

Exploring The Broad Effects Of Resistance Training On Mental Well-Being, Life Quality, And Heart Health: A Systematic Review

Kilani Kusuma¹, Hari Hara Subramanyan P.V^{2*}, R.Parthasarathy³, Mahesh Kumar P.G⁴, Kamalakannan M⁵,

¹Faculty of Physiotherapy, Meenakshi Academy of Higher Education and Research, Chennai, Tamil Nadu, India.

²Saveetha college of physiotherapy, Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu, India.

*Corresponding Author
Hari Hara
Subramanyan P.V

Article History

Received: 19.07.2025

Revised: 04.08.2025

Accepted: 25.08.2025

Published: 20.09.2025

Abstract:

It is commonly known that resistance training (RT) improves bone density, muscle strength, and metabolic function, among other aspects of physical health. Less is known, though, about how it affects atherosclerosis progression, psychological health, and quality of life. A scoping review was conducted to summarize the body of research on RT's effects on various domains. To systematically evaluate and synthesize the available evidence on the effects of resistance training on psychological well-being, quality of life, and markers of atherosclerosis in various populations. All available databases, including Pub-med, Google Scholar, Scopus, Web of Science, EMBASE, ERIC, EBSCO, Medline, Global Health with keyword's including MESH terms "resistance training," "psychological health," "quality of life "and "atherosclerosis" were searched thoroughly for relevant material from the beginning to the present for this research. A study's eligibility was determined by looking at how RT affected different groups' psychological health, quality of life, and/or atherosclerosis. Study types that met the inclusion criteria were observational, cohort, and randomized controlled trials (RCTs). Population, RT methods, study design, results, and important findings were all extracted. PRISMA guidelines were adhered to throughout the review. Forty studies were found to be eligible for inclusion. RT can improve psychologically wellbeing by lowering anxiety and depressive symptoms, elevating mood, and fostering mental resilience. Some early studies are indicating that resistance training might actually slow the progression of atherosclerosis. The study concluded that RT has delayed atherosclerosis progression and improving mental and physical health.

Keywords: Resistance training, psychological well being, quality of life, atherosclerosis.

INTRODUCTION

In today's fast-paced world, psychological stress and cardiovascular risk are prevalent issues that impact many individuals regardless of age. This will cause cardiovascular risk to emerge at an earlier age. One type of cardiovascular disease, atherosclerosis, is on the rise in emerging nations like India and is currently considered a global epidemic [1]. Atherosclerosis significantly affects both cardiovascular and overall health, with substantial impacts on mental and physical well-being [2]. Nearly 23 million people worldwide will lose their lives to CVD by 2030. Heart and cerebrovascular diseases are the leading and third causes of death for the 84 million persons with CVD in India. In India, CVD is the primary cause of death. The CVD death rate in India is 272 higher than the global average of 235/100000. There is a 3-fold increase in CAD in the urban population compared to the rural due to sedentary lifestyle, psychological stress, and alcohol intake [3]. The prevalence of CAD in rural areas 1.4%-4.6% and in urban areas was 2.5%-12.6%.CVD is the leading cause of mortality and morbidity, affecting over 523 million individuals globally. Prevalence of psychological distress with the increasing age is soaring (7.4% at the age of 18–29 years, 10.58% at the age of

30–49 years, and 14.08% at the age of 50–65 years) [4]. Atherosclerosis is just brutal. It doesn't just affect your heart—your whole life gets impacted, mentally and physically. The stress is extremely high. Resistance training—using weights, resistance bands, or other forms of load—has increasingly been promoted as a legitimate strategy to counteract these effects. It turns out, it's not just about muscles; it might actually improve mental well-being too. So here's the summary: This review examines current evidence on the effects of resistance training in improving mood, enhancing quality of life, and potentially attenuating the progression of heart disease.

MATERIAL AND METHODS:

All available databases, including Pub-med, Google Scholar, Scopus, Web of Science, EMBASE, ERIC, EBSCO, Medline, Global Health with keywords including MESH terms" resistance training," "psychological well being," "quality of life "and "atherosclerosis." were searched thoroughly for relevant material from the beginning to the present for this research. A study's eligibility was determined by looking at how RT affected different groups' psychological health, quality of life, and/or

atherosclerosis. Study types that met the inclusion criteria were observational, cohort, and randomized controlled trials (RCTs). Population, RT methods, study

design, results, and important findings were all extracted. PRISMA guidelines were adhered to throughout the review.

