A season long investigation into the effects of injury, match selection and training load on mental wellbeing in professional under 23 soccer players: a team case study

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Key words: Wellbeing; mental health; football; injuries; depression.

Abstract

This study examined the influence of injury, match selection and training load on mental wellbeing (MW) in a squad of professional soccer players. Using a longitudinal design, twenty-five male soccer players (age, 20 ± 1 years, height, 1.80 ± 5.79 m, body mass 76.33 ± 7.52 kg) from the under 23 squad playing in the Premier League 2 division in the UK completed the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) each week of the 2017/2018 season (37 weeks in total). Injury and non-selection for the match squad were the only significant predictors of MW ($P<0.05$). Injury had the biggest influence on MW that was lower when injured vs. not injured (43.6 ± 5.0 vs. 49.9 ± 3.5, respectively, $P = 0.001$, ES = 1.48), accounting for 40% of the variation in MW. This increased to 50% when not being selected to play games was also considered. Weekly training loads measured by GPS (total distance, sprint distance and total duration) and individual player win rate did not influence MW ($P > 0.05$). These findings highlight the importance of monitoring MW in professional soccer players and suggest that injured players and those rarely selected for the match squad should be educated on the strategies available for managing their mental health and wellbeing.

Key words: Wellbeing; mental health; football; injuries; depression.

Introduction

Recent studies have indicated that there is a high prevalence of mental health disorders amongst professional soccer players (Gouttebarge et al., 2015a; 2015b; Junge & Feddermann-Demont, 2016; Junge & Prinz, 2018). For example, in a study of over 500 professional male soccer players from Europe, 25-43% of players reported symptoms of anxiety and depression, 11-18% of distress, and 47-74% of adverse eating behaviors (Gouttebarge et al., 2015a). In a similar study from the same research group, in which the prevalence of adverse mental health disorders in 149 professional soccer players was assessed, 26% of respondents reported suffering from anxiety and depression related symptoms (Gouttebarge et al., 2015b). Similarly, high rates of mental health concerns, specifically anxiety disorders and depressive symptoms, have also been reported in professional female soccer players (Junge & Prinz, 2018).

Although the number of studies examining mental health in elite soccer players is still limited; especially in comparison to those assessing physical health (e.g., fitness levels and injury states) (Rice et al., 2016), the aforementioned findings suggest that the prevalence of mental health disorders might be greater in professional soccer than other sports (Gouttebarge et al., 2015b). These findings suggest that the daily pressures associated with their sport could be negatively affecting their mental health and wellbeing (e.g., ability to cope with stress, undertake daily tasks and contribute to their community and relationships positively; WHO, 2001). This highlights the need for a more concerted research effort to understand the causes and consequences of mental health problems in professional soccer players (Gouttebarge & Aoki, 2014).

Drawing on research across all sports it appears that physical challenges such as training load and injuries, and environmental factors such as low social support, major life events, match experience and career transitions are the main risk factors for developing mental health problems in elite athletes (Schinke et al., 2017; Rice et al., 2017; Junge & Prinz, 2018; Junge & Feddermann-Demont, 2016; Gouttebarge et al., 2015a; 2015b). Of these, injury is often singled out as having the greatest influence on an athlete's mental health and wellbeing (Pearson & Jones, 1992; Schinke et al., 2017). Indeed, a number of studies have found that injured athletes experience a sequelae of negative emotions associated with poor mental health, including frustration, depression, boredom, low mood, low self-esteem, and anxiety (Pearson & Jones, 1992; Leddy et al., 1994; Appaneal et al., 2009; Podlog et al., 2010).

Notwithstanding, there has been little attempt to examine the effect of injury or other potential risk factors (e.g., high training loads and match selection) on mental health in professional male soccer players (Gouttebarge et al., 2015a; 2015b Junge & Feddermann-Demont, 2016). Furthermore, the studies to date have rarely considered the mental health of youth players, who might actually be at a greater risk for developing mental health disorders than senior players (Junge & Feddermann-Demont, 2016; Gouttebarge et al., 2015b; Schinke et al., 2017). Additionally, none of the studies to date have employed a longitudinal design in which mental health was measured more than once and where the players acted as their own control.

Consequently, the aim of the present study was to examine the influence of some common physical and environmental stressors on mental wellbeing (MW) in a squad of professional under 23 soccer players across a full season. We were specifically interested in the effects injury, training load, match selection and match results had on MW throughout the season. While the effects of injury have been investigated previously, no other studies have attempted to examine the effects of training load and not being selected to play games on any aspect of mental health in professional male soccer players. We hypothesized that injury, not being selected to play games and high training loads would negatively affect the players MW.

