WHOOP MONTHLY PERFORMANCE ANALYSIS

February 2026 | Mock / Practice Run

Executive Summary

1. Average recovery was 52% (SD 24), with a low of 1% and high of 97%. Recovery trended downward from Week 52 through Week 3 before partially rebounding.

2. HRV is the single strongest predictor of recovery ($r = 0.75$, $p < 0.001$). This relationship holds even after controlling for sleep metrics (partial $r = 0.80$), confirming HRV as an independent recovery pathway.

3. The strain-recovery relationship follows an inverted U: optimal strain is ~11.9 (zone 10.4–13.4). Pushing beyond this range yields diminishing or negative returns on next-day recovery.

4. Strength training days produced significantly higher recovery than running days ($d = 0.74$, $p = .036$). Running may require longer recovery windows or periodization adjustments.

5. Top behavioral lever: "Spend time outdoors" showed the largest effect on HRV ($d = 1.91$). Other high-impact behaviors include "Took fish oil" ($d = 1.54$) and "Used social media" ($d = 1.47$).

Note: This is a mock/practice run using synthetic data. No specific injuries or events informed this analysis. All recommendations are illustrative.

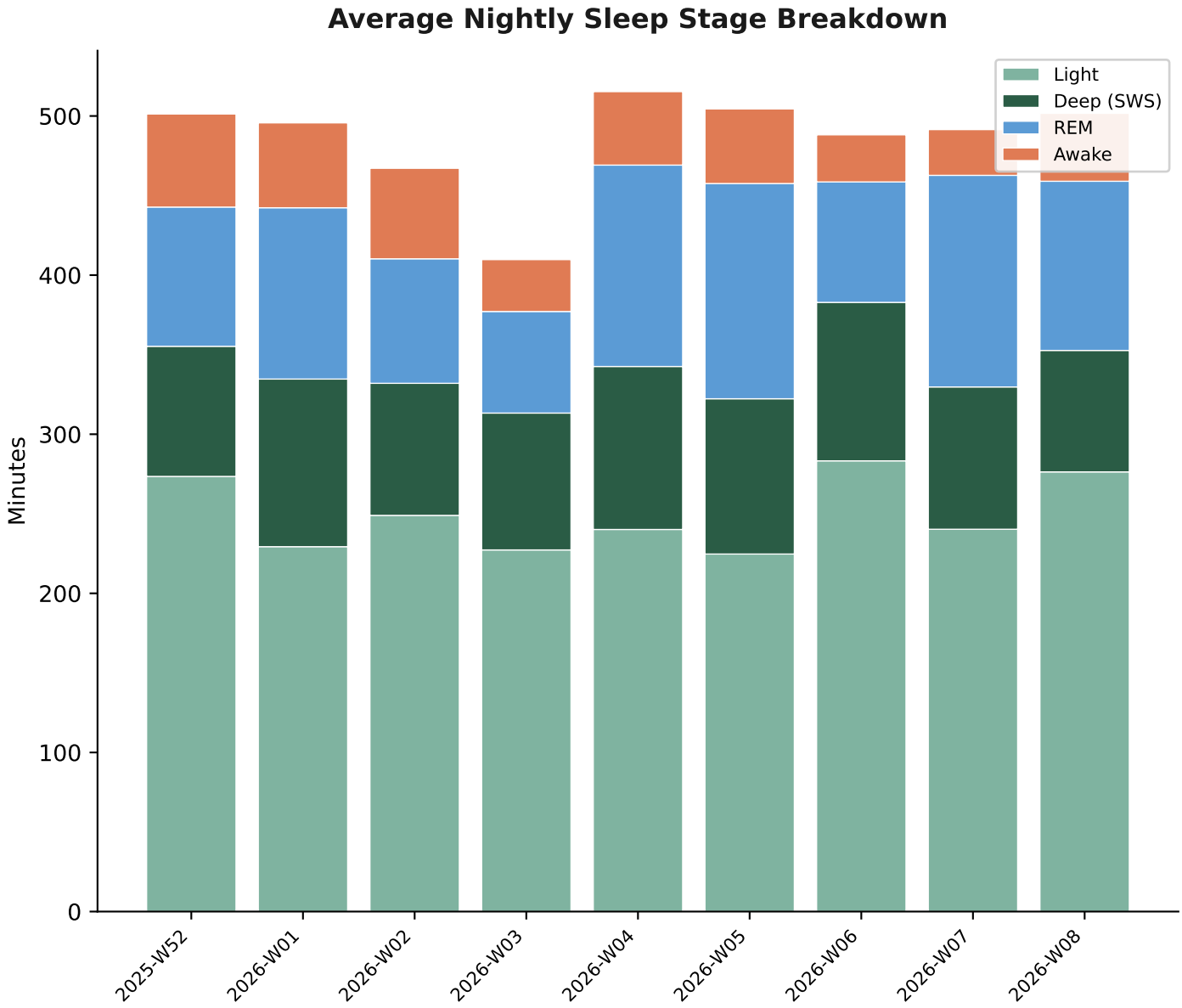
Dataset Overview

Metric	N	Mean	SD	Min	Max
Recovery %	56	51.6	24.4	1	97
RHR	56	57.2	5.8	42	71
HRV	56	128.3	37.6	32	216
Skin Temp	56	33.6	0.8	31	35
SpO2	55	95.2	1.4	92	98
Day Strain	56	13.4	4.7	1	20
Energy Burned	56	2425.9	529.5	769	3576
Max HR	56	155.1	22.4	108	182
Avg HR	56	66.8	4.7	60	87
Sleep Performance %	56	78.7	15.1	8	97
Sleep Duration	56	440.4	97.9	24	579
Deep Sleep	56	92.5	24.8	9	163
REM	56	101.5	43.2	0	187
Sleep Efficiency %	56	89.7	7.8	40	96
Sleep Consistency %	52	71.9	15.5	21	89

Sample Size: 57 days | Anomaly Flags: 2 rows

Data spans late December 2025 through mid-February 2026 (9 ISO weeks).
Anomalies include missing recovery scores, extreme RHR/HRV values, and short sleep (<4h).

Sleep Architecture by Week



Key Sleep Metrics

Avg Sleep Duration: 440 min | Deep Sleep: 92 min | REM: 101 min
Sleep Efficiency: 89.7% | Sleep Consistency: 71.9% | Sleep Performance: 78.7%

Recovery Regression Model

Model: Recovery ~ Sleep Duration + Deep Sleep + REM + Sleep Efficiency + Sleep Onset Hour + Prior-Day

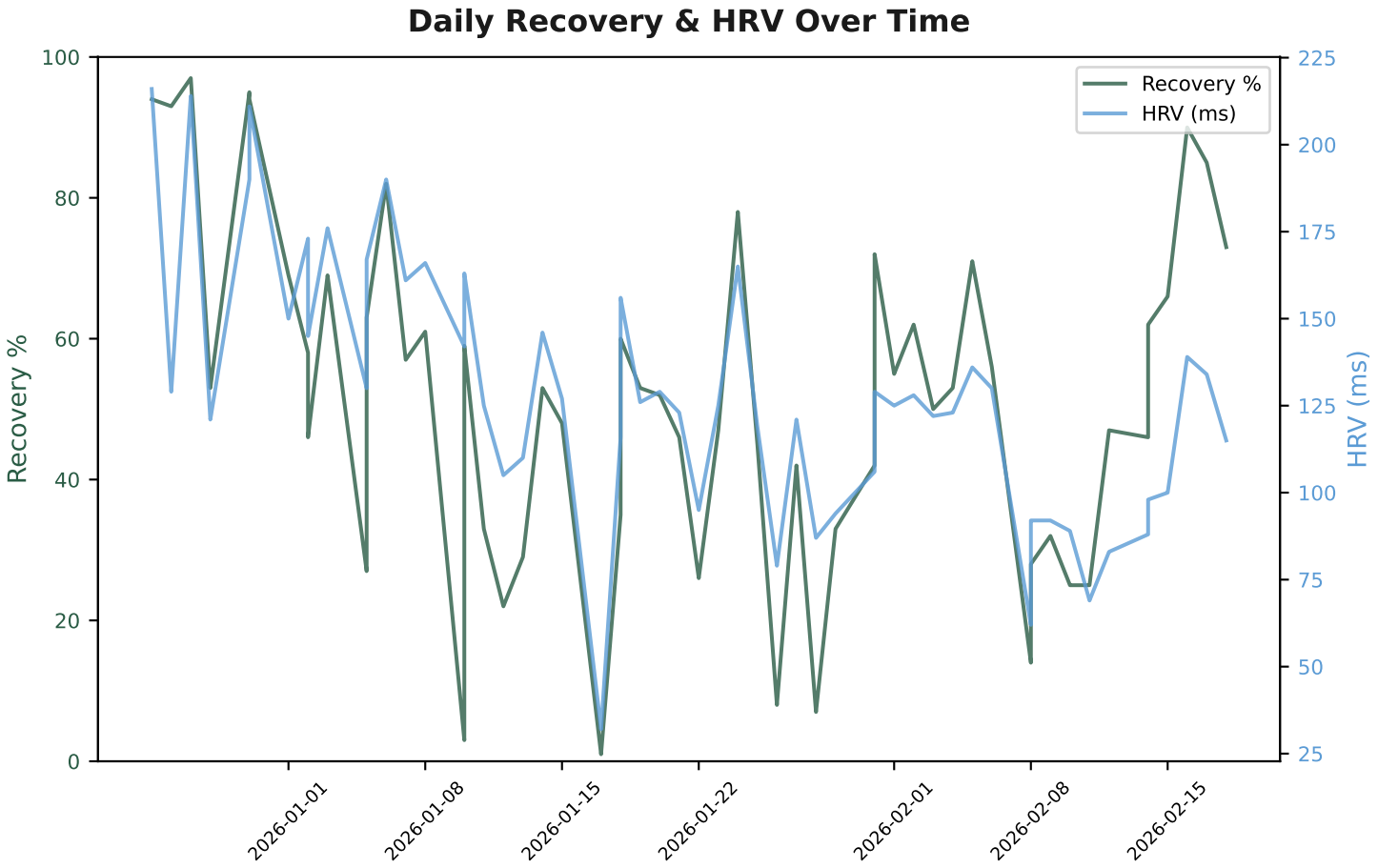
N = 56 | R^2 = 0.239 | Adj R^2 = 0.146 | F = 2.57 (p = 0.0306)

