International Journal of Multidisciplinary Horizon

ISSN:3049-2017
IJMH 2025; 2(5): 12-13

www.themultijournal.com

Received: 25-08-2025
Accepted: 05-09-2025
Publish : 08-09-2025

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Enhancing 100- Meter Sprint Performance Through Harness And Interval Training With Earthing: Evidence From Collegiate Male Athletes

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Abstract

Background:
Sprint performance is crucial for athletes in many sports. While harness and interval training are proven strategies for increasing speed, the additional role of "earthing" training barefoot on natural ground has not been widely studied.

Purpose:
This study compared the effects of harness training with earthing (HTE)and interval training with earthing (ITE) on 100-meter sprint performance in male collegiate athletes.

Methods:
Sixty healthy male college athletes (ages 18 - 24) were randomly assigned to HTE, ITE, or a control group (n = 20 each).Both training groups completed five days per week of structured barefoot sprint training for 16 weeks, followed by dedicated earthing sessions. The control group continued their usual routines. 100m sprint times were recorded before and after the intervention. Data were analyzed using ANCOVA and Scheffé's post hoc tests.

Results:
Both THE and ITE groups achieved significant improvements in 100m sprint times compared to the control group. The ITE group improved the most (mean reduction = 0.90 s), followed by HTE (0.81 s), while the control group's change was minimal (0.10 s). ANCOVA confirmed a significant group effect ($F(2, 56) = 145.43$, $p<0.001$, $\eta^2=0.980$),with post hoc analysis indicating ITE outperformed HTE (mean difference = 0.095 s, $p < 0.001$).

Conclusion:
Both harness and interval training, when combined with earthing, substantially enhance 100m sprint performance. Interval training with earthing may offer an added advantage and is recommended for athletes and coaches aiming for optimal sprint results.
Keywords: sprint performance, interval training, harness training, earthing, collegiate athletes

Introduction

Speed over 100 meters is a hallmark of athletic excellence, not just in track but also in football, rugby, and other high-intensity sports. Athletes and coaches are constantly seeking new ways to unlock higher levels of sprinting performance. Harness training, which uses resistance to develop power and stride mechanics, and interval training, which leverages repeated high-intensity efforts, are widely recognized methods for increasing sprint speed (Bompa & Haff, 2009).

Recently, the concept of "earthing" or "grounding" making direct contact with the earth by training barefoot on natural surfaces has gained interest for its potential benefits on recovery, inflammation, and the nervous system (Chevalier etal.,2012).Advocates argue that earthing can help reduce muscle soreness, regulate stress responses, and possibly enhance overall performance. Despite these advances, few studies have explored the effects of combining harness or interval training with grounding techniques on actual sprint outcomes. This research seeks to fill that gap by evaluating the impact of 16 weeks of harness training and interval training, each paired with earthing, on 100-meter sprint performance in male collegiate athletes.

Despite these advances, few studies have explored the effects of combining harness or interval training with grounding techniques on actual sprint outcomes. This research seeks to fill that gap by evaluating the impact of 16 weeks of harness training and interval training, each paired with earthing, on 100-meter sprint performance in male collegiate athletes.

Methods

Participants

Sixty healthy male college athletes, ages 18to24,volunteered for the study.All were actively involved in competitive sports, had no recent injuries, and provided informed consent. Participants were randomly assigned to one of three groups: Harness Training with Earthing (HTE), Interval Training with Earthing (ITE),or a control group (n=20each).Thestudywas approved by the university's institutional ethics board.

Experimental Design

A 16-week, pre-test/post-test, randomized controlled design was used. Both training groups trained five days per week. The control group maintained their normal daily activities with no special training.

Training Protocols

Harness Training with Earthing (HTE):

Participants performed resistance-based sprint drills with a harness, focusing on acceleration, power, and sprint technique. The program increased in volume and intensity every four weeks. All sessions were barefoot on grass, mud, or sand and ended with 15-30minutesof barefoot earthing (walking or lying on natural ground).

