Advocating for School Start Time Changes in Order to Improve Student Sleep, Academic Performance, and Physical/Mental Health

Amy Plog, Ph.D., Lisa J. Meltzer, Ph.D., Janise McNally, Ed.S.,

Session presented at the annual conference on Advancing School Mental Health. November 8, 2019, Austin, TX
Overview

• Start times & mental health in schools
• Science behind changing start times
• Process of changing start times
• Preliminary outcomes
• Advocating for change
Start Times and Mental Health in Schools

• Failure to obtain sufficient sleep impacts academics & physical/mental health.

• Sleep listed among factors thought to play a role in increasing mental health concerns in the U.S. (Hidaka et al., 2012; Knell et al., 2019; Orben & Przybylski, 2019; Pearson et al., 2019).

• Sleep quantity and quality may contribute to racial/ethnic disparities in academic achievement (Levy et al., 2016).

• School mental health professionals should play a larger role in discussions of policies that impact student sleep (Buckhalt et al., 2009).
“To be able to learn, children must come to school each day feeling healthy, safe, welcomed, and supported.”

(NASP, 2015)
Science Behind Changing Start Times
Adolescents need 8.5 to 9.25 hours of sleep per night.

75% of adolescents in the United States get 7 hours or less per night.

Carskadon et al., 1980, 2002; McKnight-Eily et al., 2011; NSF 2006, 2014; Owens et al., 2014; Kann et al., 2018)
So?

Sleep doesn’t matter

I sleep less than that and do just fine

Sleep is for slackers
WRONG!!

You have to breathe

You have to eat

You have to sleep!

Sleep is not an optional luxury, but is essential for health, daytime functioning, and well-being
Stages of Sleep

- Stage 1: Growth hormone released, brain recovery, executive functioning
- Stage 2: Memory consolidation, learning
- Stage 3: Growth hormone released, brain recovery, executive functioning
- Stage 4: Growth hormone released, brain recovery, executive functioning
- REM Sleep: Memory consolidation, learning
- Awakening:
Well if my teen just turned off his phone and went to bed earlier, then he wouldn’t have any problems waking up
Process C - Circadian Rhythm

(Borbely, 1982; Carskadon et al., 1980, 2002)
Circadian Misalignment

(Borbely, 1982; Carskadon et al., 1980, 2002)
Faces of Deficient Sleep
Deficient Sleep in Children/Adolescents

- Mood and affect changes
- Behavior problems
  - Non-compliance
  - Aggression
  - Hyperactivity
  - Poor impulse control
- Risk taking behaviors and increased accidents

(Beebe, 2011; Gruber et al., 2012; Owens et al., 2014)
Deficient Sleep in Children/Adolescents

- Neurocognitive deficits
  - Attention
  - Memory
  - Executive functioning

- Weight gain
  - Increased caloric intake
  - Increased consumption fats and carbs

(Beebe et al., 2010; Beebe et al., 2013; Gruber, Wiebe et al., 2012; Gruber, Michaelsen et al., 2012; Hart et al. (2013); Sadeh et al. (2003))
Signs of Deficient Sleep

• Needs to be awakened in morning
• Sleeps 2+ hours on weekends or vacations than weekdays
• Falls asleep in school or other inappropriate times
• Behavior/mood differ following nights of increased sleep
Extrinsic Sleep Disruptors
Later School Start Time Outcomes

- Multiple studies have demonstrated the benefit of changing to a later school start time…
- Students getting > 8 hours sleep/night
- Better academic outcomes
- Better attendance rates
- Higher graduation rates
- Reduced tardiness
- Less depression
- Less caffeine use
- Fewer car crashes

(Boergers et al., 2014; Danner & Phillips, 2008; McKeever et al., 2017; Owens et al., 2010; Wahlstrom, 2002; Wahlstrom et al., 2014; Wolfson et al., 2007)
Recommendation to start middle/high schools no earlier than 8:30 a.m.

