Project Notes:

Project Title: Point, Nap, and Match: The Impact of Nap Conditions on Table Tennis Performance
Name: Evan Cheng

Note Well: There are NO SHORT-cuts to reading journal articles and taking notes from them. Comprehension is paramount. You will most likely need to read it several times, so set aside enough time in your schedule.

Contents:

Commented [CK1]: 12/22/2024 20+2
Be consistent with adding vocab for your entries.
Double-check your APA citation format for patents #18 is incorrect in the paper referenced.
Keep your knowledge gaps and lit. Search parameters updated.

Commented [CK2]: 10/9/2024 6 full entries
Keep updating your knowledge gaps and lit. Search parameters.
Make sure you include detailed captions for future context.
Include vocab/definitions in your entries.
Check your citations for proper APA format.

Commented [3]: remember to share with Dr. C.

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KEEPING THIS UP-TO-DATE WILL HELP YOU when it comes time to write your thesis.

Knowledge Gaps:

This list provides a brief overview of the major knowledge gaps for this project, how they were resolved and where to find the information.

Knowledge Gap	Resolved By	Information is located	Date resolved
REM Sleep disorder	Online source(s)	https://www.mayoclinic.org/diseases-conditions/rem-sleep-behavior-disorder/symptoms-causes/syc-20352920	10/6/24

Commented [5]: Up date this page regularly as this can facilitate the writing process.

Commented [6]: Because this is a living document, you will be updating this table regularly, therefore it doesn't make sense to worry about organizing every time you open this sheet. Remember the A□Z Sort tool. You can sort based on how you resolved your issue, or you can choose a different organizational method. For example, you could add a column for date resolved and organize chronologically.

Commented [7]: Your notes file will grow as you continue to read. As a result, your page numbers might change. How do you ensure your references remain useful?
1. You could include enough information to find the notes page without a page number. Be careful of just using author names because you might have more than one source from the same first author. If you include title or full citation, that should be enough.
2. Insert a cross-reference
a. insert tab, cross-reference
b. If you choose this path DON'T FORGET TO UPDATE THE FIELDS before you submit or print

Literature Search Parameters:

These searches were performed between 08/18/24 and 12/18/24

Database/search engine	Keywords	Summary of search
Google/Edge	Sleep, performance	Found article 4 and 5
Science Direct	Pre-sleep-usage of technology	Found articles: 6, 7, and 8
Science Direct	circadian rhythm and sleep	Found article 9 & 10
Google/ Edge	Sleep-device -sleep-optimization	Found patents 1 and 2
Science Direct	Sleep-optimization	Found article 11 and 12
Science Direct	Sleep and athletic performance , sleep-optimization	Found articles 13-14
Google/ Science Direct	Sleep-enviroment, nap-enviroment, napping and performance, phone-usage before sleep	Found articles 16-20

Commented [8]: This can help you keep track of the searches you perform and what you searched for so that redundancy does not occur.

Commented [9]: This might seem like a silly addition, but if you read literature reviews or meta-analyses, you will notice this information is preserved. It is good practice to record how you found your information.

Tags:

Tag Name	
#Sleep	#Athletic-performance
#Circadian-rhythm	#light
#Sleep-optimization	#napping
#NappingAndPerformance	#Sleep and Performance

Article # Notes:

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Article notes should be on separate sheets

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Source Title	
Source citation (APA Format)	
Original URL	
Source type	
Keywords	
#Tags	
Summary of key points + notes (include methodology)	
Research Question/Problem/ Need	
Research Question/Problem/ Need	
Important Figures	
VOCAB: (w/definition)	
Cited references to follow up on	
Follow up Questions	

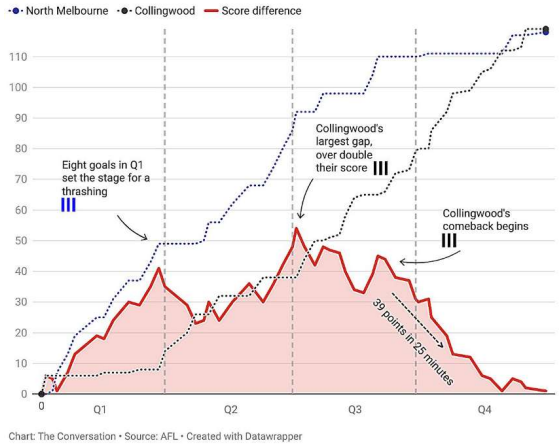
Commented [11]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #1 Notes: The mystery of the massive sporting comeback: What's the psychology of momentum in sports?

Commented [KC12]: Remember to take notes and summarize the work in your own words. Doing this upfront will help you avoid PLAGIARISM.

Article notes should be on separate sheets

Source Title	The mystery of the massive sporting comeback: What's the psychology of momentum in sports?
Source citation (APA Format)	Fox-Harding, C., & Conversation, T. (n.d.). *The mystery of the massive sporting comeback: What's the psychology of momentum in sports?* Retrieved October 11, 2024, from https://phys.org/news/2024-06-mystery-massive-sporting-comeback-psychology.html
Original URL	https://phys.org/news/2024-06-mystery-massive-sporting-comeback-psychology.html
Source type	Science News
Keywords	#Psychology, #Zone, #FlowState
#Tags	#Psychology, # Intro
Summary of key points + notes (include methodology)	The article, the mystery of the massive sporting comeback: What's the psychology of momentum in sports? by Caitlin Fox-Harding of The Conversation, defines the concept of psychological momentum in sports and how it is achieved. Psychological momentum is defined as a condition/state when teams or athletes are "in the zone and a flow state" simultaneously. Essentially, momentum is when teams or athletes can control the outcomes of their game or sport with great focus and seemingly, minimal effort. The article defines "being in the zone" as when athletes harmonize their emotions and efforts fostering the best or most efficient "play" in their sport (in others, they are playing at their best). Likewise, "being in a flow state" is defined by the article as when athletes can seemingly command or control their bodies with great power and comfort. The article states that the ability to influence the momentum of a game or match comes from consistent psychological development. Athletes have to be able to believe in themselves and their teammates, use previous success as fuel for more, and stay calm (mentally resilient) to make the correct decisions to win. By normalizing

	(through practice) success early on in a game, a match, or even a season, athletes can obtain the necessary momentum to win. Athletes practice this by amassing lessons from setbacks, and mental management that develop the necessary mental resilience. If they don't practice these things, it leads to failure such as demoralization of oneself and/or team. Finally, the article goes on to describe how a team can sway the 'hot streak' away from the opponent by utilizing important strategies such as using timeouts or changing to different tactics; teams on the verge of losing must find a way to interrupt the opponent's growing momentum. Connection to my idea: This article is highly relevant to my idea of researching how athletes can effectively manage their minds as every athlete and their team has been in some form of a setback during a game or match, so having the ability to stay in the 'zone' or 'flow' will put them back on track. From the article, it mentioned that momentum is a key factor in winning a game or match and is something that can be mastered. As a result, I have developed additional questions that can help drive my research; What are some ways athletes can develop the skill to overcome self-doubt and stay cool and confident in the face of pressure? How can a coach optimize their training to foster such mindsets/skills? What are the best practices for integrating mental skills training into an athlete's overall training regimen to optimize performance and mental resilience?
Research Question/Problem/ Need	How does momentum work?
Important Figures	**Magpies comeback against Kangaroos from 54 points down** The round 14 match is tied sixth biggest comeback in AFL history. The shaded area shows the score difference over time  Chart: The Conversation • Source: AFL • Created with Datawrapper

VOCAB: (w/definition)	"being in the zone" as when athletes harmonize their emotions and efforts fostering the best or most efficient "play" in their sport (in others, they are playing at their best). Likewise, "being in a flow state" is defined by the article as when athletes can seemingly command or control their bodies with great power and comfort.
Cited references to follow up on	
Follow up Questions	What are some ways athletes can develop the skill to overcome self-doubt and stay cool and confident in the face of pressure? How can a coach optimize their training to foster such mindsets/skills? What are the best practices for integrating mental skills training into an athlete's overall training regimen to optimize performance and mental resilience?

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Article #2 Notes: Mental preparation strategies of elite modern pentathletes

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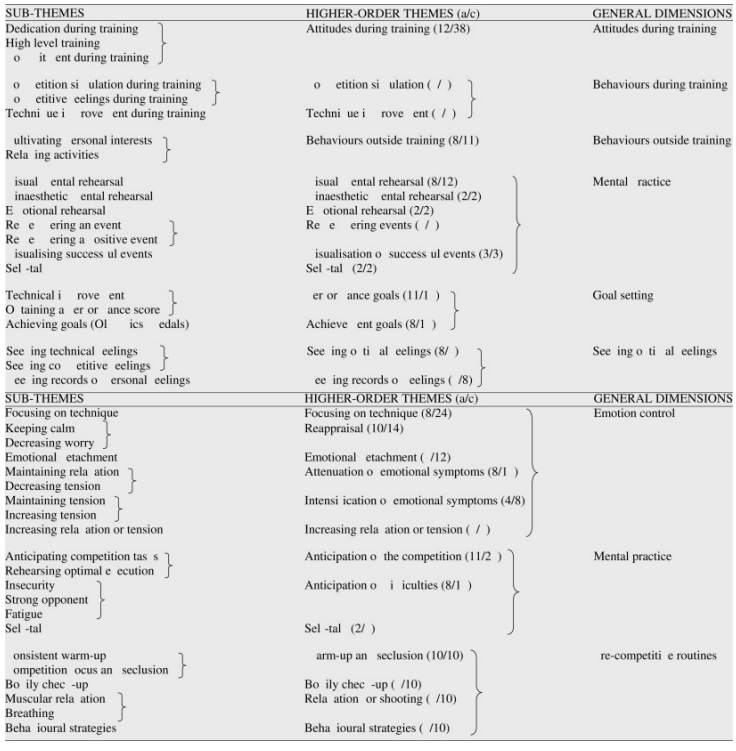
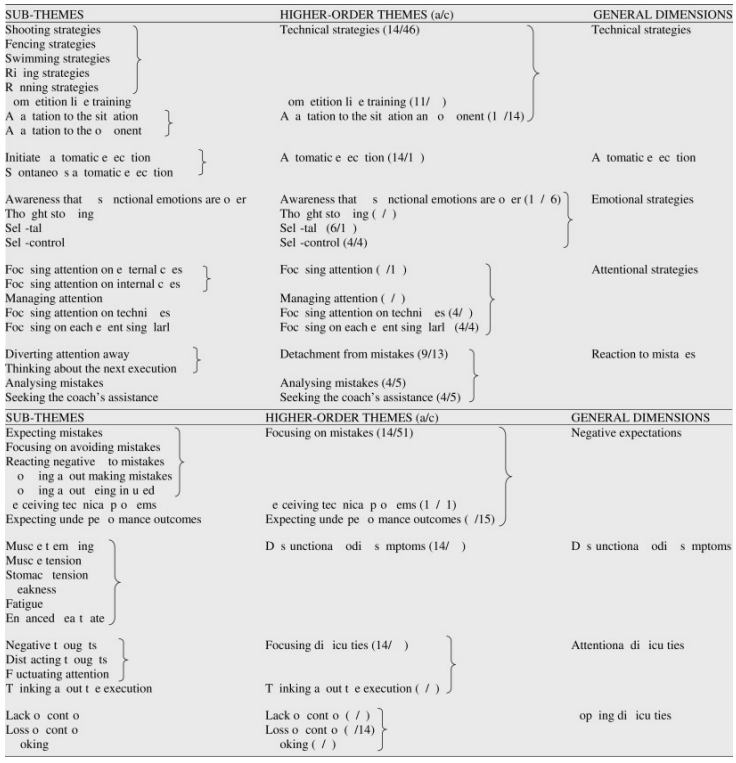
Article notes should be on separate sheets

Source Title	Mental preparation strategies of elite modern pentathletes
Source citation (APA Format)	Bertollo, M., Saltarelli, B., & Robazza, C. (2009a). Mental preparation strategies of elite modern pentathletes. *Psychology of Sport and Exercise*, 10(2), 244–254. https://doi.org/10.1016/j.psychsport.2008.09.003
Original URL	https://www.sciencedirect.com/science/article/pii/S0002961009005625#bib14
Source type	Journal Article
Keywords	Mental practice, Idiosyncratic strategies, coping responses, Pentathlon
#Tags	#survey, #methods, #strats
Summary of key points + notes (include methodology)	Based on survey responses from 14 members of the 2004 Italian National Pentathlon team (six women and eight men, who ranged in age from 21 to 33 years), the article explored how the athletes mentally prepared for and coped with the challenges of the modern pentathlon. To do so, researchers conducted in-depth and open-ended interviews with the athletes regarding their mental preparation strategies and behavior before competition at the intervals of days before, an hour prior, during, and after the competition. Before the event, while in training, athletes found it vital to 'treat training as if it were the actual competition', homing in on both quantity and quality in their practices to improve their readiness As one athlete explicitly said "I

	simulate the competition. There is no anxiety about the results because even if it goes wrong, it is only training." Additionally, the athletes utilized their mental imagery to picture themselves in action, whether that be in first person (they imagine what they will see, do, and feel) or third person (what others will see). Furthermore, the athletes also reminisced about past successes or tried to simulate their past emotions during competitions to prepare. In the hour preceding a competition, results showed four ways in which athletes handle their emotions; most of them changed their focus to the technical side of things and attempted to 'reimagine their situation' so they could 'put their pre-match emotions aside'; while few attempt to embrace their emotions to a level state where they could "relax and concentrate." Once more, the athletes were found to imagine themselves in action, this time, thinking about both success and failures (the difficulties of the competition), such as a strong opponent. They also used time for pre-competition routines to optimize physical and mental readiness by doing warm-ups, focusing, and imaging what is to come, essentially anything needed to get into the 'zone.' During the competition, the interviewees advocated for concentration on their techniques, and most strongly, advocated simulating the emotions they felt in practice to feel comfortable; However, they expressed that most importantly, they must adapt to their opponents and the situation. Additionally, the team mentioned reaching a state of "automaticity", where they 'aren't thinking, they're doing' to benefit their performance. The majority of the athletes also cited that they 'put aside their pre-game nerves or emotions and convince themselves that these emotions are gone.' Another way of live-coping strategy employed by them was positive self-talk, reinforcing confidence and thus, improving their performance more often than not. Most importantly, the athletes cited that they ensured that their focus was on the task at hand, not before, not after, but what was in front of them. Furthermore, this 'present mindset' is frequently adapted when athletes make errors or mistakes, making them divert from the past and onto the present. As for the cause of poor performance or concentration, several athletes cited that it was because of the effect of thinking about a past mistake, being distracted, over-thinking, or seeking too hard to resolve a problem; all of what was previously just said may cause dysfunctional bodily symptoms (i.e. increased heart rate, trembling), leading to poor performance. In the post-match interviews, the pentathletes were all in the same boat about assessing their performance as they aimed to find what was good, to identify their mistakes, why they happened, and to learn from them. Connection to my idea: The article describes the mental strategies of athletes to cope with the stresses of competition. Although these strategies were derived from the interviews of Pentathlon athletes, they can still apply

	to other sports players. Additionally, the Pentathlon athletes expressed the importance of simulating training as if it were the actual competition through visualization of their past and future actions, emotions, and feelings. By pretending to be in the situation of competition, players will be prepared to cope with the emotions that arise during the high-pressure moments of competition as they build resilience to the negative emotions thanks to experience.
Research Question/Problem/ Need	How do athletes prepare ahead of big games/events? What methods/mindsets do they set to do succeed?
Important Figures	

