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## Early to bed, early to rise: sleep perceptions, patterns and related behaviors in ultra-orthodox Jewish adolescents in Israel

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#### ABSTRACT

Objectives: Studies have described biological and environmental mechanisms underlying adolescent sleep, yet the role of culture has received little attention. Ultra-orthodox (*Haredi*) Judaism adheres to a traditional lifestyle. To examine how culture and lifestyle are associated with sleep, this study compared sleep perceptions, habits, and patterns and related daytime behaviors among ultra-orthodox and secular Jewish adolescents.

Methods: A sample of 178 healthy adolescents (116 ultra-orthodox, 77 males, ages 13–17) gathered via snowball sampling completed the School Sleep Habits Survey to assess sleep perceptions, habits, patterns (timing and duration), and related behaviors (sleepiness, mood, sleep-problem behaviors). Chi-square tests compared group sleep perceptions and habits. MANCOVAs tested GROUP, GENDER, and GROUP × GENDER interactions for sleep patterns and related behaviors, controlling for school start time, media devices, and habitual prayer.

Results: Compared with the secular group, ultra-orthodox adolescents perceived their sleep as more satisfactory (P < .05) and reported shorter sleep onset latency (P < .001). Ultra-orthodox males reported earlier bedtimes and longer sleep duration on school nights, earlier bed and wake times and shorter sleep duration on non-school nights, and less sleepiness and fewer sleep-problem behaviors (P < .05) than their group and gender counterparts.

Conclusions: Ultra-orthodox males exhibited early and regular sleep timing that may be considered unique among healthy adolescents. Our comparison of sleep and related behaviors in adolescents having common hereditary backgrounds yet distinct cultural backgrounds provides insights into the cultural underpinnings of adolescent sleep. Professionals who work with adolescents should be aware of changes in sleep in the cultural context.

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#### Introduction

Adolescence is the transition between childhood and adulthood, during which people experience biological, emotional, and environmental changes alongside changes related to sleep. While many studies have focused on the biological and environmental mechanisms underlying adolescent sleep patterns, 1–5 little attention has been paid to the role of culture in shaping such patterns. 6–8 The current study focuses on differences in sleep patterns and

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sleep-related behaviors among adolescents of two distinct cultures in the Israeli-Jewish society: ultra-orthodox (Haredi) and secular.

Adolescent sleep patterns in Western cultures are well described and are characterized by a tendency toward late bedtime, short nocturnal sleep time on school nights, and substantial differences between sleep timing and duration on school nights and non-school nights.<sup>2,3,5,8–10</sup> On school nights, adolescents tend to stay up late and awaken early, resulting in short sleep duration. On non-school nights, they go to bed late but tend to wake up late and extend their sleep duration by 2 to 3 hours.<sup>10</sup> These sleep patterns have been associated with reduced quality of life, daytime sleepiness and fatigue, mood impairments, and daily behavioral problems, including poor academic performance.<sup>11–13</sup>

Adolescent sleep changes have been attributed to biological changes and to environmental and lifestyle factors.<sup>3</sup> Thus, ample

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evidence suggests that delayed bedtime is the outcome of a delay in the circadian sleep–wake cycle, dictated by the biological clock, and by slower daily accumulation of sleep pressure, reflecting the homeostatic sleep factor. <sup>4,5,14</sup> On the other hand, early school start times, as well as extracurricular activities (eg, homework, sports, electronic media) are examples of demands set forth by the social environment that are related to a decline in sleep duration during the school week. <sup>2,3,15</sup>

Studies of adolescent sleep patterns have also revealed sex differences. Compared with boys of the same age, girls sleep longer, especially on weekends, 10,16,17 and wake up later on weekends 10,16,17 but earlier on school days. 17 These differences are poorly understood and have been attributed to earlier onset of puberty in girls than in boys. 10 However, in a study comparing sleep patterns among Jewish and Arab adolescents in Israel, 18 girls went to bed 30 minutes earlier than boys and slept one hour later on weekends, and the difference in bedtimes between boys and girls was greater in Arab adolescents. These findings suggest that gender roles that are shaped by culture may moderate observed sleep patterns.

Interest in the cultural aspects of adolescent sleep patterns has increased in recent years.<sup>6,16,19</sup> In a seminal study, the World Health Organization (WHO) surveyed adolescents in 10 European countries and in Israel and found that Israeli adolescents reported the shortest sleep durations and were among those reporting the latest bedtimes.<sup>19</sup> In a meta-analysis conducted among approximately 90,000 adolescents in 23 countries, <sup>16</sup> sleep duration was found to be longest in Australia and Europe and shortest in Asian countries. In these studies comparing different countries and continents, geographical, genetic, and socio-cultural factors likely underlie differences in sleep patterns.

