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# The Effect of AMRAP Training on Skill Performance Among Healthy Collegiate Students



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**Abstract** | In recent years, there has been a growing global concern over sedentary behavior due to its adverse effects on health and well-being. The As Many Reps/Rounds as Possible (AMRAP) training methodology, a key element of high-intensity interval training (HIIT) programs, has gained prominence in the fitness industry for its versatility, time efficiency, and significant health benefits. However, research on the impact of AMRAP training on skill performance components among students is limited. This study aimed to examine the effects of AMRAP training on speed, agility, power, and balance in healthy collegiate students. A total of 24 healthy collegiate students (17 males, 7 females) aged 20-21 years participated in the study. Participants were randomly assigned to either an AMRAP or Traditional Resistance Training (TRT) group for six weeks. The AMRAP group performed exercises designed to maximize repetitions or rounds within a specified timeframe, while the TRT group followed a conventional resistance training protocol. Both groups trained three times per week at 60%-67% of maximum heart rate. Skill performance components were assessed using standard protocols: speed was measured with a 30m dash, agility with a T-test, power with a vertical jump test, and balance with a stork stand test. Statistical analysis was conducted using paired t-tests to compare pre-and post-intervention results within groups and independent t-tests to compare differences between groups. Both groups showed significant speed improvements (AMRAP: -0.14s, TRT: -0.36s), agility (AMRAP: -3.31s, TRT: -2.91s), power (AMRAP: +4.2cm, TRT: +4.66cm), and balance (AMRAP: +2.65s, TRT: +11.24s). No significant differences were observed between the AMRAP and TRT groups in all skill performance components except for balance ( $p < 0.05$ ) with the TRT group showing a more substantial improvement compared to the AMRAP group. This may be due to the nature of traditional resistance training, which often includes more static and controlled movements that require stabilization and balance, thus providing greater balance training stimuli compared to the more dynamic and rapid movements characteristic of AMRAP. In conclusion, these findings suggest that AMRAP can be an effective alternative to traditional resistance training, especially for those seeking time-efficient workout options. Traditional resistance training might be more beneficial for enhancing balance.

**Keywords:** AMRAP training, agility, collegiate students, power, speed.

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## I. INTRODUCTION

The physical fitness of collegiate students is an area of growing interest, especially in light of the increasing prevalence of sedentary behavior and its negative impact on health and well-being. Speed, agility, power, and balance are critical fitness components that contribute to overall athletic performance and daily functional activities. High-intensity interval training (HIIT), particularly the As Many Reps/Rounds as Possible (AMRAP) methodology, has gained popularity due to its effectiveness, time efficiency, and broad applicability [1]. However, there is a paucity of research examining the effects of AMRAP training on these specific fitness variables among healthy collegiate students [2]. This study aims to explore the impact of AMRAP training on speed, agility, power, and balance in this population.

## II. METHODS

A total of 24 healthy collegiate students (17 males, 7 females), aged 20-21 years, participated in the study. Participants were randomly assigned to either an AMRAP or Traditional Resistance Training (TRT) group for six weeks. The AMRAP group engaged in exercises aimed at maximizing repetitions or rounds within a specified timeframe, while the TRT group followed a conventional resistance training protocol. Both groups trained three times per week at 60%-67% of their maximum heart rate.

The fitness components were assessed using standard protocols: speed was measured using a 30m dash, agility with a T-test, power with a vertical jump test, and balance with a stork stand test. These assessments provided a comprehensive evaluation of the impact of the training regimens on the key fitness variables of speed, agility, power, and balance.

## III. RESULTS AND DISCUSSION

Statistical analysis was conducted using paired t-tests to compare pre- and post-intervention results within groups, and independent t-tests to compare differences between groups. Figure 1 showed both groups displayed a significant improvement in speed (AMRAP: -0.14s, TRT: -0.36s), agility (AMRAP: -3.31s, TRT: -2.91s), power (AMRAP: +4.2cm, TRT: +4.66cm), and balance (AMRAP: +2.65s, TRT: +11.24s) following 6 weeks of training. Furthermore, no significant differences were observed between the AMRAP and TRT groups in any of the skill performance components.