SUB-THEMES	HIGHER-ORDER THEMES (a/c)	GENERAL DIMENSIONS
Dedication during training High level training o it ent during training	Attitudes during training (12/38)	Attitudes during training
o etition si ulation during training o etitive eelings during training Techni ue i rove ent during training	o etition si ulation (/) Techni ue i rove ent (/)	Behaviours during training
ultivating ersonal interests Rela ing activities	Behaviours outside training (8/11)	Behaviours outside training
isual ental rehearsal inaesthetic ental rehearsal E otional rehearsal Re e ering an event Re e ering a ositive event isualising success ul events Sel -tal	isual ental rehearsal (8/12) inaesthetic ental rehearsal (2/2) E otional rehearsal (2/2) Re e ering events (/) isualisation o success ul events (3/3) Sel -tal (2/2)	Mental ractice
Technical i rove ent O taining a er or ance score Achieving goals (Ol ics edals)	er or ance goals (11/1) Achieve ent goals (8/1)	Goal setting
See ing technical eelings See ing co etitive eelings ee ing records o ersonal eelings	See ing o ti al eelings (8/) ee ing records o eelings (/8)	See ing o ti al eelings
SUB-THEMES	HIGHER-ORDER THEMES (a/c)	GENERAL DIMENSIONS
Focusing on technique Keeping calm Decreasing worry Emotional etachment Maintaining rela ation Decreasing tension Maintaining tension Increasing tension Increasing rela ation or tension	Focusing on technique (8/24) Reappraisal (10/14) Emotional etachment (/12) Attenuation o emotional symptoms (8/1) Intensi ication o emotional symptoms (4/8) Increasing rela ation or tension (/)	Emotion control
Anticipating competition tas s Rehearsing optimal e ecution Insecurity Strong opponent Fatigue Sel -tal	Anticipation o the competition (11/2) Anticipation o i iculties (8/1) Sel -tal (2/)	Mental practice
onsistent warm-up ompetition ocus an seclusion Bo ily chec -up Muscular rela ation Breathing Beha ioural strategies	arm-up an seclusion (10/10) Bo ily chec -up (/10) Rela ation or shooting (/10) Beha ioural strategies (/10)	re-competiti e routines



SUB-THEMES	HIGHER-ORDER THEMES (a/c)	GENERAL DIMENSIONS
Shooting strategies Fencing strategies Swimming strategies Ri ing strategies R nning strategies om etition li e training	Technical strategies (14/46) om etition li e training (11/)	Technical strategies
A a tation to the sit ation A a tation to the o onent	A a tation to the sit ation an o onent (1 /14)	
Initiate a tomatic e ec tion S ontaneo s a tomatic e ec tion	A tomatic e ec tion (14/1)	A tomatic e ec tion
Awareness that s nctional emotions are o er Tho ght sto ing Sel -tal Sel -control	Awareness that s nctional emotions are o er (1 / 6) Tho ght sto ing (/) Sel -tal (6/1) Sel -control (4/4)	Emotional strategies
Foc sing attention on e ternal c es Foc sing attention on internal c es	Foc sing attention (/1)	Attentional strategies
Managing attention Foc sing attention on techni es Foc sing on each e ent sing larl	Managing attention (/) Foc sing attention on techni es (4/) Foc sing on each e ent sing larl (4/4)	
Diverting attention away Thinking about the next execution	Detachment from mistakes (9/13)	Reaction to mista es
Analysing mistakes Seeking the coach's assistance	Analysing mistakes (4/5) Seeking the coach's assistance (4/5)	
SUB-THEMES	**HIGHER-ORDER THEMES (a/c)**	**GENERAL DIMENSIONS**
Expecting mistakes Focusing on avoiding mistakes Reacting negative to mistakes o ing a out making mistakes o ing a out eing in u ed	Focusing on mistakes (14/51)	Negative expectations
e ceiving tec nica p o ems	e ceiving tec nica p o ems (1 / 1)	
Expecting unde pe o mance outcomes	Expecting unde pe o mance outcomes (/15)	
Musc e t em ing Musc e tension Stomac tension eakness Fatigue En anced ea t ate	D s unctiona odi s mptoms (14/)	D s unctiona odi s mptoms
Negative t oug ts Dist acting t oug ts F uctuating attention	Focusing di icu ties (14/)	Attentiona di icu ties
T inking a out t e execution	T inking a out t e execution (/)	
Lack o cont o Loss o cont o oking	Lack o cont o (/) Loss o cont o (/14) oking (/)	op ing di icu ties

VOCAB: (w/definition)	Idiosyncratic: Of someone (a quality/behavior) that is thought to be strange or weird.
Cited references to follow up on	
Follow up Questions	Are these coping methods useful to other tasks? Are they used by other athletes? Perhaps even by normal people? Are these same strategies being used today?

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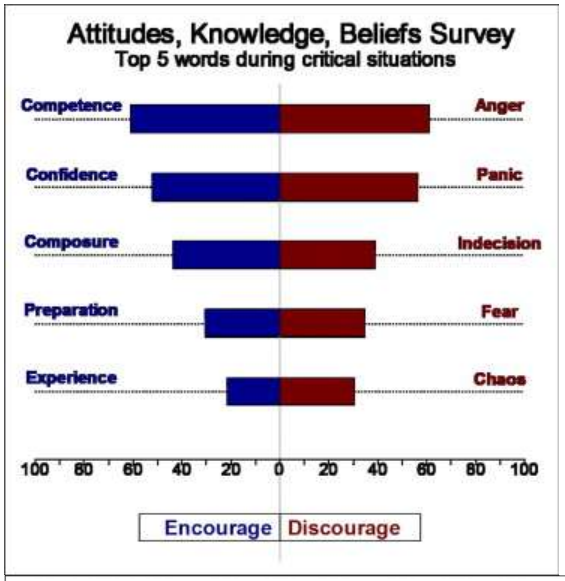
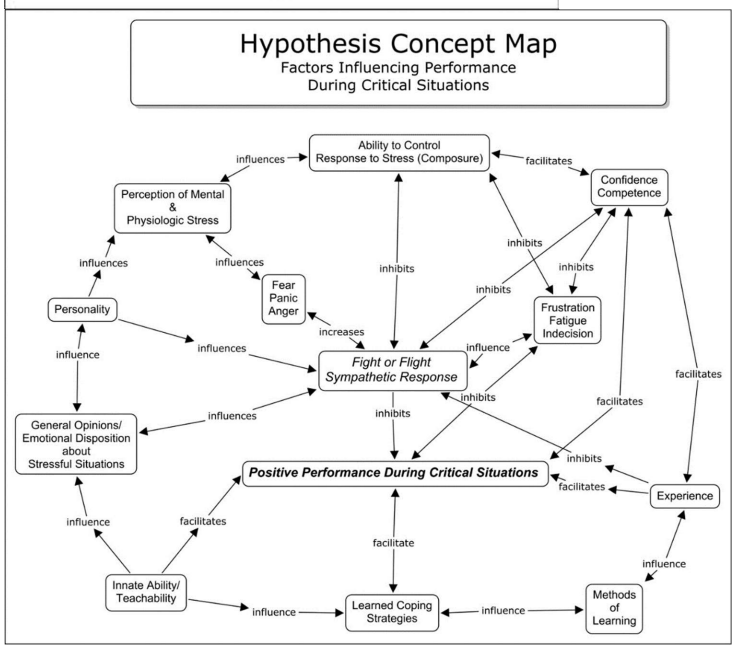
Article #3 Notes: Surgeons' performance during critical situations: Competence, confidence, and composure.

Commented [KC16]: Remember to take notes and summarize the work in your own words. Doing this upfront will help you avoid PLAGIARISM.

Article notes should be on separate sheets

Source Title	Surgeons' performance during critical situations: Competence, confidence, and composure.
Source citation (APA Format)	Wiggins-Dohlvik, K., Stewart, R. M., Babbitt, R. J., Gelfond, J., Zarzabal, L. A., & Willis, R. E. (2009). Surgeons' performance during critical situations: Competence, confidence, and composure. *The American Journal of Surgery*, *198*(6), 817–823. https://doi.org/10.1016/j.amjsurg.2009.04.030
Original URL	https://www.sciencedirect.com/science/article/pii/S0002961009005625#bib14
Source type	Journal Article
Keywords	Surgery, Stress, Critical situation, Performance under pressure, Surgeon performance
#Tags	#PerformanceUnderPressure, #Survey, #Methods
Summary of key points + notes (include methodology)	Summary of key points + notes (include methodology) This study aimed to understand how surgeons prepared and handled themselves to perform well under pressure through interviews with 26 surgeons from a single health institution. The interviews occurred over 3 months with 9 attending surgeons (73.1%) and 7 senior general surgical residents (26.9%) from various surgical specialties. Additionally, the interviews were structured, following a script consisting of 57 questions about attitudes, knowledge, beliefs, and coping mechanisms. Furthermore, open-ended questions were asked to gather qualitative data about their strategies to perform well. Interview results showed that the surgeons were generally confident and successful in their ability (96% of the surgeons). Similarly, 62% of the participants found surgeries unstressful and 56% of the surgeons were relaxed during critical situations. The survey also showed that surgeons valued practice and preparation ahead of their procedures (89%+ of surgeons); the surgeons focused on the technical details of procedures rather than the overall outcome (84%). In addition, surgeons were found to visualize before a crucial surgery (68%), though that strategy was used less during planned surgeries (89%). The interviewees were also asked to list the 3 most crucial and the 3 'worst' abilities and emotions a surgeon should have, which resulted in the following, competence, confidence, composure, preparation, and experience and the 3 'worst' abilities of anger, panic, indecision, fear, and chaos. In their personalized and open-ended section of the interviews, several common strategies were used to ensure performance which were the following: preparation, learning from experience, emotional control, environmental control, maintaining focus, maintaining order, and maintaining confidence and composure. From a surgeon's response about preparation, they advocated for

	careful planning, studying, and understanding the situation and mental rehearsal of the situation. In addition, a surgeon noted that over time in high-pressure circumstances they were able to learn from their mistakes to benefit themselves. Another surgeon empathized with the importance of deterring the "3 f-words of fear, frustration, and fatigue" (common traits of fight or flight response) to preserve adequate functionality through methods such as breathing, or focusing on the task at hand, working systematically. Likewise, the surgeons quoted for environmental control, maintaining focus, and restoring order mentioned working systematically; As the focus strategy quoted surgeon said "Putting your mind to what's currently in front of you removes stress." Finally, the surgeon quoted for confidence and composure encompassed most of the same qualities as mentioned earlier, as they advocated for a belief in one's skills, and maintaining a clear and calm mind to be successful. These findings align with research from other high-pressure fields, particularly athletics and aviation. Both emphasize the importance of preparation, mental rehearsal, and emotional control. The concept of "crew resource management" in aviation, which focuses on teamwork and communication is similar to the surgical setting. Connection to my idea: The article explained a few strategies and important traits that surgeons use and have to perform successful procedures under critical conditions. These strategies can be adopted for athletes to maintain their composure during crucial circumstances. For example, they could adopt the visualization of success before a presumed difficult opponent succeeds. Additionally, athletes could also attempt to find personalized methods that foster the 5 best crucial traits for a surgeon (competence, confidence, composure, preparation, and experience) to build on to become successful.
Research Question/Problem/ Need	How do surgeons handle or prepare for surgeries?

Important Figures	 
VOCAB: (w/definition)	

Cited references to follow up on	
Follow up Questions	How successful would these ideas be if they were applied to other fields of work? Would these results be like if this test/survey was run in the modern-day? Is following their advice really effective?

Commented [KC17]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #4 Notes: Coach-athlete relationship, social support, and sport-related psychological well-being in National Collegiate Athletic Association Division I student-athletes

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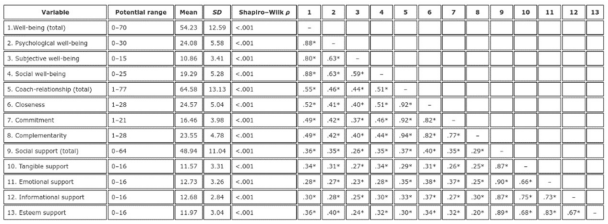
Article notes should be on separate sheets

Source Title	Coach-athlete relationship, social support, and sport-related psychological well-being in National Collegiate Athletic Association Division I student-athletes
Source citation (APA Format)	Simons, E. E., & Bird, M. D. (2023). Coach-athlete relationship, social support, and sport-related psychological well-being in National Collegiate Athletic Association Division I student-athletes. *Journal for the Study of Sports and Athletes in Education*, *17*(3), 191–210. https://doi.org/10.1080/19357397.2022.2060703
Original URL	https://www.tandfonline.com/doi/full/10.1080/19357397.2022.2060703#abstract
Source type	Journal Article
Keywords	Athlete stressors, coaching practices, coach support, college athletes, mental health, mental illness, support networks, university athletes
#Tags	#survey, #well-being, #coaching, #social-support
Summary of key points + notes (include methodology)	Mini summary: The study surveyed 151 Division I athletes on how they felt about their relationships with coaches and peers regarding their well-being. Survey results indicated that athletes with stronger bonds and support from coaches reported higher levels of well-being, while those with stronger commitment to the coach felt less happy. Similarly, peer support, especially esteem support, positively influenced athlete well-being, unlike emotional support which had the least reports of them all.
Research	How do the coach-and-athlete and social support relationships affect athletes'

Question/Problem/ Need	health?
Important Figures	 Shapiro-Wilk test note: $p < .001$ (no data is evenly distributed). Spearman's rank order-correlation: Closer to 1 or -1 = more correlated. A negative like –0.56 means a moderately correlated negative relationship.
VOCAB: (w/definition)	SD <- Standard Deviation: How much data varies from the average (of the data). A smaller SD means the data is closer to the mean, while a larger SD indicates data is farther.
Cited references to follow up on	
Follow up Questions	What specific coaching behaviors or coach styles are used in positive coach-athlete relationships and athlete well-being? What are the long-term effects of a positive coach-athlete relationship on athletes' mental health? How can coaches and peers reform their relationships with athletes to better accommodate them?

Commented [KC19]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #5 Notes: Sleep and Athletic Performance

Commented [KC20]: Remember to take notes and summarize the work in your own words. Doing this upfront will help you avoid PLAGIARISM.

Article notes should be on separate sheets

Source Title	Sleep and Athletic Performance
Source citation (APA Format)	Watson, A. M. (2017). Sleep and Athletic Performance. *Current Sports Medicine Reports*, *16*(6), 413. https://doi.org/10.1249/JSR.0000000000000418
Original URL	https://journals.lww.com/acsm-csmr/fulltext/2017/11000/sleep_and_athletic_performance.11.aspx?ref=healthtips.kr
Source type	Journal article
Keywords	#sleep, #athletic-performance,
#Tags	#Overlook-of-data, #Study, #Studies, #Cause, #Prevention
Summary of key points + notes (include methodology)	What is the central question? - How does sleep quantity and quality affect athletic performance? Why is this question important? - Understanding how sleep affects athletes' performance can help optimize their skills, training, and health. What data is needed to answer the question? -Sleep data: How many hours of sleep, how many hours of deep sleep, how many hours of light sleep. Performance data: Athletic performance tests after certain amounts of deep/light or hours of sleep in general. What methods are used to get the data? - Surveys, performance tests. What analysis must be applied for the data to answer the question? - Finding correlation/patterns supported by data. What were the results of the analysis - Found that the relationship between sleep and athletic performance was very strong; in general, more hours of sleep led to better results (in performance) while adversely, less hours of sleep led to bad results. What does this answer tell us about the broader field? This study advocates by

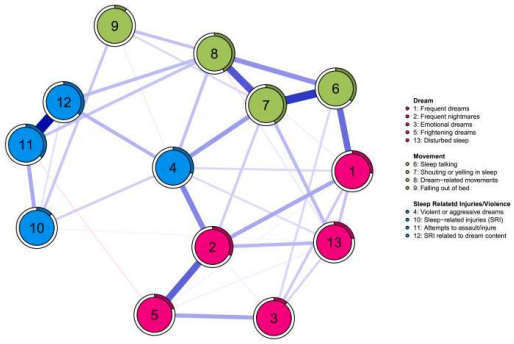
	proving evidence for more and better-quality sleep to perform well in athletics. This provides a heightened awareness, or a stronger belief in this idea, or even despite the focus on athletic performance in the power of good and plentiful sleep; furthermore, such idea can be applied to anyone trying to improve their lives and skills.
Research Question/Problem/ Need	How does sleep quantity and quality affect athletic performance?
Important Figures	N/A
VOCAB: (w/definition)	Wingate testing - 30-second test that measures an athlete's anaerobic capacity and muscular power: Neuromuscular fatigue - exercise-induced reduction in the force/power-generating capacity of a muscle or muscle group
Cited references to follow up on	
Follow up Questions	What determines bad sleep quality? How can one's sleep be affected for the worse? How can those factors be terminated/or minimized?

