

QUANTIFYING PROXIMAL AND DISTAL PREDICTORS OF READINESS IN ADOLESCENT ATHLETES

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Introduction

- Athlete readiness reflects physical and psychological preparedness to perform and adapt to training demands (Alecú & Onea, 2025).
- Recovery behaviors and environmental support may influence athlete readiness (Charest & Grandner, 2020; Balk & Englert, 2020).

RESEARCH GAP

Existing literature often examines individual recovery factors and contextual factors independently. Less is known about how recovery behaviors and environmental support jointly relate to multidimensional athlete readiness.

STUDY OBJECTIVE

This study examined whether recovery behaviors and environmental support predicted a Performance Readiness Index (PRI) derived from physical and psychological wellness indicators.

Results

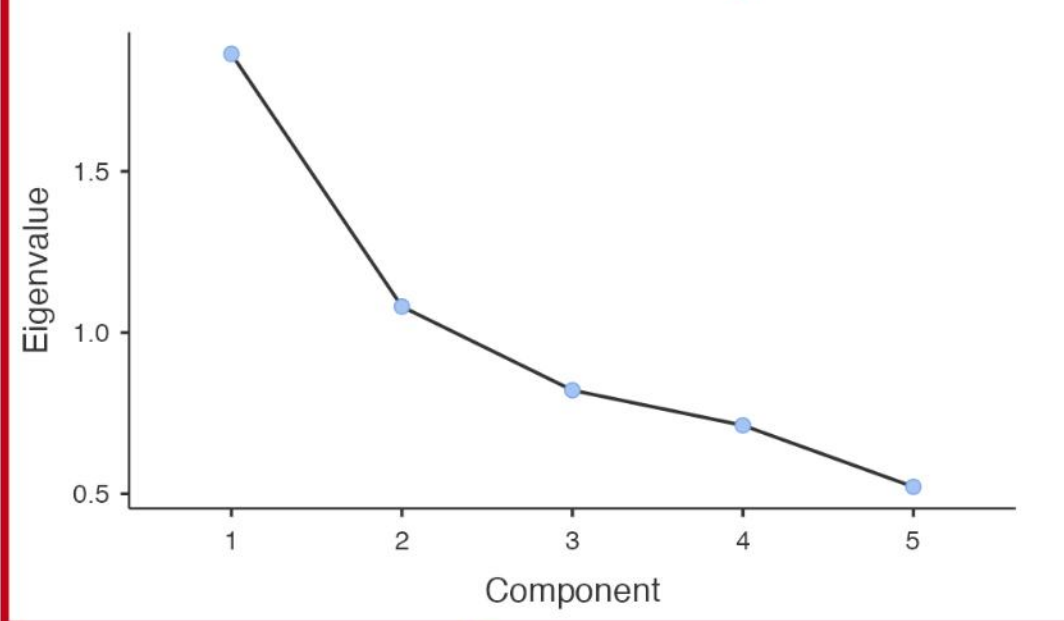
PCA: PERFORMANCE READINESS INDEX

PCA conducted on 5 wellness indicators:

- Mood
- Restfulness
- Mental focus
- Mental fatigue (reverse-coded)
- Soreness frequency (reverse-coded)

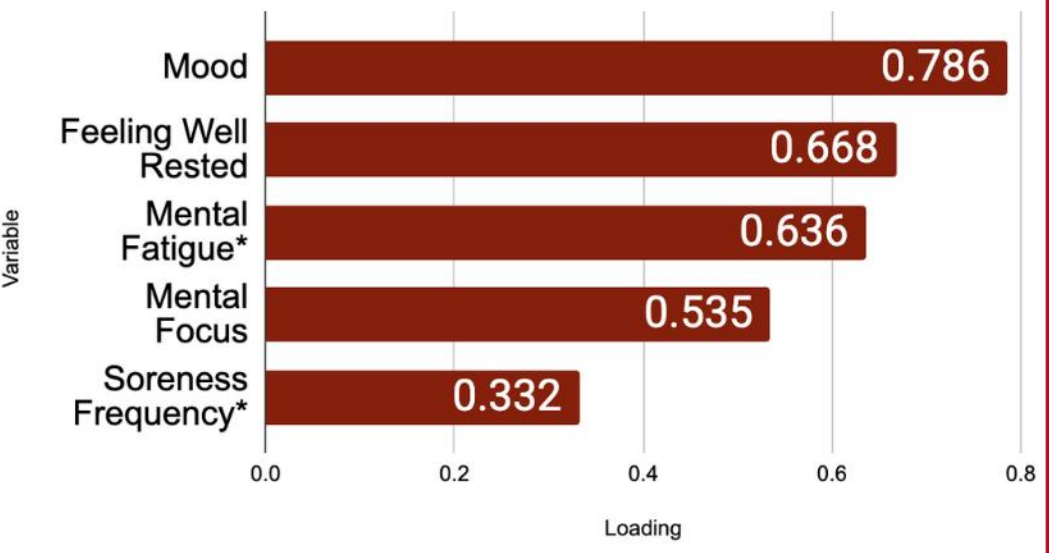
PC1 retained as the Performance Readiness Index

