Associations between retirement reasons, chronic pain, athletic identity

and depressive symptoms among former professional footballers

Word count: 2893 (excluding title page, abstract, references, and tables)

1   **Abstract**

2   **Background:** Retirement from professional sport has been recognised as a major

3   psychological stressor, and there is a need to identify factors that increase the risk of mental

4   health problems after career termination. The current study examined associations between

5   career-ending injury, chronic pain, athletic identity and depressive symptomology in retired

6   professional footballers. **Methods:** A cross-sectional study was performed with 307 retired

7   male footballers who had played within a professional United Kingdom league. Participants

8   completed measures of depressive symptoms (Short Depression-Happiness Scale), chronic

9   pain (Pain Intensity Numerical Rating Scale), and athletic identity (Athletic Identity

10   Measurement Scale), and reported their reasons for retirement. **Results:** A total of 48

11   participants (16%) met the cut-off score for possible cases of clinically-relevant depression.

12   These participants were more recently retired, and had higher athletic identity than those

13   without depressive symptoms. Former players with depressive symptoms were more likely

14   to cite injury as a retirement reason, and report higher levels of ongoing injury-related pain.

15   Multivariate logistic regression revealed that presence of depressive symptoms was

16   independently associated with retirement through injury (OR = 3.44; 95% CI = 1.39, 8.51),

17   higher pain levels (OR = 1.38; 95% CI = 1.02, 1.86), and increased athletic identity (OR =

18   1.28; 95% CI = 1.14, 1.44). **Conclusions:** Career-ending injury is strongly associated with

19   higher odds of depressive symptomology during retirement, while experiencing chronic

20   pain, and maintaining a high sense of athletic identity, are additional potential contributors.

21   [abstract word count: 233]

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23   **Key words:** football; retirement; depression; injury; pain; athletic identity

1   **Introduction**

2   According to the Professional Footballers Association (2015) as many as 900 professional

3   players retire each year from leagues in England. Retirement from sport has been recognised

4   as a significant career transition that is associated with decreased psychological wellbeing

5   for some athletes (Wylleman, Alfermann, & Lavallee, 2004). This has been particularly

6   noted when retirement is perceived as involuntary, that is forced, for example due to injury,

7   rather than through personal choice (Kuettel, Boyle, & Schmid, 2017).

8   Recent studies in retired footballers have highlighted the prevalence of psychological

9   problems, and revealed the uncertainty over the role of injury as a contributor. A preliminary

10   study including an international sample of 104 retired professional footballers found that

11   symptoms of anxiety or depression were reported by 39% of respondents (Gouttebarge,

12   Frings-Dresen, & Sluiter, 2015). A subsequent study of 219 former players across 11

13   countries had similar results with 35% reporting anxious or depressed symptoms

14   (Gouttebarge, Aoki, & Kerkhoffs, 2016). However, presence of these symptoms was not

15   associated with the severity of previous injuries, or the number of surgeries undergone.

16   Another study included 220 retired European footballers as part of a sample of 602 former

17   elite athletes across five sports to examine the relationship between the presence of

18   osteoarthritis and symptoms of mental disorders (Schuring et al., 2016). Overall there was an

19   association between osteoarthritis and distress, sleep problems, and adverse alcohol use, but

20   not anxiety/depression. Among the footballers, no associations were observed between

21   osteoarthritis and any of the symptoms measured. A more pertinent factor may be the

22   experience of chronic pain rather than the history of injury or presence of musculoskeletal

23   conditions per se. A strong association has been demonstrated between depression and pain

1   symptoms in general populations (Ohayon & Schatzberg, 2003; Ohayon & Schatzberg,

2   2010). An earlier study of the long-term health of 284 former professional footballers in the

3   United Kingdom revealed that 49% had been diagnosed with osteoarthritis, and 28% took

4   pain medication for football injuries (Turner, Barlow, & Heathcote-Elliott, 2000). Pain or

5   discomfort was frequently reported across the sample, but among significantly more former

6   players with osteoarthritis (89%) than those without (60%). Similarly, symptoms of

7   anxiety/depression were reported by more participants with osteoarthritis (37%), than by

8   those without arthritis (19%), although the relationship between pain and psychological

9   symptoms was not examined. These results suggest that chronic pain may be an important

10   variable to examine in the attempt to further understanding of the factors contributing to

11   psychological health after retirement.