American Academy of Pediatrics
Centers for Disease Control and Prevention
American Medical Association
American Thoracic Society
American Academy of Child and Adolescents Psychiatrists
American Psychological Association
American Academy of Sleep Medicine
American Association of Sleep Technologists
National Educational Association
National Parent Teacher Association
National Association of School Nurses

Less than 20% of high schools in the United States start at or after 8:30 a.m.
Take Home Message: Science of Start Times

- Sleep essential for learning and health

- Adolescents significantly sleep deprived, with school start times as one of the strongest contributing factors

- Changing start times is not coddling students, but setting them up for success in life
Process
Cherry Creek School District (CCSD)

- 4th largest district in Colorado (~55,000 students)
- 53% White, 20% Hispanic
- 29% Free/reduced lunch (range 4% - 80%)
- Southeast Denver metro area with a geographic footprint 108 square miles
Adopted Recommendations

District Goals
College and Career Preparedness and Success
Inclusive Excellence

Credit Requirements
Credits to Graduate
Online Opportunities

Competency Demonstration
College and Career Ready Demonstrations

College & Career Readiness
Innovation
Career & Innovation Center

Social & Emotional
Wellness, Mental Health
Life Skills, PBIS/SOS

Achievement
Continuous Improvement/PLC
Articulation & Rigor
System of Interventions
Early Literacy Focus
Aligned Math Programming

School Structure
Mobility & Student Achievement
Later High School Start Times

Progress Toward Future Goals
Naviance 6-12
Feeder College & Career Planning Guide

- 12 month strategic planning process
- Public meetings in all communities
- New graduation requirements
- Served as the basis for the successful 2016 bond and budget election
- Informal survey of participants on their “tolerance” for changing start times
- If we are “Dedicated to Excellence we must address start times”
Whole School  Whole Community  Whole Child

- Encouraged to take challenging classes
- Have taken challenging classes
- SEL
- Physical health and wellness
- Sleep
- Mental health
- Substance use
- Bullying
- Perceived safety
- Connection to school
- Preparedness for learning
- Adult at school
- Parent(s)
- Healthy
- Safe
- Challenged
- Engaged
- Supported

2016
Mental Health Concerns and Academic Outcomes for Students with and without Adequate Sleep

- **Stress/Anxiety**
  - Light shade = Inadequate sleep
  - Dark shade = Adequate sleep

- **Depressive Symptoms**

Study findings are unpublished and should not be shared on social media or distributed without written consent of the authors.
Process


Feb 2017: Further Refinement, Final Recommendation, Feedback

August 2017: Implementation
## Start Times Task Force

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Scott Siegfried</td>
<td>Associate Superintendent</td>
</tr>
<tr>
<td>Brooke Gregory</td>
<td>Assistant Superintendent, EdOp</td>
</tr>
<tr>
<td>Todd Fukai</td>
<td>Assistant Superintendent, Human Resources</td>
</tr>
<tr>
<td>Sarah Grobbel</td>
<td>Executive Director – High School</td>
</tr>
<tr>
<td>Dr. John Kennedy</td>
<td>Executive Director – Middle School</td>
</tr>
<tr>
<td>Chris Smith</td>
<td>Executive Director, Elementary Education</td>
</tr>
<tr>
<td>Dr. Tera Helmon</td>
<td>Executive Director, Elementary Education</td>
</tr>
<tr>
<td>Jennifer Perry</td>
<td>Executive Director, Elementary Education</td>
</tr>
<tr>
<td>Gwen Hansen-Vigil</td>
<td>Principal, Eaglecrest High School</td>
</tr>
<tr>
<td>Kim Rauh</td>
<td>Principal, Cherokee Trail High School</td>
</tr>
<tr>
<td>Ryan Silva</td>
<td>Principal, Cherry Creek High School</td>
</tr>
<tr>
<td>Dr. Lisa Sprague</td>
<td>Principal, Grandview High School</td>
</tr>
<tr>
<td>Allison Witkin</td>
<td>Principal, Adaptive Programs</td>
</tr>
<tr>
<td>Nickie Bell</td>
<td>Principal, Horizon Middle School</td>
</tr>
<tr>
<td>David Gonzales</td>
<td>Principal, Prairie Middle School</td>
</tr>
<tr>
<td>Roberta Ballard</td>
<td>Principal, Arrowhead Elementary School</td>
</tr>
<tr>
<td>Chris Hardy</td>
<td>Principal, Sunrise Elementary School</td>
</tr>
<tr>
<td>Scott May</td>
<td>Principal, Peakview Elementary School</td>
</tr>
<tr>
<td>Kyle Sorg</td>
<td>Principal, Homestead Elementary School</td>
</tr>
<tr>
<td>Michael Giles</td>
<td>Executive Director, Inclusive Excellence</td>
</tr>
<tr>
<td>Dr. Floyd Cobb</td>
<td>Executive Director, Curriculum &amp; Instruction</td>
</tr>
<tr>
<td>Dr. Norm Alerta</td>
<td>Director, Assessment &amp; Evaluation</td>
</tr>
<tr>
<td>Sheryl Cunningham</td>
<td>CCEA Association President</td>
</tr>
<tr>
<td>Holly Drake</td>
<td>Teacher, Overland High School</td>
</tr>
<tr>
<td>Scot Kaye</td>
<td>Teacher, Liberty Middle School</td>
</tr>
<tr>
<td>Kristin Chaney</td>
<td>Teacher, Rolling Hills Elementary School</td>
</tr>
<tr>
<td>John Eyolfson</td>
<td>District Coordinator, Science</td>
</tr>
<tr>
<td>Janise McNally</td>
<td>District Coordinator, Health &amp; Wellness</td>
</tr>
<tr>
<td>Dr. Amy Plog</td>
<td>Research &amp; Data Coordinator</td>
</tr>
<tr>
<td>Gincey Mansfield</td>
<td>Executive Assistant</td>
</tr>
<tr>
<td>Mike Hush</td>
<td>Director of Transportation</td>
</tr>
<tr>
<td>Erika Edwards</td>
<td>Director of Food and Nutrition Services</td>
</tr>
<tr>
<td>Chardonnay Adams</td>
<td>Route Planning Manager - Trans</td>
</tr>
<tr>
<td>Jim Parker</td>
<td>QA / Personnel Resources Manager - Trans</td>
</tr>
</tbody>
</table>