Commented [21]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #6 Notes: Network structure of REM sleep behavior disorder symptoms in iRBD patients

Article notes should be on separate sheets

Source Title	Network structure of REM sleep behavior disorder symptoms in iRBD patients
Source citation (APA Format)	Lee, M., Do, H. S., Hong, J. K., & Yoon, I.-Y. (2024). Network structure of REM sleep behavior disorder symptoms in iRBD patients. *Sleep Medicine*, *124*, 1–8. https://doi.org/10.1016/j.sleep.2024.08.033
Original URL	Network structure of REM sleep behavior disorder symptoms in iRBD patients - ScienceDirect
Source type	Journal Article
Keywords	REM sleep behavior disorder, Network analysis, REM sleep behavior disorder questionnaire Hong Kong (RBDQ-HK), Depression, Sleep quality
#Tags	#iRBDSymptoms, #REM-Sleep-behavior-disorder, #Sleep-disorders, #Polysomnography

Summary of key points + notes (include methodology)	Methodology: They used data gathered from the REM sleep behavior disorder Questionnaire Hong Kong (RBDQ-HK) to analyze and correlate IRBD symptoms with sleep quality and depression. 455 confirmed IRBD participants were included in the final analysis, although 505 patients were initially signed up. The study divided iRBD symptoms into 3 categories: Dream (e.g., frequent, frightening dreams), Movement (e.g., shouting, talking, dream enactment) Sleep-related injury (SRI)/violence dimension (e.g., violent dreams, attempts to injure). Then a Network of the RBDQ-HK in patients with iRBD was created. The study then used the following data analysis techniques/methods: Exploratory Graph Analysis (EGA), Bridge Expected Influence (BEI), multivariate linear regression. They found that the central symptoms in the iRBD network were “dream-enacting movements”, "shouting or yelling in sleep”, and "sleep talking." Additioanlly, “Violent or aggressive dreams" was identified as the symptom that connected different dimensions of the disorder. Finally, the study was able to correlate depression and sleep quality, citing that depression was linked to the dream and movement category and sleep quality primarily affected the dream dimension. The dream dimension was found to be positively correlated with depression and poor sleep quality, according to multiple linear regression analysis. On the other hand, the SRI/violence dimension was found to be more common in men and negatively correlated with sleep apnea.
Research Question/Problem/ Need	How do the symptoms of iRBD (isolated REM Sleep Behavior Disorder) relate to sleep quality and depression?
Important Figures	 Fig. 1. Network of the RBDQ-HK in patients with iRBD. (N = 455). Blue edges represent positive relationships and red edges indicate negative relationships. The colored ring shows the proportion of explained variance.

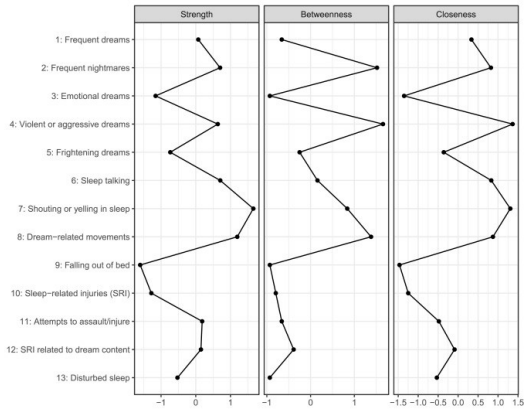


Fig. 2. Centrality indices of the RBDQ-HK network.

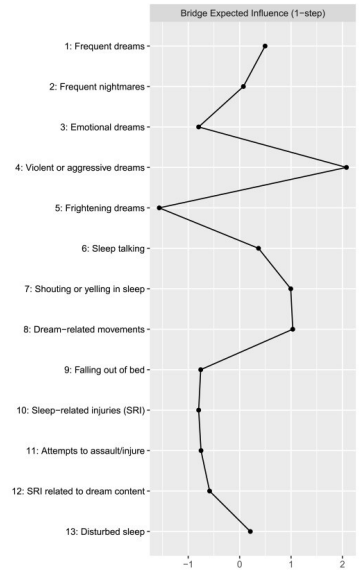


Fig. 3. Bridge expected influence of the RBDQ-HK network

Table 2. Correlation between various variables and RBDQ-HK dimension scores in patients with iRBD.

Empty Cell	**B**	**SE**	**β**	**T**	***p***
Movement					
(intercept)	20.07	3.05		6.57	**<0.001***

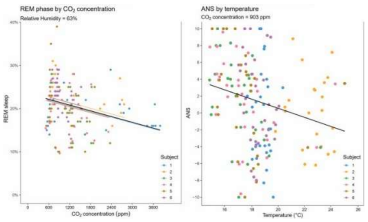
Sex	1.32	0.73	0.09	1.81	0.071
PSQI	0.12	0.09	0.07	1.28	0.201
Age	−0.02	0.04	−0.02	−0.45	0.653
AHI	−0.05	0.03	−0.08	−1.68	0.093
GDS	0.13	0.06	0.11	2.25	**0.025***
R(0.183), R^2_{adj} = 0.023, p = 0.009, Durbin-watson(1.958)					
SRI/violence					
(intercept)	9.17	2.56		3.58	**<0.001***
Sex	3.57	0.61	0.28	5.85	**<0.001***
PSQI	−0.05	0.08	−0.03	−0.65	0.516
Age	−0.02	0.04	−0.03	−0.63	0.528
AHI	−0.07	0.02	−0.13	−2.85	**0.005***
GDS	0.07	0.05	0.07	1.41	0.158
R(0.289), R^2_{adj} = 0.083, p < 0.001, Durbin-watson(1.827)					
Dream					
(intercept)	7.34	2.05		3.57	**<0.001***
Sex	−0.28	0.49	−0.03	−0.58	0.565
PSQI	0.38	0.06	0.29	6.04	**<0.001***
Age	0.00	0.03	0.00	−0.02	0.982
AHI	−0.02	0.02	−0.06	−1.23	0.218
GDS	0.12	0.04	0.15	3.17	**0.002***
R(0.390), R^2_{adj} = 0.143, p < 0.001, Durbin-watson(1.892)					
RBDQ-HK					
(intercept)	36.57	5.93		6.17	**<0.001***
Sex	4.60	1.41	0.15	3.26	**0.001***
PSQI	0.45	0.18	0.12	2.47	**0.014***
Age	−0.04	0.08	−0.02	−0.51	0.609
AHI	−0.13	0.05	−0.12	−2.52	**0.012***

	GDS | 0.32 | 0.11 0.14 | 2.87 | **0.004*** R(0.275), R^2_{adj} = 0.065, p < 0.001, Durbin-watson(1.867). Multiple linear regression included sex, Pittsburgh Sleep Quality Index (PSQI), age, apnea-hypopnea index (AHI), and Geriatric Depression Scale (GDS) as covariates. iRBD: isolated REM sleep behavior disorder. *p*-values reaching statistical significance are shown in bold font. * Indicates $p < 0.05$.
VOCAB: (w/definition)	Dichotomous - Of two things that are opposing or completely different things or divided. Electrodes- a solid electric conductor which passes electric currents into non-metallic things (solids, liquids, gases, plasmas).
Cited references to follow up on	
Follow up Questions	How reliable is the RBDQ-HK in predicting long-term outcomes for iRBD patients compared to other diagnostic tools like polysomnography? Are there any lifestyle factors (e.g., diet, exercise, or stress management) that correlate with improved outcomes in iRBD patients? How do sleep apnea and other co-existing sleep disorders complicate the management of iRBD symptoms?

Commented [22]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #7 Notes: Effect of bedroom environment on sleep and physiological parameters for individuals with good sleep quality: A pilot study
Article notes should be on separate sheets

Source Title	Effect of bedroom environment on sleep and physiological parameters for individuals with good sleep quality: A pilot study
Source citation (APA Format)	Buonanno, G., Canale, L., Solomon, M. T., Smith, M. G., & Stabile, L. (2024). Effect of bedroom environment on sleep and physiological parameters for individuals with good sleep quality: A pilot study. *Building and Environment*, *265*, 111994. https://doi.org/10.1016/j.buildenv.2024.111994
Original URL	Effect of bedroom environment on sleep and physiological parameters for individuals with good sleep quality: A pilot study
Source type	Journal Article

Keywords	Sleep quality, CO2, Sleep efficiency, Autonomic nervous system, Actigraph, Relative humidity
#Tags	#Sleep quality, #Physical-paramters, #Phyiscological-factors
Summary of key points + notes (include methodology)	Impact on Sleep Quality: Bedroom conditions, including temperature, humidity, and CO2 levels, significantly influence sleep quality. A 100 ppm increase in CO2 leads to a 0.29% decline in sleep quality. A 1°C rise in temperature results in a 0.16% reduction in sleep efficiency. Methodology: The study involved six participants with good sleep quality. -> 12 Were originally measured however half of the participants' data was not usable, and therefore excluded from the study (4 had technical issues, 2 had technical issues). Measurements included temperature, humidity, CO2, and pressure using air quality monitors. Sleep parameters were tracked using advanced actigraphs. Statistical Analysis: Linear Mixed Models were used to analyze the data, accounting for individual differences and repeated measures. Significance: Optimal bedroom conditions are crucial for enhancing sleep quality and overall well-being.
Research Question/Problem/ Need	How do bedroom environmental factors affect physiological parameters in people with good sleep quality?
Important Figures	 Fig. 1. – REM sleep duration values of the six subjects under investigation as a function of CO2 concentration measured in the bedrooms at the median RH value (63 %) (a) and ANS values of the six subjects under investigation as a function of temperature measured in the bedrooms at the median CO2 concentration (903 ppm).

Variable	Type	Description	Rescaled
SS	Response	Sleep score, calculated through the actigraph's closed-source algorithm, based on movements and the heart's beat-to-beat interval	no
WASO	Response	Wake after sleep onset, defined as the total number of minutes of night-time sleep interruption compared to overall sleep duration (%)	no
HRV	Response	Heart rate variability (ms)	yes
ANS	Response	Autonomic nervous system status	no
REM	Response	REM sleep, defined as the total number of minutes of night-time spent in REM sleep compared to overall sleep duration (%)	no
SWS	Response	Slow wave sleep, defined as the total number of minutes of night-time spent in deep or N3 sleep compared to overall sleep duration (%)	no
HR	Response	Heart rate (bpm)	yes
BR	Response	Breathing rate (breath/min)	yes
SE	Response	Sleep efficiency, defined as the ratio of time spent asleep to the total time spent in bed (%)	no
CO_2	Explanatory	Average carbon dioxide concentration (ppm)	yes
T	Explanatory	Average indoor air temperature (°C)	yes
RH	Explanatory	Average indoor relative humidity (%)	no
subject	Random	Subject	no

Chart representing the variables measured, their types, and whether they were rescaled or not for data analysis. If they were rescaled, then it was variable divided by the overall average for that particular variable (sample).

Subject	Environmental parameters				Sleep parameters					Physiological parameters		
	CO_2 (ppm)	T (°C)	RH (%)	pressure (hPa)	SS	SE (%)	WASO (min)	REM (%)	SWS (%)	BR (breath/min)	HR (bpm)	HRV (ms)
1 (male, 18y)	765 (566–3664)	19 (18–20)	65 (54–72)	1011 (1003–1016)	70 (59–82)	94 (92–97)	10 (3–20)	21 (15–26)	19 (12–27)	14.3 (13.7–14.7)	74 (70–78)	63 (48–78)
2 (male, 27y)	1011 (630–2703)	21 (22–24)	64 (57–69)	1009 (1001–1013)	72 (59–83)	93 (91–96)	11 (6–18)	23 (17–30)	18 (13–23)	14.4 (14.1–15.1)	51 (49–54)	67 (59–78)
3 (male, 34y)	1092 (624–1829)	18 (17–22)	63 (44–68)	1010 (998–1018)	80 (72–89)	96 (94–97)	4 (2–12)	21 (11–27)	17 (9–26)	12.9 (12.2–13.9)	55 (51–57)	54 (47–84)
4 (female, 46y)	1076 (611–1866)	19 (18–23)	62 (43–69)	1015 (999–1019)	80 (71–86)	96 (93–97)	4 (2–11)	21 (10–28)	16 (9–25)	12.9 (12.2–14.3)	56 (49–59)	55 (47–82)
5 (male, 55y)	1063 (617–1901)	17 (15–20)	61 (43–69)	1010 (998–1018)	81 (67–88)	96 (94–97)	5 (2–12)	21 (11–32)	17 (9–26)	12.9 (12.2–14.0)	54 (51–58)	55 (40–84)
6 (female, 60y)	981 (744–1369)	18 (17–20)	65 (57–76)	1009 (1001–1016)	88 (79–94)	96 (95–97)	5 (2–12)	23 (16–29)	16 (10–24)	14.9 (14.4–15.1)	56 (52–59)	43 (29–64)
Entire sample	903 (614–2714)	18 (15–23)	63 (46–73)	1010 (999–1016)	79 (63–92)	96 (92–97)	6.0 (2.0–17.2)	21 (11–29)	17 (9–26)	13.8 (12.2–15.0)	54 (50–76)	43 (29–64)

Table 2. Environmental parameters measured in bedrooms, sleep parameters, and physiological parameters measured for each subject involved in the study. Data are reported as median values and corresponding 5th-95th percentile range (in brackets). <- Table of data recorded.

VOCAB: (w/definition)

ANS - Automated Nervous System - This is the part of the body system that does the functions of the human body naturally without needing training; for example breathing is considered a function conducted by the ANS.
HRV - Heart rate variability (HRV) is a measure of the variation in time between heartbeats.

	PPM - Parts per million which is just a measurement of the concentration of a substance in a specific solution/mixture.
Cited references to follow up on	
Follow up Questions	What does this mean? How can the results of this study be applied for implications? Are there currently any devices made that adjust these environmental parameters?