12   Although not investigated in footballers, research in other sports has suggested that

13   athletic identity is an important construct associated with psychological wellbeing after

14   retirement. Athletic identity represents an element of self-concept among sportspeople and

15   refers to the degree to which individuals identify with their athlete role, and includes

16   perceived values and social networks (Brewer, Van Raalte, & Linder, 1993). Longitudinal

17   research with elite athletes suggests that athletic identity generally declines towards

18   retirement, and is lower among former athletes who experienced a positive adjustment to

19   career termination (Martin, Fogarty, & Albion, 2014). However, where careers were

20   terminated involuntarily, those displaying high levels of athletic identity were more likely to

21   experience negative reactions including dissatisfaction, depression, and loneliness

22   (Alfermann, Stambulova, & Zemaityte, 2004; Lally, 2007).

1   The current study aimed to increase understanding of the determinants of depressive

2   symptoms among male retired professional footballers in the United Kingdom by

3   specifically examining the relationship with retirement reasons, chronic pain, and athletic

4   identity. Based on the existing literature in football and other sports, it was hypothesised that

5   participants reporting depressive symptoms would be more likely to have retired for injury-

6   related reasons, experience chronic pain, and have high levels of athletic identity.

7

8   **Methods**

9   *Design and participants*

10   Ethical approval was provided by Loughborough University Ethics Approvals (Human

11   Participants) Sub-Committee (SSEHS-28415) to perform a cross-sectional study

12   administered online of former professional male footballers. Access to participants through

13   official player organisations was not possible, making a formal sampling frame unavailable

14   for recruitment. Therefore social media sources were used to circulate links to the study

15   information to former players using purposive and snowball sampling. To be eligible for

16   inclusion, participants had to be male, 18 years old or over, and have previously competed in

17   a professional football league in the United Kingdom. Participation was voluntary with no

18   incentives provided.

19

20   *Measures*

21   The online questionnaire was administered via Bristol Online Survey software, with

22   participants providing informed consent online and completing measures anonymously.

1   Participant information collected was current age, duration of professional football career,

2   level of play (highest league played), year of retirement, and reasons for retirement.

3   Depressive symptoms were assessed through the Short Depression-Happiness Scale

4   (SDHS; Joseph, Linley, & Harwood, 2004). This measure asks participants to judge their

5   feelings over the past seven days with reference to six items representing depression (e.g. 'I

6   felt that life was meaningless') and happiness (e.g. 'I felt happy'), scored on a four-point (0-

7   3) Likert scale. Total possible scores range from 0 to 18, with lower scores indicating greater

8   depression. The SDHS has shown acceptable levels of internal consistency (Cronbach's α =

9   0.77 to 0.92) and test-retest reliability (r = 0.68) over two weeks (Joseph et al., 2004).

10   Convergent validity was demonstrated with correlations of 0.68 with the Beck Depression

11   Inventory (Beck, Rush, Shaw, & Emery, 1978), and 0.74 with the depression scale of the

12   Crown-Crisp Experiential Index (Crown & Crisp, 1979). Based on a comparison of scores

13   on the Beck Depression Inventory (Beck et al., 1978), a total below 10 on the SDHS is

14   recommended as the cut-off indicating possible cases of clinically relevant depression

15   (Joseph et al., 2004). Cronbach's alpha in the current study was 0.87.

