

A review of rebound exercises and their impact on cognition and balance in females with obesity and overweight: A narrative review

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Abstract

Rebound exercise, performed using a mini-trampoline, is a low-impact, full-body activity that offers both physical and cognitive benefits. It is particularly suitable for populations with mobility challenges, such as overweight and obese females, who are at increased risk of impaired balance, reduced cognitive function, and chronic disease. This narrative review explores the effectiveness of rebound exercise in improving cognitive performance and postural balance in overweight and obese women.

Relevant studies published between 2018 and 2024 were identified using databases such as PubMed, Scopus, ScienceDirect, Web of Science, Cochrane, and Google Scholar. Inclusion criteria focused on females aged 18–45 years with a $\text{BMI} \geq 25 \text{ kg/m}^2$, assessing outcomes related to cognition and balance.

Findings reveal that rebound exercise leads to significant improvements in static and dynamic balance, cognitive function, BMI, waist-hip ratio, pulmonary function (FEV₁, FVC), and quality of life. It also enhances proprioception, muscular strength, and cardiovascular endurance in both overweight individuals and those with neurological disorders.

In conclusion, rebound exercise is a safe, cost-effective, and engaging intervention that improves balance and cognitive function in overweight and obese females. It shows strong potential for inclusion in both preventive healthcare and rehabilitation programs.

Keywords: Rebound Exercise; Cognition; Balance; Obesity; Women; Mini-Trampoline

1. Introduction

Rebound exercises are physical activities done on a mini-trampoline. These exercises include bouncing, jogging, jumping, or doing simple movements while standing on the trampoline. They are low-impact, which means they are gentle on the joints and safe for people of all ages. Rebound exercises help to improve balance, strength, fitness, and cognitive function. They are especially useful for people who are overweight, have joint pain, or are recovering from injuries. Because they are easy to do, rebound exercises are a great way to stay active and healthy.

In 1936, the term trampoline was initially coined, offering individuals the chance to engage with more exciting stimuli compared to mere dynamic feedback. Rebounding exercise involves utilizing a minitrampoline to facilitate vertical movement of the body, leveraging the bouncing effect of the minitrampoline. Trampoline-based exercise utilizes an elastic surface supported by springs and gravity, potentially reducing the frequency of cumulative trauma resulting from repetitive loading due to the activity's minimal jarring effect. [1]

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Balance issues have been reported to be common among females with overweight or obesity with associated fall risks. Despite the increasing reports of the negative impacts of obesity on balance and cognition, there is a scarcity of research aimed at evaluating effective interventions. [2]

Individuals with neurological disorders experience various challenges, such as movement impairments, balance issues, fear of falls, reduced exercise tolerance, loss of muscle strength, reduced functional independence, and lower quality of life. These impairments, particularly movement and balance dysfunction, can hinder their overall well-being and make physical activity difficult. World Health Organization recommends that adults engage in regular physical activity to maintain a healthy life and reduce the risk of chronic diseases such as diabetes mellitus, obesity, cardiovascular disease, cancers, and stroke. This recommendation is relevant for all adults, including those with neurological disabilities. However, the physical impairments and mobility limitations associated with neurological disorders limit physical activities, thus making them less physically fit. Therefore, finding ways to improve movement in this population is crucial. [3]

Objective of the study

- To analyze the impact of rebound exercises on improving cognitive function in females with obesity and overweight.
- To analyze the effectiveness of rebound exercises in enhancing balance and postural control among overweight and obese females.

2. Methodology

- Study design: Narrative review
- Search engines: Pub Med, Scopus, ScienceDirect, Web of Science, Google Scholar, Cochrane
- Key words: Rebound exercise, Mini- trampoline, Cognition, Balance, Overweight women, Obese women.
- Search year: 2018-2024

2.1. Inclusion criteria

- Studies involving female participants aged 18–45 years who are overweight or obese ($BMI \geq 25 \text{ kg/m}^2$).
- Studies that investigate the effects of rebound exercise (e.g., mini-trampoline)
- Studies that assess cognitive function and/or balance outcomes
- Articles published in English
- Full-text articles available

2.2. Exclusion criteria

- Studies involving male-only or mixed – gender samples without separate females analysis
- Studies that do not include cognition or balance as outcome measures
- Non-peer-reviewed sources (e.g., blogs, opinion articles)

2.3. Animal studies

Articles without full-text access

3. Result

Rebound exercise programs, typically involving mini- trampoline routines, demonstrated significant positive outcomes across various health domains and target populations. Studies consistently reported reductions in body mass index (BMI) and waist –hip ratio, particularly among overweight and obese individuals. Improvements in flexibility, muscular endurance, and cardiovascular fitness were also evident following structured rebound exercise protocols lasting between 4 to 8 weeks, with sessions conducted 2-3 times per week.

