

# Extended sleep improves the athletic performance of collegiate basketball players

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Young basketball players spend hours dribbling up and down the court aspiring to NBA stardom. Now, new Stanford University School of Medicine research suggests another tactic to achieving their hoop dreams: sleep.

In a study appearing in the July issue of *SLEEP*, Cheri Mah, a researcher in the Stanford Sleep Disorders Clinic and Research Laboratory, has shown that basketball players at the elite college level were able to improve their on-the-court performance by increasing their amount of total sleep time.

The study suggests that "sleep is an important factor in peak athletic performance," said first author Mah. In the paper, she and colleagues wrote that "athletes may be able to optimize training and competition outcomes by identifying strategies to maximize the benefits of sleep."

It's no secret that lack of sleep can have negative consequences. Extensive research has shown the impact that sleep debt has on cognitive function, mood and physical performance. But, as Mah and her colleagues point out in the paper, very few studies have looked at the opposite: the effect that sleep extension can have on performance. And few other groups have looked specifically at the effect of sleep on athletes.

While things such as nutrition and physical training are part of an athlete's daily regimen, Mah said competitive athletes at all levels

typically do not focus on optimizing their sleep and recovery. They are usually just told to get a "good night's sleep" before a competition.

"Intuitively many players and coaches know that rest and sleep are important, but it is often the first to be sacrificed," she added. "Healthy and adequate sleep hasn't had the same focus as other areas of training for peak performance."

In 2002, Mah conducted a study on sleep extension and cognitive function in Stanford undergraduate students. By chance, several participants were collegiate swimmers and mentioned that they had beaten personal swim records during the portion of the study in which they slept more than normal. A light bulb went off in Mah's head. "We had been investigating the effects of sleep extension on cognitive performance and mood, but I was now curious if sleep extension may also impact physical performance," she said.

Mah began working with sleep expert William Dement, MD, PhD, professor of psychiatry and behavioral sciences, and they turned their attention to the men's basketball team. Over the course of two basketball seasons, Mah and colleagues worked with 11 healthy players with a goal of investigating the effects of sleep extension on specific measures of athletic performance, as well as reaction time, mood and daytime sleepiness.

The researchers asked the players to maintain their normal nighttime schedule (sleeping for six to nine hours) for two to four weeks and then aim to sleep 10 hours each night for the next five to seven weeks. During the study period, players abstained from drinking coffee and alcohol, and they were asked to take daytime naps when travel prohibited them from reaching the 10 hours of nighttime sleep.

At the end of the sleep extension period, the players ran faster 282-foot

sprints (16.2 seconds versus 15.5 seconds) than they had at baseline. Shooting accuracy during practice also improved: Free throw percentages increased by 9 percent and 3-point field goal percentage increased by 9.2 percent. Fatigue levels decreased following sleep extension, and athletes reported improved practices and games.

Using a questionnaire-based sleepiness scale at the beginning of the study, Mah and her colleagues also discovered that many of the athletes had a moderate-to-high baseline level of daytime sleepiness — indicating that they were carrying sleep debt accumulated from chronic sleep loss. She called this one of the most surprising aspect of the study.

"The athletes were training and competing during their regular season with moderate-to-high levels of daytime sleepiness and were unaware that it could be negatively impacting their performance," she said. "But as the season wore on and they reduced their sleep debt, many athletes testified that a focus on sleep was beneficial to their training and performance."

The findings suggest, Mah said, that it's important for sleep to be prioritized over a long period of time, not just the night before "Game Day." She called optimal sleep an "unrecognized, but likely critical factor in reaching peak performance." She said the findings may be applicable to recreational athletes and those at the high school, semi-pro or professional level.

Mah and her co-authors noted several limitations to their study. The sample size was small and the players' travel schedule made maintaining a strict sleep-wake schedule difficult. (Mah noted, though, that this was an unusual opportunity to study actively competing elite athletes.) It's important to note, also, that the study didn't focus on in-game performance: The team aspect of basketball makes it tricky to do so, she said, but future studies could focus on swimming, track and field, or

other sports more conducive to examining individual performance.

Mah has already laid the groundwork for this research. Over the last several years she has investigated sleep extension in other Stanford sports teams including football, tennis, and swimming. She has presented abstracts with preliminary findings on these sports that suggest a similar trend: More sleep led to better performance.

Mah now works with many of the Stanford sports teams and coaches to integrate optimal sleep and travel scheduling into their seasons and also consults with professional hockey, football and basketball teams, in addition to continuing her research. She hopes to next turn her attention to the quality, versus quantity, of athletes' sleep.

Provided by Stanford University Medical Center

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