

AI-01898 Paper Resistance Training vs Acute Mental Health Responses

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Briefing Document: Acute Mental Health Responses to Resistance Training in Active Adults

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Key Theme: This study investigates the immediate psychological effects of a single session of moderate-to-high intensity resistance training (RT) on anxiety and depression in healthy, physically active individuals. It aims to fill a gap in existing research, which often focuses on chronic exercise, aerobic modalities, or sedentary/clinical populations.

Most Important Ideas/Facts:

1.

Acute Reduction in Anxiety Symptoms from Resistance Training:

- A single session of moderate-to-high-intensity resistance training (RT) significantly reduced anxiety symptoms in healthy, physically active individuals immediately post-intervention.
- The experimental (RT) group showed a "substantial decrease in anxiety levels" (median pre = 6, median post = 4) with a "large effect size ($r = -0.7$)" according to

the Wilcoxon Signed-Rank Test.

- "Between-group comparisons (Mann–Whitney U) showed significantly greater reductions in anxiety in the RT group ($p = 0.021$), while differences in depression deltas were not significant."
- Quade's ANCOVA confirmed a "statistically significant effect of group on post-intervention anxiety scores, $F(1, 54) = 8.46$, $p = 0.005$," indicating greater anxiety reduction in the RT group after adjusting for baseline.

1.

Modest/Variable Effect on Depressive Symptoms:

- While there was a "significant reduction in post-intervention [depressive] scores" within the RT group (median pre = 4.5, median post = 3.5) with a "large effect size ($r = -0.6$)," this reduction was "smaller and less consistent across analyses" compared to anxiety.
- Between-group analysis showed "no statistically significant difference in the delta depression scores between the two groups ($U = 325.5$, $Z = -1.07$, $p = 0.283$), with a small effect size ($r = 0.14$)."
- The study suggests that "depression tends to be less reactive to acute exercise and may require repeated sessions or longer interventions to produce significant shifts."

1.

Ineffectiveness of Low-Intensity Control Condition:

- The control group, which performed stretching and mobility exercises without external resistance, showed no significant changes in either anxiety or depression scores.
- "Conversely, within the C group... the decline in anxiety scores did not attain statistical significance (median pre = 6, median post = 5), $Z = -1.5$, $p = 0.139$, with a medium effect size ($r = -0.4$)."
- "This finding highlights an important distinction: not all forms of physical activity yield equivalent acute psychological effects. While low-intensity activities such as stretching or mobility work may support general well-being, they often lack the neuromuscular and metabolic demands necessary to activate the neurobiological mechanisms responsible for acute affect regulation."

1.

Proposed Psychophysiological Mechanisms:

- The acute mental health benefits of RT are thought to be mediated by various neuroendocrine, neurochemical, and immune mechanisms.

- These include "modulation of the hypothalamic–pituitary–adrenal (HPA) axis and associated cortisol responses," release of "mood-related monoamines such as serotonin, dopamine, and noradrenaline," and elevations in "brain-derived neurotrophic factor (BDNF), which promotes neuroplasticity and mood stabilization."
- Additionally, RT "stimulates the release of β -endorphins and contributes to an anti-inflammatory environment by reducing pro-inflammatory cytokines."
- The intensity-dependent nature of RT may lead to "greater or more rapid activation of these biological pathways" compared to aerobic exercise.

1.

Importance of Contextual Factors and Familiarity:

- The study emphasizes that "the perception of mastery, rather than threat or failure, has been shown to moderate the emotional effects of physical exertion."
- All participants had "prior experience with RT, which likely enhanced their sense of competence and self-efficacy during the session."
- The training environment was "familiar and non-evaluative setting, under supervision, with clearly structured tasks and appropriate rest intervals." These elements "might have mitigated perceived stress, allowing even a demanding protocol to be experienced as controllable and positively engaging rather than aversive."
- This suggests that "the key... may not lie in intensity alone, but in how intensity is managed, perceived, and supported by the training environment and the individual's familiarity with the task."

