

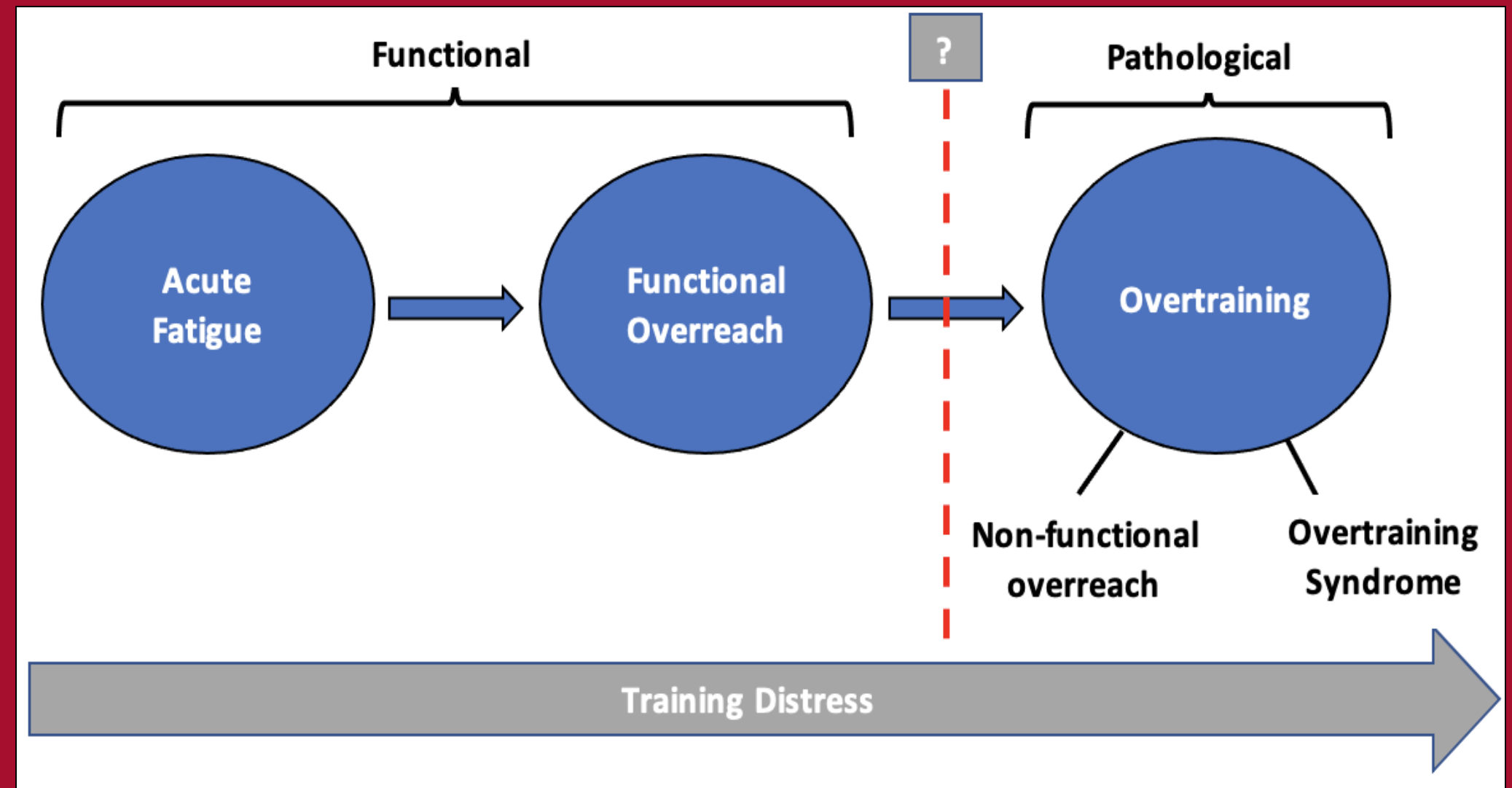
SLEEP PATTERNS OF RECREATIONALLY ACTIVE ADULTS THROUGHOUT A THREE-WEEK HIGH-INTENSITY OVERREACHING TRAINING PROTOCOL.