Predictor	β	SE	t	p	Sig?
Intercept	40.387	76.888	0.53	0.6018	
Sleep Duration	**0.150**	**0.051**	**2.95**	**0.0048**	✓
Deep Sleep	-0.094	0.147	-0.64	0.5253	
REM	-0.118	0.091	-1.30	0.2006	
Sleep Efficiency	-0.126	0.549	-0.23	0.8190	
Sleep Onset Hour	-0.277	2.146	-0.13	0.8978	
Prior-Day Strain	-1.204	0.661	-1.82	0.0748	

Interpretation

The model explains about 24% of recovery variance (R^2 = 0.239). Sleep duration is the only statistically significant predictor (β = 0.15, p = .005): each additional hour of sleep is associated with roughly a 9-point increase in recovery score. Prior-day strain shows a marginal negative effect (β = -1.20, p = .075), suggesting that high-strain days tend to suppress next-day recovery, but this did not reach significance at α = .05. Deep sleep, REM, sleep efficiency, and sleep onset hour were not significant predictors in this model, likely due to multicollinearity with total sleep duration.

HRV & Recovery Analysis

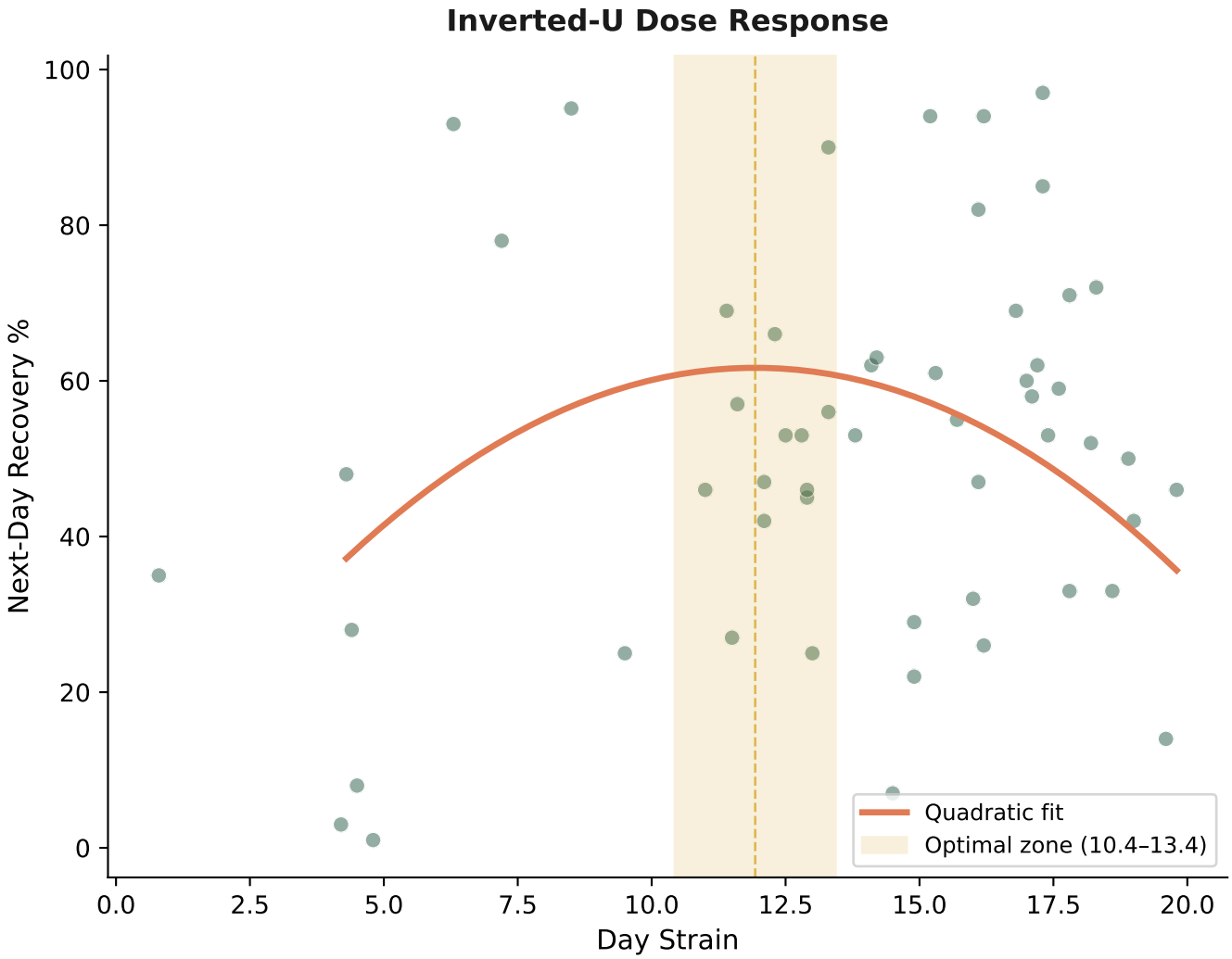


Correlation Results

Bivariate: r = 0.749 (p < 0.001) — Strong positive correlation
Partial (controlling for sleep metrics): r = 0.800 (p < 0.001)
Controls: Sleep Duration, Deep Sleep, REM, Sleep Efficiency

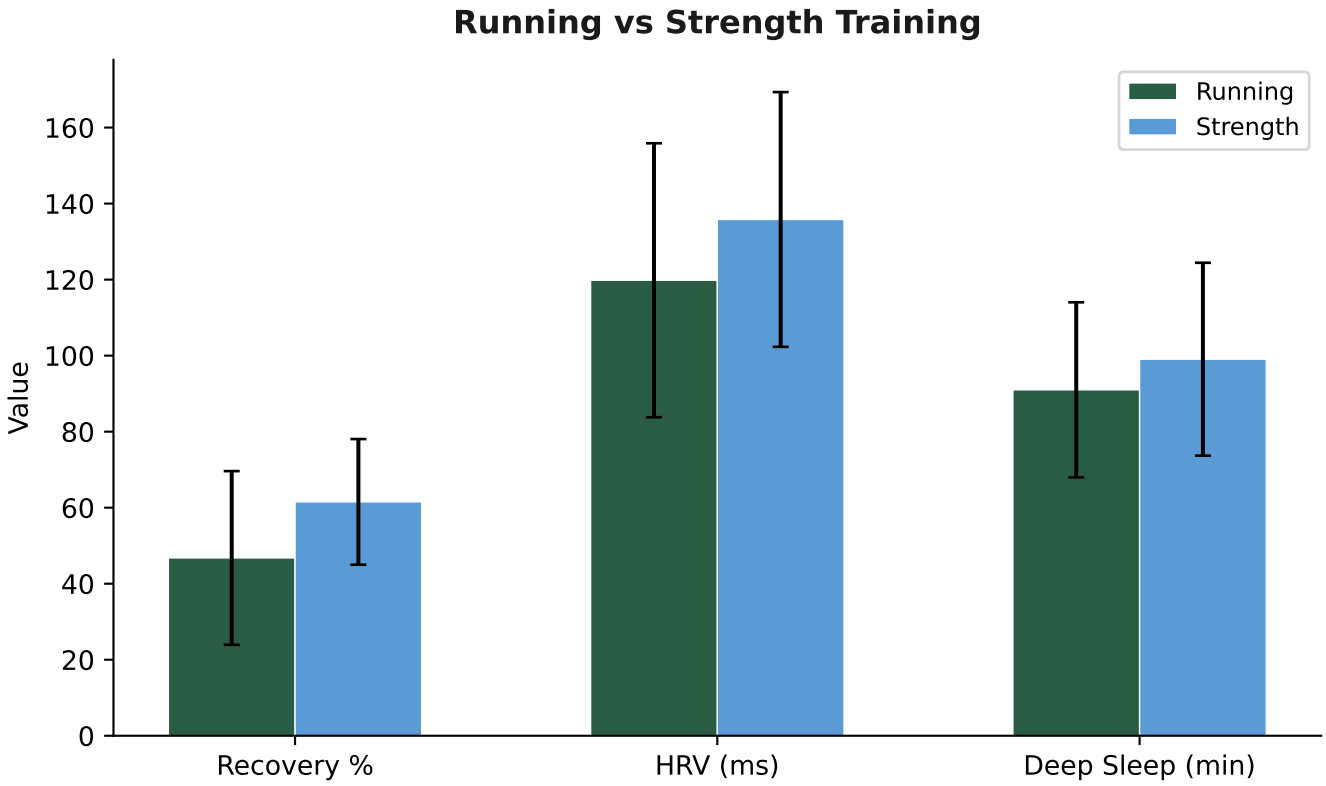
Conclusion: HRV is an independent recovery pathway. HRV explains recovery variance above and beyond what sleep duration, deep sleep, REM, and sleep efficiency can account for.
This makes HRV the single most actionable metric for predicting next-day readiness.

Strain-Recovery Dose Response



Model: Recovery = 1.8 + 10.0×Strain + (-0.42)×Strain² (R^2 = 0.121)
Optimal Strain: 11.9 (predicted recovery: 62%)
The quadratic term is significant (p = .018), confirming diminishing returns at high strain.
Training in the 10.4–13.4 strain zone maximizes next-day recovery potential.

