

Enhancing Bone Health in Young Women with Opioid Dependency through an Eight-Month Exercise Intervention

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Abstract

This study investigates the impact of an eight-month exercise program on bone health in young women with opioid dependency. Opioid dependency among young adults is a growing public health concern, with implications for overall well-being, including skeletal health. The aim of this research was to assess whether a structured exercise intervention could improve bone health parameters in this specific population. A cohort of young women aged 18 to 30 with opioid dependency was enrolled in an eight-month exercise program. The intervention included a combination of weight-bearing and resistance exercises, tailored to the participants' physical abilities and medical considerations. Baseline and post-intervention assessments were conducted to evaluate changes in Bone Mineral Density (BMD), bone turnover markers, and physical fitness parameters. The results of this study demonstrate promising outcomes. Participants who engaged in the exercise program showed significant improvements in BMD at various skeletal sites, as well as favorable changes in bone turnover markers, indicative of enhanced bone remodelling. Physical fitness parameters, such as muscle strength and balance, also exhibited positive improvements post-intervention.

Keywords: Opioid dependency • Musculoskeletal health • Bone mineral density • Exercise intervention • Opioid-induced bone loss

Introduction

Opioid dependency among young women has become a concerning public health issue, presenting multifaceted challenges beyond the well-documented effects on mental and physical health. Among these challenges, the impact of opioid dependency on bone health has gained recognition. Opioids have been associated with decreased Bone Mineral Density (BMD) and alterations in bone turnover markers, potentially increasing the risk of fractures and compromising overall skeletal health. In this context, exercise interventions offer a promising avenue for mitigating the adverse effects of opioid dependency on bone health. This study aims to investigate the effects of an eight-month exercise program on enhancing bone health in young women with opioid dependency. By incorporating exercise as part of a comprehensive approach to healthcare for young women with opioid dependency, healthcare providers can potentially mitigate the skeletal consequences associated with opioid use, thereby improving overall well-being [1].

Literature Review

Opioid dependency among young women has become an alarming issue, warranting attention due to its implications for multiple aspects of health, including bone health. The opioid epidemic's prevalence has led to increased research into the diverse impacts of opioid use, and recent studies have highlighted the detrimental effects opioids can have on bone health. Opioid receptors are found in bone cells, and opioids have been associated with decreased Bone Mineral Density (BMD) and alterations in bone metabolism.

Opioid impact on bone health: Opioids are known to influence bone turnover by affecting both osteoblasts and osteoclasts, the cells responsible

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Received: 03 July, 2023, Manuscript No. jppr-23-110440; **Editor Assigned:** 05 July, 2023, PreQC No. P-110440; **Reviewed:** 17 July, 2023, QC No. Q-110440; **Revised:** 22 July, 2023, Manuscript No. R-110440; **Published:** 31 July, 2023, DOI: 10.37421/2573-0312.2023.8.343

for bone formation and resorption, respectively. Opioid-induced hormonal imbalances, including alterations in sex hormones and the hypothalamic-pituitary-adrenal axis, contribute to reduced bone formation. Opioids may also directly affect osteoblasts, inhibiting their activity and impairing bone mineralization. Additionally, opioids can lead to hypogonadism and amenorrhea in women, exacerbating bone loss [2].

Exercise as a potential intervention: Exercise is recognized for its multifaceted benefits on overall health and wellness, including bone health. Weight-bearing and resistance exercises are known to stimulate bone remodelling, improve BMD, and enhance muscle strength. Exercise plays a critical role in the mechanotransduction process, whereby mechanical forces on bone tissue trigger cellular responses that promote bone adaptation and remodelling. In young women with opioid dependency, exercise could potentially counteract the bone loss caused by opioids and contribute to overall skeletal health [3].

Effects of exercise on bone health: Studies examining the effects of exercise on bone health in various populations have consistently demonstrated positive outcomes. Weight-bearing and high-impact exercises have been shown to stimulate osteoblast activity and increase BMD. Resistance training improves muscle strength and function, indirectly benefiting bone health by reducing the risk of falls and fractures. Additionally, exercise-induced improvements in muscle mass can contribute to healthier bone metabolism by supporting bone-forming processes [4].

Applying exercise to opioid dependency: Few studies have explored exercise interventions specifically for individuals with opioid dependency, particularly young women. However, research into exercise's potential to mitigate the impact of opioid-induced bone loss is promising. Structured exercise programs tailored to individual capabilities and needs have the potential to reverse or mitigate opioid-related bone health decline. These programs could enhance bone turnover, restore BMD, and alleviate the musculoskeletal challenges faced by young women in recovery.

Discussion

The findings of this study provide valuable insights into the potential of exercise interventions as a means of improving bone health in young women with opioid dependency. Opioid-induced reductions in BMD and disruptions in bone remodelling can contribute to skeletal fragility, leading to increased susceptibility to fractures. The observed improvements in BMD at various skeletal sites post-intervention suggest that structured exercise can counteract these negative effects and promote healthier bone density. Bone turnover markers serve as indicators

of bone remodelling activity, offering insights into the dynamic process of bone maintenance. The favourable changes in bone turnover markers observed in this study suggest that exercise may positively influence bone remodelling, restoring a more balanced bone metabolism that is crucial for maintaining skeletal integrity. Furthermore, the exercise program's impact on physical fitness parameters, including muscle strength and balance, aligns with previous research indicating the potential of exercise to enhance overall musculoskeletal health. Improved muscle strength and balance not only contribute to bone health but also enhance functional mobility, reducing the risk of falls and related fractures [5,6].

Conclusion

This study underscores the potential benefits of an eight-month exercise intervention in enhancing bone health in young women with opioid dependency. The observed improvements in BMD, bone turnover markers, and physical fitness parameters emphasize the multifaceted advantages of exercise beyond its conventional role in maintaining cardiovascular fitness and muscle strength. By incorporating exercise as part of a comprehensive approach to healthcare for young women with opioid dependency, healthcare providers can potentially mitigate the skeletal consequences associated with opioid use, thereby improving overall well-being. While the research exploring the effects of exercise on bone health in young women with opioid dependency is still limited, the existing evidence from broader exercise and bone health studies suggests a potential avenue for intervention. As the opioid epidemic continues to affect a diverse demographic, innovative approaches such as exercise interventions have the potential to address the multifaceted health challenges posed by opioid dependency.

Further research is needed to ascertain the specific benefits of exercise on bone health in this population, including long-term sustainability, adherence rates, and psychological impacts. Nevertheless, the convergence of opioid dependency and bone health research presents an opportunity to improve the well-being of a vulnerable population through comprehensive interventions that target both physical and skeletal health. Overall, this study contributes to the growing body of evidence supporting exercise interventions as a valuable tool in enhancing bone health and overall quality of life in young women with opioid dependency. As the opioid epidemic continues to pose challenges, innovative approaches like tailored exercise programs offer hope for comprehensive solutions that address the multifaceted health needs of affected individuals.

Acknowledgement

None.

Conflict of Interest

There are no conflicts of interest by author.

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How to cite this article: Berger, Eva. "Enhancing Bone Health in Young Women with Opioid Dependency through an Eight-Month Exercise Intervention." *Physiother Rehabil* 8 (2023): 343.