Methods

Participants

Twenty-five professional male soccer players (see Table 1 for physical characteristics) competing in the second tier of the under 23 championships in England took part in this study. Newcastle University Ethics Review board granted ethical approval. All players provided written informed consent for this study.

Experimental procedure

The players completed a questionnaire to assess MW on a weekly basis. The time of day (before training ~09:30) and the day of the week this was completed on was kept consistent (Thursday) throughout the study. This day of the week was selected because matches are typically scheduled for a Monday evening, and therefore it was felt that the player's MW would be less influenced by the preceding/upcoming match on this day. Nonetheless, we still analyzed the effect of match result to see if this did in fact influence MW. The first questionnaire was completed on August

14th 2017 during pre-season and the last on April 23rd 2018 at the end of the season (37 weeks in total). Figure 1 displays a longitudinal overview of the study timeline and the periodized training program the players followed during the study.

An injury was defined as a period of being unable to complete at least 1 week of training (Appaneal et al., 2009) and not being selected to play games was defined as being named in the match-day squad of 16 players (11 outfield and 5 substitutions). This data was recorded by the Head of Sports Science in conjunction with the medical team at the club. External load measures were calculated from GPS units (OptimEye S5B, Version 7.18; Catapult Innovations, Melbourne, Australia) worn during matches and training sessions (10-Hz GPS and 100-Hz accelerometer devices). Specific data collected are displayed in Table 1, and include weekly training duration, weekly training distance and weekly high-speed running distance. The mean number of satellites during data collection was 16 ± 1, and mean horizontal dilution of position was 0.8 ± 0.1. Previous research has suggested above 6 satellites are required for adequate data quality (Malone et al., 2017). However following conversations with the manufacturer, data was excluded if the number of satellites decreased below 12. If horizontal dilution of position was >1, data was excluded (Malone et al., 2017). Catapult Sprint software was used for data analysis (Catapult Sprint 5.1.5, Catapult Innovations, Melbourne, Australia).

Mental wellbeing measure

Mental wellbeing was assessed using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). The WEMWBS is a valid and reliable measure of MW in the general population, including young adults, and sensitive to change in response to interventions at the individual and group level (Stewart-Brown et al., 2009; Maheswaran et al., 2012). It has also been used to evaluate MW in several European populations, including the UK, and thus population norms were available for comparison (Tennant et al., 2007; Stewarffft-Brown et al., 2009; Haver et al., 2015). The WEMWBS has also been shown to be highly inversely correlated with psychiatric scales of depression (Bianca, 2012; Zadow et al., 2017). Finally, it is short and freely available and therefore easily accessible for sports clubs who may wish to use it with their athletes.

The WEMWBS consist of 14 positive statements about an individual’s thoughts and feelings. In the present study, we asked the players to score the questionnaire based on their thoughts and feelings in the preceding 7 days. Each item is scored on a 1 – 5 Likert scale (1 = none of the time, 5 = all of the time); the minimum and maximum scores that can be obtained are 14 and 70, respectively. A copy of the WEMWBS used in the present study is provided in the supplementary material.

It is important to highlight that we chose to look specifically at MW as opposed to the psychiatric scales favored by other studies, and this was for several reasons. Firstly, because MW, which is concerned with feelings, functioning and life satisfaction, is closely associated with both physical and mental health (Huppert et al., 2009; Stranges et al., 2014). Secondly, psychiatric scales used to assess depression, anxiety and other adverse mental disorders tend to be negatively worded and, when discussing mental health, it has been shown that individuals prefer to answer positively framed questions (Bianca, 2012). Because the players were required to answer questions weekly, we therefore felt that compliance would be higher with a MW questionnaire that contained positively worded questions. Lastly, many psychiatric scales are hidden behind paywalls. We wanted to test the utility of a freely available scale so that our study could be easily implemented and replicated in the elite sporting environment.

