exercise group as compared to the control group	Level 2 evidence Randomized controlled trial (Melnyk, 2016)	Small sample size Control and intervention groups smaller than healthy comparison group	Yes Although results considered preliminary by researchers, the results are significant and will be considered
Zhang, M., Liu, Z., Ma, H., & Smith, D. M. (2020). Chronic Physical	To determine	11 studies were	Scientific search	Physical activity	Level 1 evidence	Risks of bias and	Yes

Activity for Attention Deficit Hyperactivity Disorder and/or autism spectrum disorder in Children: A Meta-Analysis of Randomized Controlled Trials. *Frontiers in Behavioral Neuroscience, 14*. https://doi.org/10.3389/fnbeh.2020.564886	the effects of physical activity on executive function and motor skills in children with ADHD and/or ASD	compiled to perform meta-analysis N=346 children	engines use to compile studies of RCT's only.	improved executive function and motor skills in children with ADHD and/or ASD	Meta-analysis of randomized controlled trials (Melnyk, 2016)	confounding variables in the studies reviewed	High level of evidence Results support scholarly project for ADHD diagnoses
Kyei-Frimpong, J., Blood-Siegfried, J., Wijetilaka, R., & Gendler, A. (2021). Exercise as medicine: Providing practitioner guidance on exercise prescription. *Preventive Medicine Reports, 22*, 101323. https://doi.org/10.1016/j.pmedr.2021.101323	Using provider education as an intervention to increase use of exercise as a prescription in the treatment plan	Convenience sample of 12 providers-nurse practitioners, physician assistants, MD's and DO's	Pretest and post test data collected prior to education intervention and post education intervention at 3 months. 75 patient charts were examined	data showed found 20% of providers recommended exercise in the treatment plan pre-education intervention and 78% recommended exercise post education intervention.	Level 3 Quasi-experimental pre-post design (Melnyk, 2016)	Small sample size	Results support using provider education as an intervention
Rowe, A. K., Rowe, S. Y., Peters, D. H., Holloway, K. A., & Ross-Degnan, D. (2021). The	Systematic review of studies	199 studies completed	Studies were assessed	Results showed educational	Level 1 evidence -	Higher income countries	Results support use of

effectiveness of training strategies to improve healthcare provider practices in low-income and middle-income countries. *BMJ Global Health, 6*(1). https://doi.org/10.1136/bmjgh-2020-003229	done to assess the most effective delivery methods of healthcare provider education	in 51 countries	for the most effective forms of provider education - 199 studies were reviewed	outreach and in-service trainings were the most effective forms of provider education.	systematic review	not included	educational outreach and in-service in healthcare provider education

Appendix B



CITI PROGRAM

Completion Date 11-May-2022
Expiration Date 10-May-2025
Record ID 48863203

This is to certify that:

Lauren Martin

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Biomedical Research - Basic/Refresher
(Curriculum Group)
Biomedical & Health Science Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Liberty University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w5e19ecbe-80fc-4eaa-bbdf-d1b2d9aab4cc-48863203

Appendix C

5/10/22, 12:57 PM Mail - Martin, Lauren Grace - Outlook

Permission to Use The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

Kimberly Jordan - University of Iowa Hospitals and Clinics <survey-bounce@survey.uiowa.edu>
Tue 5/10/2022 12:51 PM
To: Martin, Lauren Grace <[redacted]>

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care*. Click the link below to open.

The Iowa Model Revised (2015)

Copyright is retained by University of Iowa Hospitals and Clinics. **Permission is not granted for placing on the internet.**

Reference: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14(3), 175-182. doi:10.1111/wvn.12223*

> In written material, please add the following statement:
> *Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.*

Please contact UIHCNursingResearchandEBP@uiowa.edu [redacted] with questions.

Appendix D

Dr. Sapandeep Khurana, M.D.
Medical Director

6/15/2022

To Liberty University School of Nursing,

This letter serves as confirmation of organizational support from Nevada Mental Health for student Lauren Martin to perform their DNP project focusing on provider education for use of exercise recommendations in the psychiatric treatment plan. This project will educate providers regarding the evidence exercise makes on improving mental health. The project will provide providers with easy-to-use handouts for patient education on exercise and specific recommendations. We commit to supporting implementation of this project within Nevada Mental Health. We commit to providing on-site guidance, and appropriate resources (as applicable) for the project initiatives, including securing any needed approvals for data collection and storage in accordance with our local site requirements and institutional policies and procedures. Nevada Mental Health will serve as the site organizational sponsor and is qualified to serve in this role.

