



Seasonal differences in sleep among adolescents

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Introduction

Sleep complaints and lowered mood states are frequently reported among in adolescence, especially during the dark season of the year. Autumn (Sep-Nov) in Sweden provides 14 % of global radiation, winter 5 %, markedly less than spring (38 %) and summer (43 %; SMHI, 2015).

Aim

The questionnaire and field study aimed to give detailed information on sleep, depression and light exposures at different seasons at a Nordic latitude (Stockholm).

Methods

The sample consisted of 1622 adolescents with a mean age of 16.6 years (range 14-20, 52% males answering a questionnaire on seasonality and health. Scale used were the K-SPAQ (Kiddie Seasonal Pattern Questionnaire), HAM-6 (Depression scale) and KSQ (Karolinska Sleep Questionnaire). A subsample adolescents aged 15-19 years (n=91) were studied across one week at different seasons. They used actigraphs with light meters (AW8, CamNTEch, UK) and gave diary ratings. 670 sleep periods were recorded (340 in the dark season Oct-Feb and 330 in the light season Mar-Apr).

Results

Figure 1 shows that adolescents in questionnaire report to sleep most in the dark season (Nov-Jan) and feel worst especially in November, n=1336.

Figure 2 shows that adolescents in questionnaire appear to be more depressed in winter in connection to less time spent out-doors.

Figure 3 shows that adolescents in questionnaire appear to have a worse sleep in winter in connection to less time spent out-doors.

Figure 4 shows that adolescents in questionnaire appear to have more social jetlag in winter in connection to less time spent out-doors, n=885.

Table 1 shows that rise time is delayed at the dark season on schooldays by 27 min, sleep efficiency is lowered by 4.1% but sleep duration is not affected (6.9-7.1 h). On days off bedtime is delayed by 1 hour and 11 min and sleep efficiency reduced by 4.6% at the dark season but sleep duration is not affected (7.2-7.4 h).

Conclusions

Adolescents feel worst in November and depression increases. Sleep appears to be delayed at the dark season and also risks to be of worse quality. A lowered mood might be associated with reduced exposure of natural daylight.

Table 1. Sleep characteristics depending on dark (Oct-Feb) and light (Mar-Apr) seasons in adolescence, n=91, in connection to school days and days off.

	Dark season	Light season	chi2	p-value
Schooldays:				
Bedtime (hr)	23.27±0.16	23.31±0.16	0.79	0.7876
Rise time (hr)	8.20±0.25	7.75±0.25	4.54	0.0330
Sleep time (min)	413±7	424±7	1.35	0.2451
Sleep efficiency (%)	86.9±0.6	91.0±0.6	26.3	0.0000
Days off:				
Bedtime (hr)	24.34±0.32	23.18±0.34	7.49	0.0062
Rise time (hr)	8.52±0.20	7.98±0.18	3.76	0.0526
Sleep time (min)	431±9	441±10	0.63	0.4283
Sleep efficiency (%)	86.6±0.7	91.2±0.7	26.3	0.0000