Bartlett's = $p < .001$ PC1 Eigenvalue = 1.864
KMO = 0.634 PC1 Variance Explained = 37.3%



PCA LOADINGS

READINESS INDICATOR LOADINGS



Mood, restfulness, and reduced mental fatigue contributed most strongly to the latent readiness construct.

PREDICTING PERFORMANCE READINESS

$R^2 = 9.2\%$ $F(2,300) = 15.20$ | $p < .001$ | $N = 303$
Recovery behaviors and environmental support explained 9.2% of the variance in Performance Readiness Index scores.

INDIVIDUAL PREDICTORS

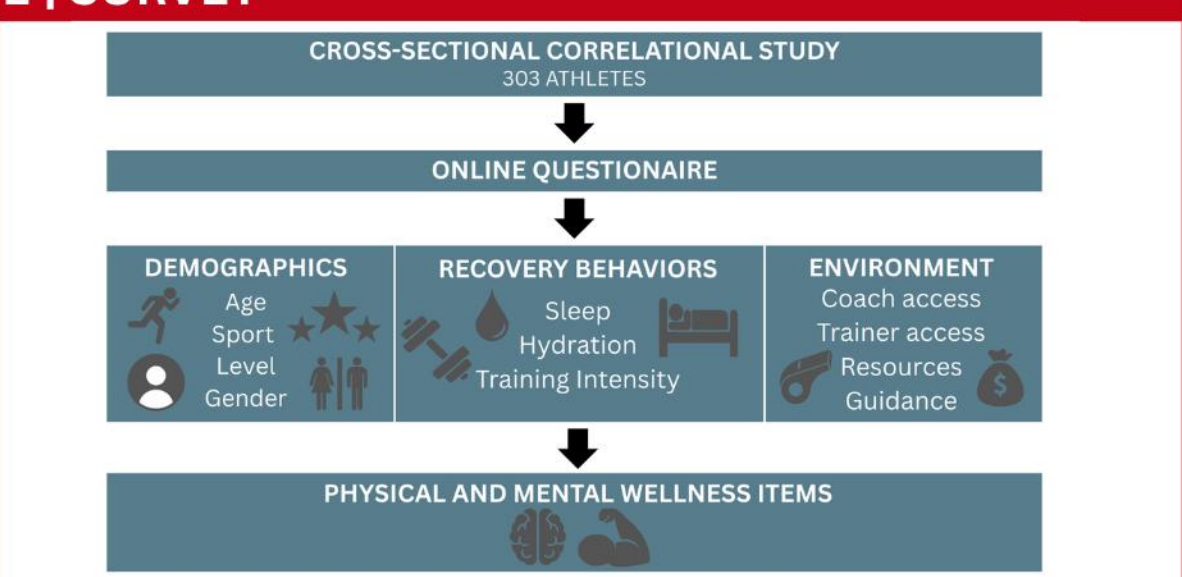
Methods

1 | SAMPLE