Other cross-cultural investigations examined differences in adolescent sleep patterns between different ethnic groups. 18,20 In a study comparing self-reported sleep patterns in Jewish and Arab adolescents in Israel, bedtime was earlier and sleep latency was longer for Arab adolescents. Findings were interpreted as a conflict between traditional, culturally appropriate norms calling for early bedtime and the biological tendency toward a late bedtime in adolescents living in a society undergoing transition to a Westernized lifestyle. 18 In a 5-year longitudinal study of sleep patterns in Hispanic and Caucasian children to young adolescents, Hispanic children had shorter sleep durations and later bedtimes than Caucasians, based on parental reports.<sup>20</sup> Authors suggested that cultural and/or genetic factors may underlie the observed differences. Evidently, as comparisons between such ethnic groups involve distinct hereditary and cultural characteristics, it is impossible to tease apart the distinct contributions of biology and culture.

Growing awareness of the negative consequences of poor sleep for adolescent health and functioning <sup>12</sup> raises the need to assess socio-cultural context and to better understand the interplay between culture and biology in adolescent sleep patterns. The current study compares adolescent sleep in two distinct Jewish cultures in Israel: the ultra-orthodox religious society and the secular society.

The ultra-orthodox society, composing about 11% of the population in Israel, <sup>21</sup> is a socio-cultural minority consisting of communities that follow a strict orthodox religious tradition. <sup>22–24</sup> This society is characterized by large families, and intensive Torah studies, which are considered a supreme value in the fulfillment of religious commands. Distinct gender roles are apparent from childhood. Adolescent girls help with household duties and care for younger siblings, and adolescent boys attend early-morning prayer 7 days a week (including on the Sabbath) and Torah studies until the late-evening hours on weekdays. <sup>23,25</sup> Access to modern technological devices such as television and computers is strictly forbidden, although some sects within the community allow exposure to computers, but with little or no access to the internet. <sup>23,24</sup> These

lifestyle characteristics stand in stark contrast to those of secular adolescents, which are characterized by omnipresent screen exposure <sup>15</sup> and decreased parental control. <sup>26</sup>

A few studies have addressed health practices in the ultraorthodox Jewish society, demonstrating relatively low implementation of health-promoting behaviors. <sup>27,28</sup> To the best of our knowledge, sleep patterns and disturbances have yet to be studied in this community. It appears that culturally determined lifestyle features that distinguish between ultra-orthodox and secular adolescents, such as school start times, sleep regularity on school versus nonschool nights, and screen exposure, are all factors strongly associated with adolescent sleep patterns. 7,15,17,26 Some evidence suggests that religious activity itself is associated with reduced sleep on school nights.<sup>26</sup> Yet, how these lifestyle differences are associated with self-reported sleep measures in these two adolescent groups has yet to be investigated. This comparison may help us understand how culture and lifestyle influence sleep patterns that in turn increase or reduce the risk for poor sleep and associated outcomes. Consequently, such understanding may guide the treatment of sleep disorders in the context of specific cultural norms.

This study examined differences in sleep perceptions and habits, sleep patterns, sleepiness, mood, and sleep-problem behaviors in Jewish male and female ultra-orthodox and secular adolescents in Israel. Our working hypothesis was that commitment to a structured and traditional ultra-orthodox lifestyle, with religious rituals such as daily prayer and with distinct gender roles, would be associated with good sleep hygiene and positive sleep-related outcomes. Specifically, we hypothesized that for ultra-orthodox adolescents, sleep is perceived as more satisfactory; that self-reported sleep patterns are characterized by early sleep timing, shorter sleep latency, and duration on both school nights and non-school nights; and that daytime sleep-related outcomes, including sleepiness, sleepproblem behaviors, and depressed mood, are lower than for secular adolescents, when controlling for lifestyle characteristics including school start time, media devices in the home, and habitual prayer. We further hypothesized that because of prominent gender differences among the ultra-orthodox adolescents, these differences are more pronounced for males than for females.

#### Methods

Study sample and design

Participants were male and female adolescents aged 13 to 17 years, recruited by snowball sampling in ultra-orthodox and secular Jewish communities in central Israel.

The secular sample included adolescents raised in secular homes, attending the public secular day-school system, and residing at home. Adolescents attending alternative educational systems (eg, Waldorf schools based on the anthroposophical philosophy of education, or democratic school systems) were excluded. The ultra-orthodox sample included adolescents residing in communities who strictly adhere to an ultra-orthodox religious lifestyle, including fulfillment of religious commands. Adolescents attending boarding schools and residing outside their homes were excluded.

Tools

(1) Sleep Survey: The School Sleep Habits Questionnaire—SSHS<sup>9</sup> was developed for adolescents 9 to 18 years old, as a comprehensive survey for assessing sleep perceptions, habits, and patterns as well as sleep-related variables including school start time, daytime sleepiness, <sup>29</sup> sleep-related problem behaviors, <sup>9</sup> and depressed mood. <sup>30</sup> Daytime sleepiness is assessed by grading the likelihood of sleepiness in the context

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