Conclusions/Implications:

- A single session of moderate-to-high-intensity resistance training can serve as a "feasible short-term intervention for emotional regulation in healthy active populations," particularly for anxiety.
- The findings support the use of RT "not only for long-term psychological health but also as a practical short-term tool for mood regulation in athletic populations."
- The study highlights the critical role of exercise intensity and neuromuscular/metabolic stimulation in eliciting acute psychological benefits.
- Future research should explore individual differences, contextual moderators, and objective physiological markers to further optimize exercise prescriptions for mental health benefits.
- The generalizability of these findings is limited to physically active individuals,

and future studies should include sedentary or clinical populations for broader applicability.

1. 1. **Acute Reduction in Anxiety Symptoms from Resistance Training:**

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- "Between-group comparisons (Mann-Whitney U) showed significantly greater reductions in anxiety in the RT group ($p = 0.021$), while differences in depression deltas were not significant."
- Quade's ANCOVA confirmed a "statistically significant effect of group on post-intervention anxiety scores, $F(1, 54) = 8.46$, $p = 0.005$," indicating greater anxiety reduction in the RT group after adjusting for baseline.

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- • This suggests that "the key... may not lie in intensity alone, but in how intensity is managed, perceived, and supported by the training environment and the individual's familiarity with the task."
- • A single session of moderate-to-high-intensity resistance training can serve as a "feasible short-term intervention for emotional regulation in healthy active populations," particularly for anxiety.
- • The findings support the use of RT "not only for long-term psychological health but also as a practical short-term tool for mood regulation in athletic populations."
- • The study highlights the critical role of exercise intensity and neuromuscular/metabolic stimulation in eliciting acute psychological benefits.
- • Future research should explore individual differences, contextual moderators, and objective physiological markers to further optimize exercise prescriptions for mental health benefits.
- • The generalizability of these findings is limited to physically active individuals, and future studies should include sedentary or clinical populations for broader applicability.

NotebookLM can be inaccurate; please double check its responses.

Study Guide: Acute Mental Health Responses to Resistance Training

I. Summary of Core Concepts

This study investigated the immediate effects of a single session of moderate-to-high intensity resistance training (RT) on anxiety and depression symptoms in healthy, physically active adults. The research aimed to address a gap in existing literature, which predominantly focuses on aerobic exercise, chronic training programs, or sedentary/clinical populations. The study hypothesized that RT would significantly reduce anxiety and depression, while a control group performing stretching/mobility would not, and that the RT group would show greater improvements, especially in anxiety.

Fifty-six active participants were randomly assigned to either an RT group (multi-joint exercises at 70–75% 1RM) or a control group (stretching/mobility).

Psychological responses were measured using the Hospital Anxiety and Depression Scale (HADS) immediately before and five minutes after the session.

The key findings were:

- **Significant reduction in anxiety and depression in the RT group:** Within-group analysis showed a significant decrease in HADS-A (anxiety) and HADS-D (depression) scores with large effect sizes.
- **No significant changes in the control group:** The stretching/mobility group did not show statistically significant reductions in either anxiety or depression.
- **Greater reduction in anxiety in the RT group:** Between-group comparisons indicated a significantly greater reduction in anxiety symptoms in the RT group compared to the control group.
- **No significant between-group difference in depression:** The effect on depressive symptoms was more modest and not significantly different between the RT and control groups.

The study concludes that a single session of moderate-to-high intensity RT can acutely reduce anxiety symptoms in healthy, active individuals. The effect on depression appears less pronounced acutely. These findings support RT as a valuable short-term intervention for emotional regulation, beyond its long-term mental health benefits. The authors suggest that exercise intensity and individual-contextual interactions play a crucial role in these acute psychological benefits.

II. Key Terms and Concepts

- **Acute Exercise:** A single, one-time session of physical activity.
- **Resistance Training (RT):** A form of exercise that involves the use of resistance to induce muscular contraction, which builds strength, anaerobic endurance, and size of skeletal muscles.
- **Aerobic Exercise:** Physical activity that increases heart rate and breathing for a sustained period, typically focusing on cardiovascular endurance.