16   Pain levels were assessed with the 11-point pain intensity numerical rating scale (PI-

17   NRS; Farrar, Young, LaMoreaux, Werth, & Poole, 2001). Respondents were asked to report

18   the intensity of any pain attributable to past football injuries on a scale anchored by "no

19   pain" (score of 0) and "worst imaginable pain" (score of 10). High test-retest reliability (r =

20   0.96) and construct validity (r = 0.86) has been reported for the PI-NRS (Hawker, Mian,

21   Kendzerska, & French, 2011).

22   Athletic identity was assessed via the 10-item Athletic Identity Measurement Scale

23   (AIMS; Brewer et al., 1993). Respondents indicate their level of agreement with ten

1 statements on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

2 The total score ranges from 10 to 50, with higher scores indicating stronger identification

3 with the athletic role. Sound psychometric properties were demonstrated of the AIMS

4 (Brewer et al., 1993), with good internal consistency (Cronbach $\alpha = 0.93$), test-retest

5 reliability (r = 0.89), and convergent validity (r = 0.83) against a measure of perceived

6 importance of sport competence (Fox & Corbin, 1989). Cronbach's alpha in the current

7 study was 0.90.

8   Reasons for retirement were ascertained by asking participants to select from a list of

9 five common reasons for retirement (shown in Table I) identified from previous research of

10 former UK footballers (Drawer & Fuller, 2002). Multiple reasons could be selected, and

11 there was an option to indicate other reasons via a free-text box. They were also asked to

12 indicate one reason that they regarded as their main reason for retirement.

13 *Data analysis*

14 All data analyses were performed using IBM SPSS Statistics for Windows version 22.0

15 (IBM Corp, Armonk, NY). Descriptive statistics (frequency, mean, standard deviation) were

16 calculated for participant characteristics and measured variables. Participants were

17 dichotomised on possible depression status using the recommended cut-off score for the

18 SDHS (<10 = cases with depressive symptoms; ≥10 cases without depressive symptoms).

19 Differences between the two groups and standardised effect sizes were calculated using

20 independent samples *t*-tests and Cohen's *d* for continuous variables, and Chi-square tests

21 (χ^2) and phi coefficients (*φ)* for categorical variables. Where significant differences were

22 identified, these variables were included as covariates in a multivariable logistic regression

1   analysis. Odds ratios and confidence intervals were calculated to estimate the odds that

2   depression status varied due to differences in explanatory variables.

3

4   **Results**

5   In total, 307 retired professional footballers provided informed consent and completed

6   outcome measures. Participant characteristics are summarised in Table I. Mean age was 46.8

7   ± 15.7 years, and the mean time elapsed since retiring was 21.2 ± 14.6 years. Injury was a

8   reason for retirement for 130 (42.3%) participants, and was the main reason for 90 (29.3%).

9   The most common sites of chronic pain from football injuries were knee (48.2%), leg

10   (34.2%), and groin (31.3%).

11   A total of 48 participants (15.6%) scored below the threshold on the SDHS indicating

12   possible clinically-relevant depressive symptoms. Differences between participants with and

13   without depressive symptoms for all variables are presented in Table I. Compared with the

14   majority of the sample, those with depressive symptoms were younger (mean age of 34.2

15   versus 49.2 years; $t = 6.48$, $p < 0.001$; $d = 1.02$), more recently retired (mean time since

16   retirement 10.4 versus 23.5 years; $t = 6.02$, $p < 0.001$; $d = 0.95$), and displayed higher

17   athletic identity (mean score of 38.9 versus 28.8; $t = 9.86$, $p < 0.001$; $d = 1.55$). They were

18   also more likely to cite injury as one reason for retiring (79.2% versus 35.5%; $\chi^2 = 31.60$, p

19   < 0.001, $\varphi = 0.32$), and the main reason for retirement (72.9% versus 21.2%; $\chi^2 = 52.20$, $p <$

20   0.001, $\varphi = 0.41$). For those retiring mainly due to injury, the prevalence of depressive

21   symptoms was 38.9%. Finally, presence of ongoing injury-related pain was reported by more

22   participants with depression symptoms than those without (95.8% versus 63.7%; $\chi^2 = 19.45$,

23     $p < 0.001$, $\varphi = 0.25$), and pain intensity was greater among this group (mean of 5.1 versus

1   3.0; $t = 6.03$, $p < 0.001$; $d = 0.95$). Age at retirement and career duration were not associated

2   with depressive symptoms.

