

20th Memorial Education Forum

The Rise of School Shootings... Could Sleep Play a Role?



Amber Allen, BA, RPSGT, RST, CCSH

Director, Polysomnographic Technology, Collin College, McKinney, TX Secretary-Elect, Board of Directors, BRPT

Overview



- Look at school shooting statistics and the mindsets of school shooters
- Discuss the development of the teenage brain
- Examine teen sleep and how sleep deprivation affects the teen brain
- Explore sleep behaviors in the school shooters of Columbine
- Explain how the rise of technology is contributing to poor sleep in teens
- Examine why sleep deprivation is under-recognized in the adolescent population and why it may be a contributing factor to school shootings

Number of School Shootings Since 1998





School Shootings Since 1998



- Total number = 299 school shootings
 - 341 people dead
 - 131 of the school shooters were 18 years old or younger
 - Youngest school shooter = 6 years old
 - Average age of the school shooters = 15 years old
 - Most of the shooters were male
 - Over 90% were current or recent students at the school
 - 68% obtained weapons from their home or a relative's home

- Source: Wikipedia (2020) and Everly (2018)

Mass School Shootings



- 1998 Thurston High School
 4 dead, 25 injured
- 1999 Columbine High School
 15 dead, 21 injured
- 2005 Red Lake, MN
 - 10 dead, 7 injured
- 2007 Virginia Tech Shooting
 33 dead, 17 injured
- 2008 Northern Illinois University Shooting
 - 6 dead, 21 injured

- 2012 Sandy Hook Elementary
 28 dead, 2 injured
- 2015 Umpqua Community College
 - 10 dead, 9 injured
- 2018 Parkland, FL
 - 17 dead, 17 injured
- 2018 Santa Fe, TX
 - 10 dead, 14 injured

Observed School Shooter Behaviors

- Socially awkward and avoidant
- Isolated
- "Strange"
- "Retreat into fantasy"
- Obsessive
- Fascinated with violence, morbid media, or death
- Some have history of cruelty to animals



- Sense of hopelessness
- Dysfunctional home life
- Posted frustrations and anger on social media or in recorded videos
- Absent from school before the attack
- Prior threats

Interviews with Surviving Medical School Shooters

- Interviews with surviving school shooters have revealed that prior to the shootings...
 - They were bullied by peers
 - Battled depression
 - Were withdrawn
 - Considered or attempted suicide
 - Drinking and doing drugs
 - Listening to songs about killing and dying

 Watching violent movies and TV shows

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- Playing violent video games
- Said the violence made them feel like they have control
- Incidents or threats at home not taken seriously
- Planned the attacks in advance—the attacks were not random

- Source: Leung (2004)

COVID-19 and a Decline in School Shootings



- From 2019 peak to lowest numbers in nearly a decade
- COVID-19 may have shut down schools, but did it really stop teen violence?
 - Shift from mass violence to increase in youth suicide

Is the Solution Gun Control?



- After pretty much all of the school shootings, the answer to the problem has been stricter gun control laws
 - But is that really the solution?
- Let's go back to Columbine...
 - It was not originally planned to be a school shooting but rather a bombing gone wrong
 - Harris and Klebold were seeking infamy on a historical scale
 - Harris was labeled a psychopath while Klebold was more suicidal
- It appears to be more of a mind issue than a means issue

What Drives the Shooters?



- Most of the shooters were described as having addictive behaviors or brain/mental illness
- The logic center of the brain is not fully developed in the teenage brain so how can they make logical decisions?
 - The teenage brain is like an entertainment center that's not been fully hooked up

- Source: Edmonds (2008)





First let's look at what's going on in the teen brain...

The Structure of the Teenage Brain





← Cortex = The logical brain

← Limbic System = The emotional brain

Brain stem = Controls basic functions

- Source: Hedaya (2010)



- Most dramatic growth spurt of the brain occurs in adolescence
- Picture a highway
 - Info highway is getting a faster speed limit (myelination)
 - Some routes shut down (pruning)
 - Some routes get re-routed and reconnected
 - Old highways connect to new highways (sprouting)
 - It's a major construction project that rarely flows smoothly
 - Why we see personality changes and different reactions in teen years

- Source: Hedaya (2010)







- Growth in synapses
 - Prefrontal cortex area is the last area to be regulated, making it more immature in teens
 - Plasticity
- Prefrontal cortex may not be fully developed until mid-20s
 - Teens use back of brain for decision making
 - Emotional based decision making stemmed from limbic system
 - Adults use frontal lobe for decision making
 - Can identify errors in decision making better
- Nucleus accumbens well developed though in teens
 - Pleasure and reward area
 - Teen brains don't register delayed gratification

- Source: Edmonds (2008)



- More receptors for oxytocin are produced
 - Oxytocin = "Bonding hormone"
 - Linked to the feeling of self-consciousness
 Peaks around age 15 years old
- What a teen does and is exposed to during this time really impacts their future
- Teens are developing their own identity—often influenced by peers
- Prefrontal cortex and limbic system don't come into balance until adulthood (mid-twenties)

- Source: Nixon (2012)

The Prefrontal Cortex



- What it is responsible for:
 - Personality
 - Regulating feelings
 - Controls impulses
 - Determining initiative
 - Judgment and logical decisions

Teens Are More Likely To...