- **Non-Pharmacological Intervention:** A treatment or therapy that does not involve medication.
- **Anxiety:** A feeling of worry, nervousness, or unease, typically about an event or something with an uncertain outcome. In the study, measured by the HADS-A subscale.
- **Depression:** A mood disorder characterized by persistently low mood and a loss of interest or pleasure in most activities. In the study, measured by the HADS-D subscale.
- **Hospital Anxiety and Depression Scale (HADS):** A 14-item self-report questionnaire used to assess the severity of anxiety and depressive symptoms. It has two subscales: HADS-A (Anxiety) and HADS-D (Depression).
- **1RM (One-Repetition Maximum):** The maximum amount of weight an individual can lift for one repetition. In this study, RT was performed at 70-75% of 1RM.
- **Multi-joint Exercises:** Exercises that involve movement at more than one joint simultaneously (e.g., squats, deadlifts).
- **Control Group:** A group in an experiment or study that does not receive the treatment or intervention being tested, used as a baseline for comparison. In this study, the control group performed stretching and mobility exercises.
- **Wilcoxon Signed-Rank Test:** A non-parametric statistical test used to compare two related samples (e.g., pre- and post-intervention scores within the same group).
- **Mann-Whitney U Test:** A non-parametric statistical test used to compare two independent samples (e.g., comparing score changes between two different groups).
- **Quade ANCOVA (Analysis of Covariance):** A non-parametric statistical method used to compare groups while statistically controlling for the effects of a covariate (e.g., baseline scores).
- **Effect Size (r/Cohen's d):** A quantitative measure of the strength of a phenomenon, indicating the magnitude of the difference or relationship.

- **Neuroendocrine Mechanisms:** The interplay between the nervous system and the endocrine (hormone) system.
- **HPA Axis (Hypothalamic–Pituitary–Adrenal Axis):** A complex set of direct influences and feedback interactions among the hypothalamus, the pituitary gland, and the adrenal glands, which plays a major role in the body's response to stress.
- **Monoamines (Serotonin, Dopamine, Noradrenaline):** Neurotransmitters that play crucial roles in mood, emotion, and cognitive function.
- **Brain-Derived Neurotrophic Factor (BDNF):** A protein in the brain that supports the survival of existing neurons and encourages the growth and differentiation of new neurons and synapses. It is associated with neuroplasticity and mood stabilization.
- **Pro-inflammatory Cytokines (e.g., IL-6, TNF- α):** Molecules that promote inflammation.
- **Anti-inflammatory Markers (e.g., IL-10):** Molecules that reduce inflammation.
- **Neuroplasticity:** The brain's ability to reorganize itself by forming new neural connections throughout life.
- **Ecological Validity:** The extent to which the findings of a research study can be generalized to real-life settings.
- **Pre-performance Routines (PPRs):** Structured sets of behaviors and thoughts athletes engage in before and during performance to enhance consistency and manage arousal.

III. Quiz

Instructions: Answer each question in 2-3 sentences.

1. What was the primary research gap that this study aimed to address regarding the psychological impact of exercise?
2. Who were the participants in this study, and what were their key demographic characteristics?
3. Describe the key components of the resistance training (experimental) session.

4. What was the methodology for the control group's intervention?
5. Which psychological assessment tool was used in this study, and what are its two main subscales?
6. What were the main findings regarding anxiety levels in the resistance training group?
7. How did the changes in depression levels differ between the resistance training group and the control group?
8. Identify two specific psychophysiological mechanisms discussed in the paper that are believed to mediate the acute mental health benefits of RT.
9. Why did the study observe a robust effect on anxiety but a more modest effect on depression?
10. What are two limitations of this study acknowledged by the authors?

