

<b>Institution:</b> University of Huddersfield		
<b>Unit of Assessment:</b> UoA24		
<b>Title of case study:</b> Monitoring Wellness and Mental Fatigue in Soccer: Implications for Recovery Practices and Psychological Support		
<b>Period when the underpinning research was undertaken:</b> August 2016 - July 2019		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Dr Liam Harper	Senior Lecturer	September 2016 - present
Dr Robert Naughton	Senior Lecturer	September 2016 - present
<b>Period when the claimed impact occurred:</b> August 2017 to December 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b>		
<p>Academy soccer players play 40-50 matches per season and travel to play matches. Sleep, recovery and wellbeing are crucial for performance and health. The findings from this research have impacted day-to-day practices of two English Premier League 2 Academy Clubs. Changes include: players being given more time to sleep and rest following away matches and losses, a hotel stay-over in the location of the match, later training start-times, prescribing recovery practices for players to undertake at home and giving players a day off. This has led to improved training practices and player recovery. Furthermore, the findings have increased awareness of the importance of psychological support for injured players.</p>		
<b>2. Underpinning research</b>		
<p>The underpinning research for this impact case study has been conducted by Harper and Naughton at the University of Huddersfield (UoH). The investigations have been undertaken in collaboration with colleagues from external organisations and institutions: Brighton and Hove Albion Football Club (Dr Will Abbott), Liverpool John Moores University (Dr Thomas Brownlee), Loughborough University (Dr Tom Clifford), Newcastle University (Andy Richardson) and Edge Hill University (Dr Richard Page).</p>		
<p>The main focus of the research has been on assessing subjective wellbeing and mental fatigue in Professional English academy soccer players. Professional soccer is characterised by high training and match loads, with risk of overtraining, injuries and psychosocial disorders. Therefore, players' recovery and readiness to train is often assessed via objective and subjective measurement tools. This enables practitioners and coaches to modulate their training schedules and practices, in order to facilitate optimal restoration and adaptation.</p>		
<p>The purpose of our research was to assess the impact of contextual (location, result and quality of opposition) factors of match-play on subjective markers of wellbeing and mental fatigue, as well as the impact of injury, match selection and training load on mental wellbeing.</p>		
<b><u>Factors that influence player subjective wellbeing – Paper 3.1</u></b>		
<p>Research carried during the 2016/2017 English Premier League 2 season revealed that match location, result and the quality of opposition all negatively influence the subjective wellbeing (in particular mood, stress and sleep quality) of under-23 soccer players for up to three days post-match, irrespective of the physical demands of the matches. Further, both playing away matches and losing (independently of each other) caused significantly higher stress and lower sleep quality</p>		

and mood compared to playing at home, or winning. Furthermore, irrespective of result, players had significantly greater fatigue and stress, and lower mood following matches against top-table, high quality opponents compared to lower quality opposition.

### **Injury as a compounding factor – Paper 3.2**

Research conducted during the 2017/2018 English Premier League 2 season revealed that players' mental wellbeing (measured using the Warwick-Edinburgh Mental Wellbeing Scale; WEMWBS) was significantly and clinically meaningfully lower when injured compared to when they were not injured, with the length of time spent injured and not being selected for matches the main factors that explained this. Training load did not appear to significantly impact WEMWBS scores.

### **Factors that contribute to mental fatigue – Paper 3.3**

As mental fatigue has been shown to negatively impact aspects of physical, skill, tactical and perceptual-cognitive performance, and as coaches and players have identified mental fatigue as an issue throughout the professional football season, further research also carried out during the 2017/2018 English Premier League 2 season aimed to assess players' mental fatigue, using a visual analogue scale, throughout the season. The research revealed that players report significantly higher mental fatigue following matches, which persists for three days following the match. Furthermore, players' mental fatigue response was closely correlated with other measures of subjective wellness such as muscle soreness, fatigue, sleep quality and motivation to train. Players' mental fatigue response was particularly impacted by losing compared to winning and drawing, with significantly higher mental fatigue values reported following matches that were lost compared to won or drawn.

