Monitoring Adolescents Sleep at Project KAIRÓS [PID2021-126846NA-I00]

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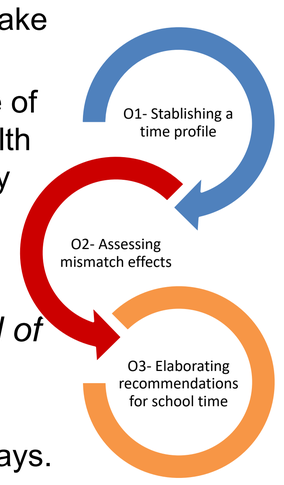
INTRODUCTION & OBJECTIVES

INTRODUCTION

It is known that biological time, also designated by chronotype, synchronize with solar time. By convention, people use social time given by watch clocks to accomplish commitments like school timing. However, if we have a misalignment between solar and social time this may also represent a misalignment between biological time and social time and this can be measured by social jet lag (SJL). Being Spain the most western country in the Central European Time Zone make this children particularly vulnerable to circadian misalignment.

In the Kairós project, which is entitled "(Mis)adjustment of the student's chronotype and the organization of school time: its effects on health, learning, the use of time and satisfaction" we intend to investigate the coincidence / mismatch of the schedule school with the chronotype of students and the effects on their health and learning, in their use of time, and in their well-being. The novelty of our study is that it addresses this relevant and complex topic in a multidisciplinary way using a mixed methodology.



OBJECTIVES

The general objective of the project is *to provide an evidence-based reference to organize school timetables in such a way that they are respectful of the needs of the students.* The specific objectives are:

1) To characterize the **social jetlag** produced by the mismatch between students chronotype and the school time organization (we assess the occurrence of social jetlag across a sample of students measured as the difference between sleep timing on weekends (waking up without an alarm clock) and on school days.

2) To characterize **sleep**, both in terms of **duration and quality** of the sleep across a sample of students.

METHODS & RESULTS

METHODS

We used the Munich Chronotype Questionnaire (MCTQ) for chronotype given by the midpoint of sleep on free days sleep corrected (MSFsc), SJL, reported sleep durations for work and free days and sleep loss. Sleep and activity were also monitored objectively with actigraphy. The treatment arm in our study are the different school schedules (compact or split, i.e. whether they have classes only before lunch, 8:00 to14:00, or before and after lunch, two days from 8:15 to 13:20 and 15:10 to 17:55 and three days 8:15 to14:15) of the educational centers at lower secondary education (1st of ESO – 13-14 years old) for a sample of 49 students. Field work took place during February-March 2023.

RESULTS

MCTQ

Figure 1

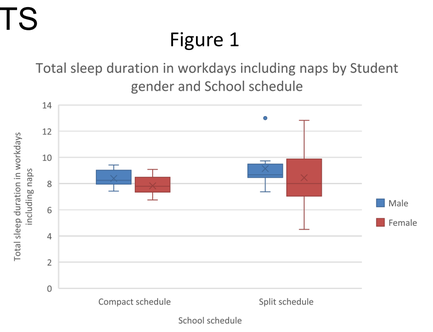


Figure 2

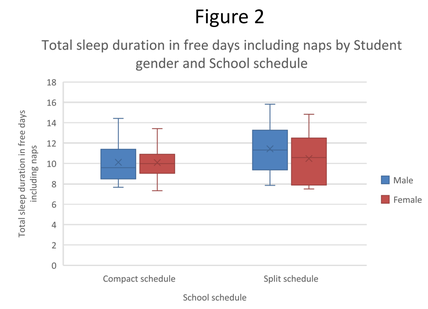


Figure 3

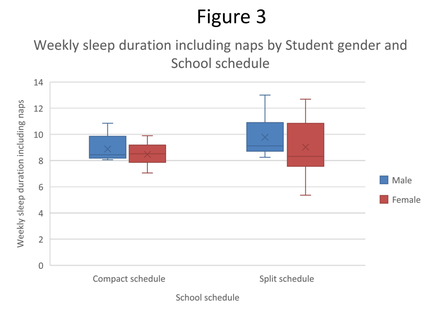


Figure 4

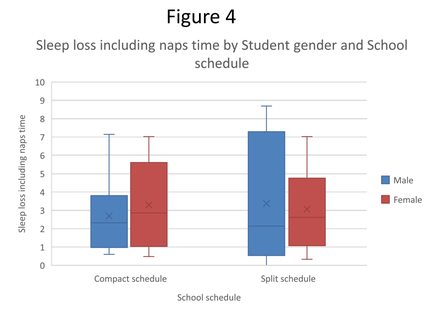
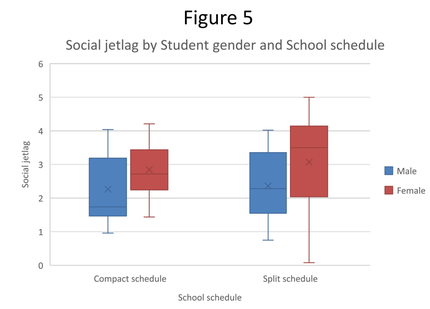