3   Four significant variables from the univariate analysis (time since retirement, injury

4   as a retirement reason, pain intensity, and athletic identity) were included as covariates in the

5   multivariable logistic regression analysis to examine the independent associations with

6   depressive symptoms. Since age and time since retirement were strongly correlated ($r = 0.94$;

7   $p < 0.001$), only time since retirement was included in the multivariable analysis.

8

9   [INSERT TABLE I HERE]

10

11   Table II shows the odds ratios and 95% confidence intervals for each variable.

12 Significant positive relationships for injury as a retirement reason, chronic pain, and athletic

13 identity were observed. In particular, the odds of being depressed were increased by 3.44

14 (95% CI: 1.39, 8.51) for those retiring due to injury. Chronic pain increased the odds of

15 depression by a factor of 1.38 (95% CI: 1.02, 1.86) for each unit increase in intensity.

16 Similarly, each unit increase in athletic identity score was associated with a 1.28 (95% CI:

17 1.14, 1.44) increase in the odds of depression.

18

19 [INSERT TABLE II HERE]

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21 **Discussion**

22 This study examined the psychological wellbeing of retired professional footballers, and

23 some of the factors associated with experiencing depression symptomology. The results

1 suggested that 16% of the sample may have been experiencing clinically-relevant depressive

2 symptoms, and this was associated with retiring through injury, experiencing chronic pain,

3 and having higher athletic identity.

4   The proportion of possible cases of depression symptoms observed here is higher

5 than the 3% prevalence rate of depressive episodes reported among the general adult male

6 population in England in the Adult Psychiatric Morbidity Survey (McManus, Bebbington,

7 Jenkins, & Brugha, 2016). Direct comparisons are not meaningful since the current study

8 was not designed to ascertain prevalence, and used a different detection method (i.e. a self-

9 reported screening tool versus structured interviews). Nonetheless, the findings are

10 compatible with evidence suggesting that professional athletes may be at increased risk of

11 depressive symptoms after retirement (Gouttebarge et al., 2016; Schuring et al., 2016).

12 Notably, a previous international study by Gouttebarge et al. (2015) reported symptoms of

13 anxiety or depression to be more prevalent among former footballers than current players

14 (39% versus 26%).

15 *Career-ending injury and chronic pain*

16   In line with the findings of a previous study of retired British footballers that reported

17 anxiety/depression symptoms in 37% of players with an osteoarthritis diagnosis (Turner et

18 al., 2000), the current study identified depressive symptoms among 39% of those who had

19 retired mainly due to injury. The regression analysis indicated that involuntary retirement of

20 this nature was strongly associated with depressive symptoms, with the odds three times

21 higher than for non-injury reasons. As well as terminating sporting careers, injuries can lead

22 to long-term pain. In an earlier study of retired British professional footballers by Drawer

23 and Fuller (2001), 80% reported some degree of pain during daily activities. As with the

1   current study, the knee was the most common pain location. Pain is a recognised correlate of

2   depression (Bair, Robinson, Katon, & Kroenke, 2003), and in this study its presence

3   significantly increased the odds of reporting depressive symptoms. These results are

4   compatible with a study of 1617 retired professional American footballers, which recorded a

5   similar proportion of possible depression cases (15%) based on a self-report screening tool

6   (Schwenk, Gorenflo, Dopp, & Hipple, 2007). Furthermore, 29% of the study sample retired

7   due to injury, and experiencing chronic pain was strongly associated with depression status.

8   Studies in general population have also demonstrated the relationship between pain and

9   depression. Among 18,980 European adults, the odds of a depression diagnosis for those

10   reporting chronic pain was more than three times higher than for those without pain (Ohayon

11   & Schatzberg, 2003).

