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Psychological flexibility & well-being in sport

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Go raibh míle maith agaibh go léir!

WORD COUNT

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Chapter 1

Introductory chapter

Elite athletes experience mental health difficulties at similar rates to the general population (Gouttebarge et al., 2019; Gulliver et al., 2015; Purcell et al., 2020). However, there are indications that they may be less likely to seek support (Gorczynski et al., 2017; Rice et al., 2016). As well as common everyday stressors (e.g., adverse life events, financial uncertainty, and lack of social support; Gouttebarge et al., 2019; Purcell et al., 2020), they are often exposed to additional sport-related stressors (e.g., injury, decreased sport performance, deselection; Gouttebarge & Kerkhoffs, 2017; Kiliç et al., 2018) which have been shown to increase their risk of experiencing psychological distress (Reardon et al., 2019). Retired athletes also report significant difficulties regarding their mental health (Mannes et al., 2019) due to managing major life adjustments related to this transition such as changes in identity and financial issues (Brown et al., 2017; Park et al., 2013). Views on mental health in sport have progressed from predominantly negative concepts such as observing the presence or absence of mental illness to include more holistic approaches of mental health and well-being that consider athletes' ability to function and flourish as individuals (Küttel et al., 2021; Schinke et al., 2018; Tennant et al., 2007). Recently, there has been an increase in guidance from elite sporting bodies and organisations e.g., *Mental Health in Elite Athletes Toolkit* published by The International Olympic Committee (IOC) to guide and support Olympic sports organisations to develop interventions to promote mental health and well-being in elite athletes (IOC, 2021). Such publications highlight the importance of the need to develop evidence-based interventions to foster well-being in elite athletes while achieving high performance.

Psychological flexibility is a key concept which has emerged in the current literature around well-being and sport performance. It involves acceptance and willingness to experience unwanted internal events to pursue values and goals important to the individual

(Hayes et al., 2006). Studies by Zhang et al. (2014) and Chang et al. (2017) have shown significant associations between psychological flexibility and well-being in athletes, while research involving mindfulness and acceptance interventions has demonstrated associations between increased psychological flexibility and improvements in athletic performance (Gross et al., 2018). These findings highlight the potential two-fold benefits that are possible for elite athletes. They also emphasise the need for elite sporting organisations to develop frameworks to guide best-practice that combine mental health policies and performance agendas while recognising athletes as "people first" (Purcell et al., 2022, p.10).

Chapter 1: An investigation of psychological flexibility measures among elite and sub-elite athletes: A systematic review.

Psychological flexibility (PF) has been significantly negatively linked with measures of anxiety, depression (Twohig & Levin, 2017), and stress (Cristina et al., 2018) as well as significantly positively associated with measures of subjective well-being (Khazaei et al., 2022) and quality of life (Hayes, 2004). To date the synthesis of research findings regarding PF and its associated measures in elite athletes has been lacking. The purpose of the current review was to create a narrative synthesis and comparison of studies measuring PF in athletes to inform future research. Findings from the 17 studies included in the review revealed discrepancies in how PF is defined and measured, and the AAQ-II was shown to be used most frequently among the studies. PF was significantly associated with anxiety, depressive symptoms, life satisfaction, other psychological variables (e.g., self-compassion and loneliness) and sport-specific measures (e.g., athletic performance).

Chapter 2: The impact of athletic identity, psychological flexibility and value consistent living on the mental health and well-being of retired elite level rugby players.

Although there has been a growth in studies investigating mental health in current rugby players, there is limited research exploring the mental health and well-being of retired

elite rugby players. The current study examined the impact that athletic identity, psychological flexibility, and values-consistent behaviour have on the subjective well-being and psychological distress of retired elite rugby players. The study adopted a cross sectional, between-subject, factorial design. The online survey was completed by 77 retired elite rugby players who were recruited to the study. Less than optimal levels of subjective well-being were reported by 64% of retired players while 43% reported clinically significant levels of distress. Valued living and psychological flexibility were both shown as significant predictors of subjective well-being. The results show that fostering psychological flexibility and valued living in retired rugby players may increase their subjective well-being. The study's findings will help to inform clinical practice around how to effectively support elite rugby players who are coming to the end of their careers and may increase our understandings of the mechanisms involved in promoting adaptive transitions for retired rugby players.

Journal submission

The systematic review and the empirical study will both be submitted to the Journal of Contextual Behavioural Science. See Appendix A for author guidelines for this journal.

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Chapter 1

An investigation of psychological flexibility measures among elite athletes: A systematic review.

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Abstract

Psychological flexibility (PF) is an important concept in sport as athletes are constantly expected to perform at their best while managing a variety of challenging internal and external stimuli. It involves an acceptance and willingness to experience difficulties while pursuing value-based goals. Although PF has been explored in many studies involving athletes and sport performers, no review has directly focused on synthesizing these research findings. The current review sought to synthesise and compare studies measuring PF in athletes by (1) exploring how PF has been defined and measured, (2) investigating the factors shown to have a significant association with PF and, (3) evaluating the type of sports which have been included in studies to date. Seventeen studies including 1,871 participants (52.12% female, mean age = 23.05) were identified for inclusion. Results indicated discrepancies in how PF is defined and measured; the AAQ-II was shown to be used most frequently (fourteen studies). Two PF assessment instruments were used that had been developed specifically to measure PF in sport (two studies each). PF was significantly negatively associated with anxiety, depressive symptoms, and positively associated with life satisfaction, other psychological variables (e.g., self-compassion), and sport-specific measures (e.g., athletic performance). The results showed no particular focus towards individual or team-based sports as basketball, tennis and football were each represented the most across the 17 studies. Methodological quality across the studies was poor. Researchers should use established outcome measures where possible and seek consensus with other clinicians to ensure firm conclusions can be drawn between studies in future reviews.

Keywords: elite athletes, psychological flexibility, performance, sport, systematic review

Introduction

Psychological flexibility (PF) is understood as "the ability to contact the present moment more fully as a conscious human being and to either change behaviour or persist, if doing so serves valued ends" (Hayes, 2004, p. 5). It relates to a range of dynamic processes reflected in how someone adapts to situations, accesses cognitive resources, considers alternative perspectives, and balances competing values and life aspirations (Kashdan & Rottenberg, 2010). PF is the central construct of Acceptance and Commitment Therapy (ACT; Hayes et al., 2011), and is widely measured across different contexts using the Acceptance and Action Questionnaire - II (AAQ-II; Hayes et al., 2011). ACT was originally developed to target experiential avoidance (EA; Hayes & Wilson, 1994), a transdiagnostic pathological process relevant to a range of mental health issues including depression, anxiety, substance use and eating disorders (Levin et al., 2014). Although the AAQ was initially designed to measure EA, this was later redefined as PF as it is considered to be a more accurate and overarching term (Hayes et al., 2006; Hayes et al., 2011). Additionally, PF and PI (psychological inflexibility) are often used interchangeably in the literature depending on the context e.g., PI in psychopathology and PF in performance and organisational psychology. Hayes (n.d.) proposes that these differences are merely terminological rather than substantive. In contrast, Cherry et al. (2021) suggested that constructs of flexibility and rigidity have been in existence since the mid-20th century (e.g., Berg, 1948; Schultz & Searleman, 2002). Moreover, research into ACT protocols by Dereix-Calonge et al (2019) and Ruiz et al (2018) have demonstrated similarities with PI and other transdiagnostic constructs such as repetitive negative thinking (RNT; Ehring & Watkins, 2008). For the purpose of this review, only papers that were published after 2011 were included, i.e., when the AAQ-II was developed and the terminology changed to PF.

In a review, Kashdan and Rottenberg (2010) proposed that PF was the key ingredient of psychological health and PF has been significantly negatively associated with measures of psychopathology, e.g., anxiety and depression (Twohig & Levin, 2017), stress (Cristina et al., 2018) and chronic pain (Vowles & McCracken, 2008). Nevertheless, PF has also been shown to be associated with indicators of well-being, e.g., positive correlations have been shown between PF and subjective well-being (Khazaei et al., 2022). Furthermore, greater PF has been linked to better quality of life (Hayes, 2004), improved satisfaction with life (Marshall & Brockman, 2016), and increased subjective happiness (Renshaw, 2018).

PF has gained popularity in sport psychology literature over the last two decades due to its relevance regarding third-wave therapies e.g., ACT and Mindfulness-and acceptance-based interventions (MABIs) targeting sports performers (Gardner et al., 2017). It is important to measure PF in current and retired athletes as there is an expectation for athletes to keep their focus on performance while managing a range of stressful and pressurised situations (Gardner & Moore, 2007). Johles et al. (2020) has linked increased PF with improved sport performance in athletes. Due to these associations, there has been increasing interest in understanding psychological predictors and associated interventions of performance, and well-being in elite performance environments. For example, cognitive behavioural techniques including mental rehearsal, imagery and arousal control have been used to support athletes with self-regulation and to reach optimal performance (Birrer & Morgan, 2010; Carraça et al., 2018). There is increasing interest in exploring PF in athlete populations to enhance well-being as well as athletic performance. To date, no review has directly focused on synthesising research findings regarding PF in athletes.

Due to the increase in research in this area, there is a move towards consensus of definitions and improvements in measures of PF in sport literature (Cherry et al., 2021). To achieve this, it is necessary to gain a comprehensive picture of the current literature base that

focuses on flexibility and rigidity constructs used in a sports context. In doing so, there is the potential to improve models of care for athletes, and to inform effective interventions for this population to target subjective well-being and/or optimising performance.

The purpose of this review was to synthesise and compare studies measuring flexibility and rigidity constructs in elite and sub-elite athletes and to identify gaps and trends in the literature to inform future research. Specifically, the review aimed to answer the following questions:

1. How has PF been defined, characterised and measured with athlete populations?
2. What factors have been shown to be significantly associated with PF in studies of athlete populations?
3. What type of sports have been included in studies investigating the PF of athletes to date?

Methods

Search

This review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) statement (Page et al., 2021). It included studies that specifically used a measure of PF with an athlete population. Inclusion and exclusion criteria details are presented in Table 1.

Table 1

Eligibility criteria

	Inclusion criteria	Exclusion criteria
Study design	Collected new data; epidemiology studies.	Case studies/case series, qualitative studies, or reviews.
Population	Recruited athletes or sports performers of at least collegiate level; or report specific analyses that focus on a group of athletes; at least 50% of sample considered active athletes and adults including where participants had conditions related to physical health, developmental delays, neurological impairments, intellectual disabilities, learning disorders, situational stress/trauma	Non athletes (i.e., coaches, support staff, etc).
Intervention	Any intervention working directly with athletes and studies with no intervention	
Comparison	Any comparator or no comparator	
Outcomes	Any flexibility and rigidity construct including PF, EA or related term reported at any time point.	Studies using no measure of PF
Publication	Full, original articles from peer-reviewed journals published in English.	Unpublished studies, theses, studies not published in English, more than 10 years old due to AAQ-II published in 2011.

Search strategy

Six electronic databases were systematically searched (Scopus, MEDLINE, The Cochrane Library, PubMed, PsycINFO and SPORTDiscus) in October 2021 to retrieve all relevant articles. Articles were retrieved based on the search strategy that included a term from two concepts in the title and/or abstract. The first concept was sport (including terms related to ‘athlete’, ‘sport’, or ‘performer’); and the second concept included flexibility and rigidity constructs which included PF PI, EA, and experiential acceptance, as well as the commonly used instruments used to evaluate these constructs). Search terms that were used are presented in Table 2.

Table 2

Search terms

Category	Search terms
Population	athlet* or sport* or performer AND
Outcomes	"psychological flexibilit*" or AAQ or "Acceptance and action" or (acceptance and commitment) or "acceptance and commitment therap*" or "experiential avoidance" or "mental flexibility" or "Comprehensive assessment of Acceptance and Commitment Therapy" or "Psy-Flex" or "Psychological Flexibility in Sport Scale"

Selection of studies for inclusion

Duplicates were removed following the database search. Titles and abstracts were independently screened for eligibility by the author and irrelevant studies were removed. The author inspected all articles against the eligibility criteria during a full-text screening. Ten percent of these studies were selected at random and screened by a second reviewer (trainee clinical psychologist). Any disagreements regarding eligibility were resolved through discussion.

Data extraction and synthesis

The author extracted relevant information from each article and entered it into a spreadsheet. Extracted data included: authors, publication year, country, study design, study purpose, sample size, age (mean and range), ratio of male to female, PF (measure, mean score), as well as factors associated with PF and main findings.

