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Using Exercise to Treat Anxiety in Adult Patients with Addiction

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Executive Summary: Staff Education Project

Using Exercise to Treat Anxiety in Adult Patients with Addiction

by

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Summary

In this Doctor of Nursing Practice (DNP) project, I selected a staff education as the best intervention to improve staff knowledge in using exercise to treat anxiety disorders in adult patients at a recovery clinic for addiction. Anxiety disorders are highly prevalent among individuals undergoing substance abuse treatment, often exacerbating withdrawal symptoms and increasing relapse risks; thus, integrating the use of exercise in addition to existing standard care for anxiety treatment in individuals with substance use disorder (SUD) will lead to decreased anxiety, decreased alcohol use and drug cravings, improved quality of life and affect, increased abstinence, and improve overall clinical outcomes.

The practice-focused question for the DNP project was: Does providing staff education on the evidence and benefits of including exercise in the treatment plan for adults diagnosed with anxiety disorders enhance staff knowledge to encourage the integration of exercise as part of the treatment for anxiety.

Pre-and post- knowledge assessments were the descriptive and comparative analytical strategies used in this doctoral project to ascertain the outcomes of the staff education. The assessments showed that 100% of the clinical team were trained and that the staff education improved their knowledge on the use of exercise to treat anxiety in patients with addiction problems. Other recommended tools to assess the benefits of exercise in treating anxiety disorders include using the Generalized Anxiety Disorder-7 and staff use of exercise and patient participation logs. The potential implications include improved staff knowledge and improved patient outcomes in the addiction clinic.

Background

This DNP project was a staff education aimed at improving staff knowledge of the importance of using exercise as part of the treatment for patients with anxiety disorders. The existing plan of care, as reported by the medical director, showed that the clinical site staff generally use psychotropics and psychotherapy to manage anxiety in patients with addiction problems. There are 40 million individuals in the United States with anxiety disorder, and the rate occurs highest in individuals with SUD (Zakhari, 2021). Regular physical activity has been shown to regulate stress responses and promote neurobiological changes that alleviate anxiety (Tas Durmus et al., 2020).

The staff at the DNP project site reported using only psychotherapy and medication management in treating anxiety disorders, which are not always effective. The American Psychiatric Association (2013) denoted that individuals suffering from anxiety disorder usually have the following symptoms: sleep problems, impaired concentration, restlessness, muscle aches, fatigue, and excessive worry. Hence, educating staff on the benefits of exercise and its implementation will help alleviate the patients' various symptoms of anxiety disorder by offering an exercise protocol in anxiety treatment that will introduce a holistic approach to anxiety management.

The practice-focused question for this DNP capstone project was: Does providing staff education on the evidence and benefits of including exercise in the treatment plan for adults diagnosed with anxiety disorders increase staff inclusion of exercise as part of the patient's treatment plan? The evidence in the literature connects the benefits of exercise to improved anxiety levels in adults in addition to existing standard care for anxiety. The purpose of this DNP capstone project was to provide education to improve staff knowledge and transform knowledge into behaviors and practice changes that will integrate exercise into the plan of care for patients at the DNP project site.

There is significant evidence in the literature supporting this project and change in practice. Alessi et al. (2020), Dowla et al. (2022) and Ellingsen et al. (2021) indicated that anxiety disorders in persons undergoing substance abuse treatment often exacerbate withdrawal symptoms and increase relapse risks if not managed or controlled. Effective management of anxiety in the addiction population is critical for improving their overall treatment outcomes. Berman and Alexandra Sanfins (2023) and Frederiksen et al. (2023) emphasized that adding up to 150 minutes of physical exercise per week to existing pharmacological and psychotherapeutic approaches significantly reduces anxiety symptoms.

