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ABSTRACT

Sports science heavily influences athletic preparedness and performance. Therefore, it is worthwhile to accurately measure athlete readiness and performance.

PURPOSE: The purpose of this project is to evaluate athlete readiness, wellness and recovery, jumping performance and sports performance in order to determine phases of the season where performance is higher or lower.

METHODS: 26 (n=26) University of Nebraska-Kearney female soccer athletes participated in this study. Recovery wellness, countermovement jump (CMJ), and global positioning system (GPS) data collected by the University of Nebraska at Kearney performance team were analyzed.

RESULTS: Measures of recovery and wellness improved from pre-season to post-season. Significant differences were observed in soreness from pre-season (3.36) to post-season (3.79). CMJ provided that jump height increased from pre-season to in-season from 12.17 to 12.32 but drops to 11.53 midseason. This reduction can be said to be a significant difference. GPS data indicated increases in sprinting distance throughout the season, with average sprint distances increasing from 14.13 yards to 30.88 yards from pre-season to in-season, and average sprint efforts nearly doubling from 0.47 to 0.83 throughout the season. These increases are almost double, a significant difference.

CONCLUSION: Recovery, wellness, the ability to produce power, and training as well as competition demands each have unique trends throughout the course of a competitive soccer season. Sports science initiatives can provide unique insights to sport coaches, sports medicine professionals, strength and conditioning staff, and sport sciences that may help improve athlete readiness and performance within training and competition.

INTRODUCTION

- Collegiate soccer is very demanding. During competition, athletes perform actions such as sprinting, stopping, changing direction, and jumping while competing with their opponent.
- Endurance, instantaneous power, speed, agility, muscle strength, and balance ability are required.
- However, there is still a need to continue high-intensity exercise for a long time. Accurately understanding and tracking these elements can therefore help athletes improve their performance.

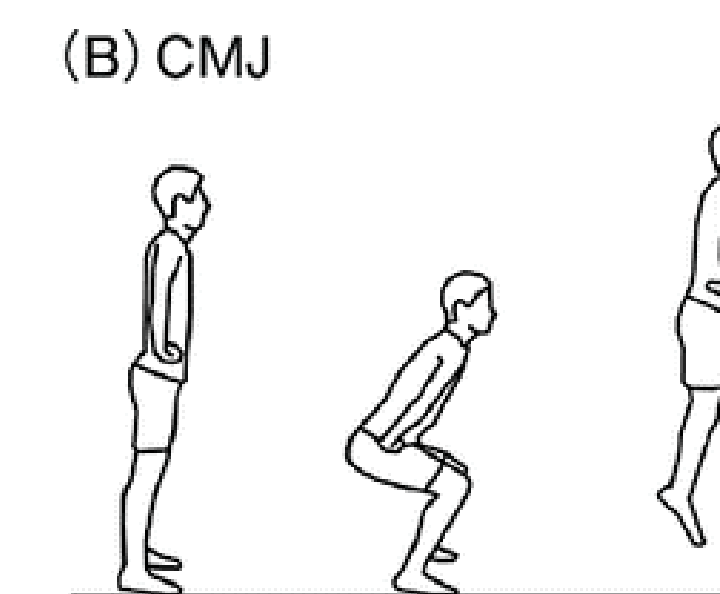
METHODS

- Anonymized archival data for 26 (n=26) University of Nebraska-Kearney female soccer athletes were analyzed for the purposes of this study.
- A one-way ANOVA with Tukey's post-hocs was used to determine differences between pre-, mid-, and post-season measures of:
 - Recovery wellness
 - CMJ performance
 - GPS



METHODS

- Recovery Wellness:** Hours of sleep, sleep quality, nutrition energy, soreness, stress, mood, illness, and wellness (%). Athletes self-rated their condition on a scale of 1 to 5 from pre-season to post-season.
- CMJ:** Jump height, time to takeoff, takeoff velocity, propulsive force asymmetry
- GPS:** Total distance, high speed run, average work rate, average hard running efforts, average sprinting, average sprint efforts, and average top speed