Quality assessment

The Quality Assessment Tool for Quantitative Studies (QATQS) developed for the Effective Public Health Practice Project (EPHPP; Thomas et al., 2004), was chosen to evaluate the quality of the studies included in this review. The QATQS was the tool of choice as it is appropriate to use with any quantitative study design e.g., cross-sectional, controlled trial and quasi-experimental designs, and it has a very strong methodological rating. To reach a conclusion on the overall methodological quality of a study, six categories are assessed,

which include selection bias, study design, confounders, blinding, data collection methods and withdrawals, and drop-outs. Each factor is rated from one to three. A score of one indicates strong, two indicates moderate, and a score of three indicates weak. The overall assessment is determined by taking into account the ratings from every category. Studies with no weak ratings and four strong ratings are considered "strong;" studies with one weak rating and less than four strong ratings are deemed to be "moderate;" and studies with two or more weak ratings are considered to be "weak". The methodological quality of the studies was independently assessed by the author and a proportion (n=2, 12%) was assessed by a second reviewer (trainee clinical psychologist). Agreement between reviewers was high (91.45%). Any disagreements were resolved through discussion.

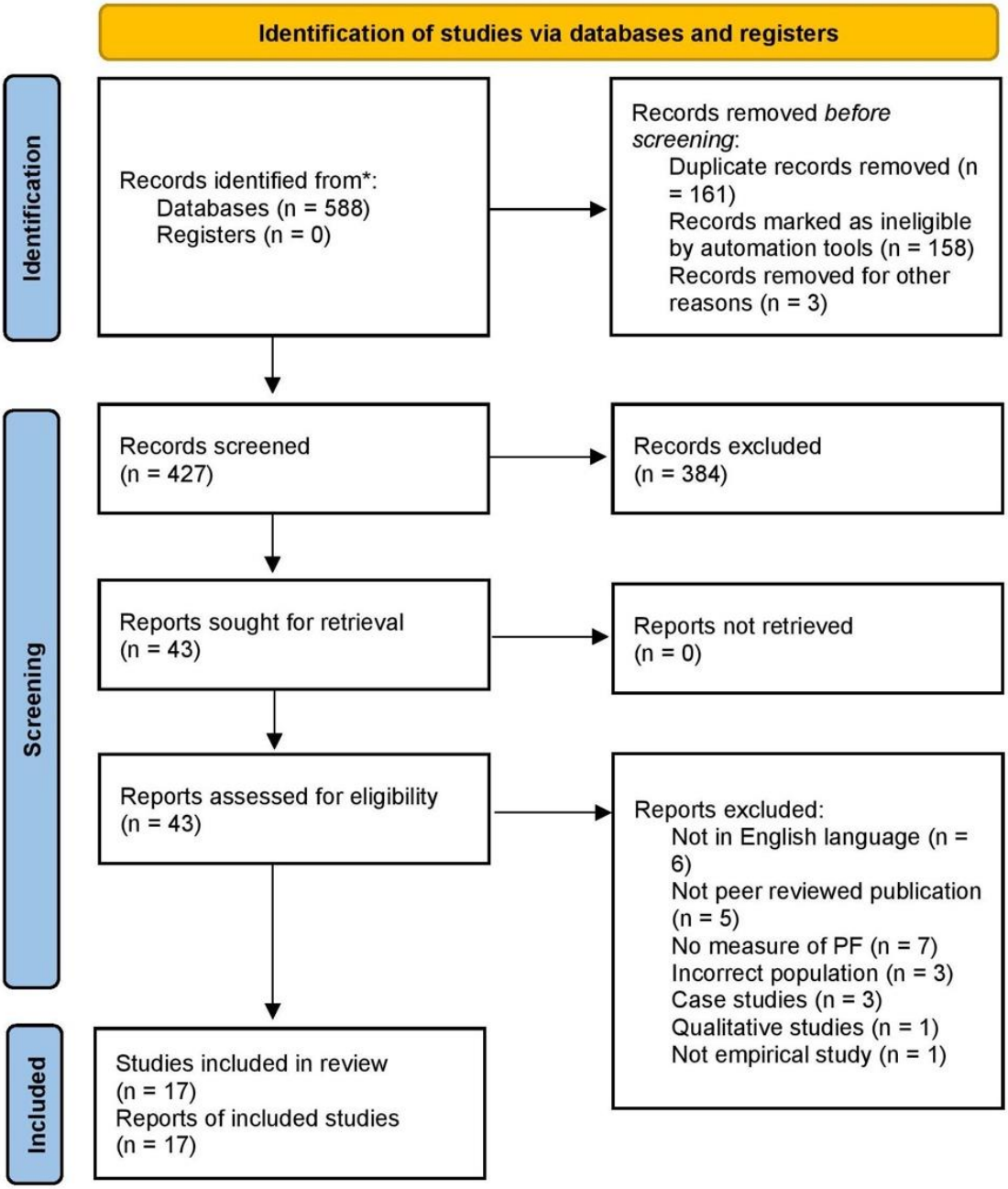
Results

Study selection

A total of 582 records were retrieved through initial database searches and six were identified through additional sources. Duplicate records were removed and 427 titles and abstracts were screened. There were 43 records deemed appropriate for full-text screening. After this, 26 articles were removed. Seventeen studies were included in the review in line with the inclusion criteria. A PRISMA flow diagram for systematic review outlining how the studies were selected is presented in Figure 1.

Figure 1

PRISMA flow diagram



Study characteristics

Study characteristics are presented in Table 3. The studies took place in nine different countries. Four studies took place in Taiwan, four were conducted in Sweden, three took place in the United States of America (USA), and the rest were conducted in Portugal, Spain, Iran, Australia, Switzerland and Hong Kong. Eight studies across six papers used a cross

sectional design (Chang et al., 2017; Clemente-Suárez et al., 2020; DeGaetano et al., 2016; Johles et al., 2020; Lundgren et al., 2018; Zhang et al., 2014), a randomised controlled trial design was used by six studies (Carraça et al., 2018; Dehghani et al., 2018; Glass et al., 2019; Gross et al., 2018; Macdougall et al., 2019; Röthlin et al., 2020), two studies used a prospective cohort design (Chang et al., 2019; Chang et al., 2018), and one used a quasi-experimental design (Lundgren et al., 2020).

Population characteristics

Participant characteristics are detailed in Table 3. PF was evaluated in a total of 1,871 athletes, and the average sample size was 118.8 (range 18-330). Participants' average age was 23.05 years (range 12-37). One study provided no information about participants' age (Gross et al., 2018). The majority of studies included mixed sex cohorts (76%, n=13), two studies included all-male cohorts, and two studies included all-female cohorts with 47.88% of all participants being male. Adult athletes were included in most studies (76%, n=13), while some included both adult and adolescent athletes (18%, n=3). All of the studies consisted of current athletes, and no studies included retired athletes. The sample population was comprised of elite athletes for most of the studies (as defined by the authors) or athletes of an Olympic-level (53%, n=9). Non-elite or sub-elite athletes were also referred to as university/collegiate athletes (47%, n=8) in other studies. Two studies included elite para-athletes (Clemente-Suárez et al., 2020; Macdougall et al., 2019) and one study included injured collegiate athletes only (DeGaetano et al., 2016).

Thirty-two unique sports were included across the studies, with basketball players appearing most frequently across nine studies; tennis players included in eight studies; and football players included in seven studies. Other recurring sports included volleyball (n=6), athletics/track and field (n=6), and less common sports included curling (Röthlin et al., 2020), korfball (Chang et al., 2017), and wushu (Zhang et al., 2014). Five studies examined athletes

from team sports only, 11 studies examined a combination of both team and individual, no studies examined individual sports only and one study did not record the types of sport that athletes participated in (Macdougall et al., 2019). The type of sport athletes participated in was not reported in one study (Macdougall et al., 2019). Five studies focused on a single sport (Carraça et al., 2018, football; Dehghani et al., 2018 and Gross et al., 2018, basketball; and Lundgren et al., 2018 and Lundgren et al., 2020, ice hockey), while eleven studies included athletes from multiple sports and one study did not record the types of sport that athletes participated in (Macdougall et al., 2019). Participants largely consisted of elite male adult athletes who were actively involved in their sport, with tennis and football players being cited most frequently across studies.

Table 3

Study and participant characteristics

Author	Country	Study design	Purpose	Sample (total, % athletes	N; M, F %	Age (mean, SD, range)	Sport; level	Outcome; definition	PF (mean, SD)	Key findings related to PF
Randomised controlled trials										
Carraça et al., 2018*	Portugal	Randomised controlled trial	Effectiveness of a Mindfulness-Based Soccer Program	57 (100)	100, 0	25.79; 3.3; NR	Football; Elite	Portuguese AAQ-II; PI	Pre 19.93, 7.04 Post 18.98, 3.84	**MBSoccerP can be effective in enhancing elite soccer performance, self-compassion, PF, mindfulness and flow.** Regression: Baseline EA/PI predicted lower increase on dispositional flow at post intervention Between group differences: Intervention change t= -1.91 p <.05 Control change t= 5.263; p<.05
Dehghani et al.,2018	Iran	Randomised controlled trial	Effectiveness of mindfulness-acceptance-commitment-based approach on athletic performance and competition anxiety	31 (100)	0, 100	23.44; .49 exp 22.34; .34 control 18-30	Basketball; Collegiate	Persian 9 item AAQ; EA	Pre: Intervention and control (36.44, 8.55;13.44, 4.64); Post: Intervention and control (28.33, 6.45;14.65, 3.89)	MAC approach significantly increases the performance of basketball playing athletes ($p<0.05$) Between group differences: MAC approach has significant effect on EA, $F=0.473$, $p=0.0032$. Effect size of difference between groups is moderate.
Glass et al., 2019	USA	Randomised controlled trial	Effectiveness of Mindful Sport Performance Enhancement (MSPE) on athlete well-being and sport performance	52 (100)	15, 85	19.32; 1.25; NR	Multiple; Collegiate	AAQ-II; PI	Pre: 18.10 Post: 16.20	No significant differences at pre-test between groups (MSPE vs. wait-list controls; attenders vs. completers), demonstrating group equivalence on demographic and all psychological and sport performance outcome measures.

Gross et al., 2018	USA	Randomised controlled trial	Effectiveness of Mindfulness-Acceptance-Commitment (MAC) approach for athletic performance and mental health	22 (100)	0, 100	NR; NR; NR	Basketball; Collegiate	AAQ-II; PF	Pre: MAC and PST (14.13,9.45;15.83, 6.56); Time 3: MAC and PST (25.38,11.78;22.33 ,9.18); Post: MAC and PST (14.38,9.91;15.00, 5.93); Follow-up: MAC and PST (11.75,8.01;13.83, 8.42)	MAC effectively reduced Substance Use, Hostility, and Emotion Dysregulation over time compared to PST group. **Within-group differences also emerged, MAC group showed reduced Generalised Anxiety, Eating Concerns, and Psychological Distress, as well as increased PF from post-intervention to one-month follow-up** Within-group differences AAQ-II ($F(3, 36) = 6.31$, $p = .02$, $\eta^2_p = .35$) at four time points (pre-intervention, session three, post-intervention, and one-month follow-up). Pairwise comparisons determined statistically significant differences in AAQ-II scores for MAC participants from pre-intervention to session three ($p = .01$), and from post-intervention to one-month follow-up ($p = .04$). 0.01, 0.00 between-group effect (F, η^2_p)
Macdougall et al., 2019	Australia	Randomised controlled trial	Feasibility and potential efficacy of MAC delivered within MI framework	18 (100)	28, 72	34; 12 exp; NR 31; 12 control; NR	NR; Elite Para athletes	AAQ-II; EA	Pre: Intervention and control (34.7,3.3;32.8,6.2) ; Post: Intervention and control (34.8,3.0;33.9,5.5)	Significant improvements were identified in the intervention group for subjective well-being, personal growth, positive relation with other with large effect sizes compared to waitlist control group.
Röthlin et al., 2020	Switzerland	Randomised controlled trial	Effects of psychological skills training and mindfulness training on performance	95 (100)	51, 49	24.43; 5.15; NR	Multiple; Elite	AAQ-II; EA	-	**Differential effect of Mental Training on decreased EA: MT decreased compared to control and PST (psychological skills training intervention) PST did not differ from WL.**
Observational designs										
Chang et al., 2017**	Taiwan	Observational, cross-sectional	Examine group invariance of AAQ-II between students and athletes	324 (52)	44, 56	20.44; 1.65; NR	Multiple; Collegiate	Taiwanese AAQ-II; EA	-	**Factorial invariance of AAQ-II was demonstrated across students and adolescent athletes.**

