Programming may matter the most. Response to “Metabolic effects of two high-intensity circuit training protocols: Does sequence matter?” by Nuñez et al. (2020)

To the Editor:

We have read with great interest the article by Nuñez et al. (2020) entitled “Metabolic effects of two high-intensity circuit training protocols: Does sequence matter?” recently published on the Journal of Exercise Science and Fitness.

This study evaluated the physiological and psychophysiological responses of a concurrent training session involving high-intensity interval training (HIIT) and circuit weight training (CWT) performed in two distinct orders. The combinations tested were: i) HIC: HIIT followed by CWT (six HIIT bouts before three rounds of a nine exercise CWT protocol), and ii) TRI: CWT interspersed with HIIT (three rounds of three mini-CWT, three exercises per circuit, integrated with three HIIT bouts as the first and second and second and third mini-CWT). As the primary outcomes, authors pointed higher blood lactate concentrations ([LAC]), energy expenditure, and post excessive post-exercise oxygen consumption (EPOC) for HIC when compared to TRI.

Analyzing the results and the placements made by the authors, it seems that the most relevant message when planning a concurrent training session involving HIIT and CWT is to start with HIIT and execute CWT soon after. It would happen because the acute demands associated with this combination had a greater magnitude than the TRI suggesting higher relative intensity. At the same time, the perceived effort (through Rate of Perceived Exertion 6–20 Scale (RPE)) and pleasure when performing the activity (through the Physical Activity Pleasure Scale (PACES)) were not different between the concurrent training combinations.

It seems newsworthy that two concurrent training protocols with equalized loads and intensities present differences in physiological responses without a difference in psychophysiological responses. In practice, since the perceived effort was not different, it would lead to choosing the one with higher physiological responses. However, analyzing these results more carefully, we need to make some observations.

Although HIIT is not a new subject in the scientific literature, it has received considerable attention from researchers in recent years, mainly due to satisfactory acute and chronic outcomes with shorter session times. In this study, the authors used a treadmill protocol that involved six efforts of 30 s duration at an intensity of 105% of the speed associated with maximum oxygen consumption (vVO2max) interspersed with active recoveries of 90 s duration with an intensity of 3 mph (~4.8 km/h; ~34% of vVO2max) and 3% of elevation. The present protocol resembles the characteristics of short interval HIIT protocols (10–60 s efforts with intensity of 100–120% of vVO2max and passive 10–60 s recoveries when short and active at 60% of vVO2max when longer); however, the recovery is too long, and the intensity of the recovery is too low (~34% of vVO2max) suggest: i) inadequate formulation of the protocol, or ii) application to individuals with low level of aptitude. Also, for the protocol to obtain better oxidative responses (longer time at vVO2max), the total session time (12 min) is too short. Therefore, not surprisingly, the oxidative responses of the two combinations of concurrent training were not high, making the protocol not very attractive in practice, after all, the application of competing protocols aims to improve cardiorespiratory and muscle strength variables.

In the case of concurrent training, there is an extensive discussion in the literature about the interfering effect that aerobic training, whether continuous or interval, can have on strength outcomes. Although there is no absolute clarity on the theme, it is consensual to prescribe the strength stimulus first and then the aerobic stimulus, since an initial aerobic stimulus tends to harm a subsequent strength stimulus. Therefore, the HIC protocol, even with higher physiological demands than the HIC protocol, seems to present notable organizational flaws that can interfere with the long-term results of the training, which would make this type of protocol less effective, especially for more trained individuals, as is the case of the study sample in question.

In conclusion, practitioners must take care when applying the findings of this study in practice, since both combinations of concurrent training are not the most appropriate to generate the best adaptive cardiorespiratory and muscle strength responses.

Declaration of competing interest

Breno Berny Vasconcelos & Fabrício Boscolo Del Vecchio, authors of the letter “Programming may matter the most. Response to “Metabolic effects of two high-intensity circuit training protocols: Does sequence matter?” by Nuñez et al. (2020)”, submitted to the Journal of Exercise Science & Fitness, declare that they have no conflicts of interest or fundings received regarding this publication.

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28 January 2020
Available online 2 July 2020