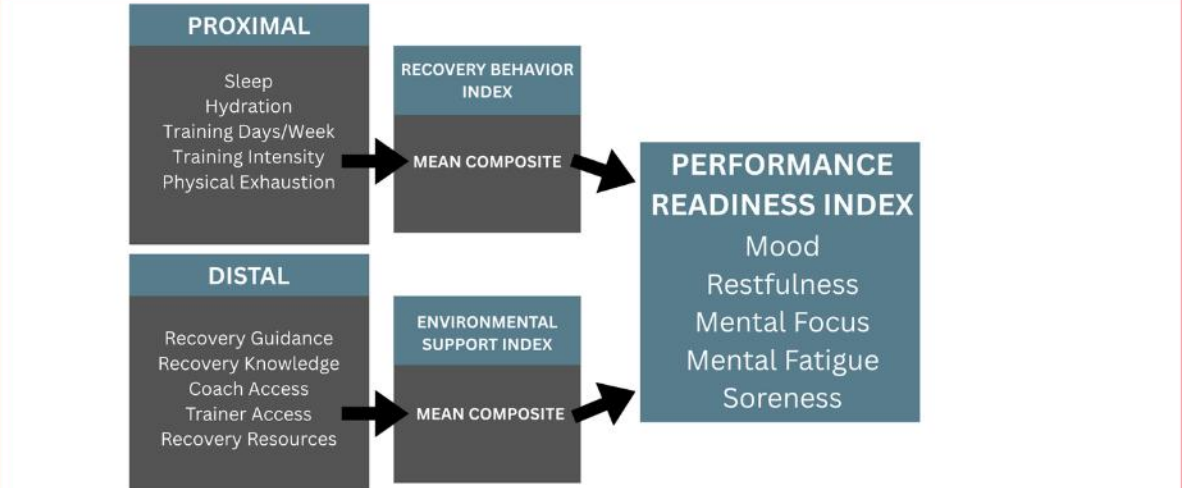
PARTICIPANTS (N = 303) ● 12 U.S. STATES, D.C, AND CANADA



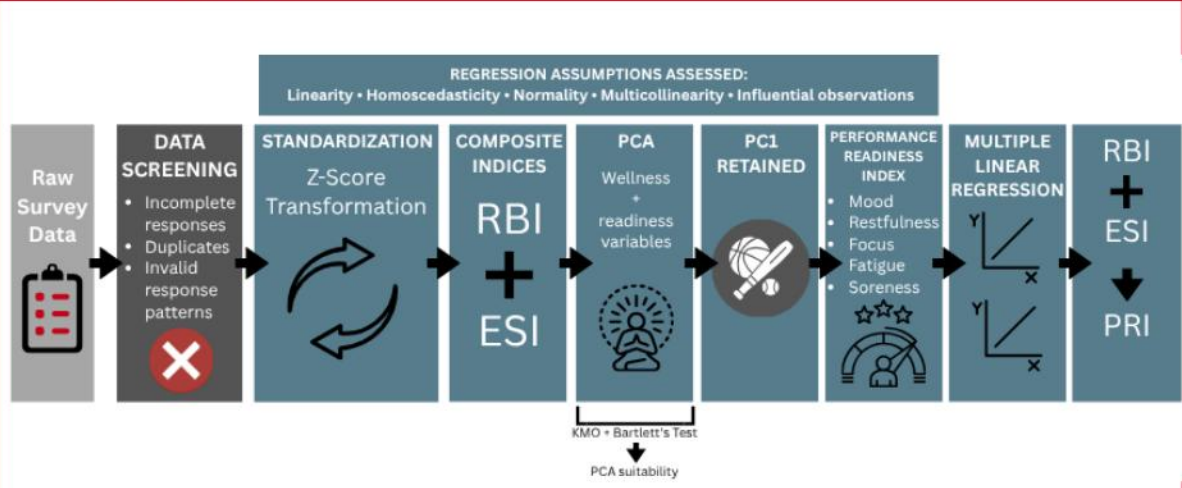
2 | SURVEY



3 | INDEX CONSTRUCTION



4 | ANALYSIS



RECOVERY BEHAVIORS

$\beta = 0.255$
 $b = 0.497$
 $SE = 0.114$
 $t = 4.36$
 $p < .001$



ENVIRONMENTAL SUPPORT

$\beta = 0.099$
 $b = 0.255$
 $SE = 0.150$
 $t = 1.70$
 $p = .091$



Recovery behaviors were significantly associated with higher athlete readiness, whereas environmental support showed a positive but non-significant association.