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Figure 1

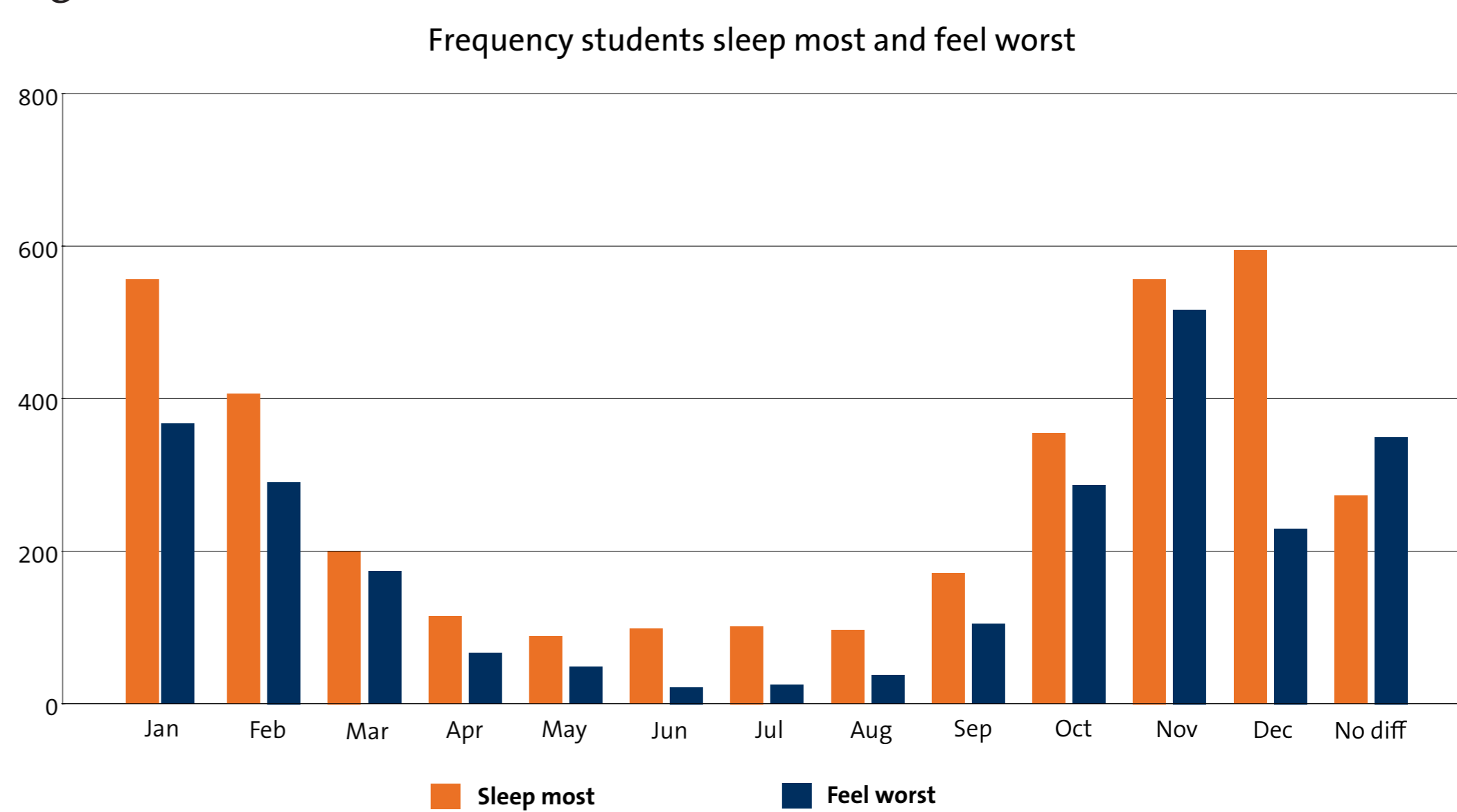