12   *Importance of athletic identity*

13   The strength of athletic identity has been shown to predict difficulties with the

14   emotional adjustment to career termination across a range of sports (Kuettel et al., 2017;

15   Ronkainen, Kavoura, & Ryba, 2016; Willard & Lavallee, 2016). In the current study athletic

16   identity was associated with depressive symptomology among retired football players. The

17   high profile status of footballers and media constructions of them as sporting heroes can lead

18   to strongly defined athletic identities (Lines, 2001). This was illustrated in a study of youth

19   footballers in professional academies, where even at age 16 years, players had developed

20   high levels of athletic identity (Mitchell et al., 2014). In another study involving interviews

21   with young footballers who were not selected for professional contracts, having a strong

22   athletic identity was a contributor to experiencing emotional distress when released (Brown

23   & Potrac, 2009). The current findings provide further support for the difficulties involved for

1   some individuals in adjusting to a different lifestyle after careers are terminated when their

2   sense of identity is closely tied to their athletic status (Kuettel et al., 2017).

3   *Considerations for provision of player welfare services*

4   Previous studies have shown that key negative influences on successful transitions

5   out of sport include low educational attainment, inadequate vocational and life skill

6   development, and limited career planning (Park, Lavallee, & Tod, 2013). Young footballers

7   in particular report that the commitment required to achieve, and maintain, professional

8   status, often overrides their attention to educational or vocational development, leaving

9   players ill-equipped for life after football (Parker, 2000). A study of retired UK footballers in

10   2002, revealed high levels of dissatisfaction with the educational and welfare services

11   available during their careers to prepare for retirement (Drawer & Fuller, 2002).

12   One successful example of an intervention addressing adjustment to career

13   termination involved British professional footballers at the point of retirement (Lavallee,

14   2005). The programme involved assessment of life events and counselling to help develop

15   coping skills, and led to significant improvements in psychological adjustment outcomes,

16   compared with a control group. Other programmes have been implemented at earlier stages,

17   before retirement is reached, to ensure that the support provided is proactive (e.g. education

18   and employment opportunities), as well as reactive (e.g. coping skills, emotional support)

19   (Park, Lavallee, and Tod, 2012). Evidence-based interventions of this nature are increasingly

20   being implemented within professional sport, including football. Within the United

21   Kingdom, both the English and Scottish Professional Football Associations dedicate

22   considerable efforts to raising awareness of mental illness, and providing resources and

1   support services for current and former players (Professional Footballers Association, 2016;

2   Professional Footballers Association Scotland, 2016).

3   *Study limitations*

4   It is important to note several limitations of this research. Notably, the cross-sectional

5   design of the study ensures that the findings represent associations between depressive

6   symptoms and the other variables, rather than imply a causal relationship. Furthermore, the

7   number of cases identified was based on reaching a specific score on a screening measure to

8   indicate possible clinically-relevant symptoms, rather than an actual diagnosis of a

9   depressive disorder. Self-report screening instruments generally overestimate the likelihood

10   of depression compared with a criterion-based diagnosis based on a structured clinical

11   interview (Valenstein, Vijan, Zeber, Boehm, & Buttar, 2001).

12   An additional limitation concerns the purposeful recruitment process that prevents

13   the calculation of a precise response rate, and may limit the representativeness of the sample.

14   Nonetheless, key characteristics of participants in this study such as age, retirement age, and

15   the percent reporting career-ending injury were very similar to those in the earlier survey of

16   retired UK professional footballers recruited through a player union (Drawer & Fuller,

17   2001). Finally, it is also worth noting that only a limited range of participant characteristics

18   were collected for this study. It is possible that other variables such as family history of

19   mental disorders, marital status, employment status, or educational achievements would be

20   associated with depressive symptoms.

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1 **Conclusion**

2 This study contributes to the growing body of evidence on mental health problems following

3 retirement from professional football. Findings suggest that a notable proportion of former

4 players may be experiencing clinically-relevant depressive symptomology, and that career-

5 ending injury significantly increases this risk. Intensity of chronic pain, and athletic identity

6 are additional potential contributors, and are factors to consider in the provision of support

7 services for former players.