Chang et al., 2017**	Taiwan	Observational, cross-sectional	Examine nomological validity by testing mediating role of PF in relationship between perceived autonomy support and well-/ill-being indicators	76 (100)	60, 40	20.00; 1.40; NR	Multiple; Collegiate	Taiwanese AAQ-II; EA	4.36, 1.04	**Perceived autonomy support was related to depression and negative emotion through EA. However, EA did not mediate the relationship between perceived autonomy support and positive emotion and life satisfaction.**
Chang et al., 2018	Taiwan	Observational, prospective cohort	Examine the moderating role of PF in the relationship between athletic identity and emotional exhaustion	132 (100)	45, 55	19.97; 1.31; 18–25	Multiple; Collegiate	Chinese AAQ-II; PF	4.18, 1.09	**Athletic identity is positively associated with development of emotional exhaustion over time among individuals with low PF but is negatively associated with emotional exhaustion for individuals with high levels of PF**
Chang et al., 2019	Taiwan	Observational, prospective cohort	Relationship between perceived coach autonomy support and development of athlete burnout, considering moderating role of EA	141 (100)	55, 45	21.14; 1.68; NR	Multiple; Collegiate	Chinese AAQ-II; EA	3.82, 1.21	**Athletes with low EA benefit more from perceived coach autonomy support than athletes who are high in EA in preventing burnout development.** Regression: AS and EA significantly predicted sport devaluation, reduced sense of accomplishment and total AB
Clemente-Suárez et al., 2020	Spain	Observational, cross-sectional	Examine the effect of psychological profile, academic schedule and gender in the perception of personal and professional threat of Olympic and Paralympic athletes facing 2021 Tokyo Olympiad during COVID-19 crisis	175 (100)	41, 59	27.62; 7.33; NR	Multiple; Olympic/ Paralympic	Spanish AAQ-II; PI	14.98, 6.27	**Neuroticism and PI presented the greatest negative feelings for female athletes**
DeGaetano et al., 2016	USA	Observational, cross-sectional	Influence of psychosocial factors and PF on rehabilitation protocol adherence	48 (100)	58, 41 of original sample	19.9; 1.35; 18-24	Multiple; Injured Collegiate	AAQ-II; PF	Not at risk 11.80 At risk 16.31 (for poor adherence)	**Supported the relationship between PF and rehabilitation adherence but did not support the anticipated relationships between forms of psychological distress and poor rehabilitation adherence.** Regression: High AAQ-II score increased the odds of poor engagement/ rehabilitation adherence by 20%, Exp(B) = 1.195.

Johles et al.,2020**	Sweden	Observational, cross-sectional	Develop Psychological Flexibility in Sport Scale (PFSS) and examine its psychometric properties	152 (100)	41, 57, 2 no gender	22.3; 4.3; 17–37	Multiple; Elite/Sub-elite	PFSS; PF	-	**PFSS was significantly negatively associated with age, years in sport, and years as an elite athlete. PFSS was significantly negatively associated with four of the QoL domains: recreation, philosophy of life, creativity, and self-regard**
Johles et al.,2020**	Sweden	Observational, cross-sectional	Test validity of modified version of PFSS to confirm the factor structure	252(100)	52, 48	16.9; 0.87; 15–19	Basketball and skiing; Elite	PFSS; PF	-	**CFA demonstrated an acceptable data fit for the seven-item PFSS**
Lundgren et al., 2018	Sweden	Observational, cross-sectional	Develop and investigate self-report instrument that measures values, acceptance and mindfulness (VAMS)	93 (100)	78, 22	21.4; 4.5; NR	Ice hockey; Elite/ Sub elite	SAAQ; VAMS; PF	-	**PF, as measured with VAMS, showed a significant correlation with performance in ice hockey**
Zhang et al., 2014	Hong Kong	Observational, cross-sectional	Psychometric properties of AAQ-II in Elite Chinese Athletes	330 (100)	46, 54	18.67; 3.1; 12-27	Multiple; Elite	Chinese AAQ-II; EA	21.90, 7.80	**AAQ-II significantly negatively correlated with esteem, vigor, and well-being suggesting that athletes with positive mood and high satisfaction with life also tend to act with lower levels of EA. Anger, confusion, depression, fatigue, tension, and anxiety were significantly positively correlated with AAQ-II suggesting that higher levels of EA are also related to mood disturbance**
Quasi-experimental designs										
Lundgren et al., 2020	Sweden	Quasi-experimental	Feasibility and effect of psychological training program based on Acceptance and commitment training (ACT)	21 (100)	100, 0	26.29; 5.14; NR	Ice hockey; Elite	VAMS-11, VAMS-22; PF	VAMS-22 Pre: ACT and control (54.0,9.4;50.2,10.4); Post: ACT and control (45.8,6.1;50.5,10.8) VAMS-11 Pre: ACT and control (30.5,6.9;29.9,6.2) ; Post ACT and control (25.2,5.1;29.9, 6.7)	**Significant increase in PF for players in ACT training group** A significant increase in PF was shown in the experimental group between pre and post with large effects as measured with both VAMS-22 and VAMS-11

Note: NR = not recorded; EA = Experiential avoidance, PF = Psychological flexibility, PI = Psychological inflexibility, AAQ = Acceptance and action, *One study reported in three papers: Carraça et al., 2018; Carraça et al., 2019a; Carraça et al., 2019b; **Multiple studies reported in one paper; Studies including participants from multiple sports:
Chang (2017i): Basketball, tennis, table tennis, volleyball, soccer, running, and korfball

Chang (2017ii): Badminton, table tennis, archery, and weight lifting
Chang (2018): Basketball, volleyball, tennis, track and field, soccer, and Tae Kwon Do
Chang (2019): Basketball, volleyball, tennis, track and field, soccer, and taekwondo
Clemente-Suárez (2020): Artistic gymnastics, Athletics, Golf, Hockey, Judo, swimming, Triathlon, Volleyball and Wrestling
DeGaetano (2016): NFL, Soccer, Lacrosse, Baseball, Softball, tennis, basketball, volleyball, field hockey
Glass (2019): Cross-country/track, swimming, tennis, lacrosse, field hockey, soccer, baseball, NFL, volleyball
Johles (2020a): Badminton, handball, soccer, ice hockey, floorball, table tennis, basketball, tennis
Röthlin (2020): Tennis, curling, floorball and badminton
Zhang (2014): Archery, athletics, badminton fencing, gymnastics, rowing, shooting, swimming, table tennis, tennis, weight lifting, wrestling, wushu, basketball, handball, water polo

Quality assessment

The quality of 11 studies was identified to be weak and five were considered moderate. Selection bias influenced weak ratings (i.e., participants were not selected at random and they appeared to differ systematically from the target population). Additionally, authors were unclear about whether they controlled for potential confounders, and there was a lack of information around blinding, as well as withdrawals and drop-outs. Quality assessments for individual studies are presented in Table 4.

Table 4

Quality assessment

First author and date	Selection bias	Study design	Confounders	Blinding	Data collection tools	Withdrawals	Global rating
Carraça (2018)*	Weak	Strong	Weak	Weak	Strong	Weak	Weak
Chang (2017)**	Moderate	Moderate	N/A	Weak	Strong	N/A	Weak
Chang (2017)**	Moderate	Moderate	N/A	Weak	Strong	N/A	Weak
Chang (2018)	Weak	Moderate	Weak	Weak	Strong	Weak	Weak
Chang (2019)	Weak	Moderate	Moderate	Weak	Strong	Weak	Weak
Clemente-Suárez (2020)	Weak	Moderate	N/A	Weak	Weak	N/A	Weak
Degaetano (2016)	Moderate	Moderate	N/A	Weak	Strong	N/A	Moderate
Dehghani (2018)	Weak	Strong	Weak	Weak	Strong	Strong	Weak
Glass (2019)	Moderate	Strong	Strong	Weak	Strong	Weak	Weak
Gross (2018)	Weak	Strong	Strong	Weak	Strong	Strong	Weak
Johles (2020)**	Moderate	Moderate	N/A	Weak	Strong	N/A	Moderate
Johles (2020)**	Moderate	Moderate	N/A	Weak	Strong	N/A	Moderate
Lundgren (2018)	Moderate	Moderate	N/A	Weak	Strong	N/A	Moderate
Lundgren (2020)	Weak	Strong	Weak	Moderate	Strong	Strong	Weak
Macdougall (2019)	Weak	Strong	Moderate	Weak	Strong	Strong	Weak
Röthlin (2020)	Moderate	Strong	Strong	Weak	Moderate	Strong	Moderate
Zhang (2014)	Moderate	Moderate	Strong	Weak	Strong	N/A	Moderate

Note: NR = *One study reported in three papers: Carraça et al., 2018; Carraça et al., 2019a; Carraça et al., 2019b; **Multiple studies reported in one paper.

Measuring PF

The most common measure used to evaluate PF was the AAQ-II (82%, n=14). The AAQ-II was used in several languages, including English, Portuguese, Taiwanese, Chinese, Spanish, Swedish and Persian. The majority of studies included AAQ-II mean scores (65%, n=11), which ranged from 3.82-36.44. The AAQ-II was identified as a measure of EA in

seven (41%) of these studies, four studies referred to this as a measure of PF (Chang et al., 2018; DeGaetano et al., 2016; Gross et al., 2018; Lundgren et al. 2018), and three studies defined the measure as assessing PI (Carraça et al., 2018; Clemente-Suárez et al., 2020; Glass et al., 2019). Additional measures included a sport-specific measure of PF called the Psychological Flexibility in Sport Scale (PFSS; Johles et al., 2020), and the Values, Acceptance, and Mindfulness Scale (VAMS-11 and VAMS-22; Lundgren et al., 2018; Lundgren et al. 2020) measuring PF specific to ice hockey, see Table 5 for details. The AAQ-II was used most frequently across 14 of the 17 studies.

Table 5

PF outcome measures

Measure	Studies	Scoring method
Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2007, 2011).	Carraça et al. (2018)	Higher scores indicating greater PI
	Chang et al. (2017)	Higher scores indicating greater EA
	Chang et al. (2017)	Higher scores indicating greater EA
	Chang et al. (2018)	Lower scores reflect greater PF
	Chang et al. (2019)	Higher scores reflect greater EA
	Clemente-Suárez et al. (2020)	Higher scores indicating greater PI
	DeGaetano et al. (2016)	Lower scores reflect greater PF
	Dehghani et al. (2018)	High scores show avoidance of internal experiences and low scores show acceptance of internal experiences
	Glass et al. (2019)	Higher scores reflect greater PI/EA
	Gross et al. (2018)	Higher scores indicate greater levels of PI
	Lundgren et al. (2018)	Higher scores indicate lower PF and lower scores indicate higher PF
	Macdougall et al. (2019)	Higher scores reflect greater EA and lower scores reflect great PF and acceptance
	Röthlin et al. (2020)	Higher scores reflect greater EA
	Zhang et al. (2014)	Higher scores reflect greater EA
Psychological Flexibility in Sport Scale (PFSS; Johles et al., 2020)	Johles et al (2020)	Higher scores reflect greater PI/EA
	Johles et al (2020)	Higher scores reflect greater PI/EA
Values, Acceptance and Mindfulness Scale (VAMS; Lundgren et al., 2018)	Lundgren et al. (2018)	Higher scores indicating greater PF
	Lundgren et al. (2020	Higher scores indicating greater PF

Additional outcome measures

Most of the studies in the review included additional outcome measures alongside PF (88%, n=15). There were 48 outcome measures recorded across these studies. The outcome measures were heterogeneous in nature - they generally included mental health and well-

being measures, other psychological variables, sport/performance measures, and miscellaneous measures relating to quality of life, physical health, and individual character. These outcome measures and their subscales accounted for a total of 119 unique psychological constructs identified across 11 of the 17 studies. Of these, 96 correlational analyses were conducted and 66 were deemed to be significantly associated with PF. Correlational analyses are detailed in Table 6 and discussed below. Mental health outcome measures were most frequently measured alongside PF among the studies in this review.