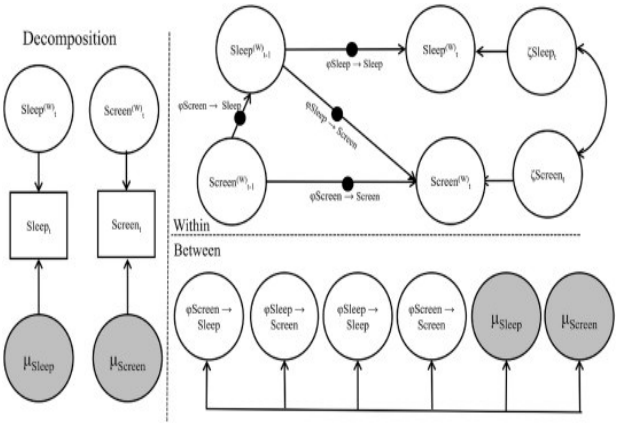
Commented [KC23]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Last Name 24

Article #8 Notes: Investigation of bi-directional relations between pre-sleep electronic media use and sleep: A seven-day dairy study

Article notes should be on separate sheets

Source Title	Investigation of bi-directional relations between pre-sleep electronic media use and sleep: A seven-day dairy study
Source citation (APA Format)	Li, Y., Chen, Q., He, M., Li, S., Chen, Y., Ru, T., & Zhou, G. (2024). Investigation of bi-directional relations between pre-sleep electronic media use and sleep: A seven-day dairy study. *Computers in Human Behavior, 161*, 108423. https://doi.org/10.1016/j.chb.2024.108423
Original URL	https://www.sciencedirect.com/science/article/pii/S0747563224002917
Source type	Research Article
Keywords	Pre-sleep electronic media use, Screen activities, Sleep Bi-directional relations
#Tags	#Survey, #Sleep-evaluation, #Technology-Effects-Sleep
Summary of key points +	The study was conducted in China. About 88 local Chinese college students participated in this study via an online survey for seven straight

notes (include methodology)	days. These were the following type of questions asked in the daily surveys: Questions about sleep (bedtime, time taken attempting to sleep bedtime, , sleep onset latency, awakenings, sleep offset time, the time out of bed, and sleep quality of the previous night) Questions about Pre-sleep screen usage in the 2 hours before sleep (i.e., minutes spent using/watching a technology, time spent on specific screen activities such as m/films/series (including streaming services), gaming, etc.). Questions about Pre-sleep cognitive arousal (Asked about the severity of four symptoms of cognitive arousal ("Worrying about problems other than sleep?", "Unable to shut off your thoughts?", "Having thoughts that kept racing through your head?", and "Feeling mentally alert, active?") before the moment they attempted to fall asleep. . Results: No cross-lagged link between evening screen time and sleep outcomes was found. Active social media use predicts delayed sleep onset within person.TV watching, social media, and shopping delay sleep onset between person.TV watching, non-work internet, and shopping reduce sleep duration between person.
Research Question/Problem/ Need	How does pre-sleep usage of technology affect sleep?
Important Figures	 Fig. 1. Multilevel cross-lagged autoregressive model for pre-sleep screen time and nighttime sleep. The left part decomposes within-person (time-varying) and between-person (time-invariant) components. The top right contains the within-person level model, a first-order vector autoregressive (VAR (1)) model. The bottom right contains the between-person level model, which includes the

between-person components from the decomposition, as well as all the random effects of the model, corresponding to the solid black circles in the within-person level model. ζ indicates the residuals.

Table 1. Standardized Coefficients in the linear mixed-effects model (LMM) of all screen activities predicting Sleep onset time at the within level.

Predictor	β	p	Confidence interval	F	df	partial R^2
Gender	0.07	0.51	[-0.15, 0.29]	0.43	72.75	0.001
Age	0.06	0.60	[-0.15, 0.27]	0.28	72.25	0.001
PSQI	0.02	0.85	[-0.20, 0.24]	0.03	72.26	<0.001
SJL	−0.003	0.98	[-0.22, 0.22]	<0.001	72.15	<0.001
Sleepiness	0.04	0.32	[-0.04, 0.12]	1	450.08	0.002
Happy	−0.03	0.43	[-0.09, 0.04]	0.63	460.89	0.001
Energetic	0.08	0.11	[-0.02, 0.17]	2.59	454.53	0.006
Day	0.021	0.32	[-0.02, 0.06]	1.01	436.32	0.002
Within-Watching TV, video	0.027	0.25	[-0.02, 0.07]	1.32	436.30	0.003
Within-Gaming	0.006	0.79	[-0.04, 0.05]	0.07	436.37	<0.001
Within-Working/studying	0.001	0.95	[-0.05, 0.05]	<0.001	436.22	<0.001
Within-Social media use	−0.02	0.43	[-0.07, 0.03]	0.62	436.21	0.001
Within-Active SMU	0.05	**0.03**	[0.01, 0.10]	4.89	436.35	0.011
Within-Browsing the internet	0.03	0.20	[-0.02, 0.07]	1.66	436.37	0.004
Within-Shopping	−0.02	0.34	[-0.06, 0.02]	0.91	436.40	0.002

Table 2. Standardized Coefficients in the linear mixed-effects model (LMM) of all screen activities predicting Sleep latency at the within level.

Predictor	β	p	Confidence interval	F	df	partial R^2
Gender	0.07	0.50	[-0.12, 0.25]	0.47	74.22	0.001
Age	0.08	0.38	[-0.10, 0.27]	0.79	72.85	0.002
PSQI	0.004	0.97	[-0.19, 0.19]	<0.001	73.07	<0.001
SJL	−0.01	0.93	[-0.20, 0.18]	0.01	72.54	<0.001
Sleepiness	−0.03	0.60	[-0.15, 0.09]	0.28	466.00	0.001
Happy	0.12	0.01	[0.03, 0.21]	6.91	486.20	0.015
Energetic	−0.08	0.22	[-0.21, 0.05]	1.50	473.20	0.003
Day	−0.06	0.05	[-0.12, 0.001]	3.74	431.59	0.008
Within-Watching TV, video	−0.02	0.62	[-0.09, 0.05]	0.24	431.88	0.001
Within-Gaming	−0.03	0.42	[-0.09, 0.04]	0.65	431.44	0.001
Within-Working/studying	0.001	0.99	[-0.07, 0.07]	<0.001	431.22	<0.001
Within-Social media use	0.01	0.83	[-0.07, 0.08]	0.04	431.78	<0.001
Within-Active SMU	−0.02	0.65	[-0.09, 0.05]	0.21	431.85	<0.001
Within-Browsing the internet	−0.07	**0.04**	[-0.13, −0.004]	4.43	431.45	0.01
Within-Shopping	−0.01	0.75	[-0.07, 0.05]	0.11	432.81	<0.001

VOCAB: (w/definition)

Sleep-onset latency - Amount of time it takes to fully fall asleep from full-consciousness.

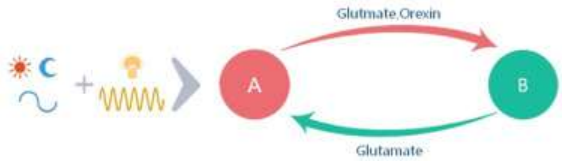
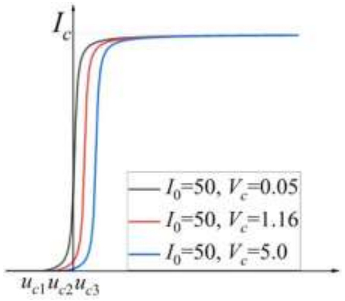
Cited references to follow up on	
Follow up Questions	What could be possible solutions to those causes of bad sleep? How many hours before bed does pre-sleep technology use have an effect(s)? What would the data look if environmental factors were also factored/studied as well?

Commented [KC24]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Cheng

Article #9 notes: How lights affect the circadian rhythm in sleep-awake circle

Source Title	How lights affect the circadian rhythm in sleep-awake circle
Source citation (APA Format)	Li, X., & Xu, Y. (2024). How lights affect the circadian rhythm in sleep-awake circle. *Chinese Journal of Physics, 91*, 719–733. https://doi.org/10.1016/j.cjph.2024.08.016
Original URL	https://www.sciencedirect.com/science/article/pii/S0577907324003162
Source type	Research paper
Keywords	Neural activities, Excitability, Light-sensitive neuron, Photocurrent
#Tags	#circadian rhythm, #circadian-rhytm-and-sleep, #light
Summary of key points + notes (include methodology)	Neuron Model: The study uses an enhanced Hodgkin-Huxley neuron model that incorporates photocurrent activation to simulate how external light influences neural dynamics. Photocurrent Mechanism: Light generates photocurrent through phototubes, with the model taking into account the photoelectric effect. The strength and frequency of light alter the firing patterns of neurons. Neuron Synchronization: Neurons within a network can synchronize their firing, influenced by the coupling strength and the presence of light signals. Proper tuning of coupling parameters can enhance synchronization in response to external light. High-Frequency Light Effects: High-frequency light causes a greater increase in neuron excitability compared to low-frequency light, especially blue light, which is more disruptive to the sleep-wake cycle.

	Applications for Sleep Disorders: Findings suggest that controlled electromagnetic radiation, such as light stimuli, may help prevent or treat sleep disorders by optimizing neural responses. Simulations: The study uses numerical simulations to demonstrate that light intensity and frequency significantly affect neuron firing patterns, with high-intensity light promoting neuronal activity and disrupting sleep. Findings: Strong and high-frequency light can impair the circadian rhythm by affecting neural activity, which regulates the sleep-wake cycle.
Research Question/Problem/ Need	How does light affect the circadian rhythm?
Important Figures	 Fig. 1. A light-dependent neural network coupled with phototubes is developed for regulating the sleep-wake cycle. The A neuron is affected by glutamate (Glu) and orexin (ox) synaptic current, circadian rhythm, or external light input signal, and the B neuron is affected by ox homeostasis.  Fig. 6. The saturation current curves of external light with the same intensity but different frequencies. Here, Ih=78, I0=50, Vc=0.05 (black line),Vc=1.16 (red line) and Vc=5.0 (blue line). The smaller the parameter Vc, the greater the cut-off voltage (the more negative). A brighter light source produces more photons when the incident light frequency is held constant, which increases the saturation current. The applied voltage has no effect on this saturation current. As seen by the curves in Fig. 6, the saturation current stays constant due to the constant light intensity.

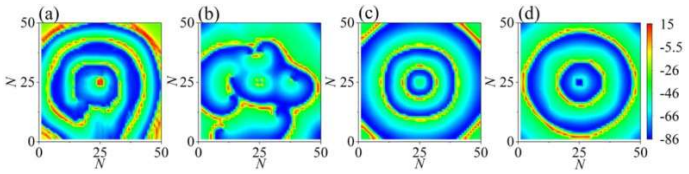


Fig 16. At indices i, j = (24, 26), external light stimulation is delivered to the core portion of the network to regulate the light signal on the system. The spiral wave's creation and elimination process with light stimulation at I0=50, Vc=0.01, and Ih=78 are depicted in the picture. This graphic shows how the development process resembles that in the absence of external light stimulation, however the spiral wave's tip disappears after five seconds. We found that the spiral wave gradually transitions into turbulent states, peaking at 10 s, and is thereafter effectively repressed. Within the system, the spiral wave rupture may be seen when the light intensity is high enough. In neural networks, spiral wave creation and propagation are insensitive to low light levels.light stimuli. In the emergence of the second circadian rhythm, the difference in beginning value is neglected, and light signals have the primary influence on the construction of system patterns.

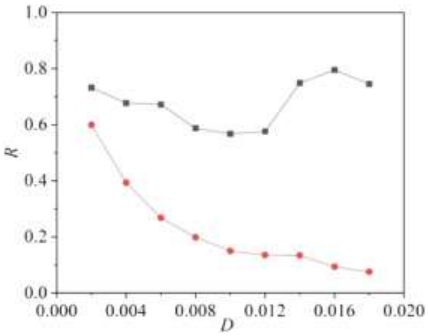


Fig 17. It was discovered that the system impacted by the light signal had an ordered target wave. Fig. 17 shows the distribution of the synchronization factor R on coupling strength D. R varies somewhat as D rises from 0.002 to 0.02, but stabilizes at 0.8 when no external light stimulus is present. However, as the coupling intensity increases in the presence of external light, the neural system's synchronization factor drops. This implies that the formation of ordered target waves in the neural network is encouraged by a suitably selected coupling strength. Based on the aforementioned findings, it is possible to control the dynamic behavior of the entire system by carefully choosing the control region's size and location.

VOCAB: (w/definition)	Circadian rhythm – The 24-hour natural, internal clock in our brain that

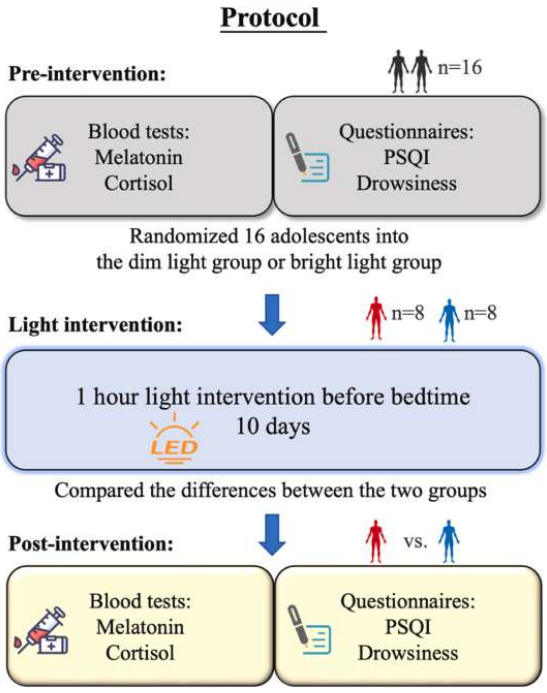
	controls alertness and sleepiness Photocurrent- an electric current induced by the action of light. Homeostasis – the natural tendency of an organism to maintain a stable internal state.
Cited references to follow up on	
Follow up Questions	How can/does unnatural light (blue light emitted from technology) affect human circadian rhythms and overall sleep quality in both the long term and short term? How do different light colors affect sleep in general?

Commented [25]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #10 notes: Optimizing residential light environments in simulated youth Olympic village for improving young athletes' sleep quality and reducing next-morning drowsiness

Source Title	Optimizing residential light environments in simulated youth Olympic village for improving young athletes' sleep quality and reducing next-morning drowsiness
Source citation (APA Format)	Wen, P., Tan, F., Li, S., Lei, M., Chen, H., & Hu, X. (2024). Optimizing residential light environments in simulated youth Olympic village for improving young athletes' sleep quality and reducing next-morning drowsiness. *Building and Environment, 261*, 111749–111749. https://doi.org/10.1016/j.buildenv.2024.111749
Original URL	https://www.sciencedirect.com/science/article/pii/S0360132324005912
Source type	Journal Article
Keywords	Residential light environment Illuminance Low correlated color temperature Sleep quality Morning drowsiness Youth Olympic village

#Tags	#Athletes, #Sleep-Enviroment
Summary of key points + notes (include methodology)	Methodology Study Design: 17-day randomized controlled trial. Groups: 16 young male athletes (12.3 ± 2.1 years) were divided into two groups: Dim light group: 160 lx Bright light group: 200 lx Both groups exposed to low CCT light (2000 K) 1 hour before bedtime for 10 days following a 7-day baseline. Environment: Simulated Youth Olympic Village with controlled schedules, diets, and activities. Measurements: Subjective: Pittsburgh Sleep Quality Index (PSQI) for sleep quality and next-morning drowsiness. Objective: Blood tests measuring melatonin and cortisol levels. Analysis: Non-parametric tests (Mann-Whitney U, Wilcoxon) using SPSS software. Key Takeaways Sleep Quality: The dim light group showed significant improvement in sleep quality post-intervention ($p = 0.018$). Bright light group showed no significant changes ($p = 0.257$). Next-Morning Drowsiness: Dim light group had less morning drowsiness, with a significant difference compared to the bright light group ($p = 0.012$). Melatonin Levels: Dim light group exhibited a significant decrease in morning melatonin ($p = 0.012$), correlating with reduced drowsiness. Bright light group showed no significant change. Cortisol Levels: Higher cortisol levels in the dim light group ($p = 0.027$), indicating better morning alertness. Conclusion:

	Lower evening illuminance (160 lx) in low CCT light environments improves sleep quality and reduces next-morning drowsiness compared to higher illuminance (200 lx).
Research Question/Problem/ Need	How do low correlated color temperature (CCT) light environments with varying illuminance levels affect sleep quality and next-morning drowsiness in young athletes?
Important Figures	 Fig. 3. A visual image of the experimental process of the 17-day study protocol.

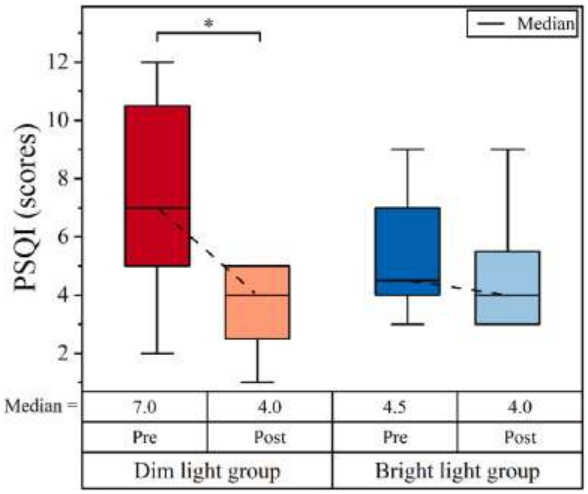


Fig. 4. The results of the PSQI. The sleep quality of the dim light group was significantly improved after the light intervention (p = 0.018). The sleep quality of the bright light group slightly increased but there was no significant difference (p = 0.257). The dim light environment improved sleep quality.