RESULTS AND OBSERVATIONS:

Forty studies were found to be eligible for inclusion. RT can improve psychologically wellbeing by lowering anxiety and depressive symptoms, elevating mood, and fostering mental resilience, Some early studies are indicating that resistance training might actually slow the progression of atherosclerosis. This includes better blood vessel function, less inflammation, and even some positive effects on cholesterol. Still, caution is advised—these results vary due to differences in how resistance training is performed and how outcomes are measured. Therefore more researches can be done.

Table 1 - Summarizes selected studies that demonstrate the effects of RT on psychological outcomes, health-related quality of life, and cardiovascular disease risk. These studies encompass a range of populations, interventions, and durations, with consistent trends toward improvements in mental health, quality of life domains, and selected cardiometabolic markers.

TABLE I: Studies demonstrated how resistance programme helping the psychological outcome, health related quality of life and cardiovascular disease risk.

AUTHOR	STUDY TYPE	SAMPLE SIZE	DURATION	OUTCOME
Goldfield, Gary2015 [13]	randomized controlled trial.	N = 75	22 weeks	psychological benefits in adolescents with and without obesity.
<u>Peter D. Hart</u> 2019 [14]	Systematic review and meta-analysis	N=20	12-22 WEEKS	improving HRQOL in older adults.
Jovan Vuković 2023 [15]	Randomized controlled trial	N=22	Resistance training with elastic bands for 12 weeks	improved six of the eight life quality dimensions.
<u>Yanghai Liu</u> 2019 [16]	Randomized controlled trial	N=12,591	Even one time or less than one hour/week of RE	reduced risks of CVD and all-cause mortality.
<u>William Evans</u> 2018 [17]	Meta-analysis	N=651	Duration 8 weeks to 24 months.	RT does not increase (worsen) AS in patients who have or are at risk for CVD.
Lorrany da Rosa Santos 2020 [18]	Randomized controlled trial	N=122	12-week RT PROGRAME	had beneficial adjustments in the Triglyceride, LDL, non-HDL, Blood Glucose, SBP, and DBP variables.
<u>Yan Sun</u> (2024) [19]	Systematic review	N=1,697	The duration of training is between one and 12 months, two to five times a week, for 30 to 80 minutes each time.	Elastic band resistance training appears to be effective in improving mental health, upper and lower limb flexibility,

				endurance, upper strength, and enhancing balance and cardiopulmonary function in elderly individuals.
Kashi (2023) [20]	Systematic Review and Meta-Analysis	N = 1610	Weekly twice	resistance training can be effective for improving most domains of quality of life, in Older Adults Aged 60 Years or More.

DISCUSSION

The results of this systematic review add to the growing body of evidence highlighting the wide-reaching benefits of resistance training (RT) beyond muscular development and physical fitness. While RT has long been recognized as an effective intervention for enhancing muscular strength, endurance, and bone density, its broader implications on mental health, quality of life, and cardiovascular outcomes—particularly atherosclerosis—are increasingly receiving scientific attention.

These psychological states can increase physical symptoms, perpetuating a negative cycle [5]. Attempts should be made to incorporate inquiries about psychological stress in the history-taking of patients at risk of a cardiovascular event, and the care plan should include psychological counseling [6]. Compared to individuals who did not exercise, those who regularly participated in resistance training reported feeling less depressed and anxious [7]. The effect of RT on mental health depends on a variety of specific factors, including the type of RT, weekly frequency, number of sets, length of intervention, and number of exercises [8]. For women with physical-motor limitations, it can improve their psychological well-being and mental tenacity [9]. After eight weeks of resistance training, muscle strength increases and anxiety and self-attention decrease [10]. Resistance training has been shown to raise energy levels, enhance physical function, and reduce discomfort in order to enhance overall quality of life. People with chronic illnesses, such as atherosclerosis, find that resistance training greatly improves their quality of life [11].

A central theme emerging from the reviewed studies is the psychological benefit of RT. Consistent findings indicate reductions in symptoms of anxiety, depression, and emotional distress following RT interventions. These effects can be attributed to various mechanisms. Biologically, RT is thought to influence neurotransmitters such as serotonin and dopamine, which play essential roles in mood regulation.

