Point, Nap, and Match:

The

Impact of Nap Conditions on Table

Tennis Performance

Graphical Abstract



Introduction & Background

Sleep is crucial for recovery, cognitive function, and athletic performance. While 7-9 hours of sleep is recommended (National Sleep Foundation, 2020), many athletes struggle to get enough rest, and even a full night's sleep may not be sufficient. Research has explored ways to enhance sleep benefits, with Mah et al. (2011) finding that sleep extension improved basketball performance in D1 players. Alternatively, athletes use naps to compensate for lost sleep or boost energy. Teece et al. (2023) generally found that napping before competition was linked to improved self-reported performance, with athletes who napped being significantly more likely to rate their performance positively.

Research Question

How do various nap conditions affect table tennis performance?

Hypothesis

The most improvement and overall best performance metrics will occur after participants take a nap in the optimal conditions. The worse performance will be the baseline performance.

Methodology

• Age, Table Tennis background, sleep quantity, and baseline performance were collected • Participants filled out a pre-nap and post-nap survey to access their energy perception for every session • They took a nap in one of the 4 environmental and behavioral conditions • Participated in Table Tennis performance tests: • Lateral Side-To-Side Agility Test • Click Reaction Time Test • Table Tennis Serve Accuracy Test

Results

CONDITION	MEAN CHANGE IN SERVE ACCURACY (BALLS MADE IN)	MEAN CHANGE IN AGILITY TIME (S)	MEAN CHANGE IN REACTION TIME (MS)
Optimal	+6.6	-2.18	+17.4
Phone Usage	-10.2	+11.92	+219.6
Higher Room Temperature	-10	+12.75	+315
Loud Noise	-4	+7.08	+107

Table 1. A table showing the mean changes in scores after participantstook naps in those conditions

Results

METRIC	X² (FRIEDMAN TEST)	DF	P-VALUE	SIGNIFICANT
Serve Accuracy	6.79	2	0.037*	Yes
Lateral Agility	4.23	2	No Nap vs Warm Room	No
Reaction Time	7.45	2	0.029*	Yes

Table 2. A table demonstrating the results of the Friedman Test

Results

COMPARISO N	W (WILCOXON TEST)	P-VALUE	SIGNIFICANT
Basline vs phone use	0	0.034*	Yes
No Nap vs Quiet Room	5.5	0.12	No
No Nap vs Warm Room	4.0	0.08	No

Table 3. A table demonstrating the results of the Wilcoxon Signed-Rank Test.

Conclusion

Napping without phone use is recommended because it significantly improved serve accuracy compared to Baseline (p = 0.034). The Friedman test showed that nap conditions led to performance differences (p = 0.037), suggesting that structured naps can enhance athletic performance.

• Further research with a larger sample size is needed to confirm these findings and explore additional factors affecting nap effectiveness.

Future Work

• Conduct this study on more people for better accuracy • Refine recommendations: Testing and changing more in-depth the napping conditions • Conduct this study on groups of people with different skill levels (pro, amateur, etc.) • Expand the study into other sports • Try using different forms of performance measurements

References

• National Sleep Foundation. (2020). How much sleep do we really need? National Sleep Foundation.

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