I conducted the literature review by searching databases (i.e., PubMed, CINAHL, Medline, and PsycINFO) available through the Walden University Library for the full text and abstracts of peer-reviewed articles that addressed the research-focused question, which highlights the benefits of exercise in anxiety treatment and addiction, the impact of adding exercise to existing treatment for anxiety. Specific inclusion and exclusion criteria were considered in the searches. After the initial search results revealed a voluminous number of articles, I employed Boolean operators and advanced search strategies reduced the number of articles. Limiting the articles to those published within the last 5 years and scanning the abstracts streamlined the article selection process. Inclusion and exclusion criteria included off-topics articles, patient populations, and addiction treatment settings.

The selected articles were thoroughly read and checked for biases, rigor, and relevancy of findings, with an audit trail kept that documented every step completed. Using the Johns Hopkins Nursing Evidence Practice Tool revealed the quality and level of evidence of peer-reviewed articles. Out of 16 peer-reviewed articles, 13 were Level 1, three were Level 2, and no articles from Levels 3–5 were selected.

The strength of evidence is strong and supports the need for change, which was seen from numerous studies revealing that using exercise has tremendous benefits in reducing anxiety in individuals with SUD. There are extensive benefits of adding exercise protocol in addiction treatment that include decreased anxiety, decreased alcohol use and drug cravings, improved quality of life and affect, increased abstinence, normalized cytokines, and improved social health (Alessi et al., 2020; Dowla et al., 2022; Ellingsen et al., 2021; Ellingsen et al., 2023; Gunillasdotter et al., 2022; Lennartsson et al., 2024; Li et al., 2023; Liu & Wang, 2023; Maden et al., 2023; Psarianos et al., 2023; Ramos-Sanchez et al., 2021; Sedhom et al., 2024; Tas Durmus et al., 2023; Xu et al., 2022). Song et al. (2023) stipulated physical exercises, like resistance and aerobics, and mind-body, such as yoga, can be effective in the prevention and treatment of addiction problems by improving negative emotions, anxiety, depression, and quality of life in individuals who abuse illicit drugs. He et al. (2024) and Fredericksen et al. (2021) added the significance of exercise in reducing negative effects and negative emotions, improving cognition, self-efficacy, immunity, dopamine level, sleep, and positive effects in individuals with SUD. Kiraz et al. (2023) explicitly emphasized that regular exercise, compared to standard care, increases motivation and mindfulness in addiction.

Staff Education Project Development

The DNP staff education project participants included five staff members: a nurse practitioner, three counselors, and a program director. I had several meetings with the project mentor and other scheduled meetings with the faculty, project mentor, and program director. During the meetings, the project mentor and program director served as expert representatives of the project site.

To develop this staff education, I used peer-reviewed articles to create staff education content; assessed strengths, weaknesses, opportunities, and threats of the organization; and conducted an organizational readiness and stakeholder analysis. The findings of these organizational-focused assessments and literature searches were used to develop staff education PowerPoint (PPT), project materials, collateral, and forms. I instituted a knowledge assessment comprising five multiple-choice questions based on the literature review findings to meet the stated learner objectives for the training.

This DNP project was implemented in person on June 5, 2025, using a PPT presentation and PPT slide printouts in two training sessions. Twenty-five minutes were allotted to the presentation, 5 to the pre knowledge assessment, 5 to the post knowledge assessment, and 10 minutes for discussions with questions and answers. Staff completed the pre knowledge assessment first using pen and paper, then I delivered the PPT presentation. There was a discussion session after the PPT presentation, and staff completed the post knowledge assessment with pen and paper. On the day of implementation, the first training session with three staff lasted about 50 minutes (beginning at 11:15 a.m. and ending at 12:05 p.m.), while the second with two staff lasted about 46 minutes (beginning at 12:14 p.m. and ending at 1:00 p.m.). I conducted each staff education session with the faculty-approved project materials: the PPT; pre- and post- knowledge assessments; and time for discussions, questions, and answers. The staff willingly consented to participate in the staff education by completing the attendance log using de-identifiers and the pre- and post- knowledge assessment questions.