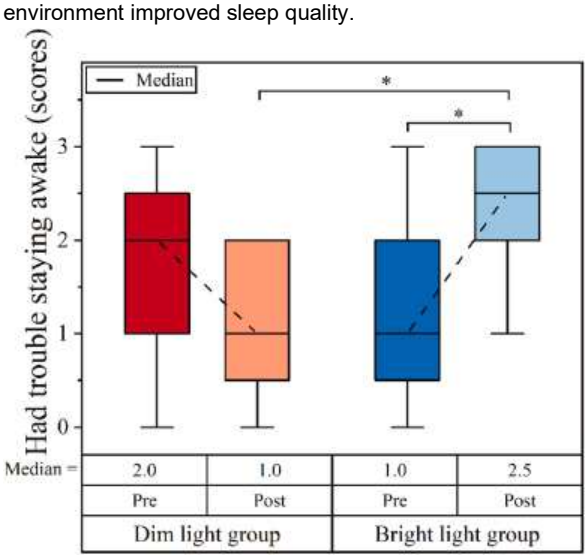


Fig. 5. The results of the morning drowsiness. The drowsiness of the dim light group was slightly decreased after the light intervention (p = 0.157), but the bright light group was significantly increased (p =

0.024). Post-intervention, a significant disparity between groups was evident (p = 0.012). The young athletes had less morning drowsiness when they stayed in the dim light environment in the evening.

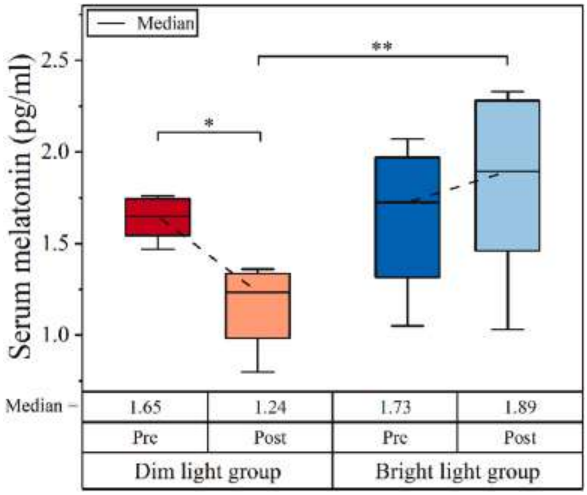


Fig. 6. The results of the serum melatonin. The serum melatonin of the dim light group was significantly decreased after the light intervention (p = 0.012). There was a significant difference between the two groups after the light intervention (p = 0.006). The serum melatonin results showed that the participants in the dim light group had less morning drowsiness compared to the bright light group.

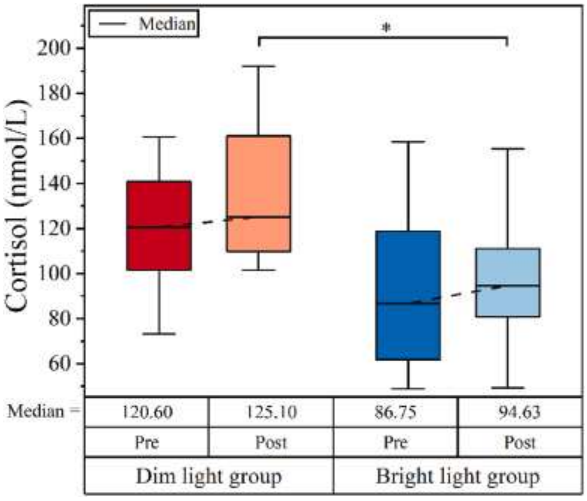


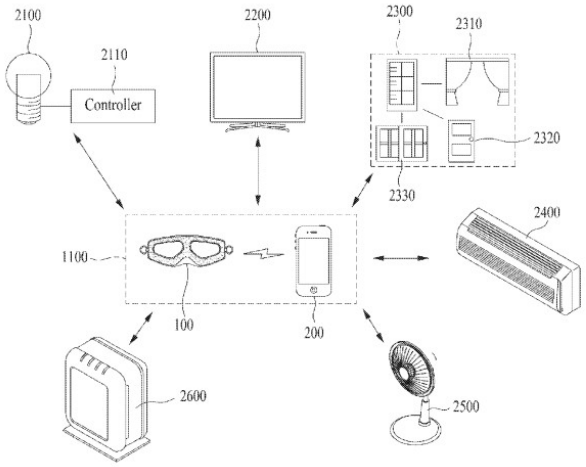
	Fig. 7. The results of the cortisol from the blood tests. Prior to the light intervention, no significant difference existed between the two groups ($p = 0.115$). However, after the light intervention, a significant difference emerged between the two groups ($p = 0.027$). Hence, the dim light group exhibited better morning alertness than the bright light group after the light intervention.
VOCAB: (w/definition)	Correlated Color Temperature (CCT): A measure of the color appearance of light, expressed in Kelvin (K). Lower CCT values (e.g., 2000 K) produce warmer, yellowish light. Illuminance (lx): The intensity of light falling on a surface, measured in lux. Higher values indicate brighter environments. Melatonin: A hormone that regulates sleep-wake cycles, with levels rising in the evening and peaking at night. Cortisol: A hormone associated with alertness and the body's stress response, peaking in the morning. Pittsburgh Sleep Quality Index (PSQI): A standardized questionnaire used to assess sleep quality and disturbances over a month.
Cited references to follow up on	N/A
Follow up Questions	How do these findings extend to other age groups or populations, such as older athletes or non-athletes? What are the long-term effects of consistent exposure to low CCT dim light on athletic performance and general health? Is the effect of the CCT light similar to the effect of blue light (light emitted from technology)?

Commented [KC26]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Patent 1 notes: Sleep inducing device and sleep management system including same

Source Title	Sleep inducing device and sleep management system including same
Source citation (APA Format)	Woo, H. J. (2020). *Sleep inducing device and sleep management system including same* (U.S. Patent No. 10,589,056). U.S. Patent and Trademark Office.
Original URL	https://patents.google.com/patent/US10589056B2/en?q=(sleep+device)&oq=sleep+devic

	e&page=5
Source type	Patent
Keywords	#Automatized, Wearable, Auto-adjusting
#Tags	#Automatic, #Device, #Treatment
Summary of key points + notes (include methodology)	Key Features: Sleep Inducing Device Components: A housing unit (adjustable and ergonomic, shaped like an eye patch). Sensors to monitor bio-information (e.g., brain waves, body temperature). Output units that emit sound or light of different frequencies to influence sleep patterns. Functionality: Measures brain waves to assess sleep states. Adjusts stimuli (frequency, intensity) to optimize sleep stages. Prevents disruptions by tailoring the device to users' facial shapes and environments. Sleep Management System: Collects data on sleep stages and environment (illumination, temperature, humidity). Suggests lifestyle adjustments (e.g., optimal sleep times, wake-up times). Provides feedback via mobile applications and integrates with IoT devices to enhance sleep environments.
Research Question/Problem/ Need	To address issues with poor sleep quality and duration by providing a system that measures, monitors, and improves sleep states through personalized stimuli such as sound and light.
Important Figures	

	 Figure 10. A visualization of how the device works
VOCAB: (w/definition)	Brain Wave Synchronization: A process where external stimuli (like sound or light) influence the brain's electrical activity to achieve desired states (e.g., relaxation for sleep). Binaural Beats: Auditory illusions created when sounds of slightly different frequencies are played in each ear, perceived as a single tone with a frequency equal to the difference, influencing brain activity. Bio-Information: Data related to biological processes, such as heart rate, temperature, and oxygen levels.
Cited references to follow up on	
Follow up Questions	How does the device calibrate stimuli (light and sound frequencies) for users with differing sleep patterns and disorders? Can the sleep management system integrate with existing health monitoring platforms to provide comprehensive wellness data? How affordable is this for the common person?

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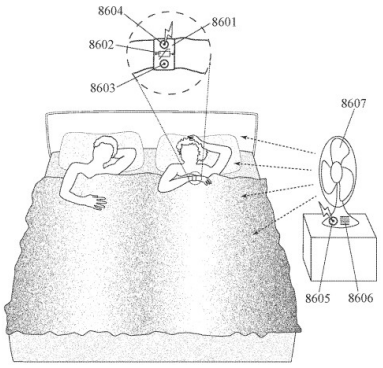
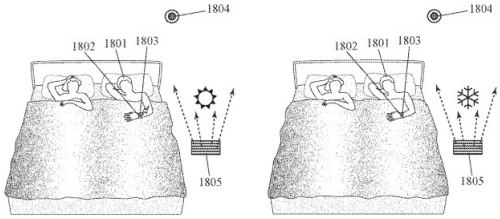
Patent 2 notes: Wearable Technology for Sleep Environment Modification

Source Title	Wearable Technology for Sleep Environment Modification
Source citation (APA Format)	Connor, R. A. (2019). *Wearable technology for sleep environment modification* (U.S. Patent No. 10,179,064). U.S. Patent and Trademark Office. https://patents.google.com/patent/US20190099009A1
Source type	Patent
Keywords	Automated, Dynamic
#Tags	#Sleep-improvement-devices, #Poor-sleep-mitigiation
Summary of key points + notes (include methodology)	Features of the System: Dynamic Mattress Adjustments: Automatically modifies mattress firmness or configuration using air inflation/deflation or electromagnetic actuators. Wearable Sensors: Includes motion sensors, snoring sensors, temperature sensors, and others to monitor physiological and environmental conditions. Environmental Controls: Adjusts temperature, airflow, lighting, or noise levels using data from wearable or embedded sensors. Snore Mitigation: Changes mattress positioning, firmness, or deploys vibrations to reduce snoring and improve sleep for partners. Technology Components: Sensors: Detect body motion, configuration, snoring, or environmental factors like temperature and humidity. Control Systems: Automatically adapt the sleep environment based on sensor data to ensure optimal comfort. Integration: Combines wearable devices and smart textiles for seamless interaction with the sleep system. Applications: Helps individuals with sleep disorders, including snoring and restlessness. Provides personalized adjustments for improved comfort and partner consideration.
Research Question/Problem/ Need	Sleep disturbances caused by factors such as snoring, body motion, temperature changes, and environmental conditions.

Important Figures	 Figure 84. A diagram of the sensor and fan at work together  Figure 18. A diagram of the HVAC system at work
VOCAB: (w/definition)	Wearable Motion Sensor: A device worn on the body that detects and measures movement or body configuration. Electromagnetic Actuator: A mechanism that adjusts mattress compressive resistance using electromagnetic force. Snoring Sensor: A device detecting snoring sounds to trigger adjustments in the sleeping environment. HVAC System: Heating, ventilation, and air conditioning systems used to modify air temperature and quality. Laminar Airflow Mechanism: A system that directs smooth airflow to reduce disturbances in the sleep environment.
Cited references to follow up on	
Follow up Questions	What data analysis techniques are used to determine optimal sleep environment adjustments from sensor readings? How does the system balance simultaneous adjustments for multiple users sharing the same sleeping area? Are there already pre-existing products/competitors? Is this

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	device/system better or worse than them?

Article #11 Notes: Optimizing sleep to maximize performance: implications and recommendations for elite athletes

Source Title	Optimizing sleep to maximize performance: implications and recommendations for elite athletes
Source citation (APA Format)	Simpson, N. S., Gibbs, E. L., & Matheson, G. O. (2016). Optimizing sleep to maximize performance: Implications and recommendations for elite athletes. *Scandinavian Journal of Medicine & Science in Sports*, *27*(3), 266–274. https://doi.org/10.1111/sms.12703
Original URL	Optimizing sleep to maximize performance: implications and recommendations for elite athletes - Simpson - 2017 - Scandinavian Journal of Medicine & Science in Sports - Wiley Online Library
Source type	Journal Article
Keywords	Athletic performance, Sleep restriction, Sleep optimization, Circadian rhythms, Neurocognitive function
#Tags	
Summary of key points + notes (include methodology)	Key Points Sleep is critical for athletic performance, impacting speed, endurance, strength, neurocognitive function, and physical health. Performance Impairments: Even mild sleep restriction (4–5 hours/night) significantly reduces accuracy, reaction time, and endurance.

	Sleep Extension Benefits: Increasing nightly sleep duration to 8–9 hours can improve athletic performance, including free-throw accuracy, sprint times, and reaction speeds. Common Barriers: Athletes face sleep challenges due to training schedules, travel, pre-competition anxiety, and cultural attitudes undervaluing sleep. Health Risks: Chronic insufficient sleep increases risks of injury, illness, impaired decision-making, and weight dysregulation. Takeaways Addressing sleep insufficiency is essential for athletes to achieve peak performance and minimize injury risk. Strategies like extending sleep duration, optimizing sleep environments, and addressing sleep disorders can improve outcomes. Awareness of the performance and health costs of sleep loss can help prioritize sleep in athletic training. Methodology Review Type: Literature review of empirical studies on sleep and athletic performance. Data Sources: Web of Science and other databases, focusing on studies with quantitative sleep and performance assessments. Domains Reviewed: Physical performance (speed, endurance, strength). Neurocognitive performance (attention, decision-making, learning). Physical health (injury risk, illness, weight maintenance).
Research Question/Problem/ Need	What are the implications of sleep quality and quantity on athletic performance, and how can athletes optimize sleep for enhanced outcomes?
Important Figures	N/A (Did not provide it)
VOCAB: (w/definition)	Sleep Restriction: Reducing sleep below the recommended duration, often leading to cognitive and physical deficits. Neurocognitive Performance: Brain functions related to attention, learning, memory, and decision-making. Circadian Rhythm: The body's internal clock regulating sleep-wake cycles, often disrupted by travel or training schedules. Sleep Extension: Deliberately increasing sleep duration to improve recovery and performance. Jet Lag: A mismatch between internal circadian rhythms and a new time zone, affecting alertness and performance

Cited references to follow up on	N/A
Follow up Questions	How do interventions like sleep tracking and cognitive-behavioral therapy improve long-term sleep quality for athletes? What specific strategies can be implemented to minimize the impact of jet lag and travel fatigue on athletic performance? Would taking a nap positively combat jet-lag and travel fatigue prior to an althletic outing?

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Article #12 Notes: The Effects of Sleep Extension on the Athletic Performance of Collegiate Basketball Players

Source Title	The Effects of Sleep Extension on the Athletic Performance of Collegiate Basketball Players
Source citation (APA Format)	Mah, C. D., Mah, K. E., Kezirian, E. J., & Dement, W. C. (2011). The effects of sleep extension on the athletic performance of collegiate basketball players. *Sleep*, *34*(7), 943–950. https://doi.org/10.5665/sleep.1132
Original URL	https://academic.oup.com/sleep/article/34/7/943/2596050
Source type	Journal Article
Keywords	Sleep extension, extra sleep, athletes, athletic performance, sports, basketball, collegiate, reaction time, mood, fatigue
#Tags	#Sleep-survey, #various-sports, #sprint
Summary of key points + notes (include methodology)	Key Points Study Objectives: Investigate the impact of prolonged sleep on athletic performance, reaction time, mood, and sleepiness. Setting: Conducted at Stanford Sleep Disorders Clinic and Research Laboratory and Maples Pavilion, Stanford University. Participants: 11 healthy male varsity basketball players from Stanford University. Mean age: 19.4 ± 1.4 years.