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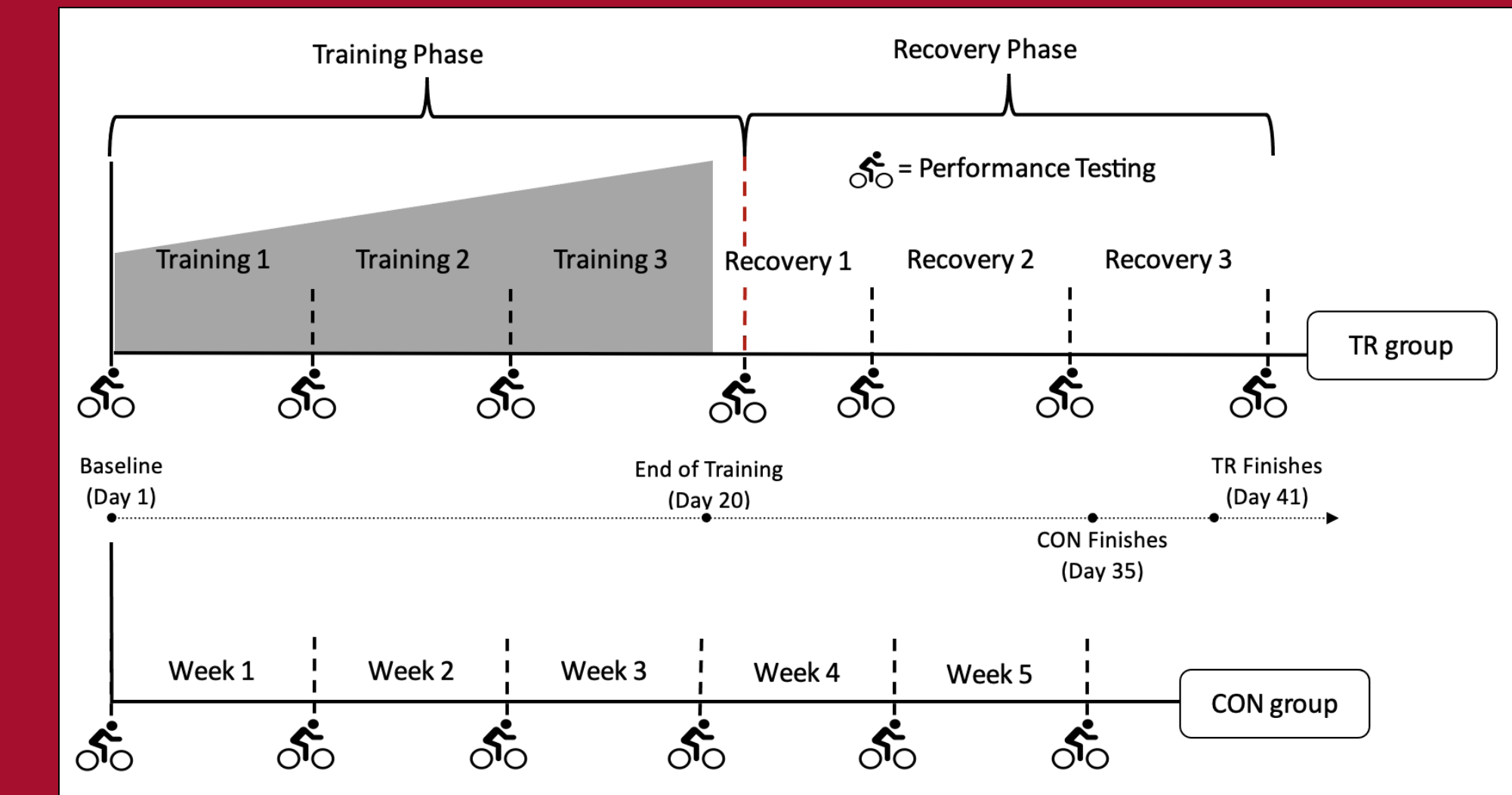
Background:

- Overtraining is a maladaptive training response caused by excessive training stress and/or inadequate recovery.
- The hallmark symptom of overtraining is an unexplained reduction in performance. Secondary symptoms can include worsened mood states, higher incidence of illness, and neuroendocrine dysfunction.
- Sleep, athletic performance, and immune system function share bi-directional relationships with one another.
- Overtrained individuals often report sleep disturbances; however, it is unclear whether poor sleep contributes to overtraining progression or are merely a symptom.



