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The Relationship Between Sleep Quality and Quantity with Muscle Readiness, Stress, and Overall Health in College Athletes

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The Relationship Between Sleep Quality and Quantity with Muscle Readiness, Stress, and Overall Health in College Athletes

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Introduction
Sleep is essential for the physical and mental recovery of athletes, and college athletes typically have poor sleep quality and poor sleep quantity. Individuals who sleep for an average of less than seven hours a day are more likely to feel stressed, additionally in college-aged students, duration of sleep has a significant inverse effect on stress levels. Poor sleep quality is linked to physical and mental health complaints, and sleep quality may be a better indicator for health and wellbeing compared to sleep quantity, as the former better reflects sleep efficiency. Good sleep is linked to improved performance capacity, as well as reduced risk of injury and illness, and improved participation in training in athletes.

Purpose
To examine the relationships between sleep quantity, sleep quality, perceived muscle readiness, stress, and overall health in Division III female college athletes.
Hypothesis: There is a positive relationship between sleep quantity, sleep quality, perceived muscle readiness, stress, and overall health, and a negative relationship with previous workout intensity and less of an indicator of sleep condition.

Methods
An online daily health and wellness survey was given to female basketball (n=23), soccer (n=25), and swimming (n=24) teams over the course of their season at a small Division III college in Minnesota.
Sleep quantity (hours) was reported by each athlete daily, while the remaining variables were measured on a one to five Likert scale (Figure 1).
The product of sleep quantity (hours) and quality was also calculated to create a composite sleep score for each athlete on each day of their respective season.
Bivariate correlations were calculated to determine the strength of the relationships between all variables, including the sleep composite scores.

Results
Relationship Between Sleep Quantity and Stress for the Basketball Team (Daily Averages)
Relationship Between Sleep Quality and Muscle Readiness for the Soccer Team (Daily Averages)
Relationship Between Sleep Quality and Overall Health for the Swimming Team (Daily Averages)

Results
Overall health was weakly correlated with composite sleep score for the basketball team (R = .291, n = 1934, p < .05) and swimming team (R = .238, n = 1981, p < .05). Stress was weakly correlated with the composite sleep score for the soccer team (R = .287, n = 2028, p < .05). The correlation between sleep quality and sleep quantity was moderate (R = .321, n = 5944, p < .05).

Discussion
Overall, sleep quantity was weakly and inversely related to stress, weakly and directly related to overall health, but not related to muscle readiness.
Additionally, sleep quality was weakly and inversely related to stress, weakly and directly related to overall health, but not related to muscle readiness.
Neither sleep quantity or quality alone produced strong correlations with stress, muscle readiness, and overall health.
Sleep deprivation leads to significantly higher stress, weakly and directly related to overall health, but not related to muscle readiness.

Table 1. Description of Likert scale for survey questions

<table>
<thead>
<tr>
<th>Feeling</th>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>Overwhelmed</td>
<td>Feeling stressed or overwhelmed</td>
</tr>
<tr>
<td></td>
<td>Stressed</td>
<td>Feeling stressed, frustrated, tense</td>
</tr>
<tr>
<td></td>
<td>Just OK</td>
<td>Feeling calm, relaxed</td>
</tr>
<tr>
<td></td>
<td>Feeling above</td>
<td>Feeling above and beyond</td>
</tr>
<tr>
<td></td>
<td>Par</td>
<td>Feeling good</td>
</tr>
<tr>
<td></td>
<td>Below Par</td>
<td>Feeling below par</td>
</tr>
</tbody>
</table>

Table 1. Description of Likert scale for survey questions

Conclusions
Data from this study suggests there are weak correlations between sleep quantity and quality with perceived stress and overall health in female college athletes. Muscle readiness does not appear to be related to sleep quality and/or sleep quantity. Despite the weak correlations, it is still important to monitor and understand athletes’ sleep quantity and overall wellness when developing and administering training plans.