The data I used for this project included five multiple-choice questions developed using the findings from literature reviews to create two knowledge-based assessments of the same questions, which were used to evaluate the staff knowledge level before and after the training on the evidence and benefits of including exercise in the treatment plan for adults diagnosed with anxiety disorders. The five participants were encouraged to use the same de-identifier on the pre- and post- knowledge assessments, and they were instructed to turn in completed knowledge assessments in a folder. No demographics questions were asked to promote participant anonymity.

The analysis for this project was descriptive and comparative capturing participants' pre- and post- knowledge assessment performance. I used the same five questions for the pre- and post- knowledge assessments to ensure standardized measures, eliminate bias, and increase the reliability and validity of the data. Using identical questions on the pre- and post- assessment tools enabled paired statistical tests, such as a paired *t* test to measure the significance of learning change.

The process for evaluating the evidence was the analysis of the successful implementation of the staff education at the project site, staff performance on the pre- and post- knowledge assessments, and the clinic site's use of exercise as part of the patient's treatment plan for anxiety. I collected the data on the same day of the training, comprising the pre- and post- knowledge assessments completed by staff. I analyzed the data using Microsoft Excel and Microsoft Word. Other recommended forms were also provided to the staff for consideration in determining the efficacy of exercise on each participant’s anxiety level at the clinic, and the recommended forms were not collected or used in the evaluation process.

Results

Based on a comparative analysis of the performance of both individuals and the groups before and after staff training, there was a consistent and measurable improvement in staff knowledge overall, with descriptive statistics showing consistent knowledge improvement among the staff. The range shows a shift from midrange scores that consistently shifted to high scores with less variability after the training.

The five staff members who I anticipated to be trained were all trained as scheduled, and they signed an attendance log using de-identifiers, which included letters and numbers the staff member picked and could remember but were difficult to guess. During the training, staff were engaged during the discussion, asked questions, and were provided clarifications by me. Staff demonstrated mastery of the content as evidenced by their post knowledge assessment performance. The pre- and post- knowledge assessments were completed by all five staff members using unique de-identifiers, which ensured their anonymity. The unique de-identifiers were omitted from the data report. Staff's post knowledge assessment results showed a substantial increase in knowledge about the benefits and evidence in using exercise to treat anxiety in individuals with SUD.

Data Analysis

Purpose

The purpose of this staff education project was to train staff on the evidence and benefits of using exercise in addition to the existing standard care of treating anxiety disorders in patients with addiction problems. In the report, I evaluated the effectiveness of the training sessions by comparing staff members' pre- and posttest scores to measure their knowledge acquisition, results, and improvements across the team

Participants

Five staff members participated in the project:

- Counselor A
- Counselor B
- Counselor C
- nurse practitioner
- program director

Attendance Rate

Five staff were scheduled to take part in the project, and all five staff were trained, meaning 100% of staff received trained.

Pre- and Posttest Score Percentage

To calculate, I added the participants' pre- and posttest total scores (see Table 1) and then divided each sum by 25 and multiplied by 100 to determine the overall score percentage.

Table 1

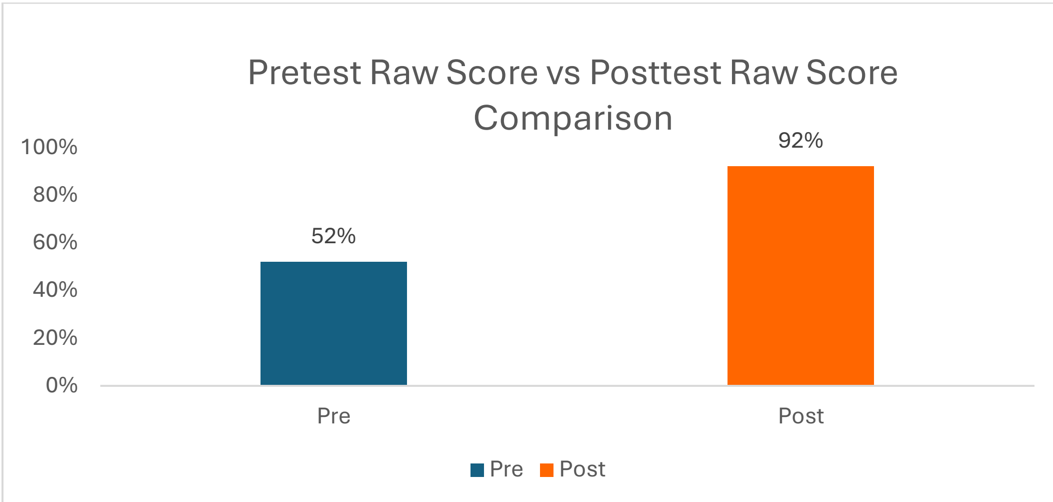
Staff Pre-Test and Post-Test Scores Total (Sum)