Table 6

PF correlations across studies

Studies	Construct	Measure	Correlation	*P*	Sample size
DeGaetano (2016)	Somatic complaints	BBHI-2	-0.43	< 0.01	48
	Other pain complaints	BBHI-2	-0.31	< 0.05	
	Functional complaints	BBHI-2	-0.31	< 0.05	
	Depression	BBHI-2	-0.52	< 0.01	
	Anxiety	BBHI-2	-0.48	< 0.01	
	Defensiveness	BBHI-2	0.50	< 0.01	
	Rehabilitation adherence	HRERS	0.31	< 0.05	
Johles (2020)**	Sport Performance	Borg CR100 scale	0.26	< 0.01	152
	Recreation	BBQ	0.23	< 0.01	
	Philosophy of life	BBQ	0.25	< 0.01	
	Creativity	BBQ	0.18	< 0.01	
	Learning	BBQ	0.14	> 0.05	
	Friends and friendship	BBQ	0.14	> 0.05	
	Self-regard	BBQ	0.47	< 0.01	
Johles (2020)**	Depression	BDI-I	-0.49	> 0.001	252
	Anxiety	BAI	-0.50	> 0.001	
Lundgren (2018)	Acceptance and action	SAAQ	0.61	< 0.001	93
	Depression	DASS-21	-0.45	< 0.001	
	Anxiety	DASS-21	-0.36	< 0.05	
	Stress	DASS-21	-0.38	< 0.05	
	Emotional distress (total)	DASS-21	-0.47	< 0.001	
	Life satisfaction	SWLS	0.43	< 0.001	
	Sport performance	Goals	-	-	
	Sport performance	Assists	0.30	< 0.05	
	Sport performance	Team points	0.29	< 0.05	
Röthlin (2020)	Mindfulness	FFMQ	-	-	95
	Use of psychological skill	TOPS	-	-	
	Emotional control	TOPS	-	-	
	Emotional competencies	SEC-27	-	-	
	Attention regulation	TOPS	-	-	
	Cognitive interference	TOQS	-	-	
	Decentering	EQ	-	-	
	Dealing with failures	ASOAF6	-	-	
Zhang et al., 2014	Anger	POMS	-0.40	< 0.001	330
	Confusion	POMS	-0.48	< 0.001	
	Depression	POMS	-0.48	< 0.001	
	Esteem	POMS	0.16	< 0.001	
	Fatigue	POMS	-0.28	< 0.001	
	Tension	POMS	-0.49	< 0.001	
	Vigor	POMS	0.23	< 0.001	
	Training/Competition well-being	TCWS	0.36	< 0.001	
	Sport Competition anxiety	SCAT	-0.46	< 0.001	

Carraça (2018)*	Flow State	DFS-total	0.43	< 0.05	57
	Self-Compassion	SCS-total	0.62	< 0.05	
	Description	FFMQ	0.36	< 0.05	
	Awareness	FFMQ	0.56	< 0.05	
	Non-judgmental	FFMQ	0.56	< 0.05	
	Thought suppression	WBSI	-0.50	< 0.05	
	Anxiety	BSI-anxiety	-0.47	< 0.05	
Chang (2017)**	-	-	-	-	324
Chang (2017)**	Depression	CES-D	-0.70	< 0.01	76
	Negative Emotion	PANAS	-0.66	< 0.01	
	Positive Emotion	PANAS	0.37	< 0.01	
	Autonomy Support	SCQ	0.23	> 0.05	
	Life satisfaction	SWLS	0.21	> 0.05	
Chang (2018)	Athletic identity	AIMS	-0.03	> 0.05	132
	Emotional exhaustion	ABQ	-0.30	< 0.01	
Chang (2019)	Autonomy support (AS)	SCQ	-0.09	> 0.05	141
	Emotional/physical exhaustion	ABQ	-0.30	< 0.01	
	Sport devaluation	ABQ	-0.38	< 0.01	
	Athlete burnout	ABQ	-0.33	< 0.01	
	Reduced sense of accomplishment	ABQ	-0.10	< 0.01	
Clemente-Suárez (2020)	Concern	Likert 1-5 scale	-0.06	> 0.05	175
	Alarm	Likert 1-5 scale	-0.01	> 0.05	
	Control	Likert 1-5 scale	0.03	> 0.05	
	Personal care	Likert 1-5 scale	0.12	> 0.05	
	JJOO delay	Likert 1-5 scale	0.10	> 0.05	
	Sport confinement	Likert 1-5 scale	-0.01	> 0.05	
	Influence performance	Likert 1-5 scale	-0.25	< 0.01	
	Institutions support	Likert 1-5 scale	0.14	> 0.05	
	Training routines	Likert 1-5 scale	-0.21	< 0.01	
	Extraversion	BFI-10	0.08	> 0.05	
	Agreeableness	BFI-10	-0.08	> 0.05	
	Conscientiousness	BFI-10	0.23	< 0.01	
	Neuroticism	BFI-10	-0.56	< 0.01	
	Openness	BFI-10	0.08	> 0.05	
	Loneliness	UCLA 3-item	-0.42	< 0.01	
	Anxiety	STAI	-0.02	> 0.05	
Dehghani (2018)	Athletic Performance	SPQ	-	-	31
	Sport Competition anxiety	SCAT	-	-	
Glass (2019)	Depression	DASS-21	-0.58	> 0.05	58
	Anxiety	DASS-21	-0.39	< 0.01	
	Stress	DASS-21	-0.42	< 0.01	
	Life satisfaction	SWLS	-	-	
	Observing	FFMQ	0.06	> 0.05	
	Describing	FFMQ	0.02	> 0.05	
	Acting with awareness	FFMQ	0.29	> 0.05	
	Nonjudging	FFMQ	0.62	> 0.05	
	Nonreactivity	FFMQ	0.28	< 0.05	
	Mindfulness total	FFMQ	0.31	< 0.05	
	Merging of action/awareness	DFS-2	0.43	< 0.01	
	Clear goals	DFS-2	0.37	< 0.01	
	Loss of self-consciousness	DFS-2	0.42	< 0.01	
	Challenge/skill balance	DFS-2	0.47	< 0.01	
	Autotelic experience	DFS-2	0.43	< 0.01	
	Transformation of time	DFS-2	-0.18	> 0.05	
	Sense of control	DFS-2	0.38	< 0.01	
	Concentration on task	DFS-2	0.33	< 0.05	
	Unambiguous feedback	DFS-2	0.26	< 0.05	
	Total flow state	DFS-2	0.43	< 0.01	
	Somatic anxiety	SAS	-0.35	< 0.01	
	Worry	SAS	-0.48	< 0.01	
	Concentration disruption	SAS	-0.47	< 0.01	
	Sport anxiety total	SAS	-0.51	> 0.05	
	Enjoyment of Sport	SRF	0.39	> 0.05	
	Physical performance	SRF	0.15	> 0.05	
	Cognitive/emotion regulation	SRF	0.34	< 0.01	
	Cohesion	SRF	0.08	> 0.05	
Gross (2018)	Psychological distress	CCAPS-62	-	-	22
	Emotion regulation	DERS	-	-	
	Mindfulness	MAAS	-	-	
	Sport performance	SPQ	-	-	
	Impression management	MC-C	-	-	
	Therapeutic alliance	WAI-S	-	-	

Macdougall (2019)	Subjective well-being	SPANE	-	-	18
	Life satisfaction	SWLS	-	-	
	Psychological well-being	PWB	-	-	
	Social well-being	SWBS	-	-	
	Physical well-being/health	ABQ, PCS	-	-	
	Mindfulness	CAMS-R	-	-	
Lundgren (2020)	-	-	-	-	21

Note. Amber font indicates moderate quality design and red font indicates weak quality design according to quality assessment. *One study reported in three papers: Carraça et al., 2018; Carraça et al., 2019a; Carraça et al., 2019b; **Multiple studies reported in one paper; DFS-2, Dispositional Flow Scale; SCS, Self-Compassion Scale; FFMQ, Five Facet Mindfulness Questionnaire; CES-D, Center for Epidemiological Studies Depression Scale; PANAS, Positive and Negative Affect Schedule; ABQ, Athlete Burnout Questionnaire; BFI-10, Big Five Inventory; UCLA 3-item, University of California, Los Angeles 3-Item Loneliness Scale; BBHI-2, Brief Battery for Health Improvement; HRERS, Hopkins Rehabilitation Engagement Rating Scale; SPQ, Charbonneau Sports Performance Questionnaire; SCAT, Sport Competition Anxiety Test; SRF, CCAPS-62, Counselling Centre Assessment of Psychological Symptoms; DERS, Difficulties with Emotion Regulation Scale; MAAS, Mindful Awareness Attention Scale; SPQ, Sport Performance Questionnaire; MC-C, Marlowe-Crowne Social Desirability Scale; WAI-S, Working Alliance Inventory; Sport Rating Form; BBQ, Brunnsviken Brief Quality of Life Inventory; BDI-I, Beck Depression Inventory II; BAI, Beck Anxiety Inventory; SAAQ, Swedish Acceptance and Action Questionnaire; DASS-21, Depression, Anxiety, and Stress scale; SWLS, Satisfaction With Life Scale; SPANE, Scale of Positive and Negative Experience; PWB, Psychological Well-being Scale; SWBS, Social Well-being Scale; PCS, Pain Catastrophising Scale; CAMS-R, Cognitive and Affective Mindfulness Scale-Revised; TOPS, Test of Performance Strategies; SEC-17, Self-assessment of Emotional Competencies; TOQS, Thought Occurrence Questionnaire for Sport; EQ, Experience Questionnaire; ASOAF6, Action and State Orientation after Failure; POMS, Profile of Mood States; TCWS, Training and Competition Well-being Scale; SCAT, Sport Competition Anxiety Test.

Mental health

Symptoms of anxiety were identified in eight studies, however only six presented findings that were associated with PF. Each of the six studies conducted correlational analyses (Carraça et al., 2018; Clemente-Suárez et al., 2020; DeGaetano et al., 2016; Glass et al., 2019; Johles et al., 2020; Lundgren et al., 2018). For clarity, all of the correlational results are presented in association with the positive form of the construct PF (higher scores indicating higher levels of flexibility / lower levels of rigidity) even where papers may have referred to the construct in the negative form as discussed above. This is also the case for data presented in Table 6. Moderate negative significant associations were identified between PF and anxiety scores in three studies (DeGaetano et al., 2016; Glass et al., 2019; Johles et al., 2018), two studies identified weak negative significant associations (Carraça et al., 2018; Lundgren et al., 2018) and Clemente-Suárez et al. (2020) identified a weak negative but non-significant association. Six studies measured depression symptoms, and all six studies measured these alongside PF (Chang et al., 2017; DeGaetano et al., 2016; Glass et al., 2019; Johles et al., 2018; Lundgren et al., 2018; Zhang et al., 2014). Correlational analysis identified moderate to strong negative significant associations between PF and depression scores (r=.70; .58; .52; .49; .45; .48, respectively for the studies noted in the previous

sentence). Two studies identified weak negative significant associations between PF and emotional exhaustion (r= .30, Chang et al., 2018; Chang et al., 2019). Chang et al. (2017) recorded the strongest significant associations with EA and depression (r=.70), and EA and negative emotion (r=.66). Anxiety and depression were the most frequent mental health related outcomes measured alongside PF and moderate to strong significant associations were observed across several studies in both cases. However, no studies reported clinical significance in relation to these findings.

Well-being

Life satisfaction was measured in four studies, but only two studies measured cognitive judgments of satisfaction alongside PF (Chang et al., 2017; Lundgren et al., 2018). Correlational analyses identified a moderate negative significant association between PI and life satisfaction scores in one study (r= -.43, Lundgren et al., 2018) and a weak negative non-significant association was identified in the other study (r= -.21, Chang et al., 2017). Well-being-related measures were included in two studies however only one study compared well-being scores to PF (Zhang et al., 2014) and a weak negative significant association was identified between PI and training and competition well-being (r=-.36). Life satisfaction was the most frequent well-being related outcome measured alongside PF, however levels of association differed across studies.

Other psychological variables

PF was significantly associated with several other mental health and well-being related constructs including loneliness and self-compassion. Five studies included mindfulness measures but only two studies compared mindful traits to PF (Carraça et al., 2018 and Glass et al., 2019). Correlational analyses revealed weak positive significant associations between acting with awareness and PF (r=.31; .29), and nonreactivity and PF (r=.39; .28), and total mindfulness (r=.31). Two studies identified weak positive significant

association between PF and flow state (r=.32, Carraça et al., 2018; r=.43, Glass et al., 2019). Mindfulness was the most frequent other psychological variable measured alongside PF and associations varied across studies.

Sport and performance

Although athletic performance was measured in five studies, only three studies presented findings concerning PF. Performance was weakly negatively and significantly associated with EA (r=-.39, Glass et al., 2019; r=-.26, Johles et al., 2020; r=-.30, Lundgren et al., 2018). One study showed a weak positive significant association between PI and impact on training routines (r=.21, Clemente-Suárez et al., 2020). Similarly, a weak positive significant association was shown between esteem and PI (r=-.16, Zhang et al., 2014). Athletic performance was measured most frequently alongside PF and associated varied across studies.

Discussion

PF involves acceptance and a willingness to invite unwanted experiences to achieve what is most valuable for the self (Hayes et al., 2006). It is a potentially important construct in the field of sport as athletes are required to maintain a clear focus on goal-oriented tasks-related to their performance whilst continually being exposed to stressors and disruptive stimuli (Gardner & Moore, 2007; Johles et al., 2020; Moore, 2009). PF has become more prevalent in sport in the last twenty years as a result of an increase in the application of third-wave therapies with elite athletes (Gardner et al., 2017). Due to its empirically supported associations with reducing psychopathology (e.g., anxiety, depression; Twohig and Levin, 2017), and improving well-being (e.g., subjective well-being; Khazaei et al., 2022), life satisfaction (Marshall & Brockman, 2016), and quality of life (Hayes et al., 2004), PF has piqued the interest of clinical psychology research and practice (Cherry et al., 2021). This

review is the first to synthesise and compare studies measuring PF in athletes and therefore has the potential to identify gaps and trends in the literature to inform future research.

