

## Academic performance in Italian students of Sport Science: the Circadian Typology is related to theoretical or practice exams?

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Circadian rhythms play an important role on activation level. The expression of circadian rhythms differs among individuals and these differences define three Circadian Typology (CT): Morning-types [M-types], Evening-types [E-types] and Neither-types [N-types]. In particular, M-types and E-types differ in the sleep-wake timing and mental or physical activation during the 24 hours. The peak of mental and physical performance is reached in the first part of the day by M-types and in the second half by E-types [1]. School schedule in Italy imposes wake up and activation timing not compliant to E-types innate circadian preferences. This condition doesn't respect the so-called synchrony effect, for which people perform better in agreement with activation peak. Because of this, E-types students may be disadvantaged respect to M-types, which are more aligned with the daily social program [2]. In order to evaluate the academic performance referring to the circadian preferences, we recruited 427 subjects (female=133; male=294; mean age  $20.8 \pm 2.2$  years). They are all attending the School of Sport Science' University of Milan and recruited at the beginning of the university career for four consecutive academic years, from 2010 to 2014. The students filled in the Morningness-Eveningness Questionnaire (MEQ), for the determination of the chronotype. Exam grades of theoretical (Anatomy, Physiology and Sport Medicine) and of practice subjects (Athletic, Swim, Volleyball and Basket) were collected. The statistical analysis showed that the mean values for all exams considered are higher for M-types respect to N-types and E-types students. As regard E-types, these students appear to be disadvantaged more in practice than in theoretical subjects respect to M-types students.

### References

- [1] Vitale et al. (2015) Chronotype influences activity circadian rhythm and sleep: differences in sleep quality between weekdays and weekend. *Chronobiol Int.* 32(3): 405-15.
- [2] Enright and Refinetti (2017). Chronotype, class time, and academic achievement of university students. *Chronobiol Int.* 34(4):445-450.

### Key words

Academic achievement, circadian typology, theoretical subjects, practical subjects.