ProjectREST
Recovery Enhancement & Sleep Training

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Disclosure

Dr. Michael Grandner has a disclosed financial interest in FitBit that had no involvement in the work reported here. The terms of this arrangement have been properly disclosed to the University of Arizona and reviewed by the Institutional Review Committee in accordance with its conflict of interest policies.
Sleep is a problem for athletes

Many athletes don’t sleep well
- Overall poor sleep quality scores were about double of controls (5.0 vs 2.6) (Samuels et al)

Problems arise due to:
- Scheduling Constraints
- Travel and Jet Lag
- Training and Competition
- Over-Scheduling
- Beliefs and Attitudes About Sleep
- Increased Sleep Needs
Data from PAC12 report

66% of students indicated that lack of flexible time is the hardest thing about being an athlete, more than academic work.

Students say sleep is the #1 thing their athletic time commitments keep them from doing!

- 77% feel that they get less sleep than non-athletes
- When asked what they would do with an extra hour, >50% say “sleep”
- Some athletes report waking up at 5AM to get to practice on time
- Many students estimated they needed a 2-3 week break just to catch up on sleep and stress
- Students want non-practice hours extended to make more time for sleep and studying
Data from ACHA

33% have received information about sleep difficulties from their college or university.
  • 52% wish that their institution provided more information about sleep difficulties.
Only 3% have been diagnosed with an insomnia disorder and 2% have a history of another sleep disorder.
  • But 20% say that sleep difficulties have been “traumatic or very difficult to handle” in the past 12 months.
  • 28% report extreme difficulty falling asleep or early morning awakenings at least 3 times per week.

42% indicated that excessive sleepiness was “more than a little problem” including 16% that indicated that this was at least “a big problem”

92% reported excessive tiredness during the day at least once per week, with 61% reporting at least 3 times per week.

68% reported going to bed because they couldn’t maintain wakefulness at least once per week, with 33% reporting at least 3 times per week.

Sleep symptoms associated with increased likelihood of lower GPA (especially insomnia)
Sleep can impact performance

Men’s basketball players who increased sleep improved free throw % by 9.0%, 3-point % by 9.2%, and sprints 5% faster. (Mah et al 2011)

Tennis players who were sleep deprived saw serving accuracy decrease by 31%. (Reyner & Horne 2013)

75% of sleepy MLB players no longer in major leagues 2 years later. (Potenziano et al 2013)
Sleep, training, and recovery

People who don’t sleep well get injured more often and experience more accidents
  • Attention, Memory, Executive, and Psychomotor errors

Sleep is critical for recovery and repair
  • Sleep loss elevates cortisol and other stress hormones
  • Deep sleep is important for building and repairing muscle
  • Sleep is necessary for recovery from injury and training
  • Sufficient sleep is important to avoid “overtraining”
  • Studies have shown how sleep is important for regulating cells throughout the body, including the brain, heart, muscles, lungs, etc.
  • Sleep is also critical for forming and consolidating memories
Effects of sleep loss

If you are not getting enough sleep:
• Your reaction time is slowed down
• You get distracted more easily and can’t maintain focus
• It becomes difficult to process multiple pieces of information at once
• You are not able to think creatively
• Cannot make good decisions
• You can improve your reaction time a little with stimulants (like caffeine), but effects on decision making and other brain functions do not get better
  • Making bad decisions faster...
Sleep and mental health

Sleep is absolutely critical for emotion regulation.

Sleep problems are a major contributor to depression and anxiety disorders.

Sleep loss increases sensations of pain and increases feelings of disability.

Insomnia and lack of sleep are a major risk factor for suicide!
Developing interventions

How do you develop interventions in the context of athletics programs?
- Dealing with situational constraints
- Dealing with the complexities of working within an athletics system
- Disparate issues across sports and contexts
- Lack of evidence-based interventions geared towards athletics
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RECOVERY ENHANCEMENT & SLEEP TRAINING
Project REST

NCAA-funded research project:

1. Collect baseline data on a large number of student athletes to explore associations between sleep and mental and physical well-being.