Seventeen studies with 1,871 athletes in total were included. A wide variety of sports were identified, due to the diverse samples represented in this review. The findings highlight a range of definitions and outcome measures used to assess PF in athlete populations. The AAQ-II was employed as a measure of PF in 14 of 17 studies. Interestingly, the AAQ-II was administered in seven different languages, on four different continents demonstrating the global breadth and diverse representation of studies included in this review. There were discrepancies around how this measure was labelled as three distinct concepts of flexibility and rigidity were applied. The AAQ-II was most commonly referred to as a measure of EA, then PF and least commonly referred to as a measure of PI. This is an important finding as the original intention of the AAQ was to measure EA, however since the development of the revised version in 2011, it has widely been referred to as PF in performance literature (Carraça et al., 2018; Chang et al., 2018; DeGaetano et al., 2016; Gross et al., 2018). Although Hayes (n.d.) has commented that these differences are not substantive, the lack of consensus of terms has been remarked upon by (Cherry et al., 2021) who cautioned against researchers assuming PF to be an inverse measure of PI as it is possible that PF and PI occur along separate continuums (Kashdan & Rottenberg, 2010; Morris & Mansell, 2018). Unfortunately, these discrepancies pose an obstacle to establishing a robust evidence base.

Eleven of the fourteen studies that used AAQ-II recorded mean scores which broadly ranged from 3.82-36.44, reflecting the large variation in findings among the studies. Importantly, the findings showed two emerging measures of PF specific to the sporting context, namely, the PFSS (Johles et al., 2020) and the VAMS (Lundgren et al., 2018; Lundgren et al. 2020). Johles et al. (2020) propose that context-specific measures that are tailored to the athlete's circumstances are shown to have more significant associations with

measures of performance (Bond et al., 2013; Johles et al., 2020). This position may offer insight into how PF is likely to be measured within sport in the future.

The review sought to determine which factors have been associated with PF in studies with athletes. The results demonstrated that 48 outcome measures were investigated together with PF in 15 of the 17 included studies. Most of these outcomes related to mental health (e.g., the Depression Anxiety and Stress Scale; DASS-21) with some well-being measures were included across multiple studies (e.g., the Satisfaction with life scale was included in studies by Glass et al., 2019; Lundgren et al., 2018; and Macdougall et al., 2019). Notably, nine studies included outcomes which measured anxiety and depression symptoms, however none of these studies reported whether their findings were non-clinical, sub-clinical or of clinical significance. This may be due to the fact that the aim of these studies related to improving performance and well-being rather than addressing a clinical need in this population.

There were also other psychological factors (e.g., self-compassion scale, dispositional flow scale used in Carraça et al., 2018) and measures specific to sport and performance (e.g., Borg CR100 scale used in Johles et al., 2020 and the Sport Performance Questionnaire employed in Dehghani et al., 2018 and Gross et al., 2018). Lundgren et al. (2018), chose to adopt an alternative means to measure performance objectively by collating goals scored, assists made and team points.

There were also outcome measures included that were context-specific (e.g., Hopkins Rehabilitation Engagement Rating Scale (HRERS) measured rehabilitation adherence in injured athletes) providing important information relevant to the target population.

Chang et al. (2017) recorded the strongest significant associations between EA and depression, and EA and negative emotion. Both depression and levels of negative emotions were outcomes that were most frequently explored in relation to PF in athlete populations.

Although the data was too heterogeneous in nature to conduct a meta-analysis and draw robust conclusions, it was noted that psychological constructs relating to mental health and well-being were most often investigated alongside PF rather than other psychological variables or performance measures. These findings are in keeping with research in clinical and non-clinical populations where the focus has most often been on associations between PI and psychopathology (e.g., (Bluett et al., 2016; Bond et al., 2011), and more recently on positive associations between PF and well-being (Guerrini Usubini et al., 2021; Marshall & Brockman, 2016). This may be due to the number of established measures in mental health and well-being research compared to performance outcome measures which are less applicable to general clinical and non-clinical populations. The findings highlight the need for researchers and practitioners where possible to develop a more consistent approach to assessing athletic performance, mental health and well-being, and PF across different sporting contexts. Although the review did not seek to explore the effectiveness of interventions for changing flexibility and rigidity constructs in athletes, several RCTs were included in this review which may indicate that there is scope for future reviews to explore this area.

The review sought to understand what sports have been included in studies investigating PF. The results showed no particular focus towards individual or team-based sports, as basketball, tennis, and football were each represented the most across the 17 studies and a combination of individual and team sports were identified in most studies. However, five studies focused on just a single sport which in some cases allowed for more specific explorations around the psychological processes important to a particular sport (e.g., Lundgren et al., 2020 developed the VAMS, a PF measure specific to performance in ice hockey). This approach may be most beneficial for researchers hoping to develop new measures of PF for elite athletes as it allows for consideration of the psychological processes

that are important for influencing behaviour change, enhancing well-being and contributing to successful performance in the context of a specific sport.

Study strengths and limitations

There are several strengths and limitations to be considered regarding the studies captured within this review. The outcome of the quality assessment demonstrated a limited amount of quality research in relation to the studies included in this review. Eleven studies were identified as weak, with six of the seventeen studies reaching a moderate quality rating. Some studies reported the use of random assignment to groups, yet no studies selected participants at random from the population. Convenience sampling was evident across multiple studies, which may have led to biased results and under-or-over representation of the population. Most studies used small sample sizes ($n<100$: $n=10$; $n>100$: $n=7$) which is likely to have impacted the type of statistical analyses carried out and the reliability of results. Regarding study reporting, many authors were unclear about whether they controlled for potential confounders and it was often unclear whether assessors had any knowledge of the participants' intervention status or if participants had any awareness of the research question. This increases the potential of bias in the studies. Not all results of analyses conducted were published in the studies, additional results were sought from authors (e.g., correlational analyses received from Glass et al., 2019) and these were added to the review's findings. Generally, sport participation (e.g., years of participation) was inadequately defined in most cases making it impractical to assess the relationship between sport participation and PF, and how this impacted mental health and well-being outcomes. It is recommended that authors follow good practice standards (e.g., Consolidated Standards of Reporting Trials [CONSORT] guidelines; Schulz et al., 2010; Template for Intervention Description and Replication [TIDieR] guidelines; Hoffmann et al., 2014) to improve clarity and consistency of writing in future studies.

An important strength is that PF was the primary outcome measure within many of the studies identified, however six of the studies failed to report any relationship between PF and the other outcome measures included (Chang et al., 2017; Dehghani et al., 2018; Gross et al., 2018; Lundgren et al., 2020; Macdoughall et al., 2019; Röthlin et al., 2020). Another strength is the diversity of participants captured in this review. The findings represent cultural values and attitudes towards sport from a variety of different backgrounds as studies took place in nine different countries with seven different languages spoken by participants. Females and para-athletes are often underrepresented in sport literature (Renton et al., 2021) however both are included in this review albeit to a lesser degree. Further research with these populations will help widen the applicability of findings across athlete populations.

Limitations and strengths of the review

The following limitations should be considered along with the findings of this review. The level of heterogeneity of the study designs and outcome measures, and risk of bias prevented meta-analysis and therefore it was not possible to draw reliable conclusions from the data. The strict exclusion criteria of this review may have caused an omission of relevant papers as qualitative studies, case studies, unpublished studies and reviews were not included. These papers could have provided additional perspectives e.g., qualitative studies and case studies may have offered richer and deeper insights into how PF is measured in athlete populations. Excluding theses/dissertations may have increased the risk of publication bias and excluding languages other than English (LOE) may have caused a language bias and led to erroneous conclusions.

As the main objective of this review was to explore the associations of flexibility and rigidity constructs, many of the studies which were relevant and included in this review were observational and cross-sectional in design. Although the quality assessment tool used allowed for a breadth of research designs, it perhaps lacked depth in relation to probing

specific types of design. A tool specific for cross-sectional study designs e.g., AXIS (Downes et al., 2016) may have offered a more precise appraisal.

Another limitation of the review relates to the exclusion criteria. Articles published before 2011 were excluded on basis of this coinciding with the publication of the AAQ-II (Bond et al., 2011), which is the most widely used measure of flexibility and rigidity constructs (Tyndall et al., 2019). This may have led to the omission of papers relevant to this review.

Despite these limitations, there are many strengths to consider. This is the first review to investigate PF measures in athletes. The search strategy for identifying relevant studies was comprehensive and ensured that the appropriate databases were searched using appropriate search strategy notations. A second reviewer was involved for screening and assessing the studies which ensured that the inclusion and exclusion criteria were used consistently and reduced the likelihood of random errors.

Conclusion

This review that synthesised and compared studies measuring PF in athletes, showed several significant associations between PF and mental health and well-being outcomes (notably depression, anxiety, life satisfaction and subjective well-being) in addition to sport and performance outcomes (e.g., athletic performance, athlete burnout). A key finding of the review was the association noted between flexibility/rigidity constructs and self-reported levels of common mental disorders. Although the causal links between these constructs need to be explored further, this raises the possibility that interventions (such as ACT) that address flexibility/rigidity constructs may be helpful for athletes experiencing depression and anxiety. However, the methodological quality across the studies was generally poor, and these clinical implications should be considered with caution.

The findings also highlight that more research is needed with adult populations however this may be difficult given that athletes' careers often tend to peak by their mid-20s (Longo et al. 2016). Additionally, researchers should employ established outcome measures where possible and seek consensus with their fellow clinicians to ensure that firm conclusions can be drawn between studies in future reviews.

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Chapter 2

The impact of athletic identity, psychological flexibility and value consistent living on the mental health and well-being of retired elite rugby players.

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Abstract

It is widely accepted that retirement from sport is an important period of change for athletes. Existing studies have tended to focus on investigating the mental health and well-being of current players, whilst there has been limited research exploring the impact of retirement on elite rugby players. The present study aimed to examine how athletic identity, psychological flexibility and valued living impact on the subjective well-being and psychological distress of retired elite rugby players. A cross sectional, between-subject, factorial design was adopted. Seventy-seven retired elite rugby players were recruited to the *Tackling Next Steps* project and completed an online survey between March 2021 and December 2021. Suboptimal levels of subjective well-being were reported by 64% of retired players and 43% reported clinical levels of distress. Valued living and psychological flexibility were shown to significantly predict subjective well-being. The results show that promotion of psychological flexibility and valued living may have a positive impact on subjective well-being in retired rugby players.

Keywords: athletic identity, mental health, psychological flexibility, retired rugby players, well-being

Introduction

Retirement from sport is recognised as a profound experience for athletes. Often associated with feelings of intense loss leading to significant changes in identity (Harvey, 1996), the deep finality reportedly experienced by sports people at the end of their careers has, for some, been compared to losing a loved one (Lawlor, 2020, p. 89). Given this analogy, it is perhaps no surprise that this considerable life transition may significantly affect an athlete's well-being (Esopenko et al., 2020), and it follows that psychologists might seek to understand how to best support retiring athletes. Typically, studies have concentrated on sports including football (Barth et al., 2021; Gouttebarge, Aoki, et al., 2016; Sanders & Stevinson, 2017), American football (National Football League; NFL; Hart et al., 2013; Schwenk et al., 2007), as well as Australian rules football (Demetriou et al., 2018; Fortunato & Marchant, 1999). There have been significantly fewer studies investigating former elite rugby players (Brown et al., 2017; Cunningham et al., 2018; Gouttebarge, Kerkhoffs, et al., 2016; Hind et al., 2020; McKenna & Thomas, 2007). According to *World Rugby Year in Review 2019*, an estimated 9.6 million people played rugby in 124 countries worldwide, of these, 3.5 million are registered players (World Rugby, 2020). Currently in the UK, there are approximately 2,000 full-time professional rugby players (Input Youth, 2022). With a global movement in rugby to prioritise player welfare at all levels, there is a demand to grow the well-being evidence base in this area (World Rugby, 2018).