**Met for 18+ months to study, review and identify rationale and constraints regarding an adjustment to start times**
In addition to the task force...

Best Practices – Task force + visits to other districts who made the change

Administrative – Legal/HR review, discussions at administrator meetings

Staff Engagement – Discussions at staff meetings, letter to all staff, staff survey

Parent/Community Engagement – Discussions at parent/community meetings, parent/community survey and opportunity to provide feedback

Student Feedback – Discussions with high school student groups, student survey, and opportunity to provide feedback
Online Survey Overview

• Developed by the School Start Times task Force
• Reviewed by the District Accountability Committee
• 12 questions designed to elicit “tolerance” and “preference” for change

Process

• Notifications to all parents via phone and email messages
• Survey open for 10 days
• Results analyzed and posted online for review
Q1 - RESPONDENTS

Number of Responses

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Responses</th>
<th>Total Invited</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>25,574</td>
<td>67,428</td>
<td>38%</td>
</tr>
<tr>
<td>Student</td>
<td>8,488</td>
<td>21,097</td>
<td>40%</td>
</tr>
<tr>
<td>Staff</td>
<td>3,224</td>
<td>7,104</td>
<td>45%</td>
</tr>
<tr>
<td>Parent / Guardian</td>
<td>12,862</td>
<td>39,227</td>
<td>33%</td>
</tr>
</tbody>
</table>

Significant and unprecedented response rate
Q2 – RESPONDENTS – Level of School They Represent

<table>
<thead>
<tr>
<th>Level</th>
<th>All Responses</th>
<th>Parents</th>
<th>Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>14,038</td>
<td>6,279</td>
<td>1,575</td>
<td>6,929</td>
</tr>
<tr>
<td>Middle</td>
<td>8,013</td>
<td>5,428</td>
<td>2,155</td>
<td>1,027</td>
</tr>
<tr>
<td>Elementary</td>
<td>7,429</td>
<td>6,582</td>
<td>1,676</td>
<td>63</td>
</tr>
</tbody>
</table>

SCHOOL START TIMES - SURVEY RESULTS
It is evident this is an important concern in our community across all groups of respondents.
Q5 – Ideal High School Start and End Times?