IV. Quiz Answer Key

1. The study aimed to address the gap in research concerning the acute psychological impact of a single resistance training (RT) session, particularly in healthy, active individuals. Most existing research focused on aerobic modalities, chronic training programs, or sedentary/clinical populations, leaving this specific area underexplored.
2. The participants were 56 healthy, physically active individuals, comprising 43 males and 13 females, with a mean age of 24.41 ± 4.41 years. All participants regularly engaged in sports practice, with a minimum of two training sessions per week.
3. The resistance training session for the experimental group was standardized and included a general warm-up, followed by a specific warm-up. It involved multi-joint exercises performed at 70–75% of 1RM, with 3–4 sets and moderate rest intervals of 90–120 seconds.
4. Participants in the control group followed a standardized 60-minute stretching and mobility protocol, which did not involve the use of external resistance. This session included a general warm-up, followed by dynamic activation, joint mobility, and concluded with static stretching.

5. The psychological assessment tool used was the Hospital Anxiety and Depression Scale (HADS). Its two main subscales are HADS-A, which assesses anxiety symptoms, and HADS-D, which assesses depression symptoms.
6. The resistance training group showed a significant decrease in anxiety levels immediately following the single session. The Wilcoxon Signed-Rank Test revealed a substantial reduction in HADS-A scores with a large effect size ($r = -0.7$).
7. While the RT group showed a significant within-group reduction in depression, the control group did not, and the between-group comparison revealed no statistically significant difference in delta depression scores. This suggests the acute RT session did not lead to a measurable short-term improvement in depressive symptoms relative to the control condition.
8. Two psychophysiological mechanisms discussed are the modulation of the HPA axis and associated cortisol responses, and the increased release of mood-related monoamines like serotonin, dopamine, and noradrenaline. Additionally, the study mentions elevations in brain-derived neurotrophic factor (BDNF) and acute anti-inflammatory effects.
9. The study observed a robust effect on anxiety but a more modest effect on depression because depression tends to be less reactive to acute exercise and may require repeated sessions or longer interventions to produce significant shifts. This difference may reflect distinct neurobiological timeframes for anxiety and depression responses, with anxiety being more sensitive to transient physiological perturbations.
10. Two limitations acknowledged are that the sample included only physically active individuals, limiting generalizability to sedentary or elite athlete populations. Additionally, the exclusive reliance on self-report measures introduces potential biases, and several contextual variables like sleep quality and nutritional intake were not formally monitored.

V. Essay Questions

1. Compare and contrast the acute psychological effects of resistance training versus low-intensity activities like stretching and mobility, as highlighted in the

study. Discuss the proposed psychophysiological mechanisms that may explain these differential effects.

2. Analyze the role of exercise intensity in modulating acute psychological responses, drawing upon the findings of this study and broader literature cited within the paper. To what extent does the study's conclusion support a "single optimal intensity" for psychological benefit?
3. Discuss the significance of the study's findings for practitioners and individuals seeking non-pharmacological interventions for mental health. How might a single bout of resistance training be practically applied in different settings (e.g., general wellness, sport, rehabilitation)?
4. Critically evaluate the methodological strengths and limitations of this study. What specific improvements or additional measures would you suggest for future research to enhance internal and external validity?
5. Explain why the acute effects of resistance training were more pronounced for anxiety than for depression in this study. Discuss the potential implications of this finding for understanding the distinct neurobiological and psychological responses to acute exercise stimuli.

VI. Glossary of Key Terms

- **1RM (One-Repetition Maximum):** The maximum amount of weight an individual can lift for one repetition with proper form. In the study, resistance training intensity was set relative to this measure (70–75% 1RM).
- **Acute Exercise:** A single, discrete session of physical activity, as opposed to chronic or long-term training programs.
- **Aerobic Modalities:** Forms of physical exercise that are primarily cardiovascular, such as running, swimming, or cycling, characterized by sustained increased heart rate and breathing.
- **Affective Responses:** Emotional or mood changes experienced by individuals, often in response to a stimulus like exercise.
- **Anti-inflammatory Markers:** Biochemical substances in the body that help to reduce inflammation (e.g., IL-10).