Lung function markers such as FEV1 and FVC showed measurable improvements in individuals participating in rebound training, highlighting its respiratory benefits (Effect of rebound exercises in overweight individuals on BMI, Waist-Hip Ratio and Lung functions). In neurological populations, particularly individuals with Parkinson's disease, rebound therapy led to notable enhancements in joint range of motion, proprioception, and quality of life when compared to traditional weight-supported training (Comparison of the effect of 8-week Rebound therapy -Based Exercise program

and Weight-supported Exercises on the Range of Motion, Proprioception, and Quality of Life in Patients with Parkinson's Disease

Overweight women who engaged in rebound exercise reported better Balance, as measured by the Berg Balance scale, and higher scores in physical and mental health domains on quality of life assessments (Effect of rebound exercises on overweight and obese adults). The exercise's rhythmic, low-impact nature contributed to improved postural control, better energy levels, and reduced fatigue. (Effectiveness of rebound exercises on cognition and balance of females with overweight and obesity) and (Effects of rebound exercises on balance and mobility of people with neurological disorder) reaffirmed these findings, documenting significant increase in cardiovascular and muscular endurance and flexibility, alongside a decrease in body composition-related parameters.

The scoping review (Rebound exercises in rehabilitation) supported these individual findings, compiling global evidence to show that rebound therapy contributes in cardiometabolic health, body composition, functional mobility and Balance. It also emphasized rebound training's potential to enhance psychological well-being and supporting its use as a comprehensive rehabilitation tool.

Table 1 Different studies identified for reviewing Rebound exercises and their impact on cognition and balance in females with obesity and overweight

Author(s) year	Title	Intervention groups	Outcome measures	Key Findings
Mayuri R. Shah et al (2018)	Effect of Rebound Exercises in Overweight Individuals on BMI, Waist-Hip Ratio and Lung Functions: Randomized Control Trial	<ul style="list-style-type: none"> Group A: Diet only Group B: Diet + rebound exercise (mini-trampoline) for 4 weeks 	BMI, waist-hip ratio (or waist circumference), lung functions (FEV ₁ , FVC, FEV ₁ /FVC)	<p>Both groups significantly Improved</p> <ul style="list-style-type: none"> BMI, waist circumference, FEV₁ and FVC (within-group, p < 0.05) No significant differences between groups in any outcome after 4 weeks
Pooya Daneshvar et al. (2019)	Comparison of the Effect of 8-Week Rebound Therapy-Based Exercise Program and Weight-Supported Exercises on the Range of Motion, Proprioception, and the Quality of Life in Patients with Parkinson's Disease:(RCT)	<p>Rebound Therapy Group: Exercises using a mini-trampoline</p> <p>- Weight-Supported Exercise Group: Treadmill with body-weight support</p>	<p>Range of Motion (degrees)</p> <ul style="list-style-type: none"> - Proprioception Error (degrees) - Quality of Life (PDQ-39) 	<p>Both groups improved significantly in all outcomes (p < 0.001)</p> <ul style="list-style-type: none"> - Rebound therapy group had Significantly Greater Improvement in all variables
Justina O. A., et al. (2021)	Effects of rebound exercises on overweight and obese adults: A scoping review	Varied protocols across included studies: e.g. ~12 weeks mini-trampoline (MRE) 3×/week, rebound + diet vs diet only, functional rebound routines vs control	Body composition (BMI, fat %, waist-hip ratio), lung function (FEV ₁ , FVC), VO ₂ max/work capacity, balance/strength, lipid/insulin markers, QoL, pain	<p>Consistent reductions in BMI/fat %, waist-hip ratio; increases in lean mass
</p> <ul style="list-style-type: none"> Improved

				VO ₂ max, work capacity in longer protocols (~12 weeks) • Lung function (FEV ₁ , FVC) improvements in shorter, diet-combined studies • Improved strength, balance, QoL; positive metabolic changes when combined with diet
Ojukwu et al. (2024)	The effect of rebound exercise on cognition and balance of females with overweight and obesity: Quasi-experimental study	Rebound exercise, 30 mins/session, 3x/week for 6 weeks	Trail making test, unilateral pedal test, meter backward walk test	Significant improvement ($p<0.001$) in cognition, static and dynamic balance over 6 weeks
Okemuo et al (2023)	Effects of rebound exercises on balance and mobility of people with neurological disorders: A systematic review	Rebound exercise in neuro patients	Balance and mobility outcomes	Rebound exercises enhance balance and mobility, but more evidence needed in neurological populations
Rathi et al. (2023)	Rebound exercises in rehabilitation: a scoping review	General review of rebound exercises in various populations	Multiple health outcome: balance, strength, blood glucose, executive function	Rebound exercises improve balance, motor performance, blood flow, and cognitive function, especially in overweight adolescents

4. Discussion

The cumulative evidence from the reviewed studies supports the effectiveness of rebound exercises in improving multiple dimensions of health and fitness across various populations, particularly overweight, obese, and neurologically impaired individuals.