Staff	Pretest score (sum)	Posttest score (sum)
1	3	5
2	3	4
3	2	5
4	3	5
5	2	4
Total	13 Points	23 Points

The percentage of the participants' pretest score total of 13 out of 25 points = 52%. The percentage of the participant's posttest score total of 23 out of 25 points = 92% (see Figure 1). The total possible points for the pre- and post- test score at 25 points each = 100%

Figure 1

Pretest Raw Score and Posttest Raw Score Comparison



Note. The chart in Figure 1 shows the staff scores before and after the educational intervention. The pretest raw score total was 13 out of 25 (52%), while the posttest raw score total increased significantly to 23 out of 25 (92%), showing effective learning outcomes and increased performance improvement among the staff.

Descriptive Statistics

The participants' pretest scores had a lower range of 2. The descriptive statistics for the participants' pretest scores were:

- $M = 2.6$
- $Mdn = 3$
- $SD = 0.55$
- Mode = 3
- Range: 2–3

The participants' posttest scores were closely grouped around high scores. The descriptive statistics for the participants' posttest scores were:

- *M* = 4.6
- *Mdn* = 5
- *SD* = 0.55
- Mode = 5
- Range: 4–5

The descriptive statistics indicated consistent improvement among the staff. The participants' midrange pretest scores consistently shifted to high scores with less variability after the training. The staff's average knowledge score went from 2.6 to 4.6 (on a 5-point scale), with all the staff showing individual improvement when compared. The most frequent pretest score of 3 shifted to 5 after training, a significant growth that proves that there is a consensus around better understanding of training among staff. The posttest scores show marked improvement in average performance and score distribution, suggesting effective learning outcomes (see Table 3 and Figure 2).