Figure 2

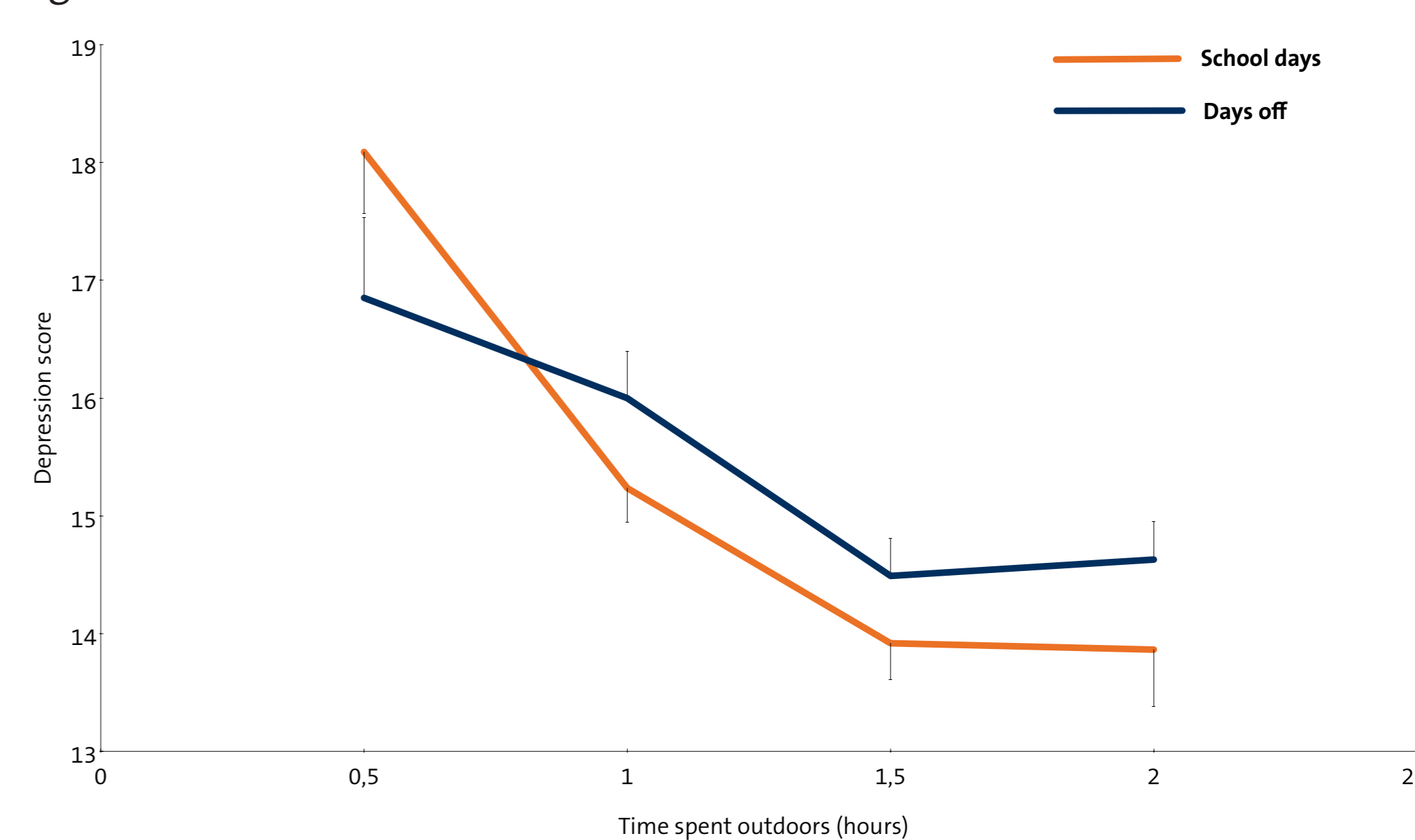


Figure 3

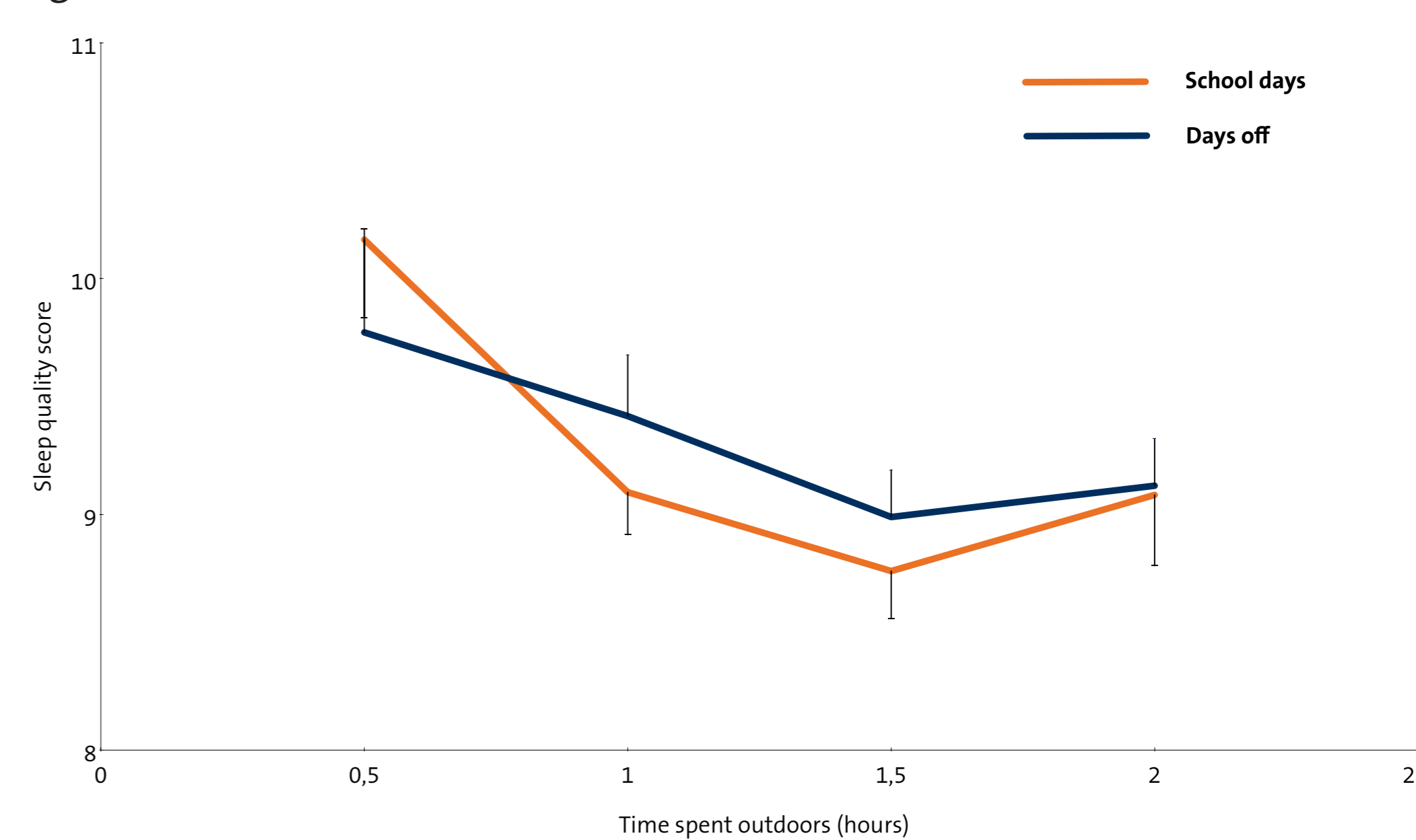