Data analysis

All data analysis was performed with SPSS for Windows (SPSS version 24.0) and statistical significance was set to $P < 0.05$ a *priori*. Normality was checked and considered normally distributed if the Shapiro-Wilk test was $P > 0.05$. Individual win rates (win percentage from the number of games selected for), match selection rate (percentage of matches selected for), time out with injury (injury percentage from time at the club) and training load (weekly sum of duration, distance and high-speed running distance) were calculated for each player and used as independent predictors of average weekly MW (see Table 2). The effects of each variable on MW (dependent variable) was analyzed using stepwise multivariate regression. Differences in average MW scores for injured vs. not injured, selected vs. not selected were also analyzed using multiple paired samples T-tests. Differences in MW for preceding match result (win, lose or draw; only including matches selected for) was calculated with a one-way analysis of variance. To estimate the magnitude of change in MW, Cohen's d effect sizes (ES) were calculated with the magnitude of effects considered either small (0.20–0.49), medium (0.50–0.79) or large (>0.80).

Results

Table 1 displays the descriptive statistics for the player's physical characteristics, independent predictor variables and average WEMWBS scores.

Average MW, as assessed with the WEMWBS, was significantly lower when injured vs. not-injured (43.6 ± 5.0 vs. 49.9 ± 3.5; P = 0.001; ES = 1.48; Figure 2) but was unaffected by the preceding match result (win: 50.0 ± 4.0, draw: 50.5 ± 5.0, loss: 49.1 ± 4.8; P = 1.000; ES all ≤0.28). There were no differences in MW scores when selected vs. not selected (48.9 ± 3.4, vs. 46.9 ± 5.9; P = 0.134; ES = 0.43).

The number of days missed to injury and not being selected for the games were the only variables found to be significant predictors of MW in the multivariate regression model (Table 2). The length of time spent injured throughout the season had a significant negative effect on MW, and accounted for the biggest variance in MW (40%). When considered together, the length of time spent injured and not being selected to play games accounted for 50% of the variation in MW scores (Table 2). Multicollinearity between the predictor variables was considered acceptable as Variation Inflation Factors were below 1.5 (Kutner et al., 2005).

The coefficient of variation for week to week changes in total distance (m), weekly total duration (min) and weekly total high speed running distance throughout the data collection period of this study was 12, 10 and 32%, respectively. As shown in Table 2, the players individual training loads did not significantly influence their MW scores.

Discussion

The main findings of this study were that time out injured and not being selected to play games significantly affected MW in a squad of under 23 professional soccer players during the course of a season. Time out injured had the strongest influence on MW; the average WEMWBS when injured was much lower than the average score in the general population (43.6 vs. 50.1; Health Survey for England, 2016), and just below the suggested cut-off for depression (44.5; Bianca, 2012) and marginally above the lowest 15th quartile for MW (42; Stranges et al., 2014). The ≥3 point change in MW when injured is also considered to be a clinically meaningful decrease (Maheswaran et al., 2012). This is the first study to longitudinally track MW in a squad of professional soccer players of any age group, and provides new information on the factors that affect MW.

As this is the first study to assess the effects of injury on MW in professional male soccer players there are no other studies available for direct comparisons. However, given the close relationship between WEBWMS and clinical depression scales (Stranges et al., 2018) we can make some tentative comparisons to studies assessing the effects of injury on depression symptoms in professional soccer players. Similar to our findings, Junge & Fedderman-demont, (2016) observed that players from the top leagues in Switzerland reported higher levels of anxiety and depression when they were injured (Junge & Fedderman-demont, 2016). Interestingly, male under-21 players had significantly higher depression scores than the senior players. However, in two studies from Gouttebarge et al., (2015a, 2015b) neither depression nor anxiety symptoms were associated with severe injury, despite the fact that depression rates were significantly higher than in other sports (25–44%). The discrepancy in findings between these studies could be due to the different study designs. Junge & Fedderman-demont, (2016) compared depression and anxiety symptoms in players currently injured or not in a cross sectional design, whereas the studies of Goutterbarge et al., (2015a, 2015b) assessed whether the number of previous injuries influenced the players *current* mental state. It is possible that the latter studies failed to detect any association between injury and mental health because the data was not collected when the players were actively suffering from an injury. Assessing mental health while injured might be more sensitive for detecting mental health problems and should be encouraged in future studies.