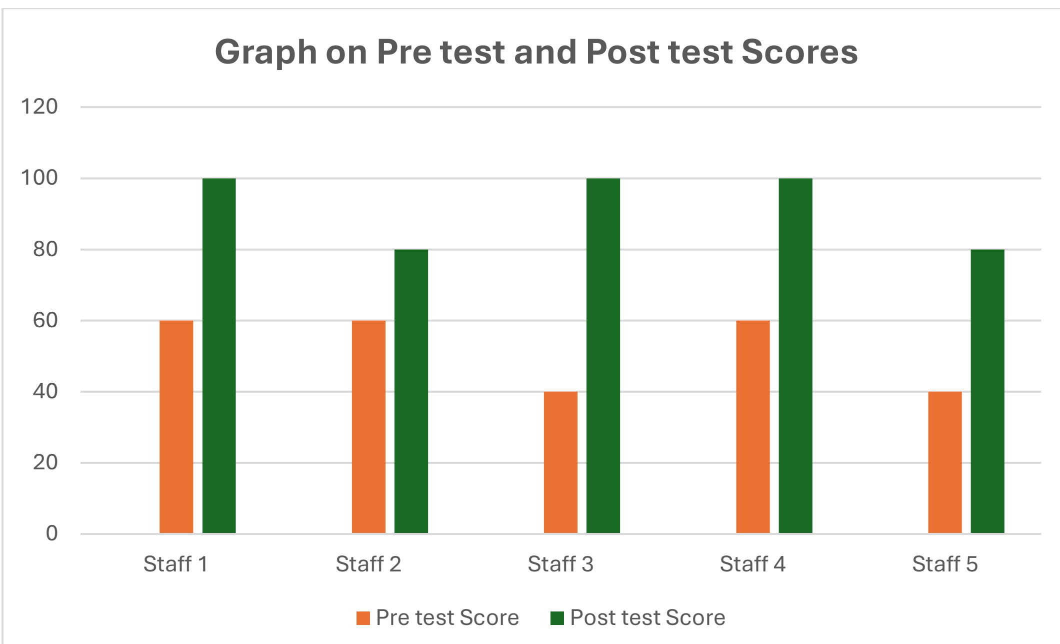
Table 3

Raw Scores of Correct Responses Converted to Percentages

Staff	Pretest score %	Posttest score %
1	60	100
2	60	80
3	40	100
4	60	100
5	40	80

Figure 2

Pre- and Posttest Scores



Inferential Analysis

The paired *t*-test results were *t* statistic = 7.04 and *p* value = 0.0021. The *p* value of 0.0021 is below 0.05, which shows that the results indicate a statistically significant improvement in staff knowledge following the training. Overall, there was a consistent and measurable improvement in staff knowledge. All participants demonstrated progress, with the majority achieving high posttest scores. Statistical and visual evidence confirmed that the training was both effective and impactful.

The impact to the DNP project site was promoting enhanced knowledge, skills, and attitudes in the staff and building the staff's confidence and comfort level in using exercise as part of the treatment plan for anxiety. The staff was intrigued by the benefits and evidence surrounding using exercise to treat anxiety in the population with addiction. The medical director reported that the project site staff is using exercise 4 days a week for at least 150 minutes in addition to the existing treatment regimen for anxiety in adults with SUD.

The limitations of this project were time constraints and the inability to analyze the actual practice change. Time constraint as a limitation impacted the results because of the need to prevent workflow disruption, which led to scheduling two training sessions for up to an hour each. However, staff did not fully use the allocated full hour for each session. One significant limitation was the low number of participants, which makes it difficult to generalize to a larger population. Another limitation that impacted the results stemmed from capturing the actual practice change by the DNP project site in using the recommended staff sign-in log with de-identifiers, which the medical director did not provide but mentioned that staff have incorporated exercise as part of the treatment for anxiety since the project.

This DNP project is recommended beyond the local site to create awareness of underutilized accessible interventions, like exercise, to treat anxiety in adults. The project does not involve equipment use and offers a scalable, low-barrier intervention and low-cost approach that the underserved population, comprising individuals with addiction problems, can use to promote health equity. There is a need to translate evidence into clinical practice by bridging a widespread implementation gap through staff training, workshops, and webinars on the benefits of exercise in mental health and steps to implement the training to align exercise intervention with broader health initiatives. Due to the small sample size of participants, I cannot generalize these results to a larger population; therefore, targeting a larger group of participants in a similar project is necessary to understand the impact of this DNP project and enhance generalizability.

Conclusions

This project had a positive impact on the DNP project site through providing a staff education on adding exercise as part of the anxiety treatment plan for patients. The staff gained the knowledge, skills, and attitudes required to integrate exercise protocols in anxiety treatment while adding the approach to the patient's treatment plan by participating in the staff education project. Assessing the DNP project revealed that the addiction and recovery treatment clinic staff gained awareness of how to manage patients' anxiety using other methods outside the existing treatment plan, including medications and psychotherapy. The favorable outcomes of the DNP project could lead to an increase in the volume of new patients who have anxiety and the dual diagnoses of SUD and other mental illnesses. However, the facility has limited capacity, and the knowledge assessment data report on staff is insufficient to monitor other outcomes impacting the patients and was only sufficient to show that staff knowledge improved after staff education.

I recommend a future study to increase the generalizability of the project by implementing multiple site studies to improve external validity. The staff completed and collated the recommended data collection for the project site, such as using a standardized anxiety scale, the Generalized Anxiety Disorder-7, for patients participating in the exercise, according to the feedback from the project site's medical director. There is still a need to evaluate the recommended questionnaires to determine the impact of the project on the patients and the project site. However, the purpose of introducing exercise as part of the anxiety treatment plan through staff education was successful, with 100% of the staff trained, and all staff self-reporting that they were using exercise after the training to treat patients with anxiety based on the report shared by the medical director a week after the project implementation.