- Be emotional
 - Tears
 - Anger
- Be rebellious and risky
 - Need higher doses of risk to feel same rush adults do
- Be impulsive
- Develop addictions
- Get less sleep
- Experience social anxiety and seek peer approval









Sleep in Teens



- Most teens I've polled say they get 2-8 hours of sleep per night
 - CDC report on teen sleep in 2016 showed 69% of high school students get less than 8 hours of sleep on school nights
 - The National Sleep Foundation said that number was 87% in a 2006 poll
- What things are keeping teens from sleeping?
 - Electronics—97% of teens have at least one electronic item
 - Operating against their circadian rhythm (school start times)
 - Addictions—Phones, Gaming, Social Media, TV
 - Social events
 - Homework

- Source: Gregoire (2015) and Aspen Education Group (2011)

Sleep Deprivation Factors



- Prefrontal cortex and its underdevelopment in teens
 - Sleep deprivation is much like drinking alcohol
- Heightens an already high emotional response
- Even more prone to inappropriate behavior and paranoia
- More likely to battle depression and substance abuse
 - Each hour of sleep lost is associated with a 38% increased risk of feeling sad or hopeless and a 58% increase in suicide attempts in high school students
 - Research has shown that sleep difficulties predicted substancerelated issues
 - Teens who sleep an average of 6 hrs/night are 3x more likely to suffer from depression

- Source: Gregoire (2015)

Sleep Deprivation Factors



- Higher risk of diabetes and obesity in adulthood
- Dependence on sleep and anxiety medications
 12 times more likely to abuse those medications
- May appear as ADHD
 - ADHD cases have escalated in the digital age
 - More likely to be inattentive, impulsive, hyperactive and oppositional
- More at risk for drowsy driving accidents

Insufficient Sleep and Risk-Taking Behaviors



- The less sleep teens get, the higher the odds of risktaking behaviors
 - These behaviors preceded accidents, suicides, and teen violence
 - Sleep amounts are usually less than 6 hours per night
 - Increases in mental health concerns, substance abuse, and motor vehicle crashes
- Strongest associations were related to mood and selfharm

- Source: Brigham and Women's Hospital (2018)

Sleep in the School Shooters at Columbine



- Dylan Klebold's mother said in her book that Dylan's sleep patterns changed prior to the Columbine shooting
 - She reported he often appeared tired in the months leading up to the shooting
 - Dylan's calculus teacher told his parents that he sometimes fell asleep in class
 - Dylan was depressed in the months leading up to the shooting
- Eric Harris was taking Zoloft, then Luvox
 - Autopsy showed this in his system at time of death
 - Lawsuit stated he was obsessed with homicidal and suicidal thoughts from taking these medications
 - Had a nightmare three times about killing kids at school before Columbine
- Both shooters' brains were found to be awash in serotonin



-Source: Bollyn (2006) and Klebold (2016)

Sleep's Role in Depression



- Did the sleep changes trigger Klebold's depression?
 - Teens who don't get enough sleep are four times more likely to develop major depression
 - And if they are depressed, four times more likely to lose sleep
 - Was spending a lot more time on the computer in months prior to shooting
- Teens are a high risk group for depression
 - Less sleep due to homework, social activities, afterschool jobs, delayed sleep phase, technology addictions
 - Most times get prescribed anti-depressants, which complicate sleep problems further

- Source: Kryger, Roth, and Dement (2016)

How Has Technology Impacted Teen Sleep?



- Teens with 4 or more devices are twice as likely to fall asleep in school
- Technology has become main source of teen entertainment
- Tech addiction is highly prevalent in the teen population
- The bedroom has ceased to be the sleep zone
- Study of 125,000 kids shows "strong and consistent association between bedtime media-device use and inadequate sleep quantity, poor sleep quality, and EDS"
- We see a rise in school shootings correlating with the rise in the availability of portable electronics accessible to the teen population
- Greater social media use

⁻ Source: Aspen Education Group (2011) and Ism (2016)

Why Isn't Teen Sleep Deprivation Being Dealt with Effectively?





 Teen sleep deprivation can look very different from adults so signs get missed



How to Change the Statistics



- Sleep education to the major stakeholders—parents, school administrators, teachers, and the teens themselves
- Watching for and responding to abnormal behaviors
 - Keep in mind most of these shooters exhibited warning signs ahead of the act
 - Don't ignore the behaviors
- Monitor what teens are doing electronically
- Help teens develop healthy habits

In Conclusion



- Teen sleep deprivation is a growing problem
- School shooters have shown sleep disruptions in months prior to the school shootings, showing sleep issues can be a contributing factor
- Electronic availability is a contributing factor to teen sleep deprivation
- Education is needed to help remedy the problem





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