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Strategic Solutions: A Systematic Review of Obesity Interventions in Military Personnel

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Abstract

Obesity poses a significant health concern within military populations, impacting both individual readiness and overall force effectiveness. This article presents a systematic review of randomized controlled trials (RCTs) aimed at addressing and mitigating obesity among military personnel. Through an exhaustive examination of existing literature, this review synthesizes key findings, identifies effective interventions, and outlines potential strategies to enhance the health and fitness of military forces.

Keywords: obesity; obesity treatment; weight loss intervention; military population; active-duty military personnel; veterans; RCT; randomized controlled trial; meta-analysis

Introduction

The prevalence of obesity in military personnel is a growing concern that transcends national borders. In addition to the well-documented health risks associated with obesity, such as cardiovascular disease and diabetes, excess weight can compromise military readiness, physical performance, and overall operational effectiveness. Recognizing the multifaceted challenges posed by obesity in the armed forces, this systematic review aims to provide a comprehensive analysis of RCTs focused on obesity interventions within military populations. Obesity is one side of the double burden of nutritional problems, affecting all age groups and countries world-wide regardless of their developmental stage.

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Today, more people are obese than underweight in every region of the world except sub-Saharan Africa and Asia. As mentioned above, the issue has grown to epidemic proportions, with over 4 million people dying each year because of being overweight or obese and its consequences. It is now widely accepted that occupational factors may play an important role in the occurrence of excessive body weight. The main occupational risk factors are performing sedentary work and adverse lifestyle factors such as high levels of occupational stress. Military personnel represent a population particularly exposed to a higher level of stress, with a higher risk of both obesity and mental health conditions such as major depression, post-traumatic stress disorder (PTSD), and disinhibited eating.

Indeed, the obesity epidemic has reached the military population: possibly related to high levels of stress and harmful environmental factors, especially during military exercises, military missions, or during deployment and relocation. Not only does obesity within the military ranks negatively impact the professional perception of the military in terms of appearance, but it also compromises function. The psychological and physiological impacts on obese military personnel include problems with cardiorespiratory fitness and neuromuscular fitness, heat stress, sleep apnea, a higher risk of musculoskeletal injuries and load carriage, and also mental health problems such as depressive symptoms, PTSD, anxiety, and substance and alcohol abuse disorders. Sedentary habits and suboptimal levels of physical activity may combine with PTSD to increase disordered eating behaviors. Thus, addressing eating behavior within this population is a high priority.

Methodology

A rigorous search strategy was employed to identify relevant RCTs published in peer-reviewed journals, databases, and grey literature. The inclusion criteria focused on studies conducted within military settings, involving active-duty personnel, and evaluating diverse interventions for obesity prevention and treatment. The systematic review followed PRISMA guidelines, ensuring transparency and reproducibility in the selection process.

Key Findings

The selected studies encompassed a range of interventions, including dietary modifications, physical activity programs, behavioral interventions, and combinations thereof. Results revealed varying degrees of success in reducing obesity rates among military personnel. Notably, certain interventions demonstrated efficacy in specific subpopulations, highlighting the importance of tailored approaches.



Dietary Interventions: Studies incorporating targeted nutritional strategies, such as calorie restriction and education on healthy eating habits, showed promise in reducing obesity rates.

Physical Activity Programs: RCTs assessing the impact of structured exercise routines indicated improvements in weight management, with enhanced benefits observed in programs that integrated both aerobic and resistance training.

Behavioral Interventions: Interventions targeting behavioral aspects, including stress management and sleep hygiene, demonstrated positive effects on weight control.

Combination Approaches: Integrated interventions that combined dietary modification, physical activity, and behavioral components often yielded the most significant reductions in obesity prevalence.

Challenges and Recommendations

Despite advancements in understanding effective obesity interventions, challenges persist. High attrition rates, limited long-term follow-up, and variations in study designs pose obstacles to drawing definitive conclusions. Moreover, the unique demands of military life, including deployment and irregular schedules, necessitate adaptable and sustainable interventions.

Recommendations for future research include long-term assessments, diverse study populations, and the exploration of innovative technologies to enhance intervention adherence. Tailored approaches that consider the specific needs of different military branches and occupational specialties are crucial for optimizing intervention effectiveness.

Discussion

The present study is the first meta-analysis and systematic review of RCTs investigating the effectiveness of weight loss interventions to treat overweight and obesity in military populations, comparing the intervention group both longitudinally and cross-sectionally with controls. Our findings highlight how military personnel, such as active-duty military soldiers as well as veterans enrolled in weight loss intervention programs, achieve an overall body weight and BMI reduction from baseline to post-intervention. Moreover, at the post-intervention time-point, BMI was lower than controls with a small-to-moderate effect size. The effectiveness of the weight loss interventions was also found to be significant largely in active-duty military personnel but not in veterans. These findings indicate that weight management interventions in the military population are effective, updating previous research [20,65,89].



Most of the included interventions were based on behavior change strategies adopting a comprehensive approach with different therapeutic goals, combining lifestyle modification with diet and nutritional changes and physical activity therapy, in line with previous evidence.

The limited role of pharmacotherapy in this population reflects current practice [90]. Indeed, only one RCT study comparing Orlistat versus Placebo has been identified through screening and was included in the meta-analyses. However, it may be that the introduction of new medications such as Glucagon-Like Peptide-1 (GLP-1) receptor agonists may change practice: the American Association of Clinical Endocrinologist guidelines emphasize this point with consideration of those patients who have not responded to intensive lifestyle therapy, or have experienced weight regain after responding to lifestyle therapy, and those with more severe complications of obesity. Adding a pharmacotherapeutic adjunct to behavioral and lifestyle therapy might turn out to be an effective strategy to stem the rising rate of obesity in the military population, especially for veterans, although further studies are needed in this regard.

Conclusion

This systematic review provides a comprehensive overview of RCTs aimed at mitigating obesity in military personnel. The findings underscore the multifaceted nature of interventions required to address this complex issue. Moving forward, strategic solutions should prioritize a holistic approach, combining dietary, physical, and behavioral interventions tailored to the unique demands of military life. By implementing evidence-based strategies, armed forces can enhance the health and readiness of their personnel, ultimately contributing to a more effective and resilient military.

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