- **Anxiety (HADS-A):** A subscale of the Hospital Anxiety and Depression Scale (HADS) specifically designed to measure symptoms of anxiety, such as worry, tension, and restlessness.
- **BDNF (Brain-Derived Neurotrophic Factor):** A protein that plays a crucial role in brain health, promoting the growth, survival, and differentiation of neurons and supporting neuroplasticity. Its release is associated with exercise.
- **Chronic Training Programs:** Sustained, regular engagement in physical exercise over an extended period.
- **Control Group (C group):** The group in the study that performed a standardized stretching and mobility protocol without external load, serving as a comparison to the experimental group.
- **Cortisol Responses:** The changes in the levels of cortisol, a primary stress hormone, which are influenced by physical activity and psychological state.
- **Depression (HADS-D):** A subscale of the Hospital Anxiety and Depression Scale (HADS) used to assess symptoms of depression, such as anhedonia (loss of pleasure), low mood, and lack of energy.
- **Effect Size (r):** A quantitative measure that describes the magnitude or strength of an observed effect or relationship between variables. In this study, values of $r = 0.50$ or above indicate a large effect.
- **Ecological Validity:** The degree to which the results of a study can be generalized to real-world settings and conditions.
- **Experimental Group (E group):** The group in the study that performed the moderate-to-high intensity resistance training session.
- **HADS (Hospital Anxiety and Depression Scale):** A widely used 14-item self-report questionnaire designed to screen for anxiety and depression in both clinical and non-clinical populations, minimizing somatic symptoms.
- **HPA Axis (Hypothalamic–Pituitary–Adrenal Axis):** A complex neuroendocrine system central to the body's stress response, involving interactions between the hypothalamus, pituitary gland, and adrenal glands.
- **Mann–Whitney U Test:** A non-parametric statistical test used to determine if there is a significant difference between two independent sample groups.

- **Monoamines:** A class of neurotransmitters, including serotonin, dopamine, and noradrenaline, which are involved in regulating mood, emotion, and cognitive function.
- **Multi-joint Exercises:** Exercises that engage multiple joints and muscle groups simultaneously (e.g., squats, deadlifts, bench press).
- **Neurobiological Mechanisms:** The underlying biological processes within the nervous system that explain observed behaviors or psychological states.
- **Neuroendocrine Mechanisms:** The physiological pathways involving interactions between the nervous system and the endocrine (hormone) system.
- **Neuroplasticity:** The brain's capacity to change and adapt structurally and functionally in response to experience, learning, or injury.
- **Non-Pharmacological Intervention:** Any therapeutic approach or treatment that does not involve the use of pharmaceutical drugs.
- **Non-parametric Analysis:** Statistical methods used when data do not follow a normal distribution or when assumptions for parametric tests are violated.
- **Pre-performance Routines (PPRs):** Mental and behavioral strategies that athletes employ immediately before and during performance to optimize their psychological and physiological state.
- **Pro-inflammatory Cytokines:** Signaling molecules that promote inflammation in the body (e.g., IL-6, TNF- α).
- **Psychometric Properties:** The statistical characteristics of a psychological test or scale, indicating its reliability, validity, and consistency (e.g., internal consistency, sensitivity).
- **Purposive Sampling:** A non-probability sampling method where participants are selected based on specific characteristics relevant to the research question.
- **Quade ANCOVA (Analysis of Covariance):** A non-parametric statistical technique used to compare groups while statistically adjusting for the influence of a confounding variable (covariate), like baseline scores.

- **Resistance Training (RT):** A form of physical activity that involves muscles working against a weight or force to build strength, endurance, and muscle mass.
- **Self-efficacy:** An individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments.
- **Shapiro–Wilk Test:** A statistical test used to check if a sample comes from a normally distributed population. A p-value less than 0.05 indicates a significant deviation from normality.
- **Wilcoxon Signed-Rank Test:** A non-parametric statistical test used to assess differences between two related samples (e.g., pre- and post-intervention measurements from the same group).

