

Research in Brief:
Do Later School Start Times
Benefit the Education,
Health, and Well-Being of
High School Students?

Background

High school students are at higher risk of sleep deprivation due to their changing brain chemistry and increased time demands. The transition from childhood to adolescence is marked by a tendency to both initiate sleep and wake up later. While approximately nine hours of sleep per night have been recommended, it was found that adolescents in the United States only sleep between 6.5-7.5 hours mainly due to the misalignment between delayed sleep schedules and traditional early school start times.

This is a concern given that even mild sleep deprivation is associated with undesirable effects, including impaired learning, slowed performance, and memory loss. Research has also demonstrated that sleep deprivation is associated with poorer emotional health and regulation. To address these negative outcomes, many school systems are considering delaying school start times to promote sufficient sleep for adolescents.



While there have been a number of individual studies on delayed school start times, it remains unclear the overall effectiveness of this intervention. A comprehensive synthesis of research evidence is necessary to guide decision-making for school administrators and educational policymakers. Therefore, a systematic review and meta-analysis was conducted to assess the effects of a later school start time for supporting health, education, and well-being outcomes among high school students.

Why does this matter?

- ⇒ Due to biological changes and the tendency to initiate sleep and wake up later, adolescents are at high risk of sleep deprivation.
- ⇒ Sleep deprivation is associated with many negative health and educational outcomes, including poor emotional health and regulation, lack of alertness, and impaired academic performance.
- ⇒ There is growing discussion and consideration among parents, teachers, and school administrators regarding the potential of later school start times to support high school students' health and educational outcomes.
- ⇒ A comprehensive assessment of the effects of later school start times on student health, education, and well-being outcomes is necessary to inform potential policy decisions.

The Knowledge Network for Student Well-Being is a project of the **Knowledge Network for Applied Educational Research** (www.knaer-recreae.ca)

Communities of practice in the KNSWB include: **Ontario Healthy Schools Coalition, PREVNet, School Mental Health ASSIST, and the Social Planning Network of Ontario**

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What is a systematic review and meta-analysis?

A systematic review is a type of study that exhaustively summarizes the literature on a specific research question. The purpose of a systematic review is to draw a collective conclusion that provides stronger evidence than any single study. This research method involves: 1) framing a specific research question; 2) running a comprehensive search in the literature; 3) screening the retrieved articles for relevance; 4) assessing the research quality of the relevant articles; 5) abstracting results from the relevant articles; and 6) synthesizing the results of the relevant articles to draw a conclusion. A meta-analysis then combines the statistical results of the relevant articles to provide a pooled estimate of effects.

What did the researchers do?

The researchers performed a systematic review and meta-analysis assessing the impact of later high school start times on high school students' health, well-being, and educational outcomes. Studies were selected from a comprehensive list of 20 databases during both 2014 and 2016, including CENTRAL, MEDLINE, PsycINFO, Embase, and ERIC. No studies were excluded based on publication date, language, or status. Researchers hand-searched 14 relevant journals, including *Sleep*, *Behavioural Sleep Medicine*, and *Journal of Adolescent Health*. Abstracts, conference proceedings, and other grey literature were also retrieved.

Relevant studies included students aged 13-19 years attending secondary school in any country. Observed outcomes at a school implementing a later start time were compared to the outcomes of a previous earlier start time at the same school. Primary outcomes included: amount/quality of sleep; student academic performance (i.e. course grades, standardized test results, exam results, graduation records, truancy); and mental health (i.e. stress, feelings of isolation or exclusion, depression or suicidal ideation). Secondary outcomes included: health behaviours (i.e. diet, exercise, substance use); safety (i.e. car accidents, falls); and social outcomes (i.e. peer relationships, extracurricular participation).

What did they learn?

From 1,881 individual studies retrieved, 11 studies were deemed eligible for inclusion in the systematic review. And of these 11 included studies, two were methodologically comparable to perform a meta-analysis. The results of the systematic review and meta-analysis:

- Interventions for a delayed school start time reflected a shift from an early time (e.g. 7:15AM being the earliest) to a later time (e.g. 8:00AM, 8:45AM, 9:00AM)
- Shifts in time for these interventions varied across studies, ranging from 25 to 90 minutes
- Students attending schools with later start times reported an increase of 29 to 117 minutes (average of 83.4 minutes) of sleep compared to students attending schools with regular start times
- No clear associations were found between later school start times and student academic outcomes, absenteeism, or alertness
- No definitive conclusions could be drawn regarding the effect of later school start times on social or family outcomes
- One study reported a statistically significant reduction in self-reported depression symptoms for students in a later starting school compared to students in an earlier starting school

Overall, the quality of the included studies was very low. Non-uniform study design and vague reporting made the pooling of results impossible for most outcomes. Although there is some evidence that suggests potential benefits for later school start times, results should be interpreted with caution.

Better data is needed to investigate the effects of different durations of start time delay (e.g. 20-minute versus 40-minute delay). Lastly, further high-quality research is required before considering any practical implications.

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