All Responses

- 7:45 - 3:15 pm: 6,002
- 8:00 - 3:30 pm: 7,271
- 8:15 - 3:45 pm: 3,741
- 8:30 - 4:00 pm: 4,014
- 8:45 - 4:15 pm: 640
- 9:00 - 4:30 pm: 1,381

By Group:

- Parents:
  - 7:45 - 3:15 pm: 2,447
  - 8:00 - 3:30 pm: 4,103
  - 8:15 - 3:45 pm: 1,258
  - 8:30 - 4:00 pm: 2,230
  - 8:45 - 4:15 pm: 449
  - 9:00 - 4:30 pm: 1,206

- Staff:
  - 7:45 - 3:15 pm: 1,085
  - 8:00 - 3:30 pm: 975
  - 8:15 - 3:45 pm: 444
  - 8:30 - 4:00 pm: 2,540
  - 8:45 - 4:15 pm: 449
  - 9:00 - 4:30 pm: 1,258

- Students:
  - 7:45 - 3:15 pm: 2,887
  - 8:00 - 3:30 pm: 2,594
  - 8:15 - 3:45 pm: 1,258
  - 8:30 - 4:00 pm: 2,230
  - 8:45 - 4:15 pm: 449
  - 9:00 - 4:30 pm: 1,206
Q9 – Is it Important that Secondary Students Dismiss First to Provide Supervision to Younger Siblings?

More parents and staff don’t find it necessary to dismiss secondary first – students trended the opposite way making it appear more families require older sibling support for daycare.
Process


## Initial Recommendation

<table>
<thead>
<tr>
<th>School Type</th>
<th>Start</th>
<th>Dismiss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>7:55 am</td>
<td>2:40 pm</td>
</tr>
<tr>
<td>High School</td>
<td>8:15 am</td>
<td>3:30 pm</td>
</tr>
<tr>
<td>Middle School</td>
<td>8:50 am</td>
<td>3:45 pm</td>
</tr>
</tbody>
</table>
Process


Feb 2017: Further Refinement, Final Recommendation, Feedback
Start Time Model

Final Recommendation

Based on

...research
...best practices
...community survey
...community feedback
...budget neutral
## CCSD Change in Start Times

<table>
<thead>
<tr>
<th></th>
<th>2016 – 2017</th>
<th>2017 - 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elementary</strong></td>
<td>9:00 a.m. to 3:30 p.m.</td>
<td>8:00 a.m. to 2:45 p.m.</td>
</tr>
<tr>
<td><strong>Middle</strong></td>
<td>7:50-8:10 a.m. to 2:50-3:10 p.m.</td>
<td>8:50 a.m. to 3:45 p.m.</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>7:10 a.m. to 2:30-2:51 p.m.</td>
<td>8:20 a.m. to 3:30 p.m.</td>
</tr>
</tbody>
</table>
Process


Feb 2017: Further Refinement, Final Recommendation, Feedback

March 2017: Board of Education Decision
Process


Feb 2017: Further Refinement, Final Recommendation, Feedback

March 2017: Board of Education Decision

August 2017: Implementation
Weekly task force meetings

• Included 40 staff representing all departments and levels, including the CCEA president

• Focused on issues at individual levels
  – High School: no new activities allowed before school
  – Middle School: supervised breakfast and study hall to allow students to be dropped off early
  – Elementary School: extra time in day allows for additional recess

• Transportation
  – Allows for most vulnerable students to be picked up on time
Promoting Healthy Sleep Behaviors

• Important to maximize the positive impact

• Provide information to students and parents about healthy sleep habits: sleep needs, consistent bedtime routines, and limits to technology and caffeine
Take Home Message: Process of Changing Start Times

- Stakeholder engagement critical at all levels
- Need buy in from administration
- Change is hard, need to consider the ripple effect and help the grown ups solve the grown up problems to help students succeed
- Sleep health is more than just changing start times
Engaging the community in the process of changing school start times: experience of the Cherry Creek School District

Lisa J. Meltzer, PhD a,*, Janise McNally, EdS b, Amy E. Plog, PhD b, Scott A. Siegfried, PhD b

a National Jewish Health, Denver, CO
b Cherry Creek School District, Greenwood Village, CO
Comprehensive Outcomes Evaluation