Training Modality Comparison

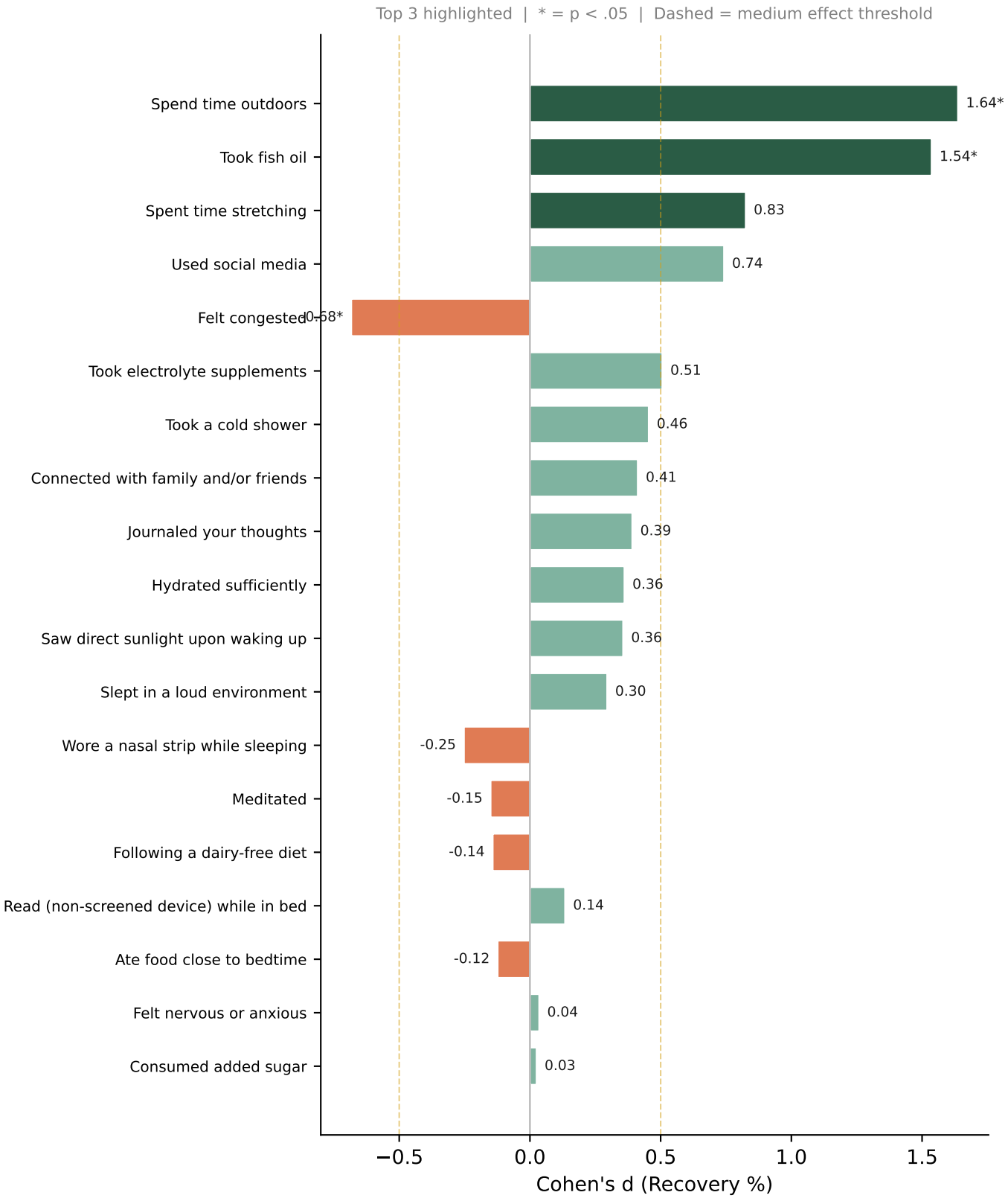


Metric	Cohen's d	p-value	Significant?
Recovery %	-0.74	0.0356	Yes
HRV (ms)	-0.46	0.1830	No
Deep Sleep (min)	-0.33	0.3335	No