The potential implications of this project to nursing practice include promoting a holistic care approach for managing anxiety in individuals with SUD. Staff having enhanced knowledge on the evidence and benefits of using regular exercise to treat anxiety will improve patients' cognition, emotional regulation, mindfulness, motivation, depression, play a role in opioid substitution therapy, reduce withdrawal symptoms and drug cravings, promote sobriety, and possess an anxiolytics effect on individuals with anxiety disorders at the project site. The implications for positive social change include improving patients' self-esteem and quality of life towards addiction recovery, reducing stigma in mental health and addiction, and supporting wellness and long-term recovery and sobriety goals. The project’s implications for diversity, equity, and inclusion include enhancing cultural and exercise preferences, overcoming language obstacles, providing fair and comprehensive whole-person care during recovery, encouraging gender and disability inclusivity, and enhancing both individual and societal health.

References

Alessi, S. M., Rash, C. J., & Pescatello, L. S. (2020). Reinforcing exercise to improve drug abuse treatment outcomes: A randomized controlled study in a substance use disorder outpatient treatment setting. *Psychology of Addictive Behaviors*, *34*(1), 52–64. https://doi.org/10.1037/adb0000517

American Psychiatric Association. (2013). Anxiety disorders. *In Diagnostic and Statistical Manual of Mental Disorders* (5th ed.).

Berman, R., & Alexandra Sanfins, A. (2023). Is exercise more effective than medication for depression and anxiety? *Medical News Today.* https://www.medicalnewstoday.com/articles/is-exercise-more-effective-than-medication-for-depression-and-anxiety

Dowla, R., Sinmaz, H., Mavros, Y., Murnion, B., Cayanan, E., & Rooney, K. (2022). The effectiveness of exercise as an adjunct intervention to improve quality of life and mood in substance use disorder: A systematic review. *Substance Use & Misuse,* *57*(6), 911–928. https://doi.org/10.1080/10826084.2022.2052098

Ellingsen, M. M., Clausen, T., Johannesen, S. L., Martinsen, E. W., & Hallgren, M. (2021). Effects of acute exercise on drug craving in adults with poly-substance use disorder. A randomized controlled trial. *Mental Health and Physical Activity,* *21*, 100423. https://doi.org/10.1016/j.mhpa.2021.100423

Ellingsen, M. M., Clausen, T., Johannesen, S. L., Martinsen, E. W., & Hallgren, M. (2023). Effects of acute exercise on affect, anxiety, and self-esteem in poly-substance dependent inpatients. *European Addiction Research,* 29(4), 285–293. https://doi.org/10.1159/000531042

Frederiksen, K. P., Stavestrand, S. H., Venemyr, S. K., Sirevag, K., & Hovland, A. (2021). Physical exercise as an add-on treatment to cognitive behavioral therapy for anxiety: A systematic review. *Behavioral and Cognitive Psychotherapy,* 49(5), 626–640. https://doi.org/10.1017/S1352465821000126

Gunillasdotter, V., Andreasson, S., Jirwe, M., Ekblom, O., & Hallgren, M. (2022). Effects of exercise in non-treatment seeking adults with alcohol use disorder: A three-armed randomized controlled trial (FitForChange). *Drug and Alcohol Dependence*, 232, 109266. https://doi.org/10.1016/j.drugalcdep.2022.109266

He, Q., Wu, J., Wang, X., Luo, F., Yan, K., Yu, W, Mo, Z., & Jiang, X. (2021). Exercise intervention can reduce the degree of drug dependence of patients with amphetamines/addiction by improving dopamine level and immunity and reducing negative emotions. *American Journal of Translational Research, 13*(3), 1779-1788.