Examining the possible ways in which injury could have affected the players MW was beyond the scope of the present study. However, if MW is considered in relation to an individual’s flourishing, that is, whether they are functioning effectively, be it physically, emotionally or socially (Huppert, 2009), then anything that disrupts this state will likely affect MW. When injured, their day-to-day functioning (e.g., ability carry out tasks), and identity as a soccer player, is disturbed, as they are not able to train or compete. This change of circumstance has been reported to evoke a wide array of emotional responses such as boredom, frustration and anger, all of which could affect MW (Pearson & Jones, 1992). It has also been suggested by Podlog et al., (2007), in a return from sport injury context, that MW is related to competence, autonomy and social connectedness (e.g., self-determination theory). In this scenario, the loss of autonomy (little control over rate of recovery) competence (inability to perform) and connectedness (isolation from teammates and coaches) could significantly affect MW, and this could help to explain the findings of the present study. To counter this, Podlog et al., (2010) recommend that interventions designed to promote feelings of autonomy, connectedness and competence (e.g., performance on physical tests) should be encouraged during the rehabilitation process. The present study's findings further highlight the need to monitor the mental health of injured soccer players so that the relevant interventions and support can be provided to ensure health and performance are not negatively affected.

It is important to note, however, that we cannot discern a cause and effect relationship between injury and lowered MW, only an association between the two. Thus, we cannot rule out that lowered MW is actually a risk factor for injuries and this could help to, at least in part, explain our findings. Although we are not aware of any research assessing MW on injury risk, a recent study by Watson et al., (2017) found that lowered mood increased injury risk in youth female soccer players, suggesting a potential relationship between emotional responses and injury risk in athletic populations. The relationship between MW and injury risk clearly needs further exploration.

Neither training load nor match result influenced the players MW; however, in our regression model, not being selected for the match squad had a moderate negative influence on players MW. Whilst this is the first study to assess the effects of match selection on MW, a recent study examined the influence of match selection on anxiety and depression symptoms in professional female soccer players (Junge & Prinz, 2018). In contrast to our findings, they found that not being selected to play games did not significantly influence depression or anxiety with no differences in symptoms between players who played *almost always* to *rarely* or *never*. The discrepancy in findings between the present and the aforementioned study could be due to several reasons; player differences (male under 23 players in England vs. senior female players in Germany), mental health scales used (WEMWBS vs. anxiety and depression scales) and method of collection (longitudinal throughout the season vs. cross sectional at a single time point).

As to why not being selected to play games might affect MW, we speculate that not being able to play can result in significant psychological distress for the athlete and, similar to injury, this is possibly due to a loss of autonomy, connectedness and competence, as suggested by Podlog et al., (2007, 2010). Such psychological distress could be even more pertinent at the under 23 level than the senior level, as their career trajectory is still uncertain. If a player is not playing, either due to injury or due to not being selected, then they are unable to impress coaches and support staff who ultimately decide whether they receive a senior contract with the club or are promoted to the senior squad. It has been shown that youth players who are released from soccer clubs in the UK often suffer from high levels of psychological distress compared to their retained counterparts (Blakelock et al., 2016). It would be reasonable to assume that the looming threat of being released from their contract, or not making it to senior level, is heightened when they are not playing. Or it could simply be the fact that younger players have yet to develop appropriate coping strategies to help them deal with such psychological stress. Future research should examine the psychological distress associated with not being selected in soccer players to better understand how their mental health can be managed.

This study has several limitations that need to be acknowledged. Firstly, the sample size was low (*n* = 25) and the population studied relatively homogenous. Thus, these findings might not be representative of senior level soccer players, female players, or those from other countries, as cultural differences in mental health have been observed (Schinke et al., 2017). As such, we caution that these findings may only be relevant to young professional soccer players in the UK. Future studies on MW in soccer players should include players from several different teams and countries. Secondly, there are several other variables that could have affected MW other than those examined in the present study. Our primary outcome measures were injury and not being selected to play games; however, adverse life events and social support could also affect MW (Goutterbarge et al., 2015a) and should be included in future studies. It is important to highlight, though, that Arnold and Fletcher, (2012) identified over 640 different psychological stressors for elite athletes and clearly not all of these can be accounted for in studies of this nature. Another potential limitation is that we did not collect a baseline value to calculate standardized individual changes in MW values. This was partly because it is very difficult to collect a true baseline that is not influenced by training load and performance to some degree, unless we were to collect the baseline value right at the outset of the season, which we were unable to do in this study. Also, some players started the season injured, and therefore getting a baseline MW score would not have been as simple as assessing MW at the start of the season. Nonetheless, this should be considered in future research. Lastly, future studies might experiment with different days the questionnaire is completed. We opted for match day + 3, at which point we expected recovery to be sufficient enough to not significantly interfere with the MW scores. If we had collected these scores on match day, for example, we might have got different results; therefore, future studies might wish to measure MW across a weekly cycle to see if this influences these values. The key strength here, is that we kept the day the survey was completed consistent. Another strength of the present study is the longitudinal design. This is the first study to track MW over a full season, with all previous studies collecting mental health data either retrospectively (Goutterbarge et al., 2015a, 2015b) or with a cross sectional design (Junge & Fedderman-demont, 2016). The present study is also the first to use each player as their own control. We believe our design strengthens the validity and reliability of the findings, as the player's scores were not subjected to recall bias or reliant on a single measure. Lastly, this is the first study to demonstrate that the freely available WEMWBS is a simple and easy to administer questionnaire to monitor changes in MW in soccer players and might serve as a useful tool for sports medicine professionals. It is important to note, however, that WEMWBS is yet to be validated as a measure of MW specifically in soccer players and this should be explored in future work.