1. What is the main finding of the study regarding acute mental health responses to resistance training?

The study found that a single session of moderate-to-high-intensity resistance training (RT) can acutely and significantly reduce anxiety symptoms in healthy, physically active individuals. While there was also a moderate reduction in depressive symptoms within the RT group, this effect was less pronounced and not statistically significant when compared directly to the control group. This highlights a stronger immediate impact on anxiety.

2. How did resistance training (RT) compare to stretching and mobility exercises in terms of acute psychological benefits?

The study demonstrated a significant difference between the two types of activities. The resistance training group showed a marked decrease in anxiety symptoms, and a moderate, significant decrease in depression, immediately after the session. In contrast, the control group, which performed stretching and mobility exercises without external resistance, did not show significant acute reductions in either anxiety or depression. This suggests that the intensity and neuromuscular demands of RT are crucial for eliciting these immediate psychological benefits.

3. What psychological assessment tool was used in this study, and why was it chosen?

The Hospital Anxiety and Depression Scale (HADS) was used to assess participants' anxiety and depression levels. This 14-item self-report instrument features two subscales (HADS-A for anxiety and HADS-D for depression). It was chosen for its robust psychometric properties, frequent use in both clinical and non-clinical populations (including physically active individuals), and its design which minimizes the influence of somatic symptoms that could confound results in exercise studies. Its sensitivity to short-term emotional changes also makes it suitable for detecting immediate variations after a single exercise session.

4. What are the proposed physiological mechanisms by which resistance training acutely benefits mental health?

The acute mental health benefits of resistance training are thought to be mediated by several neurobiological mechanisms. These include the modulation of the hypothalamic–pituitary–adrenal (HPA) axis, leading to associated cortisol responses that are often more pronounced after RT. RT also induces the release of mood-related monoamines such as serotonin, dopamine, and noradrenaline, and elevates brain-derived neurotrophic factor (BDNF), which promotes neuroplasticity and mood stabilization. Additionally, RT stimulates the release of β -endorphins and contributes to an anti-inflammatory environment by reducing pro-inflammatory cytokines and enhancing anti-inflammatory markers.

5. Why did the study focus on healthy, physically active individuals, and what gaps did it aim to address?

Most previous research on exercise and mental health has concentrated on chronic exercise interventions and has largely been conducted on sedentary or clinical populations. This study addressed a gap by investigating the acute psychological impact of a *single* resistance training session specifically in *healthy, physically active individuals*. This demographic is often exposed to lifestyle stressors that can affect psychological well-being, yet their acute responses to exercise were underexplored.

6. Was there any difference in the acute psychological responses between males and females in the study?

No, the study found no significant sex-based differences in baseline psychological measures or in the acute psychological responses to the interventions. This suggests that the immediate benefits observed from resistance training on anxiety and depression were comparable between men and women in this physically active sample. Consequently, subsequent analyses were conducted on the pooled sample to increase statistical power and simplify interpretation.

7. What contextual factors might influence the psychological impact of a resistance training session?

The study highlights that training familiarity and environmental factors play a significant role. Participants had prior experience with RT, which likely boosted their sense of competence and self-efficacy. The sessions were conducted in a familiar, non-evaluative, supervised setting with structured tasks and appropriate rest. These elements likely mitigated perceived stress, allowing the demanding protocol to be experienced positively rather than aversively. The perception of mastery, rather than threat or failure, is critical and contributes to favorable emotional outcomes.

8. What are the limitations of this study, and what are the implications for future research?

One key limitation is that the sample consisted only of physically active individuals, limiting the generalizability of the findings to sedentary or clinical populations, who may respond differently. Another limitation is the exclusive reliance on self-report measures for psychological assessment, which can introduce bias. Future studies should incorporate objective physiological markers (e.g., salivary cortisol, BDNF, heart rate variability) for a more comprehensive understanding. Additionally, future research should more rigorously control and record contextual variables like sleep quality, nutritional intake, time of day, and acute emotional state, as these can influence mood responses to exercise. Exploring individual differences and contextual moderators will help optimize exercise prescriptions for acute psychological benefit.