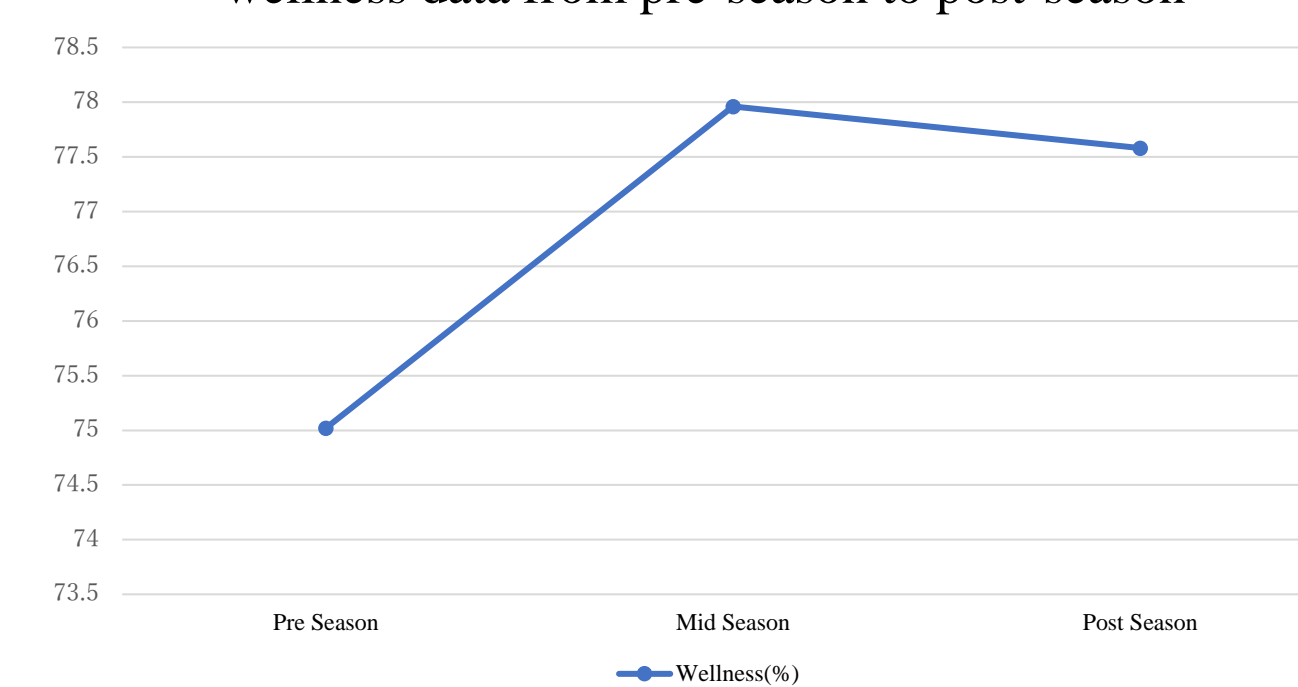


RESULTS

RECOVERY WELLNESS

- Hours slept, sleep quality, nutrition energy, soreness, mood, and wellness (%) increased from pre-season to post-season
- Stress and illness decreased from pre-season to post-season

Figure 1. Wellness(%) changes in recovery wellness data from pre-season to post-season



Measure	Pre-Season	In-Season	Mid-Season
Hours Slept	6.79	7.13	6.98
Sleep Quality	4.03	4.17	4.20
Nutrition	3.85	3.98	3.96
Energy	3.50	3.65	3.70
Soreness	3.36	3.76	3.79
Stress	3.52	3.43	3.44
Mood	3.83	3.78	3.91
Illness	-0.37	-0.25	-0.52
Wellness (%)	75.02	77.96	77.58

CMJ

- Jump height increased from pre-season to in-season from 12.17 to 12.32, but drops to 11.53 mid-season
- The left-right difference increased from 15.86 to 17.42 from pre-season to mid-season
- The left-right difference decreased to 10.00 from mid-season to post-season.

Measure	Pre-Season	In-Season	Mid-Season
Average of Jump Height	12.17	12.32	11.53
Average of Time to Takeoff	0.97	0.92	0.96
Average of Takeoff Velocity	2.46	2.47	2.39
Propulsive Force Asymmetry	15.86	17.42	10.00

SPT

- Total distance covered in competition increased throughout the season.
- High speed run distance increased throughout the season.
- Average sprinting distance and sprint efforts nearly doubled throughout the season.

Measure	Pre-Season	In-Season
Total Distance	5982.83	6896.12
HSR	121.20	175.43
Average Work Rate	43.73	45.54
Average Hard Running Efforts	5.27	7.33
Average Sprinting	14.13	30.88
Average Sprint Efforts	0.47	0.83
Average Top Speed	15.43	16.22

CONCLUSIONS

- Recovery wellness scores for all measures except stress and illness increased from pre-season to post-season.
- Hours slept, nutrition, and illness values were highest in mid-season. Sleep quality, energy, soreness, and mood values were highest in post-season.
- CMJ performance improved from pre-season to mid-season and declined from mid-season to post-season.
- All GPS metrics for sprinting and total distance increased throughout the season.

PRACTICAL APPLICATIONS

Managing recovery and wellness while simultaneously maintaining and improving performance levels for Division 2 women's soccer athletes remains a challenge. However, sports science initiatives can be a useful approach for bridging the gap between professionals in order to improve outcomes.