Sincerely,

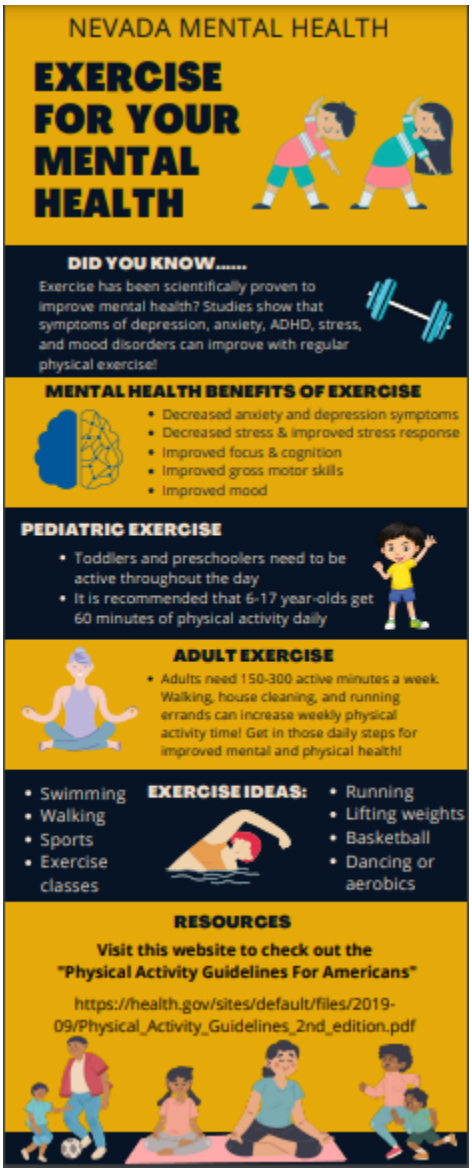
Sapandeep Khurana MD

Dr. Sapandeep Khurana, M.D.
Medical Director

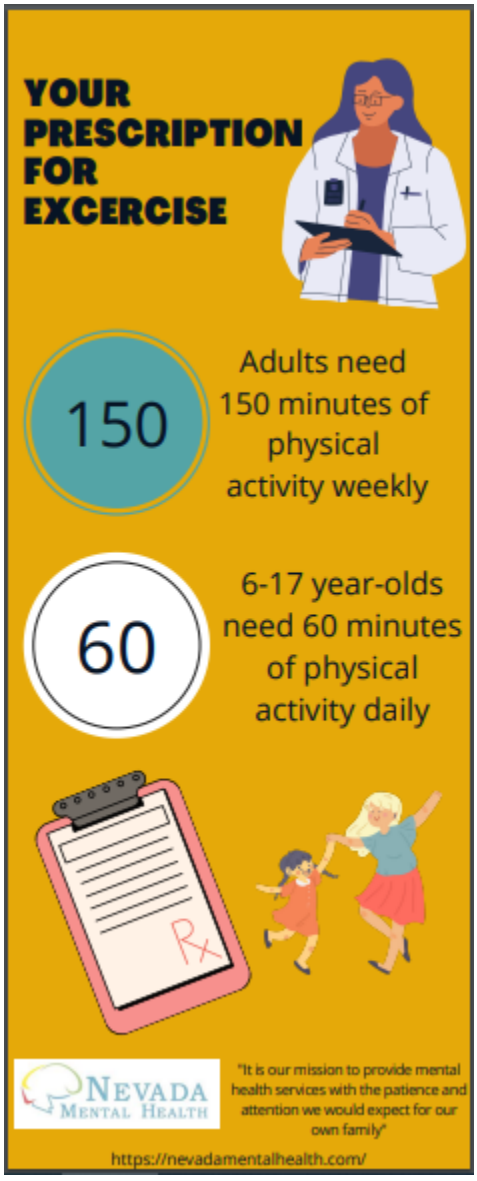
526 S. Tonopah Dr. Suite 200
Las Vegas, Nevada 89106
Phone (702) 440-8430 Fax (866)640-0525
Email: Scheduling@NevadaMentalHealth.com

Appendix E

FRONT



BACK



Appendix F

IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

August 3, 2022

Lauren Martin
Sherri Walker

Re: IRB Application - IRB-FY22-23-92 IMPLEMENTATION OF PROVIDER EDUCATION REGARDING EXERCISE AS ADJUNCTIVE TREATMENT FOR COMMON MENTAL HEALTH DIAGNOSES

Dear Lauren Martin and Sherri Walker,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your project with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study is not considered human subjects research for the following reason:

Evidence-based practice projects are considered quality improvement activities, which are not "designed to develop or contribute to generalizable knowledge" according to 45 CFR 46.102(l).

Please note that this decision only applies to your current application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP

Appendix G

Budget

Printing Budget: $100

Lunch for Medical Assistants: $35

Lunch for IT department: $40