## **3. References to the research**

**3.1** Abbott, W., Brownlee, T. E., Harper, L. D., Naughton, R. J., & Clifford, T. (2018). The independent effects of match location, match result and the quality of opposition on subjective wellbeing in under 23 soccer players: a case study. *Research in Sports Medicine*, 26(3), 262-275. DOI: <https://doi.org/10.1080/15438627.2020.1784176> [can be supplied on request]

**3.2** Abbott, W., Brownlee, T. E., Harper, L. D., Naughton, R. J., Richardson, A., & Clifford, T. (2019). 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. *European Journal of Sport Science*, 19(9), 1250-1256. DOI: <https://doi.org/10.1080/17461391.2019.1600586> [can be supplied on request]

**3.3** Abbott, W., Brownlee, T. E., Naughton, R. J., Clifford, T., Page, R., & Harper, L. D. (2020). Changes in perceptions of mental fatigue during a season in professional under-23 English Premier League soccer players. *Research in Sports Medicine*, 28(4), 529-539. DOI: <https://doi.org/10.1080/15438627.2020.1784176> [can be supplied on request; embargoed until 30/6/2021]

**Evidence of research quality:** All three articles have been published in high-quality international peer-reviewed journals, and cover topics that are international in scope (professional soccer).

## **4. Details of the impact**

The research described in this case study has revealed impact in two main areas:

1. Improved post-match recovery practices
2. Enhanced support for player wellbeing.

### Improved post-match recovery practices

The findings from paper 3.1 led to changes to post-match recovery practices for two English Premier League Academy clubs (C1 and C2). The majority of English Premier League 2 matches are played in the evening (19:00). As such, matches typically finish at 20:50. Factoring in the time for players to return to the changing rooms, shower, dress and return to the team bus, it may be as late as 22:00-22:30 that a team would begin their journey home. If the club is competing away from home, and depending on the location of their opponents, the players may not arrive at their residences until as late as 04:00. In paper 3.1, we observed lower subjective ratings of sleep on the day following an away match. As a result, C2 adopted a policy of staying in a hotel in the town/city of their opponents on the night of the match: *“the lower subjective ratings of sleep on MD+1 compared to MD contributed to our decision to ‘stay over’ after away games with an evening KO and requiring >3hrs return travel. The rationale included providing a more nutritious and substantial meal at the hotel, quickly after the game and the opportunity for the players to retain their typical sleep routines before travelling back on MD+1”* [5.2].

Coaching staff were particularly interested in the findings of decreased subjective wellness on the day following a match, as this was their typical time for delivering post-match analysis (e.g., highlighting strengths and weaknesses from the match using video). This led to a change in the timing of these analysis sessions [5.2].

C1 changed their training prescription based on the findings of the study, with the weekly microcycle being structured differently following an away match compared with a home match. This included asking players to report to the training ground the day after an away match three to four hours later than usual to allow for more sleep. This led to improved subjective ratings of muscle soreness and fatigue on the day following a match, as well as improved mood and sleep, leading to enhanced quality of training [5.1].

C2's practices on the day following a match also changed, with either the training session being delayed until later in the day, allowing the players to complete a 'home based' recovery session, or giving the players a day off. Overall, the findings of the paper led to C2 using their subjective wellness data when making decisions on training prescription across the whole season [5.2].

The findings from paper 3.3, where players' subjective ratings of mental fatigue were significantly higher following a loss compared to a win changed C1's approach to training following a loss, giving the players more time off to recover before analysing the previous match and training. They felt that this would then provide the players with more time to recover both mentally and physically and have a heightened receptiveness to tactical information, as well as physical training [5.1].

### Enhanced support for player wellbeing

The findings from paper 3.2 led to changes in the wellbeing support for players at C1. The significantly lower ratings of mental wellbeing from injured players highlighted that there was a need not just for physical support, but also for further psychological support, for injured players: *“...that really highlighted for us the importance of... the psychological support around injury, not just the physical support around injury. So as a consequence... we've touched base with our Psychology Department. We've actually, as a Club, from this season onwards, recruited Mental Wellbeing Practitioners and we've got access to Applied Counsellors as well...”* [5.1].

These findings helped stimulate discussions around the importance of mental health for academy footballers and established a mental wellbeing service at C1. The club now administers the questionnaire used in the study (Warwick-Edinburgh Mental Wellbeing Scale) to players every week, to assess changes in mental well-being across the season, in order to stimulate conversations and identify interventions as necessary. This has led to a culture change in the organisation and increased the importance of assessing mental wellbeing [5.1].

**Impact case study (REF3)**

Taken together, all three papers have had an impact at C1 on the relationship between the performance staff and the coaching staff, with increased objectivity and application of empirical evidence to the coaching process and day-to-day practices [5.1].

**5. Sources to corroborate the impact**

5.1 Testimonial from the Academy Performance Manager at a Premier League Division 2 Academy.

5.2 Testimonial from a Senior Fitness Coach at a Premier League Division 2 Academy.