	Interventions: Baseline: 2–4 weeks of habitual sleep schedule. Sleep extension: 5–7 weeks of attempting 10 hours of nightly sleep. Performance metrics: Basketball-specific (timed sprint and shooting accuracy). Psychomotor Vigilance Task (PVT) for reaction time. Epworth Sleepiness Scale (ESS) for daytime sleepiness. Profile of Mood States (POMS) for mood. Results: Sleep duration increased by 110.9 ± 79.7 minutes ($P < 0.001$). Athletic performance: Sprint times improved by ~0.7 seconds ($P < 0.001$). Free throw and 3-point shooting accuracy improved by ~9% each ($P < 0.001$). Reaction time and sleepiness scores decreased ($P < 0.01$). Mood improved with increased vigor and reduced fatigue ($P < 0.001$). Players reported enhanced physical and mental well-being. Conclusions: Sleep extension is likely beneficial for optimizing athletic performance and improving overall well-being. Takeaways Increasing nightly sleep duration positively impacts athletic performance metrics such as sprinting and shooting accuracy. Extended sleep improves reaction time, mood, and reduces daytime sleepiness. Collegiate athletes may benefit from prioritizing sleep as part of their training regimen. Methodology Participants: Stanford men's varsity basketball team, aged 19.4 ± 1.4 years. Procedure: Baseline period (2–4 weeks): Habitual sleep schedule. Sleep extension period (5–7 weeks): Minimum 10 hours in bed each night. Data Collection: Performance metrics after every practice. PVT for reaction time. ESS for sleepiness. POMS for mood assessment. Analysis: Comparison of baseline vs. sleep extension results using statistical methods ($P < 0.001$).

Research Question/Problem/ Need	How does sleep extension over multiple weeks affect athletic performance, reaction time, mood, and daytime sleepiness in collegiate basketball players?
Important Figures	
VOCAB: (w/definition)	Psychomotor Vigilance Task (PVT): A test measuring reaction time and sustained attention. Epworth Sleepiness Scale (ESS): A questionnaire used to measure daytime sleepiness levels. Profile of Mood States (POMS): A psychological tool to evaluate mood states such as vigor, fatigue, and overall well-being. Sleep Extension: Prolonging sleep duration beyond habitual patterns to achieve optimal rest. Timed Sprint: A measure of how quickly an individual can complete a specified running distance.
Cited references to follow up on	
Follow up Questions	How might the results differ for athletes in sports with less emphasis on reaction time or precision, such as endurance-based activities? What are the long-term effects of sleep extension on athletic performance and mental well-being beyond the study's 5–7-week period? Would taking a nap pre-game be better than prolonging one's night's rest?

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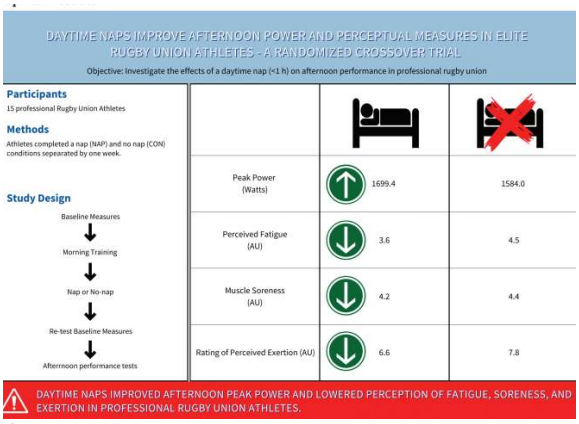
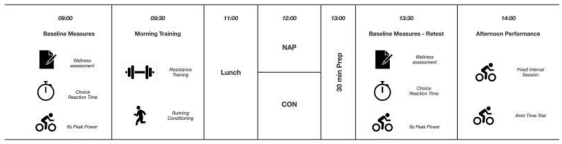
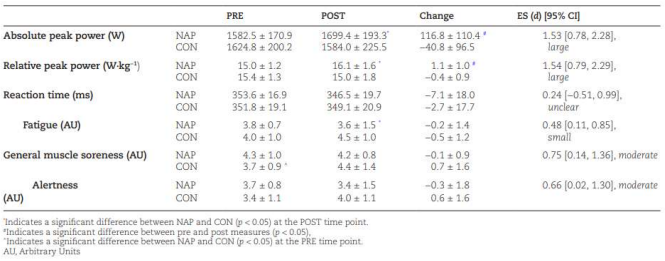
Article #13 Notes: Daytime naps improve afternoon power and perceptual measures in elite rugby union athletes—a randomized cross-over trial

Source Title	Daytime naps improve afternoon power and perceptual measures in elite rugby union athletes—a randomized cross-over trial

Source citation (APA Format)	Teece, A. R., Beaven, C. M., Argus, C. K., Gill, N., & Driller, M. W. (2023). Daytime Naps improve afternoon power and perceptual measures in elite rugby union athletes—a randomized cross-over trial. *SLEEP*, *46*(12). https://doi.org/10.1093/sleep/zsad133
Original URL	https://doi.org/10.1093/sleep/zsad133
Source type	Journal Article
Keywords	Peak power, team sports, athletic performance, fatigue, exercise exertion
#Tags	#ANOVA, #Naps-and-Sports, #Athletes, # similar
Summary of key points + notes (include methodology)	Participants: 15 professional rugby union players in a randomized crossover trial. Methodology Design: Randomized, counterbalanced crossover trial. Conditions: NAP: Athletes napped for up to one hour in a controlled environment. CON: Athletes refrained from napping and followed their regular activities. Measurements: Self-reported wellness (fatigue, soreness, alertness). Physical performance (6-second peak power, fixed-intensity cycling). Reaction time using a mobile application. Statistical Analysis: Two-way repeated measures ANOVA and paired t-tests. Findings: Daytime naps improved afternoon peak power output. Lower levels of perceived fatigue, exertion, and muscle soreness were reported in the nap condition compared to the no-nap condition. No significant changes in reaction time or self-reported alertness were observed. Practical Implications: Incorporating naps into training schedules could enhance recovery and improve afternoon performance Takeaways: Short daytime naps (~35 minutes) significantly improve neuromuscular performance. Reduced fatigue and soreness after naps suggest better recovery between training sessions. No adverse effects of napping were reported, supporting its safe inclusion in athlete recovery protocols.
Research Question/Problem/	How does a daytime nap (less than one hour) impact afternoon

Need	performance, self-reported wellness, and fatigue in athletes (elite rugby union)?
Important Figures	 Graphical Abstract.  Figure 2. Experimental Protocol. Figure 2. Procedure for participants  Table 3. Data (Mean ± SD) for Comparison Between NAP and CON Conditions for Morning and Afternoon Peak Power in the 6 Seconds Cycle Test, Reaction Time, Fatigue, General Muscle Soreness, and Alertness Including Effect Size Comparison Between Conditions for Both Time Points (PRE = Morning, POST = Afternoon)
VOCAB: (w/definition)	Peak Power: The maximum amount of power an athlete can generate in a short duration.

		PRE	POST	Change	ES (*d*) [95% CI]
Absolute peak power (W)	NAP	1582.5 ± 170.9	1699.4 ± 193.3 ˆ	116.8 ± 110.4 #	1.53 [0.78, 2.28], *large*
	CON	1624.8 ± 200.2	1584.0 ± 225.5	−40.8 ± 96.5	
Relative peak power (W·kg^{-1})	NAP	15.0 ± 1.2	16.1 ± 1.6 ˆ	1.1 ± 1.0 #	1.54 [0.79, 2.29], *large*
	CON	15.4 ± 1.3	15.0 ± 1.8	−0.4 ± 0.9	
Reaction time (ms)	NAP	353.6 ± 16.9	346.5 ± 19.7	−7.1 ± 18.0	0.24 [−0.51, 0.99], *unclear*
	CON	351.8 ± 19.1	349.1 ± 20.9	−2.7 ± 17.7	
Fatigue (AU)	NAP	3.8 ± 0.7	3.6 ± 1.5 ˆ	−0.2 ± 1.4	0.48 [0.11, 0.85], *small*
	CON	4.0 ± 1.0	4.5 ± 1.0	−0.5 ± 1.2	
General muscle soreness (AU)	NAP	4.3 ± 1.0	4.2 ± 0.8	−0.1 ± 0.9	0.75 [0.14, 1.36], *moderate*
	CON	3.7 ± 0.9 *	4.4 ± 1.4	0.7 ± 1.6	
Alertness (AU)	NAP	3.7 ± 0.8	3.4 ± 1.5	−0.3 ± 1.8	0.66 [0.02, 1.30], *moderate*
	CON	3.4 ± 1.1	4.0 ± 1.1	0.6 ± 1.6	

ˆIndicates a significant difference between NAP and CON ($p < 0.05$) at the POST time point.
#Indicates a significant difference between pre and post measures ($p < 0.05$).
*Indicates a significant difference between NAP and CON ($p < 0.05$) at the PRE time point.
AU, Arbitrary Units

	Crossover Trial: A study where participants experience all conditions in a randomized order. Reaction Time: The time taken to respond to a stimulus. Rating of Perceived Exertion (RPE): A self-reported scale assessing how hard physical activity feels. Sleep Inertia: A state of impaired cognitive and physical performance immediately after waking.
Cited references to follow up on	
Follow up Questions	How would different nap durations (e.g., 20 minutes vs. 60 minutes) affect similar outcomes? Would longer or shorter naps be more efficient? Can chronic implementation of napping (e.g., over several months) lead to sustained performance benefits or physiological adaptations?

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Article #14 Notes: Sleep interventions for performance, mood and sleep outcomes in athletes: A systematic review and meta-analysis

Source Title	Sleep interventions for performance, mood and sleep outcomes in athletes: A systematic review and meta-analysis
Source citation (APA Format)	Gwyther, K., Rice, S., Purcell, R., Pilkington, V., Santesteban-Echarri, O., Bailey, A., & Walton, C. C. (2022). Sleep interventions for performance, mood and sleep outcomes in athletes: A systematic review and meta-analysis. *Psychology of Sport and Exercise*, *58*, 102094. https://doi.org/10.1016/j.psychsport.2021.102094
Original URL	https://doi.org/10.1016/j.psychsport.2021.102094
Source type	Review Article
Keywords	Sleep, Athletes, Mental health, Intervention, Performance
#Tags	#Evidence, #sources
Summary of key points + notes (include methodology)	Key Points Sleep interventions improve subjective sleep quality, reduce sleepiness, and

	decrease negative affect in athletes. Objective sleep measures (e.g., actigraphy) showed no significant changes post-intervention. Sleep interventions did not significantly enhance aerobic or anaerobic performance. Common interventions include sleep hygiene education, sleep extension, and assisted sleep strategies. Takeaways Sleep interventions primarily affect athletes' perceptions of their sleep and mood rather than measurable sleep metrics or athletic performance. Subjective benefits may be influenced by athletes' awareness of participating in a sleep intervention. Sleep extension strategies (9–10 hours per night) consistently improve mood and specific athletic performance metrics. Sleep hygiene education promotes better self-reported sleep quality and reduced fatigue in athletes. Methodology Design: Systematic review and meta-analysis of 27 studies, including 16 controlled designs. Participants: 617 athletes (sub-elite to Olympic levels). Interventions: Sleep hygiene, assisted sleep (e.g., light or audio devices), sleep recovery (e.g., cryotherapy), and sleep extension. Outcomes Measured: Sleep: Subjective (self-report) and objective (actigraphy or polysomnography) metrics. Performance: Aerobic/anaerobic measures and sport-specific skills. Mood: Negative affect and psychological strain. Analysis: Random-effects meta-analysis; outcomes assessed for heterogeneity and publication bias.
Research Question/Problem/ Need	Do sleep interventions improve outcomes in athletes?

Important Figures

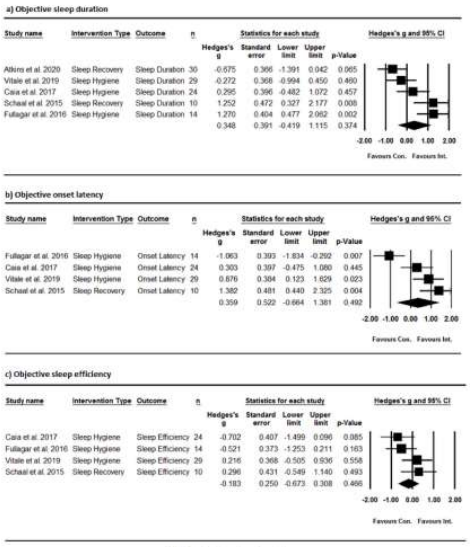

Fig. 2. Objective sleep forest plots.

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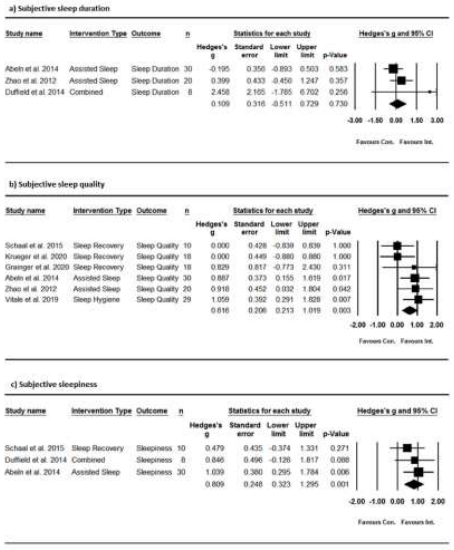
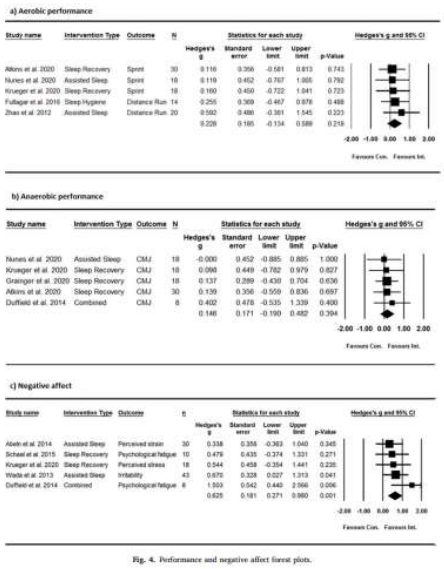


Fig. 3. Subjective sleep forest plots.

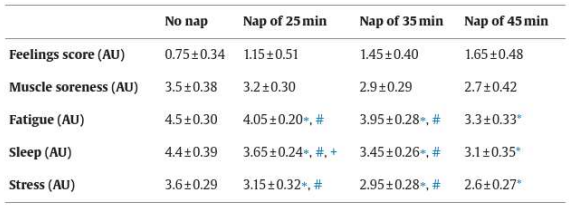
Fig. 3. Subjective sleep forest plots.

	 Fig. 4. Performance and negative affect forest plots.
VOCAB: (w/definition)	Sleep Hygiene: Behavioral and environmental practices that promote good sleep quality (e.g., limiting caffeine, maintaining a regular sleep schedule). Sleep Extension: Increasing sleep duration, typically aiming for 9–10 hours per night. Actigraphy: A non-invasive method to monitor sleep patterns via movement using wearable devices. Polysomnography: The gold-standard test for measuring sleep through brain waves, eye movements, and other physiological signals. Negative Affect: A subjective state of experiencing negative emotions such as stress or anxiety
Cited references to follow up on	
Follow up Questions	How do sleep interventions compare in their effectiveness between elite and sub-elite athletes? Could combining sleep interventions with mental health support yield better overall outcomes for athletes? Are there any existing products that combine many of these interventions (if applicable)?