Studies focusing on overweight and obese individuals (Effect of rebound exercises in overweight individuals on BMI, Waist-Hip Ratio and Lung functions, Effect of rebound exercises on overweight and obese adults, Effectiveness of rebound exercises on cognition and balance of females with overweight and obesity, Effects of rebound exercises on balance and mobility of people with neurological disorder) consistently demonstrated reductions in BMI, waist-hip ratio, and improvements in cardiovascular endurance, muscular endurance, following regular mini-trampoline sessions. These changes can be attributed to the dynamic, full-body engagement of rebound activities, which stimulate both

aerobic and muscular systems while minimizing joint impact. The nature of the exercise also supports consistent participation, as it is often described as enjoyable and less monotonous than traditional routines.

The findings from Effect of rebound exercises in overweight individuals on BMI, Waist-Hip Ratio and Lung functions also showed improvements in pulmonary function (FEV₁ and FVC), indicating that rebound exercise may enhance respiratory efficiency. This is likely due to the increased thoracic mobility and controlled breathing patterns required during rhythmic bouncing.

In neurological populations such as those with Parkinson's disease (Comparison of the effect of 8-week Rebound therapy -Based Exercise program and Weight-supported Exercises on the Range of Motion, Proprioception, and Quality of Life in Patients with Parkinson's Disease), rebound therapy produced superior outcomes compared to conventional weight-supported treadmill exercises. Participants experienced greater gains in proprioception, joint range of motion, and quality of life, emphasizing the therapy's potential for enhancing neuromuscular control and functional independence.

Effect of rebound exercises on overweight and obese adults added further support by highlighting gains in balance and psychosocial domains among overweight women. Balance improvements are particularly relevant, as they not only reduce the risk of falls but also foster confidence and independence in daily tasks.

The broader synthesis in the scoping review (Rebound exercises in rehabilitation) consolidates these findings, showing rebound exercise's impact on a wide range of outcomes—from cardiometabolic health to mental well-being. The review identifies the mechanisms behind these improvements, such as enhanced lymphatic flow, increased energy expenditure, improved neuromuscular coordination, and hormonal benefits including endorphin release.

Despite these promising outcomes, a few limitations were noted across the literature. Some studies had relatively small sample sizes and short intervention periods, which may restrict the generalizability of findings. Additionally, the risk of injury due to poor technique or inadequate supervision was highlighted in Rebound exercises in rehabilitation, indicating the need for structured protocols and safety guidelines in clinical and home-based settings.

Overall, rebound therapy presents a cost-effective, low-impact, and engaging option for improving physical and psychological health. Its versatility allows it to be adapted for various fitness levels and clinical conditions, making it a valuable tool in both preventive and rehabilitative care.

5. Conclusion

Rebound exercise, performed using a mini-trampoline, has emerged as a highly effective and accessible form of physical activity that offers a wide range of health benefits. Across multiple studies, it has shown consistent improvements in body composition, cardiorespiratory fitness, muscular endurance, flexibility, balance, and quality of life, Especially among overweight, obese, and neurologically affected individuals.

The unique qualities of rebound exercise- such as its low-impact nature, aerobic intensity, and engaging format- contribute to high levels of participant adherence and safety. Moreover, its potential to enhance pulmonary function, proprioception, and mental well-being further supports its role in comprehensive rehabilitation and health promotion strategies.

Given its versatility, cost-effectiveness, and clinical benefits, rebound therapy can be considered a valuable intervention in both preventive and therapeutic settings. Future research with larger sample sizes and longer follow-up periods is encouraged to explore its long-term effects and broaden its application across diverse patient populations.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Rathi MA, Joshi R, Munot P, Pandit S, Kulkarni CA. Rebound Exercises in Rehabilitation: A Scoping Review. *Cureus*. 2024 Jul 2;16(7): e63711. doi: 10.7759/cureus.63711. PMID: 39099935; PMCID: PMC11296216.
- [2] Ojukwu CP, Nnyaba IS, Ede SS, Okemuo AJ, Enebe JA. The effect of rebound exercise on cognition and balance of females with overweight and obesity. *Libyan J Med*. 2025 Dec;20(1):2438513. doi: 10.1080/19932820.2024.2438513. Epub 2024 Dec 6. PMID: 39643930; PMCID: PMC11626867
- [3] Okemuo AJ, Gallagher D, Dairo YM (2023) Effects of rebound exercises on balance and mobility of people with neurological disorders: A systematic review. *PLoS ONE* 18(10): e0292312
- [4] Shah, Mayuri R., and Shilpa A. Parab. "Effect of rebound exercises in overweight individuals on BMI, waist-hip ratio and lung functions: randomized control trial." *Int J Sci Res Sci Technol* 4 (2018): 1837-43.
- [5] Justina, Okemuo Adaora, et al. "Effects of rebound exercises on overweight and obese adults: A scoping review." *Archives of Physiotherapy & Global Researches* 25.1 (2021)
- [6] Daneshvar, P., Ghasemi, G., Zolaktaf, V., & Karimi, M. T. (2019). Comparison of the effect of 8-week rebound therapy-based exercise program and weight-support exercises on the range of motion, proprioception, and the quality of life in patients with Parkinson's disease