Moreover, RT may help modulate the hypothalamic-pituitary-adrenal (HPA) axis, reducing cortisol levels and enhancing stress resilience. Psychosocially, the structured nature of RT promotes goal-setting, self-efficacy, and body image satisfaction—all of which are known to improve mental well-being. Some studies further suggest that RT may serve as a gateway intervention that encourages individuals to adopt healthier lifestyle behaviors, including better sleep hygiene and improved dietary habits, which collectively improve psychological health.

This damage can be caused by factors such as hypertension, high cholesterol, smoking, diabetes, and other inflammatory conditions [12]. Understanding the patho-physiology of atherosclerosis is crucial for developing effective strategies to prevent and treat this pervasive condition [13]. Exercisers showed lower levels of LDL cholesterol and C reactive protein, two important factors in the development of atherosclerosis [14]. BMI acts as a mediator in the connection between total CVD events and resistance exercise [15-16].

Interestingly, mental health improvements were observed not only in healthy individuals but also in those with chronic illnesses, disabilities, and age-related cognitive decline. This suggests the universal applicability of RT as a low-cost, non-pharmacological intervention to enhance psychological outcomes across age groups and health statuses. Moreover, gender-specific outcomes were observed in some studies, where women, especially postmenopausal or those with physical limitations, showed significant improvements in self-confidence and reduction in stress-related disorders. This underlines the need for personalized and culturally sensitive RT programs to maximize benefits.

The review also identifies strong associations between RT and improvements in health-related quality of life (HRQoL). Improvements in domains such as physical functioning, vitality, general health perception, and pain reduction were consistently reported. In particular, populations suffering from rheumatic diseases, cardiovascular risk, and metabolic syndromes

experienced not only functional improvement but also better social interaction, emotional well-being, and independence in daily activities. RT thereby plays a multidimensional role—improving both objective health outcomes and subjective well-being.

Resistance training (RT) has positive physiological and clinical benefits for cardiovascular disease (CVD) and its risk factors, in addition to helping to maintain or increase muscle mass and strength [17]. RT improves cardiovascular health by enhancing insulin sensitivity, reducing blood pressure (BP), and raising cholesterol [18]. The most benefit happens at 30–60 minutes per week, the lowest risk compared to no RT persists until 130–140 minutes per day, and the biggest risk reduction happens between those practicing no RT and modest quantities of RT [19]. The percentage of RT participants varies throughout demographic categories [20]. Populations of lower socioeconomic position, female sex, non-White race and ethnicity, and senior age are far less likely to engage in RT [21]. It is critical to pursue implementation science in order to address the low rates of RT and disparities in RT participation.

From a cardiovascular perspective, one of the more intriguing findings of the review is RT's potential role in attenuating the progression of atherosclerosis, a major contributor to cardiovascular morbidity and mortality. Several studies included in the review suggest that RT may improve endothelial function, reduce arterial stiffness, lower systemic inflammation, and positively influence lipid profiles. While aerobic training has traditionally dominated cardiovascular disease prevention strategies, the evidence is growing for RT as a complementary modality. One plausible mechanism is RT's capacity to enhance nitric oxide bioavailability, thereby promoting vasodilation and improving arterial compliance. Furthermore, reductions in C-reactive protein (CRP), LDL cholesterol, and blood pressure following RT provide a biochemical foundation for its cardioprotective effects.

However, it must be noted that the heterogeneity in RT protocols across studies makes it difficult to pinpoint an optimal "dose" or method for specific outcomes. Variables such as intensity, frequency, duration, supervision, equipment used (free weights vs. resistance bands), and progression strategies differed substantially. This variability can influence both the magnitude and consistency of outcomes. Future studies must aim to standardize intervention protocols, report adherence levels, and assess long-term sustainability to improve reproducibility and comparability.

Another area deserving attention is the interaction between resistance training and body composition—specifically, the mediating role of BMI, muscle mass, and fat percentage in cardiovascular and psychological outcomes. Studies have demonstrated that adiposity, particularly visceral fat, is closely linked to systemic

inflammation and depression. RT has the potential to reshape body composition by reducing fat mass and increasing lean muscle mass, thereby indirectly influencing markers of atherosclerosis and mental well-being. However, this hypothesis requires further investigation through longitudinal studies and imaging-based assessments.