Commented [KC32]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #15 Notes: Effect of different nap opportunity durations on short-term maximal performance, attention, feelings, muscle soreness, fatigue, stress and sleep

Source Title	Effect of different nap opportunity durations on short-term maximal performance, attention, feelings, muscle soreness, fatigue, stress and sleep
Source citation (APA Format)	Hsouna, H., Boukhris, O., Abdessalem, R., Trabelsi, K., Ammar, A., Shephard, R. J., & Chtourou, H. (2019). Effect of different nap opportunity durations on short-term maximal performance, attention, feelings, muscle soreness, fatigue, stress and sleep. *Physiology & Behavior*, *211*, 112673. https://doi.org/10.1016/j.physbeh.2019.112673
Original URL	https://doi.org/10.1016/j.physbeh.2019.112673
Source type	Journal Article
Keywords	Nap, Exercise, Fatigue, Stress, Mood, Sleep
#Tags	#similar, #ANOVA
Summary of key points + notes (include methodology)	Key Points Nap opportunities significantly improve physical performance (e.g., 5-jump test) and cognitive attention (e.g., digit cancellation test). - Longer nap durations (35-45 minutes) yielded better outcomes than shorter ones (25 minutes). -Subjective perceptions of fatigue, stress, and sleep quality improved significantly with naps of at least 25 minutes. - Muscle soreness and mood were not significantly affected by nap durations.

	-Takeaways - A 35-45 minute nap is optimal for enhancing short-term maximal performance and cognitive attention. Even a short 25-minute nap reduces fatigue and stress compared to no nap. Nap effectiveness is closely related to the duration, with longer naps providing more substantial benefits. Methodology Participants: 20 physically active males (age ~21.1 years). Design: Randomized crossover design with four conditions: No nap (N0) 25-minute nap (N25) 35-minute nap (N35) 45-minute nap (N45) Assessments: Physical performance: 5-jump test Cognitive performance: Digit cancellation test Subjective measures: Hooper questionnaire (sleep, fatigue, stress, muscle soreness), feelings scale Statistical Analyses: ANOVA and Friedman non-parametric tests; effect sizes and significance levels were calculated.
Research Question/Problem/ Need	What is the optimal nap duration for improving physical and cognitive performance, as well as subjective measures of fatigue, stress, and sleep quality?
Important Figures	

	No nap	Nap of 25 min	Nap of 35 min	Nap of 45 min
Feelings score (AU)	0.75 ± 0.34	1.15 ± 0.51	1.45 ± 0.40	1.65 ± 0.48
Muscle soreness (AU)	3.5 ± 0.38	3.2 ± 0.30	2.9 ± 0.29	2.7 ± 0.42
Fatigue (AU)	4.5 ± 0.30	4.05 ± 0.20*, #	3.95 ± 0.28*, #	3.3 ± 0.33*
Sleep (AU)	4.4 ± 0.39	3.65 ± 0.24*, #, +	3.45 ± 0.26*, #	3.1 ± 0.35*
Stress (AU)	3.6 ± 0.29	3.15 ± 0.32*, #	2.95 ± 0.28*, #	2.6 ± 0.27*

* Significant difference in comparison with the no-nap condition.

\# Significant difference in comparison with the nap of 45 min.

\+ Significant difference in comparison with the nap of 35 min.

Table 1. Feelings, muscle soreness, fatigue, sleep and stress scores recorded after the no-nap, the nap of 25 min, the nap of 35 min and the nap of 45 min conditions.

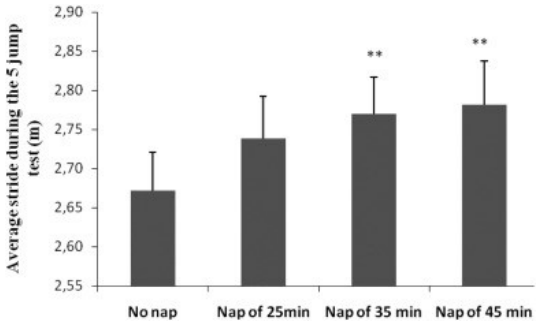


Fig. 2. Representation of the average stride recorded during the 5 jump test after the different experimental conditions no nap, nap of 25 min, nap of 35 min and nap of 45 min.

**Significant difference in comparison with no-nap condition ($p < .01$).

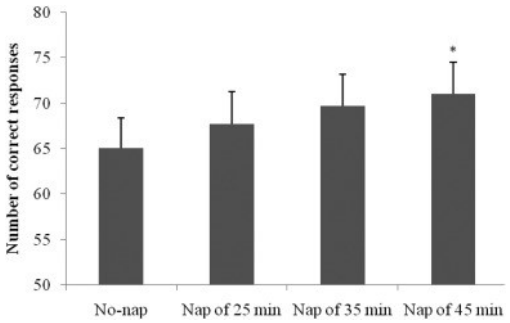


Fig. 3. Representation of the number of correct responses (i.e., attention) recorded by the digit cancellation test after the different experimental conditions (i.e., no nap, nap of 25 min, nap of 35 min and nap of 45 min).

*Significant difference in comparison with no-nap condition ($p < .05$).

VOCAB: (w/definition)	5-Jump Test: A measure of lower limb explosive power based on five consecutive strides. Digit Cancellation Test: A test evaluating attention and cognitive processing speed by identifying specific digit patterns. Hooper Questionnaire: A tool assessing subjective feelings of sleep quality, fatigue, stress, and muscle soreness. ANOVA (Analysis of Variance): A statistical method to compare means across multiple groups. Kendall's W: A statistic measuring agreement among raters for ordinal data.
Cited references to follow up on	

Follow up Questions	How do individual differences in sleep quality or habits influence the effectiveness of naps? Would the benefits of napping observed in this study apply to older adults or individuals with different activity levels? Are these results universal amongst other sports?

Commented [KC33]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #16 Notes: Sleep environments and sleep physiology: A review

Source Title	Sleep environments and sleep physiology: A review
Source citation (APA Format)	Troynikov, O., Watson, C. G., & Nawaz, N. (2018). Sleep environments and sleep physiology: A Review. *Journal of Thermal Biology*, *78*, 192–203. https://doi.org/10.1016/j.jtherbio.2018.09.012
Original URL	https://doi.org/10.1016/j.jtherbio.2018.09.012
Source type	Review Article
Keywords	Sleep, thermal microclimate, bedding, human thermal physiology, post-exercise recovery, and sleep research methods.
#Tags	#Temperature, #physiology
Summary of key points + notes (include methodology)	Key Points Sleep environments significantly impact sleep quality, including thermal microclimates created by bedding and sleepwear. Optimal sleep is critical for recovery, athletic performance, and cognitive functioning. Factors like temperature, humidity, and airflow in the sleep environment affect core and skin temperatures, impacting sleep quality. Current research on bedding systems' effects on thermal microclimates and sleep quality is limited. Takeaways Stable thermal environments (30–32.5 °C) support better sleep patterns by reducing skin temperature variability. Bedding and sleepwear combinations significantly influence sleep microclimates and quality, but more comprehensive studies are needed. Both NREM and REM sleep are sensitive to temperature variations, impacting restorative processes like hormonal regulation and cognitive recovery.

	Methodology Study Design: Systematic review of 139 studies on sleep environments and their physiological impacts. Data Sources: Scopus, Web of Science, Google Scholar, and EBSCOhost databases.
Important Figures	

Characteristics	Sports	Effects
Low aerobic	Road cycling, aiming sports	Increased errors
Moderate aerobic, high concentration	Team sports	Decreased decision-making
High aerobic	Running 3000 m, swimming 400 m	Marginal
Aerobic/anaerobic	Swimming, middle distance running	Decreased power
Anaerobic	Sprints, power events	Marginal
Repeat anaerobic	Jumping events, weight training	Increased fatigue

Overview of effects of sleep disruption on performance in sporting activities (source: (Halson, 2008), adapted from (Reilly and Edwards, 2007)).

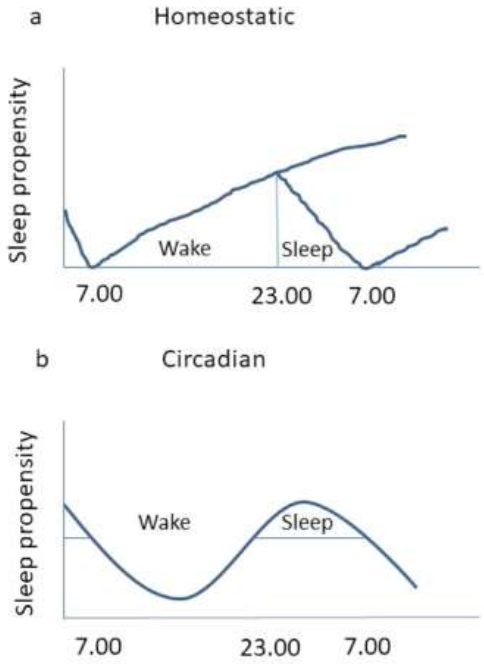
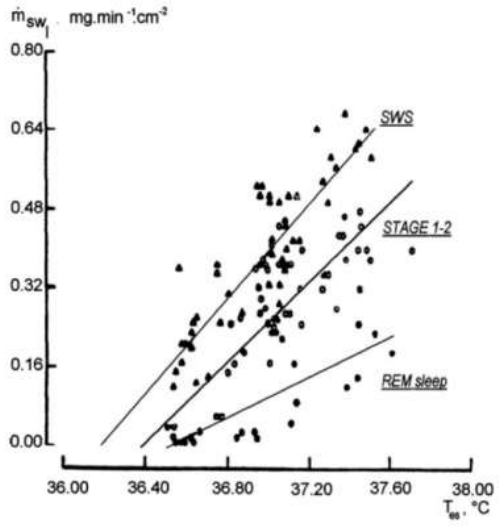


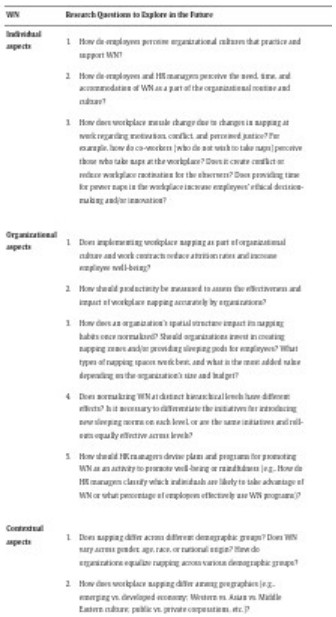
	Fig. 1. Sleep propensity (%) and (a) homeostatic drive and (b) circadian driveduring 24-h Time course (X axis): adapted from Fisher et al. (2013). “The homeostatic drive for sleep increases sleep propensity with prolonged wakefulness. Sleep pressure declines following sleep, but increases again at waking. The circadian regulation of sleep creates a drive for wakefulness during the day, which declines at night. As such, sleep propensity is low during the day, but increases at night” (Fisher et al., 2013, p.158) O. Troynikov et al.  Fig. 5. Relationship between the local sweating rate (msw) and the oesophageal temperature (Tes) during slow wave sleep (SWS, sleep stage 2, and REM sleep in adult humans (reproduced from Libert and Bach, 2005).
VOCAB: (w/definition)	Thermal Microclimate: The local climate around the body created by bedding and sleepwear. Core Body Temperature: The internal temperature of the body, crucial for regulating sleep phases. Sleep Efficiency (SE): The percentage of time spent asleep while in bed. Sleep Onset Latency (SOL): The time taken to transition from wakefulness to sleep. Non-REM (NREM) Sleep: Restorative sleep stages critical for physical recovery
Cited references to follow up on	

Follow up Questions	How do specific materials in bedding and sleepwear contribute to maintaining optimal sleep microclimates? - What material is ideal to do so? Can interventions like smart bedding systems improve both subjective and objective sleep quality?

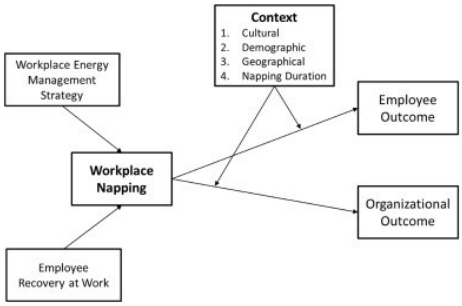
Commented [KC34]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #17 Notes: Wake up and get some sleep: Reviewing workplace napping and charting future directions

Source Title	Wake up and get some sleep: Reviewing workplace napping and charting future directions
Source citation (APA Format)	Anand, A., Tóth, R., Doll, J. L., & Singh, S. K. (2024). Wake up and get some sleep: Reviewing workplace napping and charting Future Directions. *European Management Journal*. https://doi.org/10.1016/j.emj.2024.04.003
Original URL	https://doi.org/10.1016/j.emj.2024.04.003
Source type	Journal Article
Keywords	Workplace napping, Sleeping at work, Well-being, Workplace policies, Human resource management
#Tags	#Introduction, #background, #previous-study, #reference
Summary of key points + notes (include methodology)	Key Points Workplace napping (WN) is an emerging strategy to improve employee well-being, productivity, and organizational outcomes. Short naps (10–30 minutes) are effective for restoring energy, improving cognitive function, and reducing fatigue without causing sleep inertia. Cultural attitudes and organizational policies significantly influence the acceptance and implementation of WN. While tech companies lead the way in providing nap-friendly environments, other industries lag due to misconceptions about napping's productivity benefits. The review identifies gaps in research, such as demographic influences on WN and industry-specific applications.

	Takeaways WN supports physical recovery, mental health, and work performance but faces stigma in many organizational cultures. Integrating WN into organizational policies can mitigate sleep deprivation-related issues like workplace errors and reduced creativity. Organizations should consider demographic, cultural, and industry-specific factors when designing and implementing WN policies. Methodology Approach: Scoping review of 96 publications across journals, conference papers, and popular media. Focus Areas: Definitions of WN, cultural and organizational contexts, demographic variations, and WN benefits and challenges. Analysis: Thematic coding and synthesis to identify patterns and research gaps.
Research Question/Problem/ Need	How can workplace napping be normalized to improve employee well-being and organizational performance across different industries and cultures?
Important Figures	 Table 2. Key research question to explore in the future.

WN	Research Questions to Explore in the Future
Individual aspects	1. How do employees perceive organizational cultures that practice and support WN? 2. How do employees and HR managers perceive the need, time, and accommodation of WN as a part of the organizational routine and culture? 3. How does workplace morale change due to changes in napping at work regarding motivation, conflict, and perceived justice? For example, how do co-workers [who do not watch to take naps] perceive those who take naps at the workplace? Does it create conflict or reduce workplace motivation for the observers? Does providing time for power naps in the workplace increase employees' ethical decision-making and/or innovation?
Organizational aspects	1. Does implementing workplace napping as part of organizational culture and work contracts reduce attrition rates and increase employee well-being? 2. How should productivity be measured to assess the effectiveness and impact of workplace napping accurately by organizations? 3. How does an organization's spatial structure impact its napping habits once normalized? Should organizations invest in creating napping zones and/or providing sleeping pods for employees? What types of napping spaces work best, and what is the most added value depending on the organization's size and budget? 4. Does normalizing WN at distinct hierarchical levels have different effects? Is it necessary to differentiate the initiatives for introducing new sleeping norms on each level, or are the same initiatives and roll-outs equally effective across levels? 5. How should HR managers devise plans and programs for promoting WN as an activity to promote well-being or mindfulness [e.g., How do HR managers classify which individuals are likely to take advantage of WN or what percentage of employees effectively use WN programs)?
Contextual aspects	1. Does napping differ across different demographic groups? Does WN vary across gender, age, race, or national origin? How do organizations equalize napping across various demographic groups? 2. How does workplace napping differ among geographies [e.g., emerging vs. developed economy; Western vs. Asian vs. Middle Eastern culture; public vs. private organizations, etc.]?

	 Fig. 2. Conceptual model of WN.
VOCAB: (w/definition)	Workplace Napping (WN): Short, scheduled naps during work hours intended for recovery and performance enhancement. Sleep Inertia: The grogginess and disorientation experienced immediately after waking from deep sleep. Power Nap: A short nap (typically less than 20 minutes) aimed at quickly restoring alertness and energy. Effort-Recovery Model: A theory suggesting recovery activities, like napping, restore energy depleted during work. Conservation of Resources Theory: A framework positing that individuals conserve and replenish resources (e.g., energy) to prevent stress and maintain productivity.
Cited references to follow up on	
Follow up Questions	What organizational strategies can effectively reduce the stigma around workplace napping? How can WN policies be adapted to meet the needs of different employee demographics and job roles? Are there currently any WN policies in place at companies? Are the policies working?