Figure 5



The analysis of the MCTQ sample data shows some differences in terms of age (figures not shown), gender and school schedule. In terms of age 'Total sleep duration including naps', 'Weekly sleep duration including naps' and 'Sleep duration including naps' means are greater for older students (>= 14) than younger ones (< 14), differences in 'Sleep loss including naps time' and in 'Social jetlag' are very small. In terms of gender boys have higher 'Total sleep duration including naps' both in school days and free days (fig. 1 & 2) and therefore also in 'Weekly sleep duration including naps' (fig. 3), and girls show higher 'Social jetlag' (fig. 5) and slightly higher 'Sleep loss including naps time' (fig. 4). Regarding school schedule there seem to be differences for all the abovementioned dependent variables with greater values always for the split schedule.

Actigraphy

Figure 6

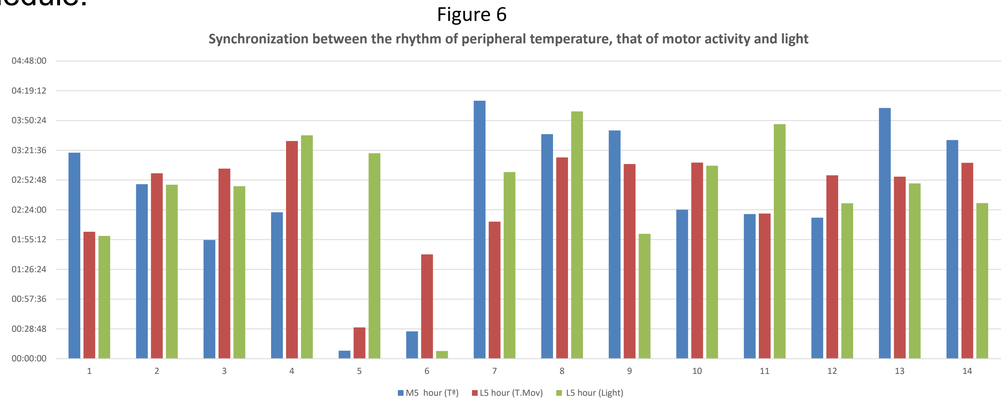


Figure 7

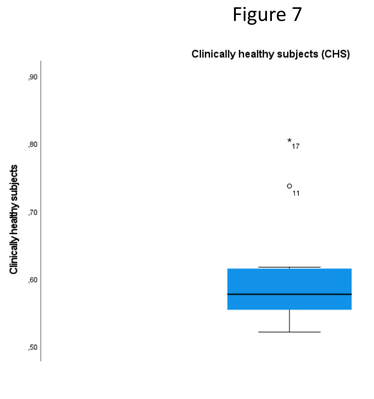
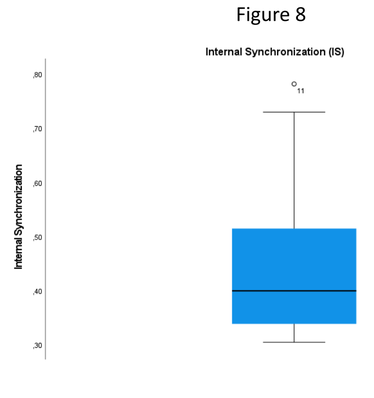


Figure 8



The analysis of the Actigraphy data has been limited to the group with compact schedule (data have been obtained from 25 subjects, of which 14 records were valid). The data at Figure 6 shows the values of Hour M5, L5 (light) and L5 (mov), we see that there is a high degree of variability between subjects, but within subjects there is an acceptable agreement between the values, this means that adolescents in our sample have an adequate internal circadian rhythm.

On the contrary, in the Figures 7 and 8 show in which we collect respectively CHS (Clinically healthy subjects) on the one hand and IS (internal synchronization) on the other, we see that practically all the values are quite far from 1, which would be the ideal value for circadian health.

CONCLUSION

With this project we try to develop a holistic approach to understand students' social jetlag effect in their health, wellbeing and school performance. First results allow us only to describe, for the moment, the reduce sample from the first wave. MCTQ descriptive analysis shows differentiated patterns when comparing by age, gender and school schedule, but more data needs to be collected to prove it. Most likely due to the reduce sample, means comparison, statistical analysis of t test for independent samples does not allow us to reject the hypothesis of equal means for any of the sub analysis.

Despite the even more reduced sample in the case of Actigraphy data we have the information obtained from IS shows us the irregularity of the rhythms of our adolescents, possibly influenced in large part by the social jetlag.

Regarding these data, it is worth highlighting the need to evaluate each record individually in order to better study each factor that influences poor circadian health and, based on these results, try to develop global measures that allow improving the adjustment of rhythms at these ages.

CONTACT

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