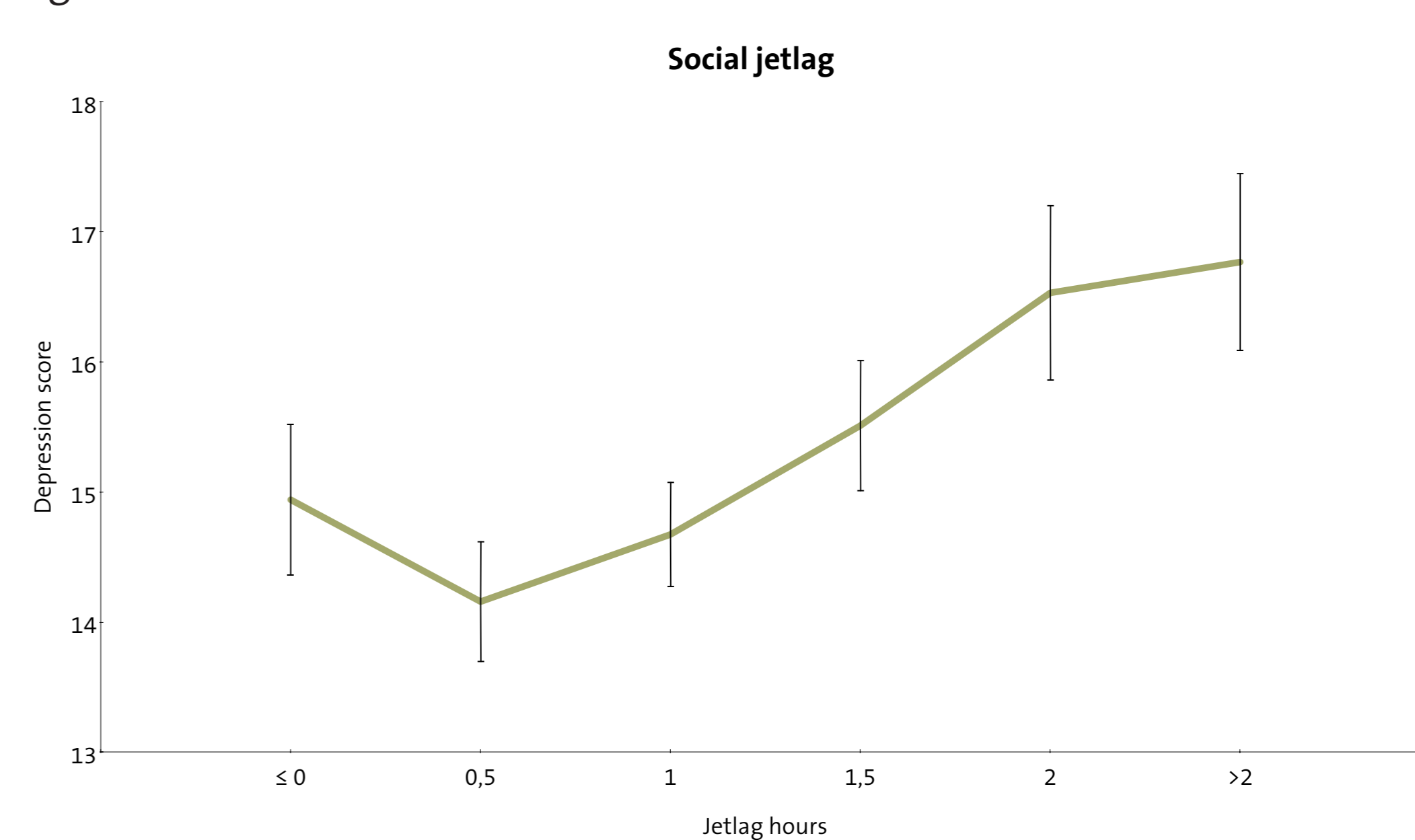


Figure 4



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