Interval Training with Earthing (ITE):

Participants completed high-intensity interval sprints (e.g.,6×30-second sprints,8×20-second sprints), with structured work-to-rest ratios and weekly progression. All training and 30-minute earthing sessions were performed barefoot outdoors.

Control Group (CG):

Control participants continued with their normal routines and did not participate in any structured sprint or earthing program.

Outcome Measure: 100mSprint

100-meter sprint times were measured at baseline and after 16 weeks using standardized electronic timing. The best time from two trials was used for analysis.

Statistical Analysis

Means and standard deviations were calculated for each group. ANCOVA was used to compare post-test 100m sprint times across groups, with pre-test values as covariates. Scheffé's post hoc tests examined group differences. Statistical significance was set at p< 0.05. Analysis used SPSS v25.

Results

Descriptive Statistics

Table1.Pre-TestandPost-Test Means (SD) for 100m Sprint Performance

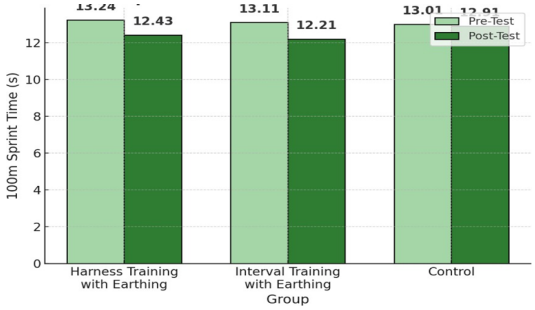
Group	Pre-Test Mean(SD)	Post-Test Mean(SD)	Mean Improvement(s)
Control	13.01 (0.64)	12.91 (0.61)	0.10
HTE	13.24 (0.63)	12.43 (0.60)	0.81
ITE	13.11(0.66)	12.21 (0.61)	0.90

Statistical Analysis

ANCOVA revealed a significant group effect on post-test 100m sprint times, after adjusting for baseline performance ($F(2, 56) = 145.43$, $p < 0.001$, $\eta^2 = 0.980$). Both the HTE and ITE groups improved significantly more than the control group ($p < 0.001$), and the ITE group's improvement was significantly greater than HTE (mean difference = 0.095 s, $p < 0.001$).

Bar Diagram

Figure1.100mSprintPerformance:Pre-Testvs.Post-Test



Discussion

This study demonstrates that both harness and interval sprint training, when combined with earthing, can significantly improve 100-meter sprint performance in male collegiate athletes. Notably, the greatest gains were seen in the interval training group, suggesting that combining high-intensity intervals with grounding may offer a unique advantage for explosive speed.

The effectiveness of interval training is consistent with past research emphasizing the benefits of repeated high-intensity efforts for both aerobic and anaerobic power (Buchheit&Laursen, 2013). The additional benefit observed with grounding may be due to its influence on recovery and muscle fatigue, potentially allowing athletes to maintain higher training quality throughout the intervention (Chevalier et al., 2012; Oschman, 2015).

Harness training was also effective, supporting its use for developing sprint technique and neuromuscular strength. The relatively greater gains in ITE may reflect the powerful physiological adaptations that interval protocols provoke, especially when athletes can recover quickly thanks to grounding.

The minimal changes in the control group underscore the importance of structured training for speed development. The findings also highlight earthing as a low-cost, easily implemented recovery strategy that could be adopted by coaches and teams at all levels.

Conclusions

Combining earthing with structured harness or interval sprint training leads to substantial improvements in 100-meter sprint performance among college athletes. Interval training with earthing appears especially effective, making it a valuable option for coaches seeking to maximize sprint outcomes.

Recommendations

- Coaches should consider incorporating both high-intensity interval sand grounding sessions to optimize sprint performance and recovery.
- Further research should investigate the physiological mechanisms behind earthing, and explore its use with female athletes and team sport players.
- Studies including larger sample sizes and biomarker analysis (e.g.,cortisol, inflammatory markers) would provide deeper insights.