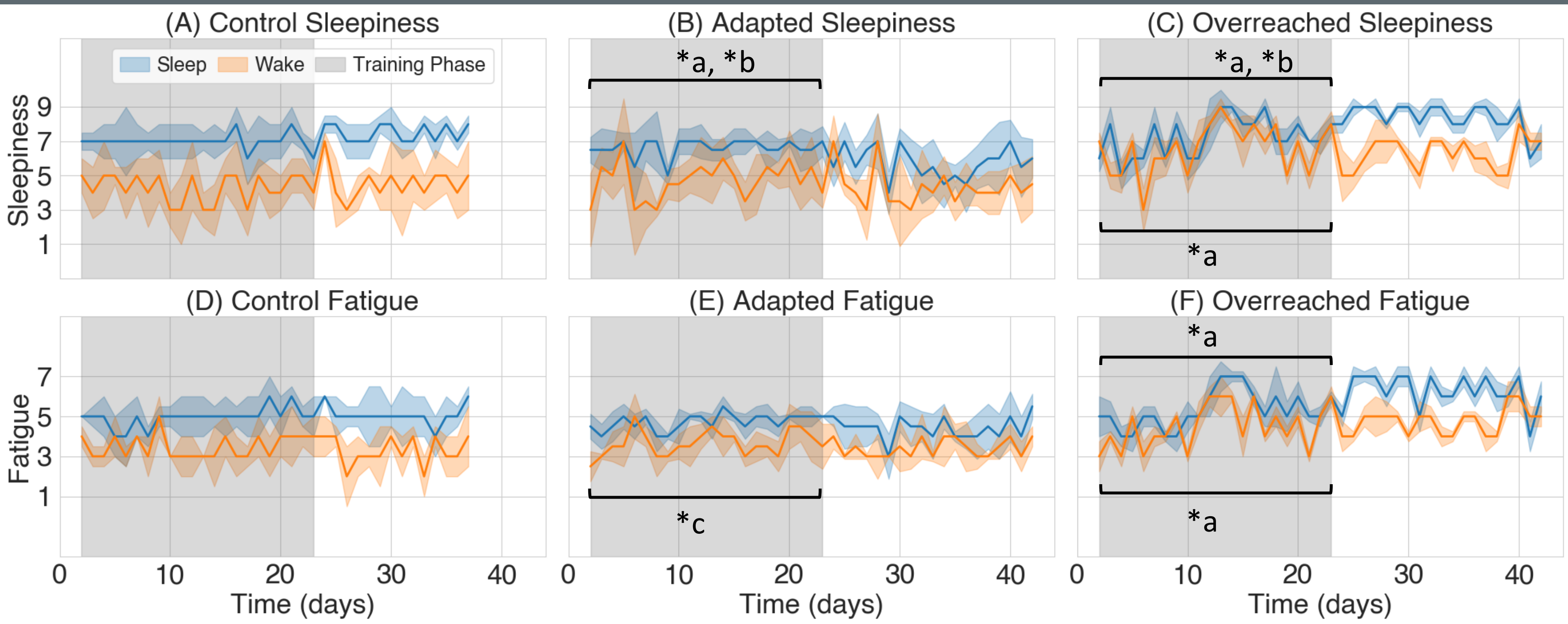
Methods:

- Study participants were randomized into a training group (TR, n=11) or control group (CON, n=9). TR group underwent a three-week high-intensity training protocol, followed by three weeks of recovery.
- Sleep was measured using actigraphy and paired sleep surveys. Illness symptoms were assessed using the Wisconsin Upper Respiratory Illness Symptoms Score (WURSS-11).
- After training, three TR participants were considered overreached (OR), evidenced by a decrease in performance ($-10.38 \pm 5.55\%$ from baseline); other TR participants (n=8) were considered adapted (AD).