Timeline of Events: Acute Mental Health Responses to Resistance Training Study

2003 (January 3): The Hospital Anxiety and Depression Scale (HADS) manual, a self-report instrument used in the study, is made available online.

2024 (November 27): The study protocol is approved by the Institutional Ethics Committee (Area Vasta Centro AOU Careggi, Florence, Italy—ref:17768_oss).

2025 (January 3): The Snaith, P. "Health and Quality of Life Outcomes The Hospital Anxiety And Depression Scale" article (2003) is accessed online, likely for research purposes related to the study's methodology.

2025 (May 26): The Random Allocation Software (version number 1.0) is accessed, used for randomly assigning participants to either the experimental or control group.

2025 (June 13): The manuscript for "Single-Bout Strength: Acute Mental Health Responses to Resistance Training in Active Adults" is received.

2025 (June 27): The manuscript for the study is revised.

2025 (July 3): The revised manuscript for the study is accepted for publication.

2025 (July 7): The article "Single-Bout Strength: Acute Mental Health Responses to Resistance Training in Active Adults" is published in *Sports*.

(Undated, but occurring prior to participant recruitment and the study's experimental procedure):

- An a priori power analysis is conducted to determine the required sample size for the study.
- Individual one-repetition maximums (1RMs) for participants in the Resistance Training (RT) group are previously assessed.
- Participants are recruited (56 healthy, physically active individuals: 43 males, 13 females; mean age = 24.41 ± 4.41 years).
- Participants provide written informed consent before the start of the study.
- Participants are randomly assigned to either the experimental (RT, n=30) or control (stretching/mobility, n=26) group.

(Undated, occurring during the study's experimental phase):

- All training sessions are conducted under the supervision of qualified experts.
- Participants complete the Hospital Anxiety and Depression Scale (HADS) immediately before their assigned activity.
- The experimental group (RT) performs a single standardized resistance training session, including a general warm-up (10-15 min) followed by a specific warm-up and multi-joint exercises at 70–75% of 1RM, with 3–4 sets and moderate rest intervals (90–120 s).
- The control group performs a standardized stretching and mobility protocol for 60 minutes, preceded by a general warm-up (10-15 min), divided into dynamic activation, joint mobility, and static stretching.
- Participants complete the HADS five minutes after their assigned activity.

Cast of Characters:

Researchers/Authors (Kinesiology and Motor Control (Ki.Mo.Co.) Laboratory, Department of Experimental and Clinical Medicine, Physiological Sciences Section, University of Florence, Italy):

- **Manuel Amore:** (1,*) One of the lead authors and corresponding authors. Involved in conceptualization, methodology, formal analysis, investigation, resources, visualization, and original draft preparation.
- **Adolfo Alfarano:** (1) Involved in conceptualization and methodology.
- **Vincenzo Sorgente:** (1) Involved in investigation, visualization, and original draft preparation.
- **Giulia Panconi:** (1) Involved in software and investigation.
- **Riccardo Bravi:** (1) Involved in writing—review and editing, and supervision.
- **Diego Minciocchi:** (1,*) One of the lead authors and corresponding authors. Involved in validation, data curation, writing—review and editing, supervision, and project administration.

Researcher/Author (Department of Information Engineering, University of Florence, Italy):

- **Sara Guarducci:** (2) Involved in software.

Study Participants:

- **Fifty-six healthy, physically active individuals:** (43 males, 13 females; M age = 24.41 ± 4.41 years). All regularly engaged in sports practice with a minimum of two training sessions per week. Divided into two groups:
- **Experimental Group (RT):** (n = 30) Underwent a single session of moderate-to-high-intensity resistance training.
- **Control Group (Stretching/Mobility):** (n = 26) Performed non-load-based mobility and flexibility exercises.

Institutions/Committees:

- **MDPI, Basel, Switzerland:** Licensee and publisher of the *Sports* journal.
- **Institutional Ethics Committee (Area Vasta Centro AOU Careggi, Florence, Italy):** Approved the study protocol.
- **University of Florence:** Affiliation for the primary research team.