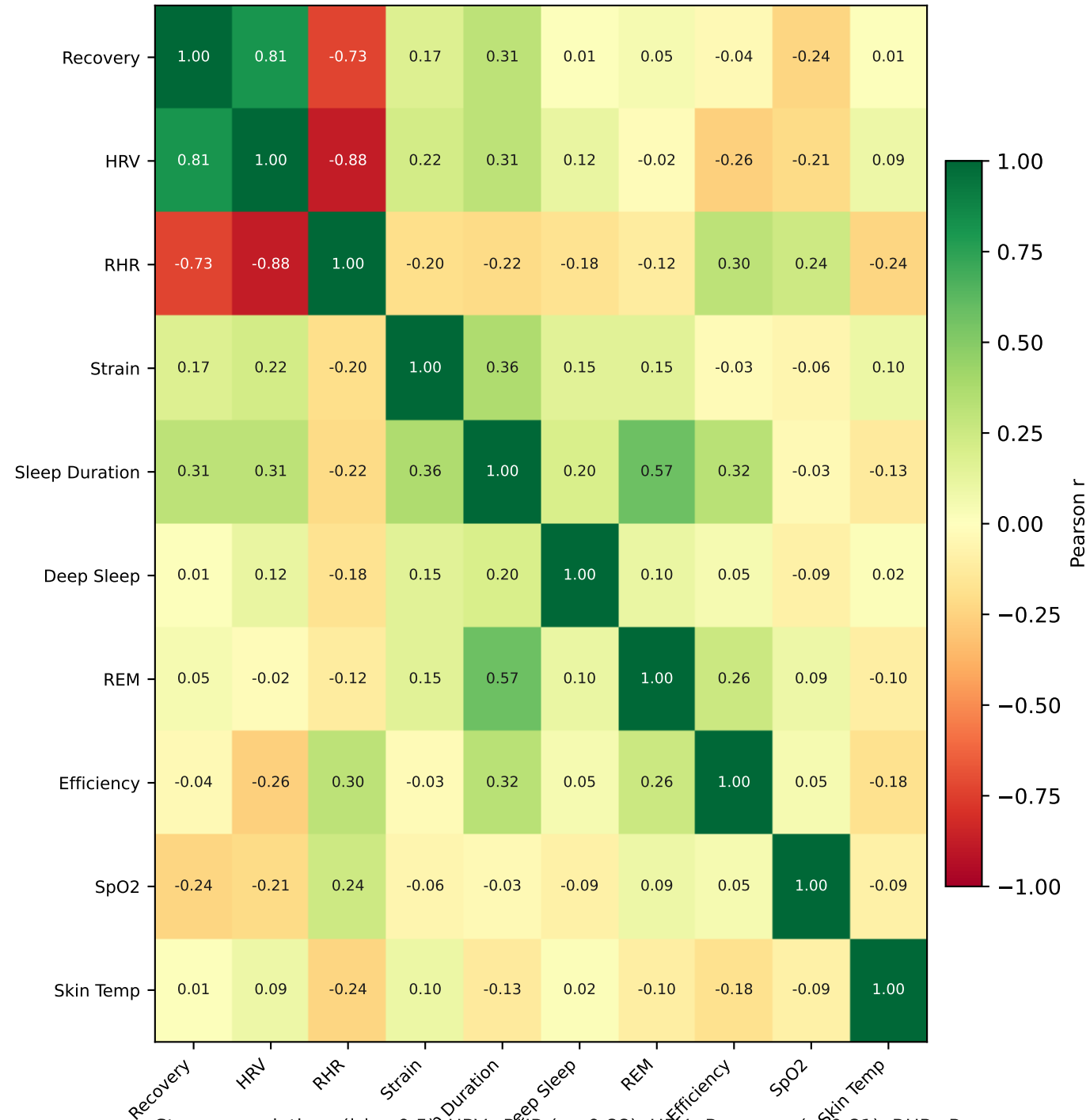
Running: n=18 | Strength: n=17 | Rest: n=2 (excluded, insufficient sample)

Behavioral Interventions

Cohen's d for Recovery % (YES vs NO days)