- **Quantitative surveys of students (grades 6-11), parents (grades K-11), teachers/staff/transportation employees**
- **District level-data (i.e., attendance, tardy, test scores)**
- **Cohort with parent consent to link survey data** year-over-year and link surveys to district-level data
- **Qualitative data collection with key stakeholders**
- **Biennial anonymous surveys** of health and risk behavior
- **School nurse visits** (time of day, presenting problems)
- **Community data from CDOT and law enforcement**
Student Surveys

- Online surveys completed by CCSD MS/HS students
  - Spring 2017 n = 15,700  Spring 2018 n = 18,607
- Cohort: link data across years and to district level data
  - Middle School n = 1,224  High School n = 934
- Questions focused on sleep and well-being
  - Sleep timing: Reported weekday bedtime and wake time
  - Sleep duration: Calculated from reported BT to WT
  - Extracurricular: Past 7 days participation in sports/activities
  - Academic: Homework completion, first period engagement
  - Daytime mood: PROMIS items, past 7 days
Student Reported Bedtimes and Wake Times

Bedtime slightly later

MS: +8 m  HS: +13 m

Wake time significantly later

MS: +39 m  HS: +61 m

Study findings are unpublished and should not be shared on social media or distributed without written consent of the authors.
Student Reported Sleep & Sleep Deficit

Changes in sleep driven by wake time

MS: +31 m  HS: +48 m

Weekend oversleep (hours)

<table>
<thead>
<tr>
<th>Week</th>
<th>2017 (Pre)</th>
<th>2018 (Post)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>8.50</td>
<td>7.00</td>
</tr>
<tr>
<td>7th</td>
<td>8.00</td>
<td>6.50</td>
</tr>
<tr>
<td>8th</td>
<td>7.50</td>
<td>6.00</td>
</tr>
<tr>
<td>9th</td>
<td>7.00</td>
<td>5.50</td>
</tr>
<tr>
<td>10th</td>
<td>6.50</td>
<td>5.00</td>
</tr>
<tr>
<td>11th</td>
<td>6.00</td>
<td>4.50</td>
</tr>
</tbody>
</table>

Significant decrease in weekend oversleep

MS: -38 m  HS: -59 m

Weekend oversleep (hours)

<table>
<thead>
<tr>
<th>Week</th>
<th>2017 (Pre)</th>
<th>2018 (Post)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>1.00</td>
<td>0.50</td>
</tr>
<tr>
<td>7th</td>
<td>1.50</td>
<td>1.00</td>
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<tr>
<td>8th</td>
<td>2.00</td>
<td>1.50</td>
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<tr>
<td>9th</td>
<td>2.50</td>
<td>2.00</td>
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<tr>
<td>10th</td>
<td>3.00</td>
<td>2.50</td>
</tr>
<tr>
<td>11th</td>
<td>3.50</td>
<td>3.00</td>
</tr>
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</table>

Clinically significant oversleep

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Cohort Changes in Weekday Sleep

Significantly greater increase in sleep for MS-FRL students

Middle School (6th/7th pre-change)
Not: 9 m  FRL: 21 m  Total: 11 m

High School (9th-11th pre-change)
Not: 39 m  FRL: 44 m  Total: 40 m

No difference in increase for HS students by FRL status

Dark bars are pre-change (2017) and light bars are post-change (2018)

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**Goal SH-3:** Increase the proportion of students in grades 9 through 12 who get sufficient sleep (8 or more hours of sleep on an average school night)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Baseline/2017</th>
<th>Goal/2018</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2020</td>
<td>30.9%</td>
<td>33.1%</td>
<td>+2.2%</td>
</tr>
<tr>
<td>CCSD (HS)</td>
<td>26.8%</td>
<td>60.9%</td>
<td>+34.1%</td>
</tr>
<tr>
<td>CCSD (MS ≥ 9 hours)</td>
<td>37.7%</td>
<td>58.5%</td>
<td>+20.8%</td>
</tr>
<tr>
<td>YRBS June 2018</td>
<td>30.9%</td>
<td>25.4%</td>
<td>-5.5%</td>
</tr>
</tbody>
</table>

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Activities and Homework

In the Past 7 Days, % of Students Who Participated in:

**Sports**

- Middle: MS: -7.5% HS: -2.1%
- High: MS: -2.9% HS: -2.2%

**Activities**

- Middle: MS: -8.2% HS: -18.3%
- High: MS: -8.2% HS: -18.3%

**Too Tired for Homework**

- Middle: MS: -7.5% HS: -2.1%
- High: MS: -2.9% HS: -2.2%

Past 7 days, % Students Always/Almost Always Too Tired for Homework

Dark bars are pre-change (2017) and light bars are post-change (2018)

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Academic Engagement

In the Past 7 Days, % of Students At Least Half the Time

### Ready for First Period

<table>
<thead>
<tr>
<th></th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>7.1%</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>12.5%</td>
<td></td>
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</tbody>
</table>

### Alert First Period

<table>
<thead>
<tr>
<th></th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>7.0%</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>16.0%</td>
<td></td>
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</table>

### Prepared for First Period

<table>
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<tr>
<th></th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>8.6%</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>15.8%</td>
<td></td>
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</tbody>
</table>

Dark bars are pre-change (2017) and light bars are post-change (2018).

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HS Teachers Notice Differences In Class
(2017 n=485, 2018 n=567)

In the past 7 days, have you noticed students falling asleep in class?

Dark bars are pre-change (2017) and light bars are post-change (2018)

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On most school mornings how easy it is for your child to wake up?

In the past 7 days when my child woke up he/she felt ready to start the day

Dark bars are pre-change (2017) and light bars are post-change (2018)

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Parent and Staff/Transportation Sleep

Parent sleep decreased 6 min for ES only, increased 12-18 min all other groups

ES no change; MS increase 12 min, HS increase 21 min, Transport increase 6 min

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Changes in Daytime Mood
In the Past 7 Days, % of Students Always/Almost Always

Feeling Sad
MS: -0.4%  HS: -4.6%

Feeling Nervous
MS: -1.6%  HS: -6.1%

Feeling Worried
MS: -2.6%  HS: -8.9%

Dark bars are pre-change (2017) and light bars are post-change (2018)

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HS Students Who Report Stress/Anxiety Over Time – Reported Separately Based on Sleep

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\( \chi^2 = 12.96, p < .001 \)
MS Students Who Report Stress/Anxiety Over Time – Reported Separately Based on Sleep

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\( X^2 = .88, \text{n.s.} \)
HS Students Who Report Depressive Symptoms Over Time – Reported Separately Based on Sleep

- Not Enough Sleep - HS
- Enough Sleep - HS
- Total - HS
- If no change in sleep - HS

Study findings are unpublished and should not be shared on social media or distributed without written consent of the authors.

$\chi^2 = 4.99, \ p < .05$
MS Students Who Report Depressive Symptoms Over Time – Reported Separately Based on Sleep

Study findings are unpublished and should not be shared on social media or distributed without written consent of the authors.

X²=.88, n.s.
HS Students Who Report Suicidal Thoughts Over Time – Reported Separately Based on Sleep

Study findings are unpublished and should not be shared on social media or distributed without written consent of the authors.
MS Students Who Report Suicidal Thoughts Over Time – Reported Separately Based on Sleep

<table>
<thead>
<tr>
<th>Year</th>
<th>Not Enough Sleep - MS</th>
<th>Enough Sleep - MS</th>
<th>Total - MS</th>
<th>If no change in sleep - MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-13</td>
<td>16.2%</td>
<td>10.5%</td>
<td>13.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>2014-15</td>
<td>15.4%</td>
<td>10.5%</td>
<td>13.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>2016-17</td>
<td>18.0%</td>
<td>10.5%</td>
<td>13.9%</td>
<td>10.7%</td>
</tr>
<tr>
<td>2018-19</td>
<td>22.3%</td>
<td>10.5%</td>
<td>13.9%</td>
<td>10.7%</td>
</tr>
</tbody>
</table>

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$\chi^2 = .94, \text{ n.s.}$
Advocating for Change

• Familiarize yourself with the research
• Educate others
• Look for existing data to support need/opportunities for change
• Take a teaming approach
• Involve stakeholders in the process
• Consider collecting data
References

References


• McKeever, P.M., & Clark, L. (2017). Delayed high school start times later than 8:30 a.m. and impact on graduation rates and attendance rates. *Sleep Health, 3*(2), 119–125.


References


References


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