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1 Table I. Participant characteristics and differences between depressed and non-depressed

2 retired footballers

	Total sample (n = 307)	Depressed (n = 48)	Non-depressed (n = 259)
Current age (years)	46.8 ± 15.7	34.2 ± 14.0	49.2 ± 14.9[a]
Athletic identity (AIMS)	30.4 ± 7.5	38.9 ± 5.4	28.8 ± 6.7[a]
Psychological wellbeing (SDHS)	12.8 ± 2.8	8.0 ± 1.1	13.7 ± 2.0[a]
Duration of playing career (years)	6.7 ± 3.7	5.7 ± 3.7	6.9 ± 3.6
Highest level played*			
Premier League	59 (19.2%)	14 (29.2%)	45 (17.4%)
Football League Championship	49 (16.0%)	10 (20.8%)	39 (15.1%)
Football League One	60 (19.5%)	12 (25.0%)	48 (18.5%)
Football League Two	82 (26.7%)	9 (18.8%)	73 (28.2%)
National League	57 (18.6%)	3 (6.3%)	54 (20.8%)
Age at retirement (years)	25.3 ± 5.2	23.8 ± 5.4	25.6 ± 5.1
Time since retirement (years)	21.5 ± 14.6	10.4 ± 12.3	23.5 ± 14.1[a]
Reasons for retirement			
Family/personal	130 (42.3%)	5 (10.4%)	125 (48.3%) [a]
Injury	130 (42.3%)	38 (79.2%)	92 (35.5%) [a]
Contract end	128 (41.7%)	20 (41.7%)	108 (41.7%)
Declining ability	121 (39.4%)	17 (35.4%)	104 (40.2%)
Age	73 (23.8%)	5 (10.4%)	68 (26.3%)
Other	5 (1.6%)	0 (0.0%)	5 (1.9%)
Total number of reasons	1.9 ± 0.9	1.8 ± 0.9	1.9 ± 1.0
1	136 (44.3%)	24 (50.0%)	112 (43.2%)
2	79 (25.7%)	12 (25.0%)	67 (25.9%)
3	76 (24.8%)	11 (22.9%)	65 (25.1%)
4	15 (4.9%)	1 (2.1%)	14 (5.4%)
5	1 (0.3%)	0 (0.0%)	1 (0.4%)
Main reason for retirement			

Family/personal	112 (36.5%)	2 (4.2%)	110 (42.5%) [a]
Injury	90 (29.2%)	35 (72.9%)	55 (21.2%) [a]
Contract end	36 (11.7%)	7 (14.6%)	29 (11.2%)
Declining ability	25 (8.1%)	2 (4.2%)	23 (8.9%)
Age	39 (12.7%)	2 (4.2%)	37 (14.3%)
Other	5 (1.6%)	0 (0.0%)	5 (1.9%)
Presence of injury-related pain	211 (68.7%)	46 (95.8%)	165 (63.7%) [a]
Intensity of injury-related pain (PI-NRS)	3.3 ± 2.4	5.1 ± 1.5	3.0 ± 2.3 [a]
Pain areas			
Knee	148 (48.2%)	23 (47.95)	125 (48.3%)
Leg	105 (34.2%)	15 (31.3%)	90 (34.7%)
Groin	96 (31.3%)	11 (22.9%)	85 (32.8%)
Hip	79 (25.7%)	13 (27.1%)	66 (25.5%)
Back	63 (20.5%)	6 (12.5%)	57 (22.0%)
Ankle	60 (19.5%)	13 (27.1%)	47 (18.1%)
Other	44 (14.3%)	7 (14.6%)	37 (14.3%)

1   Note: Data are mean ± standard deviation or number (percent); *Current league system in

2   England, or equivalent earlier league systems or Scottish leagues; AIMS: Athletic Identity

3   Measurement Scale (scored 10-50); PI-NRS: Pain intensity numerical rating scale (scored 0-

4   10); SDHS: Short Depression Happiness Scale (scored 0-18); [a] significant difference (p <

5   0.001) between depressed and non-depressed participants

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Table II. Odds of depression among retired professional footballers in association with

injury, pain, and athletic identity.

	Odds ratio (95% confidence intervals)	p
Injury as retirement reason	3.44 (1.39, 8.51)	0.007
Ongoing injury-related pain	1.38 (1.02, 1.86)	0.038
Athletic identity	1.28 (1.14, 1.44)	< 0.001
Years since retirement	1.00 (0.95, 1.05)	0.998

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