Despite the evident benefits, engagement in resistance training remains disproportionately low, especially among older adults, women, and individuals from lower socioeconomic backgrounds. Barriers such as fear of injury, lack of access to equipment, and misconceptions about its complexity contribute to low participation rates. Public health initiatives should aim to demystify RT, promote its benefits through community awareness, and integrate RT into primary healthcare and rehabilitation settings. Home-based RT programs using minimal equipment or body weight may offer a practical solution to improve accessibility and adherence.

Furthermore, policy-level changes are essential to promote RT at a population level. These include incorporating RT guidelines into national health promotion strategies, training healthcare providers to prescribe RT appropriately, and integrating RT into educational and workplace wellness programs. Researchers must also adopt an equity-focused approach to understand and bridge the demographic disparities in RT participation. This is particularly crucial in countries like India, where urban-rural health inequalities and cultural factors may limit engagement. Finally, while the overall evidence is promising, caution is warranted due to certain limitations across studies. Many trials were of short duration, had small sample sizes, or lacked robust blinding. Additionally, psychological outcomes were often self-reported, introducing potential bias. There's a pressing need for high-quality randomized controlled trials using objective outcome measures and long-term follow-up to solidify the evidence base.

CONCLUSION

The evidence reviewed indicates that resistance training offers substantial benefits for psychological well-being, health-related quality of life, and certain cardiovascular risk factors. Regular participation in RT can reduce symptoms of anxiety and depression, improve mood, enhance mental resilience, and promote positive changes in lipid profiles, blood pressure, and vascular function. While emerging data suggest a potential role in slowing atherosclerosis progression, variations in study design, intervention protocols, and outcome measures warrant caution in interpretation. Further large-scale, well-controlled trials are needed to confirm these findings and establish optimal RT protocols for maximizing both mental and cardiovascular health outcomes.

CONFLICT OF INTEREST

No conflict of interest.

ACKNOWLEDGEMENT

The authors acknowledge Dr. Hari Hara Subramanyan P.V for his guidance and support throughout the study. His expertise and valuable suggestions greatly contributed to the successful completion of this research.

