TITLE: Actigraphy-based sleep behavior and high intensity interval training (HIIT): the chronotype effect.

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INTRODUCTION

Physical activity can improve sleep quality through numerous mechanisms by creating a state of general well-being. It is difficult to understand exactly how exercise impacts on sleep and vice versa: different volumes, intensities and types of physical activity could have some positive or negative effects on sleep and sleep loss or restriction could influence both physical and cognitive performances (Souissi et al., 2008). It is largely demonstrated that M-types go to bed and wake up earlier than E-types and that E-types use to sleep less during the working days but more during the weekends (Vitale et al., 2015). The aim of this study was to evaluate the effects of sleep behavior following the 4x4 min of high-intensity interval training (HIIT) proposed by Helgerud (Helgerud et al., 2001), performed by subjects at 08:00 pm, also taking into account the influence of the chronotype variable.

METHODS

15 male subjects (mean age: 20 ± 2), soccer players, enrolled in the School of Exercise Science, University of Milan, at baseline filled in the Horne-Ostberg Morningness-Eveningness Questionnaire (MEQ) for the assessment of chronotype (Horne & Ostberg, 1976). An actigraph monitoring was performed for one week to detect nocturnal sleep PRE-HIIT, and POST-HIIT taking into account the following actigraphy-based sleep parameters: Actual Sleep % (AS), Sleep Efficiency % (SE), Immobile Time % (IT) and Movement Fragmentation Index % (MFI). We compared sleep behavior from PRE to POST conditions between chronotypes.

RESULTS

9 soccer players resulted E-types while 6 resulted M-types. E-types and M-types did not present any significant differences for sleep behavior from PRE to POST condition, nevertheless M-types showed a trend to worsen their sleep in the POST condition with a decrease in SE and an increase in MFI.

DISCUSSION

Our results suggest that HIIT performed at 08:00 pm did not affect the sleep behavior in E-types while M-types, who are more active in the first part of the day, showed a strong trend to worse

their sleep quality therefore it seems that they are disadvantaged when performing a training task in the evening.

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