Conclusion

In conclusion, this study demonstrates that injury and not being selected to play games can significantly influence MW in under 23 soccer players. These findings add to the scant literature available on mental health in professional soccer players, further highlighting the need to better understand the causes and consequences of psychological distress in this population. From a practical perspective, these findings indicate that soccer players should be educated on strategies to better manage their mental health when injured and not selected. Of the available strategies for coping with common stressors, a recent position stand on the topic (Schinke et al., 2017) suggested that mindfulness based interventions incorporating resilience training might be effective for managing sub-clinical mental health concerns in athletes. Lastly, these findings demonstrate that the WEMWBS is a simple and cost-effective way to detect and monitor for potential mental health disturbances in a squad of professional male soccer players.

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Figure 1 – Longitudinal design of the data collection period, including a detailed overview of the players training cycles throughout season. WEMWBS, Warwick-Edinbugh Mental Wellbeing Scale; Cond, conditioning; St, strength; Spd, speed; Bas, basic; CD, change of direction; Pro, production; Mech, mechanics; Accel, acceleration; Pow, power; Med, medium; Dist, distance; H, high intensity; M, medium intensity; L, low intensity; End, endurance; HIIT, high intensity interval training; PBC, pitch-based conditioning.

Figure 2 – Average WEMWBS score when injured vs. not injured (n = 18) and selected vs. not-selected for the match squad (n = 25). *Represents difference in WEMWBS scores; $P < 0.05$. Boxplots show median, 25–75th percentiles, and minimum to maximum scores.

Table 1 – Descriptive statistics for players age, height, mass, WEBWBS scores, training load (total duration, total distance, total sprint distance) and the % of time spent out injured, % of matches they were selected for, and % of matches won.

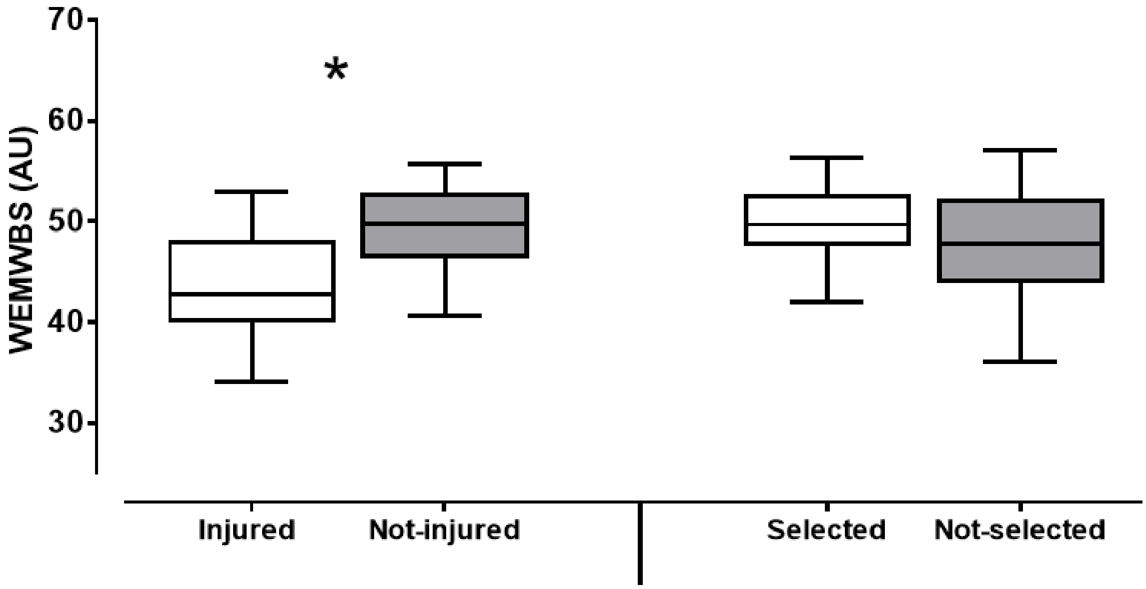
Variable	Mean ± SD
Age (years)	20 ± 1
Height (m)	1.80 ± 5.79
Mass (kg)	76.33 ± 7.52
Weekly WEMWBS score (14 - 70)	48.0 ± 3.9
Time out with injury (%)	24.3 ± 23.6
Weekly training duration (minutes)*	272.7 ± 28.0
Weekly training distance (m)*	21249.5 ± 2565.6
Weekly high-speed running distance (m)*#	600.6 ± 193.9
Player match selection (%)**	60.1± 27.9
Player win percentage (%)**	56.1± 17.6