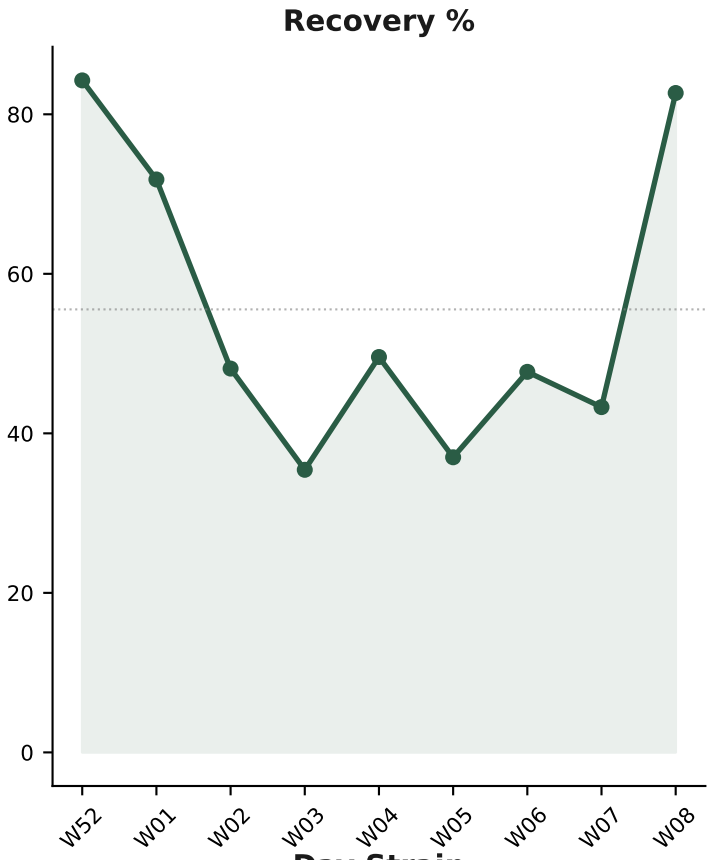


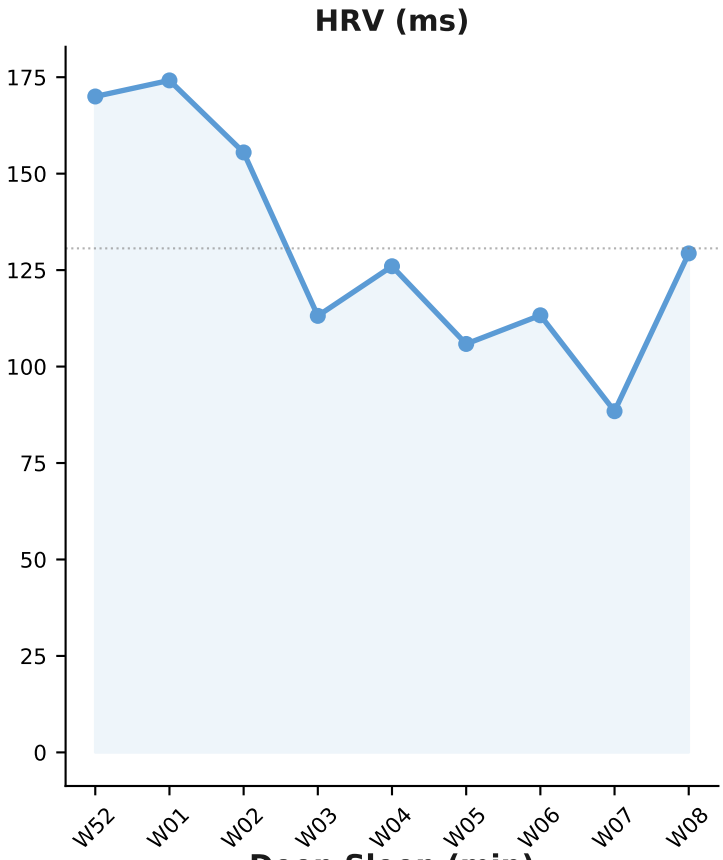
Correlation Matrix

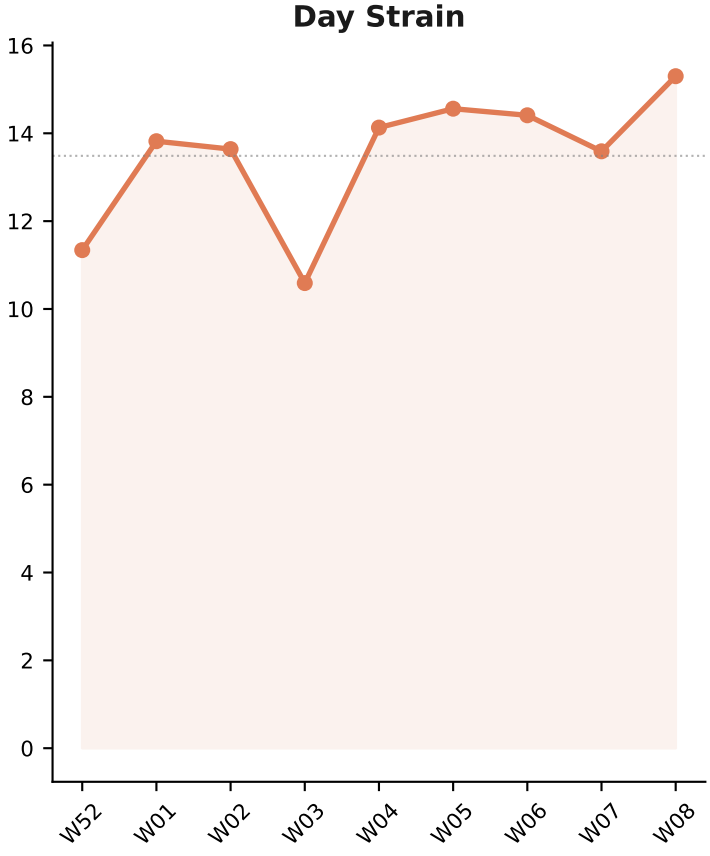


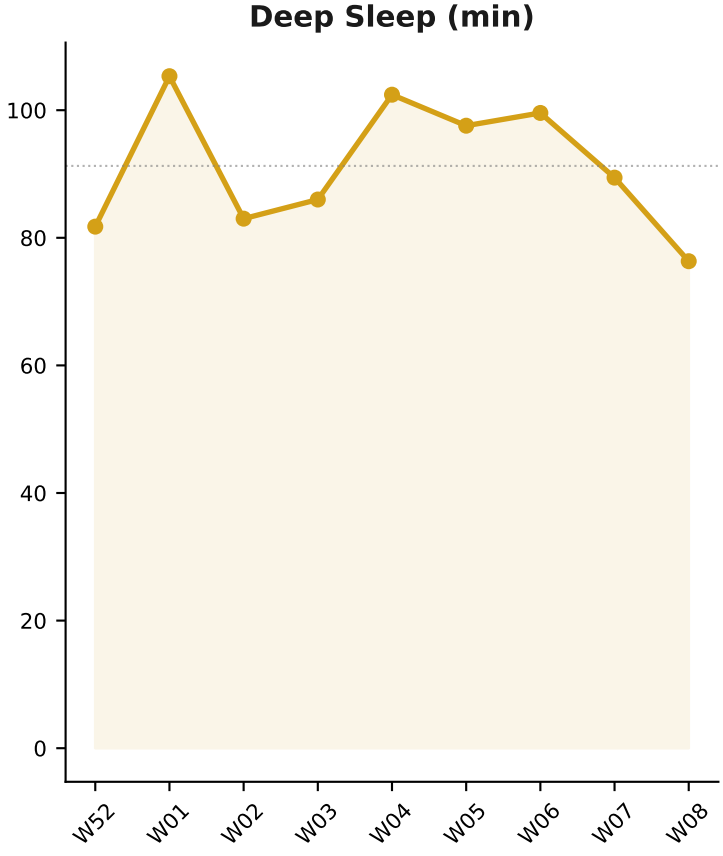
Strong correlations (|r| > 0.5): HRV↔RHR (r=-0.88), HRV↔Recovery (r=0.81), RHR↔Recovery (r=-0.73), REM↔Sleep Duration (r=0.57)

Weekly Trajectory









Protocol Recommendations

Evidence-based, actionable steps for the next training block

1. Target 10.4–13.4 Day Strain on training days

The dose-response curve peaks at ~11.9 strain. Stay in the 10.4–13.4 zone to maximize next-day recovery. On days you exceed 15, plan a lower-strain or rest day the following day. Track weekly average strain and keep it below 14.0.

2. Prioritize total sleep time over sleep timing

Sleep duration was the only significant predictor in the regression model (β = 0.15, p = .005). Aim for 7.5+ hours of actual sleep (450+ min). Set a non-negotiable lights-out window 8 hours before your alarm. Sleep onset hour itself was not significant, so consistency matters more than exact bedtime.

3. Add outdoor time on training days

"Spend time outdoors" showed the largest behavioral effect on recovery (d = 1.64) and HRV (d = 1.91). Even 20–30 minutes of outdoor exposure, ideally combining natural light and movement, could meaningfully boost next-day readiness. Stack this with a post-workout cooldown walk.

4. Add a recovery buffer after running days

Running days produced significantly lower recovery than strength days (d = 0.74). Consider scheduling a lighter strength or mobility session the day after a hard run. Alternatively, keep running strain in the lower half of the optimal zone (10–12).

5. Monitor HRV trend as an early warning system

HRV is the strongest single predictor of recovery (r = 0.81). When your 7-day HRV average drops below 110 ms, proactively reduce training load for 2–3 days. The Week 7 dip to 88 ms coincided with the lowest recovery stretch of the month.