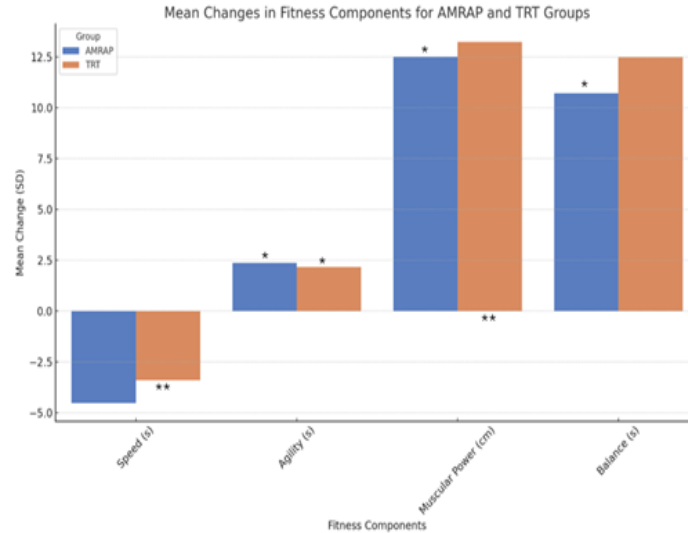


Fig. 1 Changes in fitness components pre- and post-intervention for AMRAP and TRT groups (\*\* significant difference between pre and post,  $p < 0.01$ ; \* significant difference between pre and post,  $p < 0.05$ )

The present study aimed to evaluate the impact of AMRAP (As Many Reps/Rounds as Possible) and Traditional Resistance Training (TRT) on key fitness components which are speed, agility, muscular power, and balance among healthy collegiate students. Both training protocols demonstrated significant improvements across various fitness domains, though no significant differences were observed between the two groups for most measures.

Both the AMRAP and TRT groups showed significant reductions in sprint times, indicating improvements in speed. The AMRAP group decreased by 4.53 seconds, and the TRT group by 3.40 seconds. These findings are consistent with previous research highlighting the efficacy of HIIT using AMRAP and resistance training in enhancing anaerobic performance and speed [3]. Past study conducted revealed high-speed exercise could increase muscle strength by 10.20% which may lead to the improvement of speed performance [4]. Pareja-Blanco et al. found that repeating resistance training at the maximum velocity, compared with half-maximal concentric velocity, provided a superior stimulus for inducing neuromuscular adaptations, thus improving athletic performance [5].

Significant improvements in agility were noted in both groups, with the AMRAP group improving by 2.37 seconds and the TRT group by 2.16 seconds. These results align with studies suggesting that both AMRAP and traditional resistance training can enhance neuromuscular coordination and reaction times, leading to better agility performance [2]. The study observed substantial gains in muscular power, measured by vertical jump height, in both groups. The AMRAP group showed an increase of 12.50 cm, while the TRT group improved by 13.25 cm. These increases are indicative of enhanced explosive strength, which is a critical component of athletic performance and can be significantly improved through both AMRAP and resistance training [6]. Balance also improved significantly in both groups, with the AMRAP group showing a 10.71-second increase in single-leg stance time, and the TRT group demonstrating a 12.49-second increase. Basically, every human body has been equipped with the basic ability of sensors to maintain balance so that everyone is able to maintain their body balance simply in daily movements because there are three nervous systems that maintain human balance, namely sensory, central nerve and motor nerve [7] such as walking, running, pushing, jumping and others. This movement can help develop one's balance [2]. In both interventions, the exercise model movement using AMRAP and resistance training

media is expected to improve balance, abdominal muscle strength and core muscle endurance, including sit ups, push ups, squats and others. These movements are variations of contact point movements and movements for 6 weeks.

Overall, the results of this study indicate that both AMRAP and TRT are effective in improving speed, agility, muscular power, and balance among healthy collegiate students. Despite the significant within-group improvements, the lack of significant differences between the groups suggests that both training protocols are equally effective.

#### IV. CONCLUSIONS

The findings of this study underscore the efficacy of both AMRAP and TRT training regimens in enhancing critical fitness components such as speed, agility, muscular power, and balance in healthy collegiate students. These results provide valuable insights for fitness professionals and athletes, indicating that either training method can be effectively employed to achieve substantial fitness gains.

Given the observed improvements, future studies should aim to explore the long-term sustainability of these benefits and investigate the underlying mechanisms driving these adaptations. Additionally, examining the psychological aspects, such as motivation and adherence associated with each training protocol, could provide a more holistic understanding of their overall effectiveness. Incorporating larger and more diverse populations, including different age groups and fitness levels, would also enhance the generalizability of the findings.

Furthermore, future research could investigate the combination of AMRAP and TRT with other training modalities, such as flexibility or cardiovascular exercises, to develop comprehensive training programs that address multiple aspects of fitness simultaneously. Such integrative approaches could potentially mitigate the observed reductions in flexibility and further optimize overall fitness outcomes.

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