Commented [KC35]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #18 Notes: Screen use and sleep duration and quality at 15 years old: Cohort study

Source Title	Screen use and sleep duration and quality at 15 years old: Cohort study
Source citation (APA Format)	Anand, A., Tóth, R., Doll, J. L., & Singh, S. K. (2024). Wake up and get some sleep: Reviewing workplace napping and charting Future Directions.

	European Management Journal. https://doi.org/10.1016/j.emj.2024.04.003
Original URL	https://doi.org/10.1016/j.sleepx.2023.100073
Source type	Journal Article
Keywords	Screen-time Sleep, Sleep duration, Sleep quality, Adolescents, Cohort study
#Tags	#screen-time, #reference
Summary of key points + notes (include methodology)	Key Points Inverse Relationship: Increased screen time is associated with shorter sleep duration and poorer sleep quality. Sleep Impact Thresholds: 6–8.8 hours of screen time reduces sleep by 23.4 minutes. 9+ hours reduces sleep by 32.4 minutes and increases the likelihood of poor sleep quality by 60%. Median Screen Time: Adolescents typically spent 4.5 hours daily on screens, exceeding recommended levels. Methodology Study Design: Data were collected from the 2004 Pelotas Birth Cohort. Measures: Sleep duration was assessed using the Munich Chronotype Questionnaire. Self-reported sleep quality was used to gauge sleep perception. Analysis: Linear and Poisson regressions provided adjusted beta coefficients and prevalence ratios with 95% confidence intervals. Takeaways Excessive screen use significantly impacts both the duration and quality of adolescent sleep. Screen time exceeding 9 hours daily is particularly detrimental, associated with both shorter sleep and poorer sleep perception.
Research Question/Problem/ Need	What is the association between screen time for entertainment and sleep duration and quality among adolescents?

Commented [CK36]: Incorrect entry for the link.

Important Figures

Screen time (hours/day)	Mean sleep duration in hours (N=1851)				Prevalence of self-reported poor quality sleep (N=1949)			
	N (%)	Mean	95%CI (n=1851)	p	N (%)	Prevalence (%)	95%CI	p
				p<0.001[a]				p=0.025[a]
<2.0	368 (19.9%)	7.8	7.6–7.9		398 (20.4%)	14.8%	11.7–18.7	
2.0–3.5	370 (20.0%)	7.7	7.5–7.8		383 (19.7%)	17.0%	13.5–20.1	
3.6–5.9	433 (23.4%)	7.6	7.5–7.8		456 (23.4%)	15.4%	12.3–19.0	
6.0–8.9	348 (18.8%)	7.4	7.2–7.5		360 (18.5%)	19.7%	15.9–24.2	
≥9.0	332 (17.9%)	7.3	7.1–7.5		352 (18.1%)	20.5%	16.6–25.0	

Table 2. Weighted mean duration of sleep in hours over 24 h and prevalence (%) of poor quality sleep, according to screen use.

Screen time (hours/day)	β[a]				RP[c]			
	Crude		Adjusted[b]		Crude		Adjusted[d]	
	β (95%CI)	P	β (95%CI)	p	RP (95%CI)	p	RP (95%CI)	P
		<0.001		<0.001		0.026		<0.001
<2.0	REF		REF		1.00		1.00	
2.0–3.5	−0.12 (−0.33; 0.09)		−0.10 (−0.32; 0.12)		1.14 (0.83–1.58)		1.23 (0.83–1.82)	
3.6–5.9	−0.17 (−0.37; 0.03)		−0.20 (−0.41; 0.18)		1.04 (0.75–1.43)		1.05 (0.70–1.58)	
6.0–8.9	−0.42 (−0.64;−0.21)		−0.39 (−0.62;−0.16)		1.33 (0.97–1.82)		1.43 (0.98–2.08)	
≥9.0	−0.50 (−0.72;−0.28)		−0.54 (−0.77;−0.30)		1.38 (1.01–1.89)		1.60 (1.10–2.32)	

Table 3. Crude and adjusted analysis for sleep duration and quality, according to daily screen use.

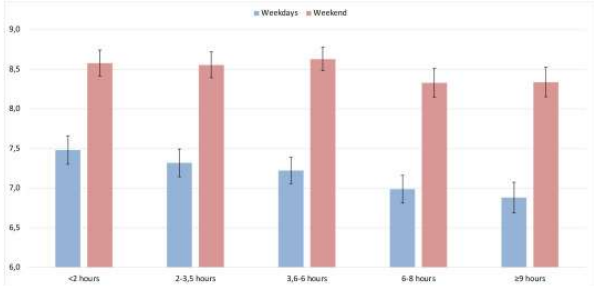
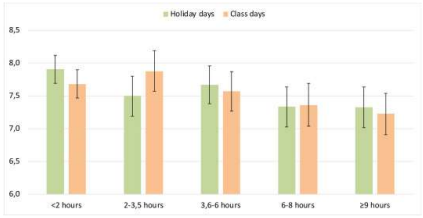


Fig. 2. Mean sleep duration in hours, on weekdays and at weekends, according to screen time.

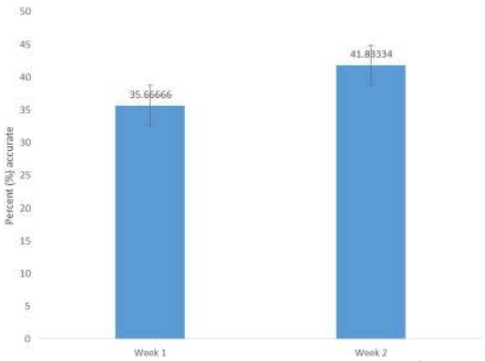
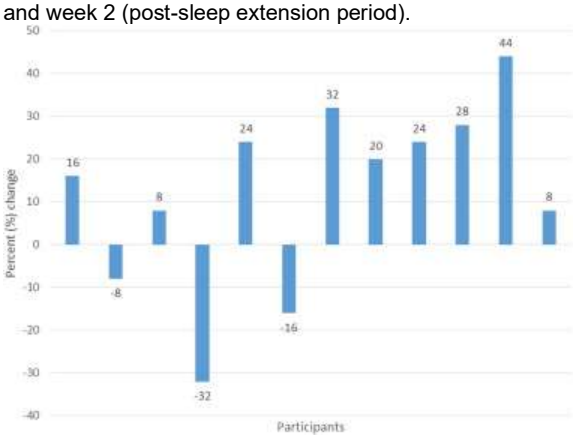
	 Fig. 3. Mean sleep duration, according to screen time in holiday periods and class periods.
VOCAB: (w/definition)	Chronotype Questionnaire: A tool to assess an individual's circadian preferences, including wake and sleep times. Prevalence Ratio (PR): A measure indicating the likelihood of an outcome (e.g., poor sleep) relative to exposure levels (e.g., screen time). Beta Coefficient (β): A statistic reflecting the degree of change in the outcome variable for each unit change in the predictor variable.
Cited references to follow up on	
Follow up Questions	What interventions can effectively mitigate the impact of screen time on adolescent sleep? How do other factors (e.g., social media use, gaming) contribute to changes in sleep patterns compared to general screen time? How would different uses (i.e. reading digitally vs gaming) of screen time differ?

Commented [KC37]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #19 Notes: Sleep extension improves serving accuracy: A study with college varsity tennis players

Source Title	Sleep extension improves serving accuracy: A study with college varsity tennis players
Source citation (APA Format)	Schwartz, J., & Simon, R. D. (2015). Sleep extension improves serving accuracy: A study with College Varsity Tennis Players. *Physiology & Behavior*, *151*, 541–544. https://doi.org/10.1016/j.physbeh.2015.08.035
Original URL	https://doi.org/10.1016/j.physbeh.2015.08.035
Source type	Journal Article
Keywords	Sleep extension, Tennis, Serving accuracy, Sleep deprivation

#Tags	#similar, #background. #introduction, #reference
Summary of key points + notes (include methodology)	Key Points Sleep Duration Impact: Extending sleep from ~7 hours to ~9 hours per night over a week significantly improved tennis serving accuracy in varsity players. Performance Improvements: Serving accuracy increased from 35.7% during the baseline week to 41.8% after the sleep extension week. Reduced Sleepiness: Participants experienced significant reductions in perceived daytime sleepiness, measured by the Epworth and Stanford Sleepiness Scales. Controlled Variables: The study accounted for caffeine and alcohol consumption to avoid confounding effects. Takeaways Sleep extension enhances both cognitive and physical aspects of athletic performance, particularly in tasks requiring precision and coordination. Athletic training programs should prioritize adequate sleep as a vital component of preparation and recovery. Addressing sleep deprivation can lead to measurable improvements in complex motor skills. Methodology Participants: 12 NCAA Division III varsity tennis players (7 females, 5 males) aged 18-22. Design: Week 1: Baseline with habitual sleep (average ~7 hours per night). Week 2: Sleep extension targeting at least 9 hours per night, including naps. Tennis serving accuracy and sleepiness were assessed before and after the sleep extension week. Measures: Sleepiness: Stanford and Epworth Sleepiness Scales. Serving Accuracy: Percentage of serves hitting a target during controlled sessions. Analysis: Paired t-tests and repeated measures ANOVA assessed changes in performance and sleepiness.
Research Question/Problem/ Need	Does sleep extension improve tennis serving accuracy and reduce subjective sleepiness in college varsity athletes?

Important Figures	 Fig. 2. Tennis serving accuracy at week 1 (post-habitual sleep period) and week 2 (post-sleep extension period).  Fig. 3. Change in serving accuracy of each participant at week 2 (post-sleep extension period).

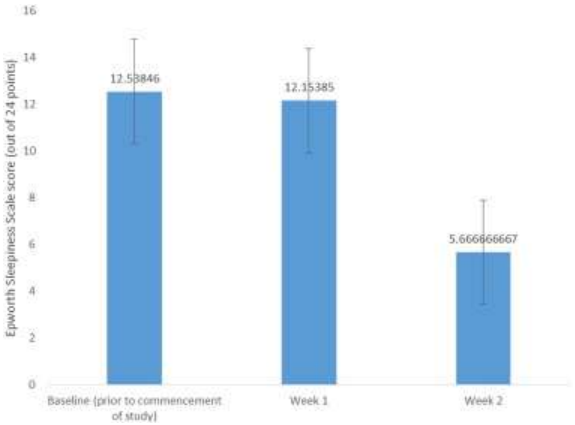


Fig. 4. Epworth Sleepiness Scale scores at baseline, after week 1 (post-habitual sleep period), and after week 2 (post-sleep extension period).

	Week 1 (before sleep extension)	Week 2 (after sleep extension)	p value
Accurate serves out of 50 (deuce & add side together), mean (SD)	17.83 (7.84)	20.92 (6.80)	<0.05
Accurate serves on the deuce side (out of 25), mean (SD)	9.25 (5.28)	10.67 (3.99)	
Accurate serves on the add side (out of 25), mean (SD)	8.58 (3.32)	10.25 (3.49)	
Sleep per night (hours), mean (SD)	7.14 (0.87)	8.85 (0.60)	<0.05
Stanford Sleepiness Scale score, mean (SD)	3.56 (0.77)	2.67 (0.64)	<0.05
Epworth Sleepiness Scale score, mean (SD)	12.15 (4.20)	5.67 (2.46)	<0.01
Caffeinated beverages consumed, mean (SD)	0.89 (0.47)	0.94 (0.77)	0.41

Table 1. Characteristics of participants' tennis serving accuracy, sleep, and caffeine consumption before and after sleep extension.

VOCAB: (w/definition)

Sleep Extension: Increasing sleep duration beyond habitual levels to achieve restorative effects.
Epworth Sleepiness Scale: A questionnaire evaluating daytime sleepiness across different scenarios.
Stanford Sleepiness Scale: A self-report measure of perceived alertness and fatigue.
Motor Memory: The process by which the brain retains and refines motor skills through practice and sleep.
Sensorimotor Task: Activities requiring integration of sensory inputs and motor responses, such as a tennis serve.

Cited references to follow up on	
Follow up Questions	How do the benefits of sleep extension vary across sports with differing skill and endurance requirements? Could a longer intervention period (e.g., several weeks) further enhance the benefits of sleep extension on athletic performance? Are these results similar to if tennis players were tested after napping?

Commented [KC38]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

Article #20 Notes: 0792 SLEEP OPTIMIZATION IMPROVES MOOD DIFFERENTLY BETWEEN CANADIAN NATIONAL TEAM CURLERS AND ROWERS

Source Title	0792 SLEEP OPTIMIZATION IMPROVES MOOD DIFFERENTLY BETWEEN CANADIAN NATIONAL TEAM CURLERS AND ROWERS
Source citation (APA Format)	Bender, A., Werthner, P., & Samuels, C. (2017). 0792 sleep optimization improves mood differently between Canadian national team curlers and rowers. *Sleep*, *40*(suppl_1). https://doi.org/10.1093/sleepj/zsx050.791
Original URL	https://doi.org/10.1093/sleepj/zsx050.791
Source type	Journal Article
Keywords	Sleep interventions, Elite athletes, Mood states, Blue-blocking glasses. Olympic preparation
#Tags	#Very-similar, #refernce, #background, #introduction
Summary of key points + notes (include methodology)	Key Points Sleep Interventions: Three strategies were implemented: Increasing nighttime sleep. Napping. Reducing technology use an hour before bedtime. Rowers also wore blue-blocking glasses 2 hours before bedtime. Baseline Mood States: Rowers showed higher levels of tension-anxiety, depression, fatigue, and total mood symptoms compared to curlers. Post-Intervention Changes: Rowers: Significant reduction in depression symptoms after the intervention. Curlers: Reduced fatigue, increased vigor, and lowered total mood

	symptoms. Impact of Stress: The rowers' stress related to Olympic preparations may have limited the effectiveness of the interventions. Takeaways Sleep optimization interventions improve mood states in elite athletes, with varied effectiveness based on individual and sport-specific factors. Stress may diminish the impact of sleep interventions, highlighting the need for tailored strategies. Blue-blocking glasses and reduced technology use may have additional benefits, particularly in managing depression symptoms. Methodology Participants: Curlers: N=15 (mean age 30.7 ± 4.5 years; 8 females). Rowers: N=11 (mean age 26.0 ± 3.1 years). Design: Two time points: baseline (pre-intervention) and post-intervention (after 3.5 weeks). Interventions: Increased nighttime sleep, napping, reduced evening technology use, and blue-blocking glasses for rowers. Measures: Mood states were assessed using the Profile of Mood States (POMS) questionnaire. Sub-scales: Tension-anxiety, depression, fatigue, vigor, and total mood scores. Analysis: Independent t-tests compared baseline mood states between groups. Paired t-tests assessed mood changes within each sport after the intervention.
Research Question/Problem/ Need	How do sleep optimization interventions affect mood states in elite athletes, and do outcomes differ by sport?
VOCAB: (w/definition)	Profile of Mood States (POMS): A psychological tool measuring mood across sub-scales such as tension-anxiety, depression, fatigue, and vigor. Blue-Blocking Glasses: Glasses designed to filter out blue light, which can interfere with melatonin production and sleep quality. Sleep Optimization: Strategies aimed at improving sleep quality and duration to enhance overall well-being and performance. Tension-Anxiety: A mood state characterized by feelings of nervousness or worry. Vigor: A measure of energy, enthusiasm, and vitality.
Cited references to follow up on	
Follow up Questions	How do stress levels and competition proximity impact the effectiveness of

Commented [KC39]: Questions are crucial in leading you towards the next paper. This is a MANDATORY section and should include AT LEAST 3 Questions that stem from reading the paper.

	sleep interventions in athletes? Could additional interventions, like mindfulness or stress management, enhance mood outcomes alongside sleep optimization? What long-term effects do these sleep interventions have on performance and recovery across an Olympic quadrennial?