Methodological Notes

Sample Size & Coverage

N = 57 daily records spanning 9 ISO weeks (late Dec 2025 – mid-Feb 2026). All records include recovery scores; 1 record missing SpO2. Workout classification available for 47 days.

Statistical Methods

Descriptive statistics: mean, SD, min, max for 16 physiological and sleep metrics. Recovery regression: OLS with 6 predictors (sleep duration, deep sleep, REM, sleep efficiency, sleep onset hour, prior-day strain). HRV analysis: Pearson bivariate and partial correlation controlling for 4 sleep variables. Dose-response: quadratic regression of next-day recovery on strain. Training modality: independent-samples t-tests with Cohen's d effect sizes. Behavioral interventions: YES/NO group comparisons with Cohen's d and Welch's t-test. Correlation matrix: pairwise Pearson r across 10 key metrics. All p-values are two-tailed; significance threshold $\alpha = .05$.

Limitations

1. Mock/synthetic data — results are illustrative only and should not guide real training. 2. Small sample (n=56 days); many behavioral subgroups have $n < 10$, limiting statistical power. 3. Observational design — no causal claims can be made. 4. No control for confounders (e.g., alcohol, illness, travel) beyond those logged in the journal. 5. Paradoxical flags in some interventions (e.g., meditation associated with lower HRV) likely reflect confounding or reverse causation rather than true harmful effects. 6. Weekly trajectory uses ISO weeks; partial weeks at the boundary may skew averages.

Skipped Analyses

Sleep onset timing analysis was included in the regression but showed no effect ($p = .90$). Activity-specific strain breakdowns (e.g., per-workout type) were not performed due to mixed-activity days. Longitudinal time-series modeling (ARIMA, etc.) was not applied given the short observation window.