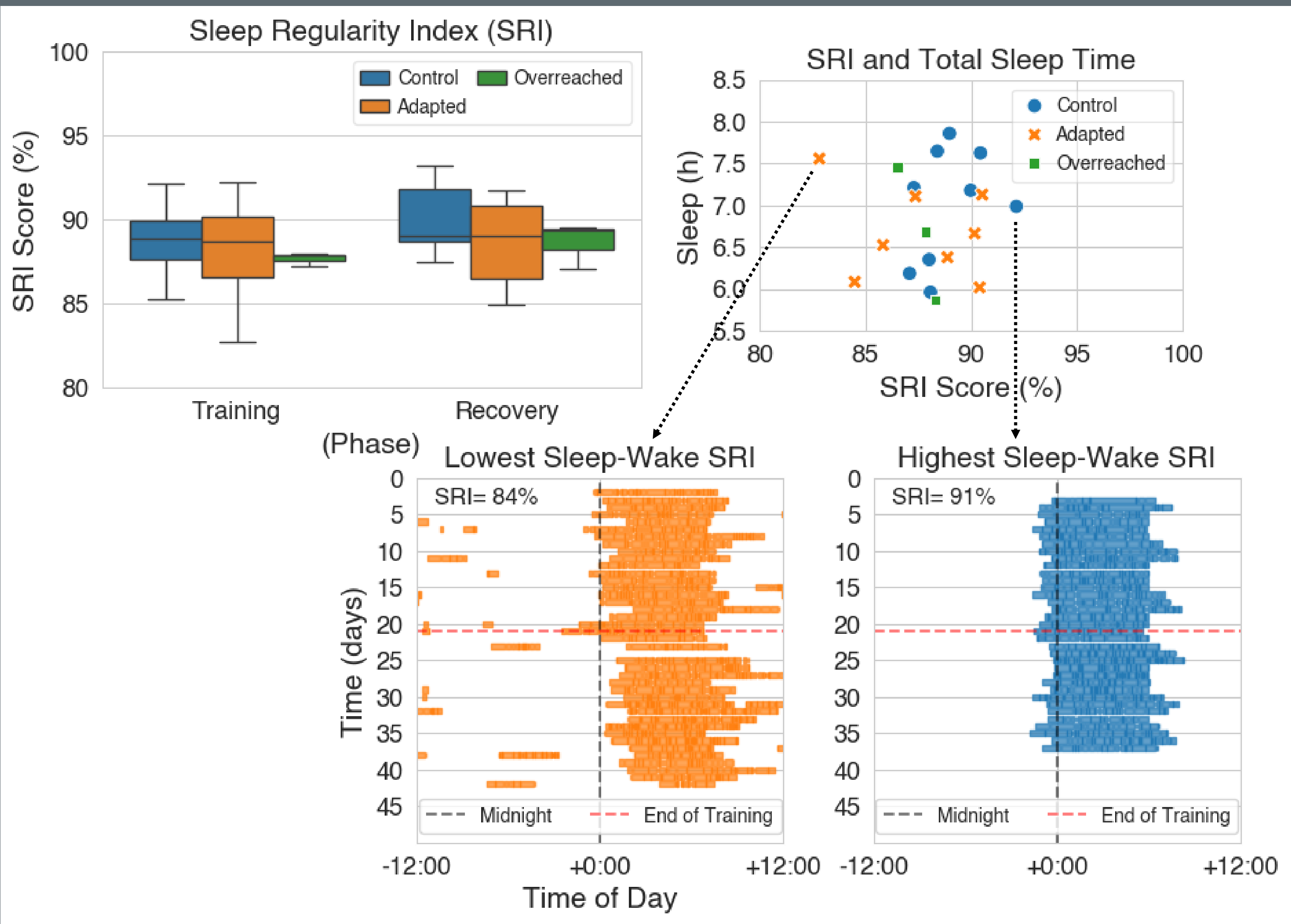
After intensified training, **overtrained individuals experience:**

- Excessive fatigue and sleepiness**—both at bedtime and upon waking.
- increased illness symptoms.**



Group differences over time were assessed using linear mixed-effects models. *a indicates group·time interaction with CON group during same phase. *b indicates group·time interaction with AD group during the same phase. *c indicates within-group main effect of time during the specific phase. Upper brackets indicate group differences at bedtime; lower brackets indicate group differences upon waking. Data reported as median + interquartile ranges.

Intensified training **does not appear** to affect sleep regularity.



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