The discourse surrounding athletic retirement has seen a radical transformation over the last five decades, from being viewed as "a social death" in the 1980s to an expected normative transition in current times (Rosenberg, 1984; Stambulova et al., 2021). Primarily focused on negative outcomes (e.g., career ending injuries, maladaptive coping strategies and long-term effects on mental health; Blinde & Stratta, 1992; Ogilvie & Howe, 1982), these ideas provided initial frameworks to conceptualise the process of athletic retirement but

failed to gain a holistic understanding of life beyond the sporting context (Wylleman et al., 2004; Wylleman et al., 1999). More recently, there has been a move by theorists such as Stambulova (2012), Ryba et al. (2016), and Wylleman (2019) towards re-conceptualizing retirement through a transitional framework by viewing it as a process that occurs along an athlete's career journey rather than an end point or a separate entity (Stambulova et al., 2021). From this perspective, Stambulova et al. (2021) conceptualise the athlete as a whole person, whose psychological well-being is viewed as a fundamental element of their achievements in sport and their life beyond sport, extending into retirement.

Psychological distress

Reasons for athletes retiring from sport can vary from the expected to the unexpected (Papaioannou & Hackfort, 2014). Common factors include age, physical injury, voluntary termination and deselection (Lavallee, Grove, et al., 1997). They can often affect the way athletes manage the significant changes brought about by this unique life transition. A meta-analysis conducted by Gouttebarge et al. (2019) showed that prevalence rates of former elite level players of cricket, American football, football, rugby and ice hockey, ranged from 16% for distress to 26% for anxiety and depression. Similarly, a study carried out with former professional rugby union players showed higher levels of depression and anxiety in retired participants in comparison to the general public (Gouttebarge, Kerkhoffs, et al., 2016). Gouttebarge et al. (2016) reported prevalence rates of 28% for psychological distress for former rugby players measured by the 12-item General Health Questionnaire (GHQ-12). Despite high prevalence rates of mental health difficulties in rugby populations, Kola-Palmer et al. (2020) suggest that many do not seek help.

Other factors associated with the experience of retirement include demographic characteristics including type of sport participation and athletic identity (self-identity in sport; (Park et al., 2013). Although research has been inconclusive in this area and requires further

investigation, studies have identified athletic identity to be a significant predictor of the quality of athletes' transitions out of sport (Grove et al., 1997; Lally, 2007; Park et al., 2013).

Athletic identity

Athletic identity is well researched in retired athlete populations (Grove et al., 1997; Lavallee, Gordon, et al., 1997; Martin et al., 2014). It is defined as "the degree of strength and exclusivity to which a person identifies with the athlete role or the degree to which one devotes special attention to sport relative to other engagements or activities in life" (Edison et al., 2021, p. 2). High levels of athletic identity or athletic identity foreclosure (i.e., obligation to the athlete position without consideration for alternative occupation or ideology; Brewer & Petitpas, 2017), have consistently been shown as key negative predictors of adjustment in retired athlete populations in both qualitative and quantitative research (Cosh et al., 2015; Haslam et al., 2021; Park et al., 2013). Yet, to date, no study has investigated the role of athletic identity in relation to the experience of retired elite rugby players. An individual with strong athletic identity risks placing all of their self-worth in their sporting successes and is unable to acknowledge value in other areas of their life (Brewer et al., 1993). Kerr and Dacyshyn (2000) suggest that sports people may experience identity dysphoria for five years or more after retirement and high levels of athletic identity are associated with high levels of distress, particularly during end of career (Bethell, 2019; Brewer & Petitpas, 2017). Further, Giannone et al. (2017) showed athletic identity significantly predicted anxiety in university athletes after retirement from sport.

Impact of physical health complications associated with sport

Another focus of athletic retirement research has been on the adverse long-term health consequences of participating in impact sports like rugby, particularly at elite level due to the physical demands and high injury rates experienced by players (Davies et al., 2017). It is well known that these athletes often develop issues relating to their physical health e.g., chronic

injuries and the likelihood of developing neurodegenerative diseases increases due to repeated head injuries and sports-related concussions (SRCs; Esopenko et al., 2020; Hume et al., 2017; McMillan et al., 2017). Some sport researchers (Esopenko et al., 2020; Hind et al., 2020) suggest that retired elite rugby players may be up to ten times more at risk of experiencing long-term injuries such as chronic pain or osteoarthritis compared to athletes from non-contact sports. Due to the likelihood of people with a long-term physical condition experiencing higher rates of psychological distress (Moussavi et al., 2007), investigating the well-being of former elite rugby players and how they cope should be of high priority to researchers. Given these findings and the limited studies that have focused their investigations on the effects of retirement on subjective well-being with elite rugby players and retired athlete populations in general (Bethell, 2019; Lewandowska et al., 2017; Stephan & Bilard, 2003), it is important that this study examines the association of athletic identity and subjective well-being in retired rugby players.

Subjective well-being

Subjective well-being, is understood to be "one's appraisal of one's own happiness and life satisfaction" (VandenBos, 2015, p. 1043). Increased subjective well-being is synonymous with the notion of *flourishing* whilst decreased subjective well-being is synonymous with *languishing*. (Keyes, 2002). Levels that are less than flourishing and more than languishing are understood to be moderate mental health (Keyes, 2002). Decreased subjective well-being has consistently been linked to poor health outcomes and reduced psychosocial functioning (see Keyes, 2014 for a review). However, these states can exist in both the presence and absence of mental ill-health (Keyes 2002) as those in a state of languishing can report a similar reduction of psychosocial functioning compared with adults with mental ill-health who report moderate or flourishing mental health (Keyes 2005). Thus, it is important to examine the association between psychological distress and subjective well-

being to understand more about how to intervene and prevent mental ill-health in retired rugby players while also promoting flourishing in those without mental ill-health but who lack of positive mental health (Keyes 2007).

In a longitudinal study of retired athletes carried out by Stephan (2003), it was reported that individuals' subjective well-being increased over time. The initial period of transition post retirement (first two months) was associated with feelings of loss and void, and the increase in well-being (between 8-12 months) was accounted for by an increase in the athlete's sense of personal control, sense of job accomplishment and competence (Stephan, 2003). Currently there are no studies which have investigated subjective well-being with retired rugby players. Given the number of injuries and high retirement rates in professional rugby, there has been an increased focus on player safety and well-being (Fitzpatrick et al., 2018; Hind et al., 2022; Williams et al., 2013). The current study aims to advance on the limited results of previous studies with former elite rugby players by investigating the outcomes of both subjective well-being and psychological distress.

Psychological Flexibility

Under the ACT model, psychological flexibility[1] is defined as "…the ability to feel and think with openness, to attend voluntarily to your experience of the present moment, and to move your life in directions that are important to you, building habits that allow you to live in accordance with your values and aspirations" (Hayes, 2020, p. 5). It is associated with a reduction in anxiety, depression (Twohig & Levin, 2017), stress (Cristina et al., 2018), and chronic pain (Vowles & McCracken, 2008). Limited studies have explored the association of

[1] Psychological flexibility was originally known as experiential avoidance (EA) and was introduced as a central feature of the Acceptance and Commitment Therapy (ACT) model (Hayes et al., 1999). The Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004) was subsequently developed to measure EA. Although these terms are largely considered to be interchangeable, PF is now widely used to describe this model as it is considered to be a more accurate and overarching term (Hayes et al., 2006) particularly in performance and sport literature. Whereas it is more commonly referred to as psychological inflexiblity (PI) or EA with regard to psychopathology. For the purpose of this study, it will be consistently called PF.

PF with subjective well-being (using MHC-SF) however positive correlations have been shown (Khazaei et al., 2022). Additionally, PF has been shown to be a significant predictor of flourishing (Bohlmeijer et al., 2015) and Fledderus et al. (2010) demonstrated the effectiveness of an ACT intervention in promoting subjective well-being by enhancing PF. Research has demonstrated moderate correlations between PF and valued living (Smout et al., 2014), quality of life (Hayes et al., 2004), life satisfaction (Marshall & Brockman, 2016), and higher subjective happiness (Renshaw, 2018). Importantly, PF has yet to be investigated with a retired elite rugby population. Further, associations have been demonstrated with value-consistent living, or behaving in a way that is consistent with one's values and greater psychological well-being (Ciarrochi et al., 2011) and a reduction in anxiety and depression (Michelson et al., 2011) which may be difficult for retired athletes given their values could be intrinsically linked to their experiences as a sportsperson.

Athlete retirement interventions

A number of career transition programmes have been established to support elite athletes manage with adjusting to life beyond sport. These interventions typically provide lifestyle support, skills training, education and counselling opportunities (e.g., Athlete Futures collectively developed by UK Sport, the English Institute of Sport, the British Olympic Association and the British Paralympic Association; Hattersley et al., 2019; Lenton et al., 2020; UK Sport, 2022). Emerging evidence suggests that focusing on improving PF could enhance sporting performance among athletes (Josefsson et al., 2019; Lundgren et al., 2020; White et al., 2021) and it has been linked to a reduction in psychological distress and an increase in subjective well-being in studies with clinical and non-clinical samples (Bohlmeijer et al., 2015; Googhari et al., 2022; Hayes et al., 2006; Stenhoff, 2019).

Aims

In the present study, the aim was to examine how athletic identity, psychological flexibility and valued living impact psychological distress and subjective well-being of retired elite rugby players.

Hypotheses / objectives:

1. It is predicted that flourishing retired players would have higher levels of psychological flexibility and higher levels of valued living compared to those who were in the moderately mentally healthy group and the languishing group.
2. It is predicted that those who score above the threshold for psychological distress would have stronger athletic identity and lower levels of psychological flexibility compared to retired players who scored below the threshold for clinical levels of distress.
3. It is predicted that psychological flexibility and valued living would both predict variance in subjective well-being after levels of psychological distress and athletic identity were controlled for.

Method

Design

To answer the research aims and hypotheses, a cross sectional, between-subject, factorial design was adopted. The between-groups factors were category of subjective well-being (Flourishing vs. Languishing vs. Moderately mentally healthy) and category of psychological distress (Caseness for psychological distress vs. No caseness for psychological distress). Three groups were chosen for category of subjective well-being as this is the recommended scoring system used by the developers of the Mental Health Continuum Short Form (MHC-SF) measure due to the three levels of positive mental health that are inherent to the measure (Lupano Perugini et al., 2017).

Participants

Information about the study was shared with organisations such as Rugby Players Ireland (RPI), personal contacts, and anyone was able to access the web link for the study via the information disseminated through social media such as Twitter, Instagram, and Reddit. Participants were recruited through convenience sampling from March 2021 to December 2021. It is unclear to what extent snowball sampling may have been a factor in recruitment as participants were not asked to divulge how they heard about the study. Eligibility to take part in the study required that former players were aged 18 years and over; retired from playing rugby at an elite level within the last 25 years, and to be able to speak, read, and/or understand English.

Sample size and power

G*Power 3.1 was used to conduct a priori power analysis (Faul et al., 2009). At least 68 participants were needed to achieve .80 power with a medium effect size ($f^2 = .15$) and a significance criterion of α=.05 for a hierarchical regression analysis with eight predictor variables. The study was powered on the basis of the most sophisticated form of analysis as is the convention with other studies of this type (Bethell, 2019).

Measures

Demographic and rugby participation variables

Information on demographics and rugby participation (e.g., type of rugby, highest playing level, playing level at retirement, reason for retirement) was gathered from a self-report questionnaire that was specifically developed for this study (see Appendix B).

Subjective well-being

The Mental Health Continuum Short Form (MHC-SF; Keyes, 2002) is a 14-item instrument measuring mental health, which focuses on emotional, psychological, and social well-being. Those experiencing increased amounts of emotional, psychological, and social

well-being are considered to be flourishing. Those with reduced amounts of emotional, psychological, and social well-being are considered to be languishing. The scale has shown strong internal reliability (α=.89; Lamers et al., 2011). Internal consistency in the present study was excellent (α = .94).

Psychological distress

The General Health Questionnaire (Goldberg & Williams, 1988) is a 12-item instrument measuring the severity of psychological distress over several weeks using a 4-point measure from 0-3. The 0 to 12 scoring method, where scores are converted into binary scores (i.e., 0 or 1 = 0, and 2 or 3 = 1), was used to establish "caseness" for psychological distress, scores of three or more indicated clinically important levels of psychological distress (Goldberg et al., 1997). The Likert method (where items are scored 0-1-2-3; range 0-36) was used in correlational and regression analyses. The measure has shown excellent internal consistency (α = .90; Lundin et al., 2016). Internal consistency in the present study was also considered excellent (α = .91).

Psychological flexibility

The Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011) is a 7-item self-report scale designed to measure psychological flexibility. Lower scores indicate greater psychological flexibility (range 7-49). The measure has shown good internal consistency (α=.84), test-retest reliability (α=.79) and construct validity (Bond et al., 2011). Internal consistency was excellent in the present study (α = .93).