*Includes matches, if selected. **Only for matches in which the players were available for selection.
#high-speed running distance is the distance travelled at ≥60% of maximum speed ($km \cdot h^{-1}$).

Table 2 – Results from stepwise multiple regression analysis of the independent predictors on the dependent variable, mental wellbeing.

Predictor	**B**	**SE (B)**	**ß**
Step 1			
Days missed to injury	-.105	.27	-.632*
Step 2			
Days missed to injury	-.091	.26	-.545*
Not selected to play games	.53	.24	.336*

Step 1 R^2 = .399, Step 2 R^2 = .505, ΔR^2 = .0.106. *P < .05.


70
60
50
40
30
WEMWBS (AU)
*
Injured
Not-injured
Selected
Not-selected

Dates	Months	August			September				October					November				December				January					February				March				April			
	Week Begin	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	5	12	19	26	5	12	19	26	2	9	16	23
WEMWBS		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gym based cond	Primary focus	Physical Maintanence																			Recovery		Physical Maintanence															
	Sessions	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Hypertrophy	L	L	L	L	L	L	M	M	M	L	L	L	L	L	L	M	M	M	M	L	L	M	M	M	L	L	L	L	L	L	M	M	M	L	L	L	L
	Bas Strength	L	L	L	L	L	L	H	H	H	L	L	L	L	L	L	H	H	H	H	L	L	H	H	H	L	L	L	L	L	L	H	H	H	L	L	L	L
	Max Strength	M	M	M	L	L	L	H	H	H	M	M	M	L	L	L	H	H	H	H	L	L	H	H	H	M	M	M	L	L	L	H	H	H	M	M	M	L
	St-Spd	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	Spd-St	M	M	M	H	H	H	L	L	L	M	M	M	H	H	H	L	L	L	L	L	L	L	L	L	M	M	M	H	H	H	L	L	L	M	M	M	H
PBC	Primary focus	Physical Maintanence																			Recovery		Physical Maintanence															
	Sessions	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Pre-Season Cond	Aerobic Base	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	HIIT Training	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	Speed End	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	Spd pro	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
In Season Cond – Plyos	Land Mech	L	L	L	L	L	L	H	H	H	L	L	L	L	L	L	H	H	H	H	L	L	H	H	H	L	L	L	L	L	L	H	H	H	L	L	L	L
	Slow SSC	H	H	H	M	M	M	L	L	L	H	H	H	M	M	M	L	L	L	L	L	L	L	L	L	H	H	H	M	M	M	L	L	L	H	H	H	M
	Fast SSC	M	M	M	H	H	H	L	L	L	M	M	M	H	H	H	L	L	L	L	L	L	L	L	L	M	M	M	H	H	H	L	L	L	M	M	M	H
In Season Cond – Spd/CD	Accel Pow	M	M	M	M	M	M	H	H	H	M	M	M	M	M	M	H	H	H	H	L	L	H	H	H	M	M	M	M	M	M	H	H	H	M	M	M	M
	Med Dist Spd	H	H	H	M	M	M	M	M	M	H	H	H	M	M	M	M	M	M	M	L	L	M	M	M	H	H	H	M	M	M	M	M	M	H	H	H	M
	Long Dist Spd	M	M	M	H	H	H	L	L	L	M	M	M	H	H	H	L	L	L	L	L	L	L	L	L	M	M	M	H	H	H	L	L	L	M	M	M	H