Kiraz, S., & Yıldırım, S. (2023). The effect of regular exercise on depression, anxiety, treatment motivation and mindfulness in addiction: A randomized controlled trial. *Journal of Substance Use*, *28*(4), 643–650. https://doi.org/10.1080/14659891.2023.2194417

Lennartsson, A. K., Henriksson, M., Wall, A., Nyberg, J., Bolin, K., Larsson, B. A. M., Danielsson, L., Waern, M., Åberg, N. D., & Åberg, M. (2024). (2024). One-year follow-up of a primary care-based 12-week exercise intervention for adults with anxiety disorders. *Mental Health and Physical Activity, 27*, 1–10. https://doi.org/10.1016/j.mhpa.2024.100630

Li, H., Su, W., Cai, J., Zhao, L., & Li, Y. (2023). Effects of exercise of different intensities on withdrawal symptoms among people with substance use disorder: A systematic review and meta-analysis. *Frontiers in Physiology, 14*, 1126777. https://doi.org/10.3389/fphys.2023.1126777

Liu, X. X., & Wang, S. (2023). Effects of aerobic exercise combined with attentional bias training on cognitive function and psychiatric symptoms of individuals with methamphetamine dependency: A randomized controlled trial. *International Journal of Mental Health and Addiction, 21*, 1727–1745. https://doi.org/10.1007/s11469-021-00686-w

Maden, C., Bayramlar, K., Arıcak, O. T., & Yagli, N. V. (2022). Effects of virtual reality-based training and aerobic training on gaming disorder, physical activity, physical fitness, and anxiety: A randomized, controlled trial. *Mental Health and Physical Activity*, *23*. https://doi.org/10.1016/j.mhpa.2022.100465

Psarianos, A., Paparrigopoulos, T., Chryssanthopoulos, C., & Philippou, A. (2023). The role of physical exercise in opioid substitution therapy: Mechanisms of sequential effects. *International Journal of Molecular Sciences, 24*(5), 4763. https://doi.org/10.3390/ijms24054763

Ramos-Sanchez, C. P., Schuch, F. B., Seedat, S., Louw, Q. A., Stubbs, B., Rosenbaum, S., Firth, J., van Winkel, R., Vancampfort, D. (2021). The anxiolytic effects of exercise for people with anxiety and related disorders: An update of the available meta-analytic evidence. *Psychiatry Research*, *302*, 114046. https://doi.org/10.1016/j.psychres.2021.114046

Sedhom, S., Hammond, N., Thanos, K. Z., Blum, K., Elman, I., Bowirrat, A., Dennen C. A., & Thanos, P. K. (2024). Potential link between exercise and N-methyl-D-aspartate glutamate receptors in alcohol use disorder: Implications for therapeutic strategies. *Psychology Research and Behavior Management*, *17*, 2363-2376. https://doi.org/10.2147/PRBM.S462403

Song, L. Y., Huang, Z. J., Yang, S. S., Bu, D. R., Yi, N., & Zheng, X. (2023). Effectiveness of short-term exercise on drug rehabilitation effect for drug abusers: A systematic review and meta-analysis. *International Journal of Sport and Exercise Psychology.* Advance online publication. https://doi.org/10.1080/1612197X.2023.2264298

Tas Durmus, P. T., Vardar, M. E., Tayfur, P., Sut, N., & Vardar, S. A. (2020). Evaluation of the effects of high intensity interval training on cytokine levels and clinical course in treatment of opioid use disorder. *Turk Psikiyatri Derg*, *31*(3), 151-158. http://doi.org/10.5080/u25070

Xu, J., Zhu, Z., Liang, X., Huang, Q., Zheng, T., & Li, X. (2022). Effects of moderate-intensity exercise on social health and physical and mental health of methamphetamine-dependent individuals: A randomized controlled trial. *Frontiers in Psychiatry, 13*, 997960. https://doi.org/10.3389/fpsyt.2022.997960

Zakhari, R. (2021). *The psychiatric-mental health nurse practitioner certification review manual.* Springer Publishing Company.