Valued living

The Valuing Questionnaire (Smout et al., 2014) is a 10-item 2-factor model (Progress and Obstruction) self-report scale designed to measure the consistency with which an individual has been living with their self-determined values. The measure has demonstrated satisfactory content validity, internal consistency, and construct validity. Internal consistency

was acceptable and good for both subscales (Progress = .81; Obstruction = .79; Smout et al., 2014). For the current study, internal consistency was acceptable for Progress subscale (α = .79) and good for Obstruction subscale (α = .86).

Athletic identity

The Athletic Identity Measurement Scale (Brewer & Cornelius, 2001) is a 10-item scale measuring athletic identity, which is the degree to which an individual identifies with the athlete role. It is scored by summing responses on 7-point Likert-type scales and has shown strong internal consistency in previous research (α = .81; Brewer, 1993). Internal consistency was acceptable in the current study (α = .78).

Procedure

The current study received approval from the University of Liverpool Health and Life Sciences Research Ethics Committee (reference 8333; Appendix H). Data were collected online using Qualtrics. The study questionnaire was promoted via social media and participants were provided with a hyperlink which directed them to the study website (tacklingnextsteps.org). Here, where they were presented with the information sheet (Appendix I) and consent form (Appendix J) before they took part in the online questionnaire. Once the survey was completed, contact details of several support services were provided to participants and they were able to share their email address to be contacted with the results of the study.

Plan of analysis

IBM SPSS Statistics (Version 27) predictive analytics software was used to conduct statistical analyses. Incomplete data were discarded and only completely observed cases of subscales and total scores were retained for analysis and calculated for each measure. Normality and homogeneity of variance tests were conducted on each measure. Visual inspection of box plots, histograms, and Q-Q plots indicated that data were approximately

normally distributed. However, a formal normality test using Kolmogorov Smirnoff test suggested otherwise. When used with samples larger than 30, the Kolmogorov Smirnoff test is considered overly conservative and "the violation of the normality assumption should not cause major problems" (Ghasemi & Zahediasl, 2012, p. 486), implying parametric procedures may be applied in cases where data is not normally distributed (Bethell, 2019; Ghasemi & Zahediasl, 2012). For samples less than 30, a z-test was applied and normality was assessed using skewness and kurtosis of the distribution (Kim, 2013). Absolute z-scores for these samples were less than 1.96, which corresponds with an alpha level .05, concluding that the distribution of the samples were normal (Kim, 2013). Levene's test indicated equal variances between groups. Descriptive statistics were calculated and independent samples t-test and ANOVA were conducted to examine between group comparisons. A hierarchical linear regression analysis was conducted to explore the unique contributions of psychological flexibility and valued living in the explanation of subjective well-being, while age, gender, time since retirement, distress, and athletic identity were controlled for.

Results

Demographic Characteristics

Participant characteristics are presented in Table 1 and rugby-related characteristics are presented in Table 2. One hundred and twenty-seven retired elite rugby players were recruited. Fifty respondents failed to complete all the measures and their data were excluded from analysis. The total study sample comprised of 77 former elite rugby players (63 rugby football union; RFU; 18 rugby football league; RFL), and included 64 males and 13 females. Participants predominantly identified as White British (n = 55; 71%) aged between 20 and 56 years (M = 37.05, SD = 7.29) and years post-retirement ranged from 0 to 25 years (M =5.32, SD = 5.36). Voluntary retirement was the primary reason given for retirement in 33 (43%) cases, with 30 (39%) former players stating that they were forced to retire. Twenty-six

participants (34%) reported they had previously received mental health support. Forty-four (57%) respondents said that they were Christian with no representation from the other five major world religions of Judaism, Islam, Hinduism or Buddhism in the sample.

Table 1

Sociodemographic Characteristics of Participants

Characteristics	Full sample (N = 77)	
	n	*%*
Gender		
Male	64	83.1
Female	13	16.9
Ethnicity		
English/Welsh/Scottish/Northern Irish/British	55	71.4
Irish	8	10.4
Any other white background	9	11.7
Any other mixed/multiple ethnic background	4	5.2
Any other ethnic group*	2	2.6
Sexuality		
Heterosexual or Straight	65	84.4
Gay or Lesbian	9	11.7
Bisexual	3	3.9
Relationship status		
Single	12	15.6
Married	47	61.0
De facto/living together	1	1.3
Partnered	2	2.6
Separated	1	1.3
Divorced	1	1.3
Widowed or surviving partner	4	5.2
Other*	9	11.7
Do you have children?		
Yes	47	61.0
No	30	39.0
Religion		
No religion	32	41.6
Christian	44	57.1
Prefer not to say	1	1.3
Education		
No qualification	1	1.3
1-4 GCSEs or equivalent	2	2.6
5+ GCSEs or equivalent	3	3.9
2+ A-Levels or equivalent	15	19.5
Degree level or above	47	61.0
Other qualifications	8	10.4
Prefer not to say	1	1.3
Previous mental health support?		
Yes	26	33.8
No	49	63.6
Prefer not to say	2	2.6
Currently employed?		
Yes	75	97.4
No	2	2.6
Current employment related to rugby?		
Yes	16	20.8
No	61	79.2

Table 2

Rugby Characteristics of Participants

Characteristics	Full sample (*N* = 77)	
	n	*%*
Type of rugby played		
Rugby Union	63	81.8
Rugby League	14	18.2
Reason for retirement		
Voluntary retirement	33	42.9
Forced retirement (e.g., Injury)	30	39.0
Released by team/club	7	9.1
Prefer not to say	2	2.6
Other*	5	6.5
Length of retirement		
6 months ago, or less	12	15.6
12 months ago	4	5.2
1-3 years ago	20	26.0
3-5 years ago	11	14.3
5+ years ago	30	39.0
International career at senior level?		
Yes	38	49.4
No	37	48.1
Prefer not to say	2	2.6
Highest level played?		
International	28	36.4
Level 1 Premiership Rugby/RFL Super League	38	49.4
Level 2 RFU Championship/RFL Championship	5	6.5
Level 3-5 National league/RFL women's championship	3	3.9
Men's Regional league/Women's National Challenge	1	1.3
Other	2	2.6
Level at retirement		
International	3	3.9
Level 1 Premiership Rugby/RFL Super League	10	13.0
Level 2 RFU Championship/RFL Championship	33	42.9
Level 3-5 National league/RFL women's championship	18	23.4
Men's Regional league/Women's National Challenge	7	9.1
Missing	1	1.3
Other	5	6.5

Note. *Responses for other: job opportunity, chose work over sport, mixture of voluntary and contract not being renewed, geographically displaced.

Descriptive statistics

Descriptive statistics are presented in Tables 3 and 4. Thirty-three of participants (43%) reported clinically important levels of psychological distress, indicated by a total GHQ-12 score of three or above (Jackson, 2007). Twenty-eight (36%) were identified as flourishing, 38 (49%) as moderately mentally healthy and 11 (14%) as languishing.

Table 3

Questionnaire cut-off scores

Measure	Full sample		Gender			
			Male		Female	
	n	*%*	*n*	*%*	*n*	*%*
GHQ-12 score of three or more	33	42.9	27	42.2	6	46.2
MHC-SF Flourishing	28	36.4	25	39.1	3	23.1
MHC-SF Moderate mental health	38	49.4	30	46.9	8	61.5
MHC-SF Languishing	11	14.3	9	14.1	2	15.4

Note. $N = 77$ (male sample, $n = 65$ and female sample, $n = 13$).

Table 4

Means, Standard Deviations, and One-Way Analyses of Variance in groups of subjective well-being

Measure	*F*(2, 74-76)	*p*	η^2	Flourishing		Moderately mentally well		Languishing	
				M	*SD*	*M*	*SD*	*M*	*SD*
AAQ-II total score	19.96	<.001**	.35	14.96	7.27	22.26	7.62	31.18	7.37
AIMS total score	5.91	.004*	.14	29.96	7.46	34.45	6.62	37.91	7.78
VQ Progress	21.67	<.001**	.37	26.32	4.30	23.50	3.90	16.27	5.46
VQ Obstruction	16.07	<.001**	.30	11.71	7.76	16.61	6.57	25.27	4.13

Note. AAQ-II: Acceptance and Action Questionnaire- II; AIMS: Athletic Identity Measurement Scale; VQ: Valuing Questionnaire. *significant differences between groups at the $p < .05$ level, ** significant differences between groups at the $p < .001$ level.

Comparison of well-being groups

An ANOVA was used to examine the differences in athletic identity, psychological flexibility, and valued living scores according to categories of well-being. The independent variable represented the different categories of subjective well-being with three groups being represented: 1) Flourishing; 2) Moderately mentally healthy; and 3) Languishing. Psychological flexibility, athletic identity, and value consistent living were used as the dependent variables. See Table 4 for the means and standard deviations for the three groups.

Comparison of well-being groups for athletic identity scores

The results of the ANOVA showed that there was a statistically significant difference in athletic identity between the different categories of well-being, $F(2, 74) = 5.91$, $p = .004$. Tukey's HSD test was used to compare all pairs of groups. Tukey's test controls for Type 1 error rate but is considered to be conservative, i.e., lacks statistical power (Field, 2015). It is not necessary to correct for multiple comparisons when using Tukey's HSD as it was developed specifically to account for multiple comparison and maintains experiment-wise alpha at the specified level of .05 (Maxwell et al., 2017, p. 210).

The mean value of athletic identity score of those deemed moderately mentally healthy ($M = 34.45$, $SD = 6.62$) was statistically significantly higher than for those who were flourishing ($M = 29.96$, SD = 7.46, $p = .035$, 95% C.I. = .26, 8.71). The mean value of athletic identity score was statistically higher for those who were languishing ($M = 37.91$, $SD = 7.78$) than those who were flourishing ($M = 29.96$, $SD = 7.46$, $p = .007$, 95% C.I. = 1.90, 13.99). There was no statistically significant difference in mean athletic identity scores between those who were languishing and those who were moderately mentally healthy ($p = .334$). Athletic identity was statistically significantly higher in retired athletes who were moderately mentally healthy and languishing compared to the flourishing group.

Comparison of well-being groups for psychological flexibility scores

The analysis showed that there was a statistically significant difference in psychological flexibility between the different categories of well-being, $F(2, 74) = 19.96$, $p < .001$. Tukey's HSD test for multiple comparisons indicated that the mean score of psychological flexibility of those who were flourishing ($M = 14.96$, $SD = 7.27$) was statistically significantly higher than those who were moderately mentally healthy ($M = 22.26$, $SD = 7.62$, $p < .001$, 95% C.I. = 2.86, 11.74). The mean value of psychological flexibility was statistically significantly higher for those who were moderately mentally

healthy (*M* = 22.26, *SD* = 7.62) than those who were languishing (*M* = 31.18, *SD* = 7.37, *p* = .002, 95% C.I. = 2.81, 15.03). The mean value of psychological flexibility was statistically significantly higher for those who were flourishing (*M* = 14.96, *SD* = 7.27) than those who were languishing (*M* = 31.18, *SD* = 7.37, *p* = <.001, 95% C.I. = 9.87, 22.56). Psychological flexibility was statistically significantly higher in retired athletes who were flourishing compared to both the moderate mentally healthy group and the languishing group.

Comparison of well-being groups for valued living scores (progress and obstruction)

The results of the ANOVA showed that there was a statistically significant difference in valued living score for the construct of progress between the different categories of well-being, *F*(2, 74) = 21.67, *p* <.001. Tukey's HSD test indicated that the mean value of valued living scores for the construct of progress of those who were flourishing (*M* = 26.32, *SD* = 4.30) was statistically significantly higher than for those who were moderately mentally healthy (*M* = 23.50, *SD* = 3.90, *p* = .027, 95% C.I. = .27, 5.38). The mean value of valued living scores for the construct of progress was statistically significantly higher for those who were moderately mentally healthy (*M* = 23.50, *SD* = 3.90) than those who were languishing (*M* = 16.27, *SD* = 5.46, *p* <.001, 95% C.I. = 3.71, 10.74). The mean value of valued living scores for the construct of progress was statistically significantly higher for those who were flourishing (*M* = 26.32, *SD* = 4.30) than those who were languishing (*M* = 16.27, *SD* = 5.46, *p* <.001, 95% C.I. = 6.40, 13.70. Progress of valued living was statistically significantly higher in retired athletes who were flourishing compared to both the moderate mentally healthy group and the languishing group.

