

## ACUTE EFFECTS OF RESISTANCE EXERCISE ON AFFECTIVE RESPONSE: A SYSTEMATIC REVIEW

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### ABSTRACT

The objective of this study was to determine, through a systematic review of clinical trials, the acute effects of resistance exercise on affect in healthy young adults. Only articles published in English or Portuguese, with a sample of healthy young adults and that collected some acute affective variable related to resistance exercise, were selected. The criteria proposed by the PRISMA and PICOS approaches were used for the development of the review. 11 studies involving 606 young people (67.9% men) covered this review. Compared to the no-exercise control, resistance exercise with an intensity of 70-80% 1RM, 2-4 sets of 10 repetitions, and a recovery interval of 120-240 seconds between sets showed a better affective response. On the other hand, low and moderate intensities (40-70% 1RM), 3 sets of 5-20 repetitions, and a recovery interval of 30-90 seconds were more efficient in improving affective state compared to high intensities (80-100% 1RM), 3 sets of 4-10 repetitions, and a recovery interval of 90-150 seconds. Resistance exercise acutely improves affect in healthy young individuals, but the affective response depends on the type of exercise protocol used and other variables, such as the level of affect and the timing of post-exercise measurement. The available studies do not allow for the establishment of a dose-response relationship between resistance exercise and affect.

**Keywords:** Aerobic Exercise; Panic Disorder; Heart Rate

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## INTRODUCTION

We know that resistance exercise promotes various physical<sup>1</sup> and psychological benefits<sup>2</sup>, contributing to disease prevention and health promotion. Among the psychological benefits of exercise is the improvement of affective response<sup>4,5,6</sup>. Affect is an empirical component associated with mental functions that encompasses emotions and mood, being influenced by both acute and chronic effects of exercise. Acute changes in affect are directly related to exercise adherence. Individuals who exhibit a better post-exercise affective response tend to engage in exercise more frequently over a period of six to twelve months<sup>7</sup>. Moreover, considering the relationship between acute response and mental benefits, research on aerobic exercise indicates that the prescription of moderate doses is optimal for improving affect<sup>5,8</sup>.

In the context of resistance exercise, both the volume and the prescribed workload suggest that the "inverted U" pattern is crucial for achieving a positive effect in the non-athlete population. Moreover, there is evidence of better modulation of positive affect in self-adjusted workload, which could deviate from the basic recommendation proposed by the American College of Sports Medicine (ACSM) and the desired effects for such exercise. These analyses, however, lack consistency and are often contradictory. In a study conducted in laboratories, for example, we observed a high variability in psychoaffective responses when comparing different intensities in strength exercises (40%, 60%, 80% of 1 repetition maximum and self-adjusted intensity).

Therefore, there is a need to investigate the acute psychological effects of resistance exercise, to elucidate the dose-response relationship for greater mental benefits and contribute to increasing practitioners' adherence to resistance training<sup>3</sup>. Given the above, the present study aimed to determine, through a systematic review, the acute effects of resistance exercise on affect in young adults.

## **METHODS**

The structuring of the present study followed the method proposed by PRISMA9. Thus, the PICOS approach (participants, interventions, comparisons, outcomes, and study design). The electronic databases MEDLINE/PubMed, ISI Web of Knowledge, PsycINFO, and SciELO were accessed for the collection of studies. The search strategy used the following keywords: resistance exercise, resistance training, strength exercise, strength training, affect, affective, mood, and emotions, individually and/or in combination.

The following data were extracted from the articles: number and sex of participants, study design, presence or absence of a control group, type of exercise, configuration of the resistance exercise (intensity, number of sets and repetitions, and rest interval between sets), affective scale used, and timing of scale measurement (pre-exercise, during, and post-exercise) and main results.

For the assessment of the risk of bias for each included article, the following were analyzed: the presence of eligibility criteria; randomization of participants; results expressed with at least 85% of the sample analyzed; presence of a control group; presence of intergroup results; and variability of results.

## **RESULTS**

It was observed that resistance exercise performed at moderate to high intensity (50-80% 1RM), with 2-5 sets of 10 repetitions and a 120-240 s rest interval between sets, improves affect (reduces negative affect and/or increases positive affect) compared to the control situation without exercise. Moreover, low to moderate intensity (40-70% 1RM), with 3 sets of 5-20 repetitions and a rest interval of 30-90 seconds, seems to be more efficient in improving affective state compared to high intensities (80-100% 1RM), with 3 to 4 sets of 10 repetitions and a rest interval of 90 to 150 seconds. Regarding the duration of the resistance exercise session, no conclusion can be drawn, as few studies had this variable under control. The results are supported by the satisfactory quality of the methods in the articles, a fact that minimizes the risk of bias.

It is worth noting that the methodological differences of the studies influence the interpretation of the results of this review. Different instruments are used for the assessment of affect. In a review on this topic, Ekkekakis highlights the POMS (The Profile of Mood States), AD-ACL (The Activation-Deactivation Adjective Check List), and PANAS (Positive and Negative Affect Schedule) scales. According to the author, although some of these scales are statistically accurate, such as POMS, AD-ACL, PANAS, some do not have a validated construct for different populations. Thus, the search for the validation of these instruments is necessary. Furthermore, the standardized use of analysis strategies is necessary.

## **CONCLUSION**

We concluded that an acute session of resistance exercise improves affect in young individuals and that this response depends on the type of exercise protocol used. It is suggested to perform moderate to high-intensity resistance exercise (50-80% 1RM) with 2-5 sets of 10 repetitions and a recovery interval of 120-240 seconds between sets. Such a configuration seems to be more effective in improving affect compared to higher intensities.

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