2. Develop and implement a simple educational and peer-support intervention for sleep health and examine outcomes.

3. Explore the added benefit of an add-on, self-directed, circadian rhythm intervention.
Project REST (What we did)

- N=189 student athletes participated in a baseline survey that included questionnaires on sleep, health, mental well-being, stress, social functioning, and other factors.
- N=40 participated in an intervention period
  - 2-hour education and Q&A session
  - 24/7 access to peer and study support
  - 10 weeks of tracking with sleep diary and sleep tracker
  - Daily text message reminders
  - N=20 received extra tools (blue-blockers and light bulb)
Project REST (Sample)
Project REST (Survey results)

Sleep problems are highly prevalent
- 68% “poor sleep” on PSQI
- 43% get < 7 hours of sleep (87% ≤ 8 hours)
- 29% have sleep latency of ≥30 mins
- 28% have sleep efficiency <85%
- 12% moderate to high sleep apnea risk
- 12% with moderate-severe insomnia
- 23% excessive fatigue
- 17% drowsy driving in the past month
Project REST (Survey results)

Poor sleep quality associated with
- Depression (B=1.14, p<0.0001)
- Anxiety (B=0.79, p<0.0001)
- Stress (B=1.04, p<0.0001)
- Fewer healthy days (B=1.03, p<0.0001)
- Less support from
  - family (B=-0.31, p=0.014),
  - friends (B=-0.37, p=0.003),
  - significant-other (B=-0.33, p=0.022), and
  - teammates (B=-0.39, p=0.001)

Insomnia associated with
- Depression (B=0.85, p<0.0001)
- Anxiety (B=0.50, p<0.0001)
- Stress (B=0.78, p<0.0001)
- Fewer healthy days (B=0.60, p<0.0001)
- Less support from
  - family (B=-0.30, p<0.0001),
  - friends (B=-0.28, p<0.0001),
  - significant-other (B=-0.23, p=0.006), and
  - teammates (B=-0.33, p<0.0001)
- Less support from
  - family (B=-0.30, p<0.0001),
  - friends (B=-0.28, p<0.0001),
  - significant-other (B=-0.23, p=0.006), and
  - teammates (B=-0.33, p<0.0001)

Fatigue associated with
- Depression (B=0.31, p<0.0001)
- Anxiety (B=0.17, p<0.0001)
- Stress (B=0.24, p<0.0001)
- Fewer healthy days (B=0.19, p<0.0001)
- Less support from
  - family (B=-0.08, p=0.018) and
  - teammates (B=-0.10, p=0.003)

Longer sleep duration associated with
- Less depression (B=-1.85, p<0.0001)
- Less anxiety (B=-0.78, p=0.006)
- Less stress (B=-1.00, p=0.03)
- More support from family (B=0.93, p=0.005)

Not explained by stress alone
Project REST (Intervention results)

Observed pre-post changes:

- Reduced sleep latency (12mins, p=0.0002)
- Advanced waketime (32mins, p=0.033)
- Improved sleep quality score (1.3pts, p=0.04)
- Reduced insomnia score (3.5pts, p=0.0007)
- Lower anxiety score (1.6pts, p=0.025)
- Decreased drowsy driving (67%, p=0.009)
- Increased morning energy (19%, p=0.05)
- Increased evening energy (22%, p=0.027)
- Increased total energy level (16%, p=0.019)
Project REST (Intervention results)

Perceived changes in sleep:

- I know what to do if I am sleepy during the day (97.1%)
- My sleep timing is better (91.6%)
- I know what to do if I have trouble sleeping (85.7%)
- My sleep is better (82.9%)
- I am more satisfied with my sleep (82.9%)
- I fall asleep easier (77.1%)
- Awakenings at night are less of a problem (76.3%)
- I am more energized during the day (74.3%)
Project REST (Intervention results)

Perceived changes in other domains:

- Energy Level (91.4%)
- Athletic Performance (88.6%)
- Physical Health (85.7%)
- Ability to Focus (82.8%)
- Family Life (71.4%)
- Academic Performance (77.1%)
- Social Life (77.1%)
- Mental Health (77.1%)
- Stress (65.7%)
Thanks!

UA Athletics
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- REST Responders: Elizabeth Smith and Nancy Bowling

Sleep and Health Research Program
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Questions?

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