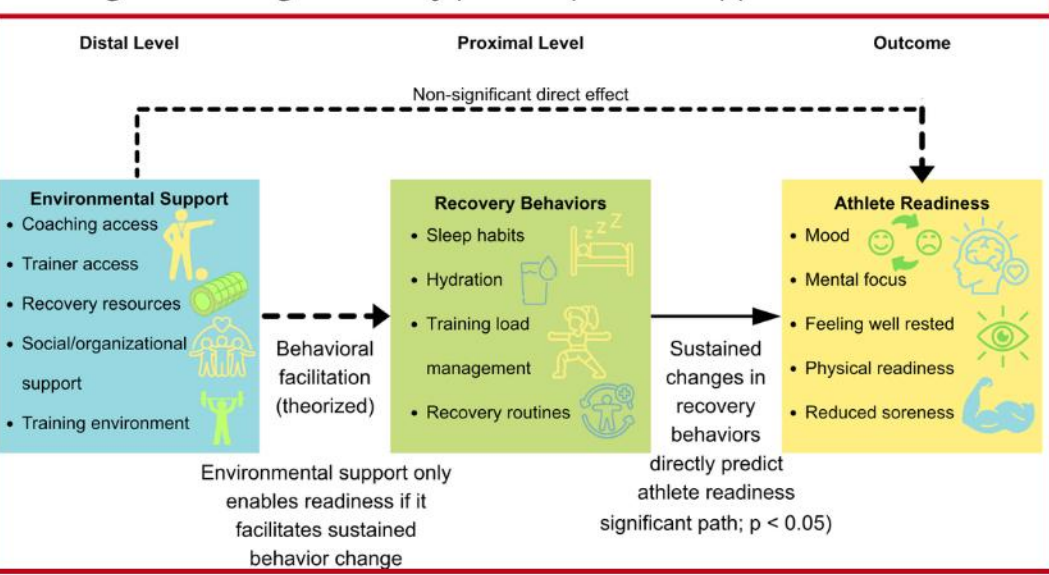
DISCUSSION

- RECOVERY BEHAVIORS WERE THE STRONGEST PREDICTOR**
Recovery behaviors were significantly associated with higher Performance Readiness Index scores ($\beta = 0.255$, $p < .001$), supporting the proposed role of proximal, daily recovery behaviors in athlete readiness.
- ENVIRONMENTAL SUPPORT MAY ACT INDIRECTLY**
Environmental support was positively associated with readiness yet did not reach statistical significance ($\beta = 0.099$, $p = .091$). This may indicate that contextual support influences readiness through athletes' actual recovery behaviors rather than directly.
- READINESS WAS STRONGLY PERCEPTUAL**
Mood (loading = 0.786), feeling well rested (0.668), and reduced mental fatigue (0.636) were the most influential contributors to the Performance Readiness Index, suggesting that perceived psychological states were prominent within the readiness construct.
- FUTURE STUDIES**
Interventions targeting sleep, hydration, and training-load management may provide practical opportunities to support athlete readiness.

RECOVERY BEHAVIORS WERE A SIGNIFICANT PREDICTOR OF ATHLETE READINESS, WHILE ENVIRONMENTAL SUPPORT SHOWED A POSITIVE BUT NON-SIGNIFICANT ASSOCIATION.

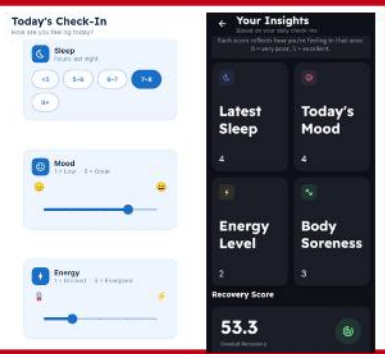
LIMITATIONS

- Cross-sectional design limits causal inference.
- Convenience sampling may limit generalizability.
- Self-reported measures may introduce response/perception bias.



APPLICATION

- ReAMP app integrates the factors examined in this study (mood, sleep, energy, focus, fatigue, soreness, etc.) to identify patterns across athlete check-ins and generate personalized recovery recommendations.
- Multidimensional input:** Captures physical and psychological wellness indicators
 - Pattern recognition:** Identifies recurring relationships among recovery and readiness factors
 - Personalized outputs:** Generates targeted recommendations based on detected patterns



REFERENCES

Alecú, S., & Onea, G. A. (2025). Readiness for competition across sports and genders. *Frontiers in Psychology*, 16.
Charest, J., & Grandner, M. A. (2020). Sleep and athletic performance. *Sleep Medicine Clinics*, 15(1), 41–57.
Balk, Y. A., & Englert, C. (2020). Recovery self-regulation in sport. *International Journal of Sports Science & Coaching*, 15(2).