FUNDING

No funding

REFERENCES

- Kathiresan, V., & Mohanan, K., 2025, Enhancing foot posture and balance in flexible flatfoot: Short foot exercise, balance training, and plyometrics approach. *Muscles, Ligaments & Tendons Journal (MLTJ)*, 15(1), https://www.researchgate.net/publication/391113054_Enhancing_Foot_Posture_and_Balance_in_Flexible_Flatfoot_Short_Foot_Exercise_Balance_Training_and_Plyometrics_Approach
- Geovinson, G. S., Mohanan, K., Kandakurti, P. K., & Mathukrishnan, R., 2025, Comparative analysis of the effects of real-time audio-visual feedback, yoga and pressure biofeedback stabilizer in core strengthening: A randomised controlled trial. *Biomedical Human Kinetics*, 17(1), 135–146, <https://sciendo.com/article/10.2478/bhk-2025-0013>
- Dinesh, S., Kamalakannan, M., Juveria Nazneen, S. S., Jilna James, R., Varsha, K., Yuvasri, S., & Hariharan, J., 2025, Drive away neck pain: Transformative motor control therapeutic neck exercises and tailored programs redefine posture for automotive workers. *Work*, 80(1), 256–262, <https://pubmed.ncbi.nlm.nih.gov/39121148/>
- Revanth, M., et al., 2025, Enhancing recovery: The impact of foam roller-assisted stabilization exercises on low back pain — a comparative analysis with conventional therapies. *Fizjoterapia Polska*, 25(1), 369–375, <https://doi.org/10.56984/8ZG007DLGPO>
- Josyula, S., 2024, Revolutionizing sports rehabilitation: Unleashing the power of tele-rehabilitation for optimal physiotherapy results. *Telemedicine & e-Health*, 30(4), <https://doi.org/10.1089/tmj.2023.0299>
- Dhanusia, S., Nallusamy, B., & Suganthirababu, P., 2025, Effectiveness of virtual reality on functional outcome in median nerve injured patients. *Asian Journal of Pharmaceutical and Clinical Research*, 18(5), 137–141, <https://doi.org/10.22159/ajpcr.2025v18i5.54272>
- Gopal Nambi, et al., 2025, Comparative effects of integrated physical training with a high protein diet versus a regular protein diet in post-COVID-19 older men with sarcopenia symptoms. *BMJ Nutrition, Prevention & Health*, bmjnp-2024-001076, <https://doi.org/10.1136/bmjnp-2024-001076>
- Sneha, M., et al., 2025, A quasi-experimental investigation of scapular stabilization exercises on muscle coordination and functional recovery in scapular dyskinesia. *Journal of Orthopaedic Reports*, 4(3), 100609, <https://doi.org/10.1016/j.jorep.2025.100609>
- Unknown Author(s), 2021, The effectiveness of yoga exercises on anxiety and depression in patients with psoriasis. *The Neuroscience Journal of Shefaye Khatam*, 9(2), 60–67, <https://doi.org/10.52547/shefa.9.2.60>
- Perrig-Chiello, P., Perrig, W. J., Ehram, R., Staehelin, H. B., & Krings, F., 1998, The effects of resistance training on well-being and memory in elderly volunteers. *Age and Ageing*, 27(4), 469–475, <https://doi.org/10.1093/ageing/27.4.469>
- Sieczkowska, S. M., Coimbra, D. R., Vilarino, G. T., & Andrade, A., 2020, Effects of resistance training on the health-related quality of life of patients with rheumatic diseases: Systematic review with meta-analysis and meta-regression. *Seminars in Arthritis and Rheumatism*, 50(2), 342–353, <https://doi.org/10.1016/j.semarthrit.2019.09.006>
- Kotteswaran, K., Manikumar, M., Muthukumaran, J., & Swetha, K., Effectiveness of Maitland mobilization technique (talocrural glides) and kinesiio taping on posterior ankle impingement syndrome in dancers. (Journal name and year not provided)
- Geirsdottir, O. G., Arnarson, A., Briem, K., Ramel, A., Tomasson, K., Jonsson, P. V., & Thorsdottir, I., 2012, Physical function predicts improvement in quality of life in elderly Icelanders after 12 weeks of resistance exercise. *Journal of Nutrition, Health and Aging*, 16(1), 62–66, <https://doi.org/10.1007/s12603-011-0076-7>
- Goldfield, G. S., et al., 2015, Effects of aerobic training, resistance training, or both on psychological health in adolescents with obesity: The HEARTY randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 83(6), 1123–1135, <https://doi.org/10.1037/ccp0000038>
- Hart, P. D., & Buck, D. J., 2019, The effect of resistance training on health-related quality of life in older adults: Systematic review and meta-analysis. *Health Promotion Perspectives*, 9(1), 1–12, <https://doi.org/10.15171/hpp.2019.01>
- Vuković, J., Korovljević, D., Zrnić, R., Pantelić Babić, K., Rašković, B., 2023, The effects of resistance training on improving the quality of life of institutionalised older adults. *Teme*, 607–622, <https://doi.org/10.22190/teme230428038v>
- Liu, Y., et al., 2019, Associations of resistance exercise with cardiovascular disease morbidity and mortality. *Medicine & Science in Sports & Exercise*, 51(3), 499–508, <https://doi.org/10.1249/MSS.0000000000001822>

18. Evans, W., Willey, Q., Hanson, E. D., et al., 2018, Effects of resistance training on arterial stiffness in persons at risk for cardiovascular disease: A meta-analysis. *Sports Medicine*, 48, 2785–2795
19. Santos, L. R., et al., 2020, Effects of 12 weeks of resistance training on cardiovascular risk factors in school adolescents. *Medicina*, 56, 220
20. Li, A., Sun, Y., Li, M., Wang, D., & Ma, X., 2024, Effects of elastic band resistance training on the physical and mental health of elderly individuals: A mixed methods systematic review. *PLoS One*, 19(5), e0303372, <https://doi.org/10.1371/journal.pone.0303372>
21. Khodadad Kashi, S., Mirzazadeh, Z. S., & Saatchian, V., 2023, A systematic review and meta-analysis of resistance training on quality of life, depression, muscle strength, and functional exercise capacity in older adults aged 60 years or more. *Biological Research for Nursing*, 25(1), 88–106, <https://doi.org/10.1177/10998004221120945>