The results of the ANOVA showed that there was a statistically significant difference in valued living scores for construct of obstruction, *F*(2, 74) = 16.07, *p* = <.001. Tukey's HSD test was used to compare all pairs of groups. The mean value of valued living scores for the construct of obstruction of those deemed moderately mentally healthy (*M* = 16.61, *SD* =

6.57) was statistically significantly higher than for those who were flourishing (*M* = 11.71, *SD* = 7.76, *p* = .013, 95% C.I. = .86, 8.92). The mean value of valued living scores for the construct of obstruction was statistically significantly higher for those who were languishing (*M* = 25.27, *SD* = 4.13) than those who were moderately mentally healthy (*M* = 16.61, *SD* = 6.57, *p* = .001, 95% C.I. = 3.12, 14.21). The mean value of valued living scores for the construct of obstruction was statistically significantly higher for those who were languishing (*M* = 25.27, *SD* = 4.13) than those who were flourishing (*M* = 11.71, *SD* = 7.76, *p* <.001, 95% C.I. = 7.80, 19.32). Obstruction of valued living was statistically significantly higher in retired athletes who were languishing compared to both the moderate mentally healthy group and the flourishing group.

Comparison of psychological distress groups

An independent samples t-test was conducted to examine the differences in athletic identity, psychological flexibility and valued living scores according to categories of psychological distress. The independent variable represented the different categories of psychological distress with two groups being represented: 1) Caseness; and 2) No caseness. As detailed in the Methods section, caseness was established using the GHQ scoring method where a total score of three or more specified clinically important levels of psychological distress (see Goldberg et al., 1997). See Table 5 for the means and standard deviations for each group.

Table 5

Means, Standard Deviations, and Comparison of groups of psychological distress

	Caseness		No Caseness		*t*(75)	*p*	Cohen's *d*
Measure	*M*	*SD*	*M*	*SD*			
AAQ-II total score	25.64	8.39	17.32	8.04	4.41	<.001**	8.19
AIMS total score	35.91	6.43	31.36	7.79	2.73	.008*	7.24
VQ Progress	21.42	4.89	25.05	5.17	3.11	.003*	5.05
VQ Obstruction	19.85	7.27	13.23	7.39	3.92	<.001**	7.34

Note. Caseness group, $n = 33$ and no caseness group $n = 44$, AAQ-II: Acceptance and Action Questionnaire- II; AIMS: Athletic Identity Measurement Scale; VQ: Valuing Questionnaire. *significant differences between groups at the $p < .05$ level, as shown by Independent samples *t*-test, ** significant differences between groups at the $p < .001$ level, as shown by Independent samples *t*-test.

Comparison of psychological distress groups for athletic identity scores

Participants who met caseness for psychological distress ($M = 35.91$, $SD = 6.43$) demonstrated statistically significantly higher levels of athletic identity compared to participants who did not meet caseness ($M = 31.36$, $SD = 7.79$, $t(75) = 2.73$, $p = .008$). Athletic identity was statistically significantly higher in retired athletes who had clinically significant levels of distress compared to those who did not.

Comparison of psychological distress groups for psychological flexibility scores

The 33 participants who met caseness for psychological distress ($M = 25.64$, $SD = 8.39$) demonstrated statistically significantly lower levels of psychological flexibility compared to the 44 participants who did not meet caseness ($M = 17.32$, $SD = 8.04$, $t(75) = 4.41$, $p < .001$). Psychological flexibility was statistically significantly higher in retired athletes who had clinically significant levels of distress compared to those who did not.

Comparison of psychological distress groups for valued living scores (progress and obstruction)

Participants who did not meet caseness for psychological distress ($M = 25.05$, $SD = 5.17$) demonstrated statistically significantly higher levels of valued living scores for the construct of progress compared to participants who did meet caseness ($M = 21.42$, $SD =$

4.89, $t(75) = 3.11$, $p = .003$). Participants who met caseness for psychological distress (M = 19.85, SD = 7.27) demonstrated statistically significantly higher levels of valued living scores for the construct of obstruction compared to participants who did not meet caseness (M = 13.23, SD = 7.39, $t(75) = 3.92$, $p < .001$). Progress for valued living was statistically significantly higher in retired athletes who did not have clinically significant levels of distress compared to those who did, and Obstruction for valued living was statistically significantly higher in retired athletes who had clinically significant levels of distress compared to those who did not.

Correlational analysis

Table 6 reports on the internal consistency (Cronbach's Alpha) of the assessment instruments used and the correlations that existed between them. The results revealed that all the assessment instruments had good or better internal consistency (>.70). There was a significant negative correlation between subjective well-being and psychological distress, r_s = -.53, $n = 77$, $p < .01$, subjective well-being and obstruction of valued living, r_s = -.59, $n = 77$, $p < .01$, and athletic identity and psychological flexibility, r_s = -.35, $n = 77$, $p < .01$. Significant positive associations were shown between subjective well-being and psychological flexibility, $r_s = .62$, $n = 77$, $p < .01$, subjective well-being and progress of valued-living, r_s = .69, $n = 77$, $p < .01$, and between athletic identity and psychological distress, $r_s = .39$, $n = 77$, $p < .01$. All effect sizes were of moderate to large magnitude except for a significant positive correlation shown between athletic identity and obstruction of valued living, $r_s = .24$, $n = 77$, $p < .05$. No significant correlations were found between athletic identity and progress of valued living. Significant negative correlations were shown between subjective well-being and psychological distress, obstruction of valued living and between athletic identity and psychological flexibility. Significant positive correlations were shown between subjective

well-being and progress of valued living, as well as athletic identity and psychological distress.

Table 6

Means, standard deviations, Cronbach's Alpha and Pearson's correlation coefficients for all measures

Measure	*M*	*SD*	α	1	2	3	4	5	**6**
1. MHC-SF	42.04	14.43	.94	-					
2. GHQ-12	13.55	6.47	.91	-.53**	-				
3. AAQ-II	20.88	9.13	.93	-.62**	.63**	-			
4. AIMS	33.31	7.54	.78	-.29**	.39**	.35**	-		
5. VQ PROGRESS SCORE	23.49	5.33	.79	.69**	-.49**	-.49**	-.22	-	
6. VQ Obstruction score	16.06	8.00	.86	-.59**	.69**	.69**	.24*	-.51**	-

Note. MHC-SF: Mental Health Continuum-Short Form; GHQ-12: General Health Questionnaire 12; AAQ-II: Acceptance and Action Questionnaire-II; AIMS: Athletic Identity Measurement Scale; VQ: Valuing Questionnaire. * $p < .05$, ** $p < .01$.

Regression analyses

Tests indicated that multicollinearity was not a concern (Age, Tolerance = .70, VIF = 1.42; Gender, Tolerance = .91, VIF = 1.10; Length of retirement, Tolerance = .69, VIF = 1.45; Psychological distress Scores, Tolerance = .54, VIF = 1.67; Athletic identity, Tolerance = .82, VIF = 1.22; Psychological flexibility, Tolerance = .41, VIF = 2.44; Progress of valued living, Tolerance = .68, VIF = 1.47; Obstruction of valued living, Tolerance = .46, VIF = 2.17).

A four-step hierarchical multiple regression analysis was conducted. Results are presented in Table 7. Step one, included age, gender and length of retirement, and explained approximately 0% of the total variance of subjective well-being ($F(3, 73) = .17$, ns), indicating that neither age ($\beta = .18$, ns), gender ($\beta = -1.17$, ns), nor length of retirement ($\beta = -.79$, ns) played a significant role in predicting subjective well-being. At step two, psychological distress explained an additional 28% of the variance of subjective well-being

while controlling for age, gender and length of retirement ($F(1, 72) = 7.23$, $p < .001$). Psychological distress ($\beta = -1.10$, $p < .001$) was a significant negative unique predictor of subjective well-being. At step three, while controlling for age, gender, length of retirement and psychological distress, athletic identity explained approximately 0% of variance of subjective well-being ($F(1, 71) = 5.97$, ns). This finding indicted that athletic identity was significant in predicting variance in subjective well-being. At step four, psychological flexibility and progress of valued living predicted approximately 30% additional variance in subjective wellbeing when controlling for age, gender, playing status, psychological distress and athletic identity ($F(3, 68) = 13.01$, $p < .001$). Psychological flexibility ($\beta = .36$, $p < .01$) and valued living ($\beta = 1.25$, $p < .001$) were both significant positive unique predictor of subjective well-being. The overall regression model explained approximately 61% of the variance in subjective well-being. Psychological flexibility, and progress of valued living were significant predictors of subjective well-being.

Table 7

Hierarchical regression analysis of predictors of subjective well-being

Predictor	Cumulative			Individual predictors	
	R^2	ΔR^2	ΔF	β	p
Step 1	.01	.01	F (3, 73) = .17		
Age				.18	.518
Gender				-1.17	.801
Length of retirement				-.79	.570
Step 2	.29	.28	F (1, 72) = 7.23**		
Age				.05	.839
Gender				.70	.861
Length of retirement				-.70	.556
Psychological distress				-1.19	<.001**
Step 3	.30	.01	F (1, 71) = 5.97**		
Age				.05	.833
Gender				1.20	.764
Length of retirement				-.69	.563
Psychological distress				-1.10	<.001**
Athletic identity				-.20	.330
Step 4	.61	.31	F (3, 68) = 13.01**		
Age				.07	.625
Gender				1.25	.632
Length of retirement				-.13	.825
Psychological distress				-.22	.264
Athletic identity				-.09	.609
Psychological flexibility				.36	.006*
Progress of valued living				1.25	<.001**
Obstruction of valued living				-.25	.230

Note. Dependant variable = subjective well-being, measured by the MHC-SF; $N = 77$; *p <.01; **p <.001.

Post-hoc analysis

Twenty-six (34%) of the overall sample reported that they had received mental health support. As this was not an expected outcome, it provided an opportunity for explorative analysis to determine how this group, compared to other participants, performed on psychological distress, subjective well-being, psychological flexibility, athletic identity and

valued living. Those who received mental health support reported significantly higher levels of psychological distress, athletic identity, and obstruction to valued living compared to those who received no mental health support. In addition, those who received no mental health support reported significantly higher levels of subjective well-being and psychological flexibility. See Table 8 for details.

Table 8

Descriptive statistics

Scale	Previous mental health support?	*M*	*SD*	Welch's *t*-test	*p*
MHC-SF total score (0-70)	Yes	33.85	15.28	3.60	<.001**
	No	46.37	12.35		
GHQ-12 total score (0-36)	Yes	16.19	6.86	2.48	.017*
	No	12.24	5.99		
AAQ-II total score (7-49)	Yes	27.62	8.44	5.16	<.001**
	No	17.41	7.57		
AIMS total score (7-49)	Yes	35.73	7.23	2.15	.036*
	No	31.90	7.53		
VQ Progress (0-30)	Yes	21.65	6.20	2.01	.051
	No	24.45	4.70		
VQ Obstruction (0-30)	Yes	21.08	6.16	4.84	<.001**
	No	13.20	7.63		

Note. Previous mental health support sample, $n = 26$ and no previous mental health support sample, $n = 49$. MHC-SF: Mental Health Continuum-Short Form; GHQ-12: General Health Questionnaire-12; AAQ-II: Acceptance and Action Questionnaire- II; AIMS: Athletic Identity Measurement Scale; VQ: Valuing Questionnaire, * significant differences between groups at the $p < .05$ level, as shown by Welch's *t*-test, ** significant differences between groups at the $p < .001$ level, as shown by Welch's *t*-test as equal variance is not assumed.

An ANOVA was conducted to examine the differences in well-being scores according to categories of reason for retirement. The results of the ANOVA showed that there was a statistically significant difference in well-being scores, $F(4, 76) = 3.06$, $p = .022$. Tukey's HSD test was used to compare all pairs of groups. The mean value of well-being scores of those who retired voluntarily ($M = 47.42$, $SD = 11.69$) was statistically significantly higher than for those who were forced to retire e.g., due to injury ($M = 37.50$, $SD = 14.90$, $p = .042$,

95% C.I. = .25, 19.60). Rugby players who retired on a voluntary basis has statistically significantly higher levels of well-being compared to those who were forced to retire.

Discussion

There is increasing concern around the mental health and well-being of retired elite rugby players and the lack of effective evidenced-based support available to players during the period of transition out of sport. The study aimed to examine the impact of athletic identity and psychological flexibility on the subjective well-being and psychological distress of retired elite rugby players, and to examine which of these variables significantly predicted levels of subjective well-being in this population. This study presents preliminary findings that indicate a high prevalence of clinical levels of psychological distress and insufficient levels of subjective-wellbeing among retired elite rugby players.

Consistent with what was hypothesised, participants who had higher levels of subjective well-being showed increased levels of psychological flexibility and higher levels of valued living. These findings suggest that retired elite rugby players living with an optimal range of human functioning are more accepting and aware of their thoughts and emotions, and are more likely to act on long-term values rather than short-term impulses (Hülsheger et al., 2013). In line with the second hypothesis, those who met threshold for psychological distress showed increased levels of athletic identity and decreased levels of psychological flexibility compared to participants with lower levels of distress. The results support previous research in this area (for a review see Park et al., 2013) and suggests that those who experience clinical levels of distress maintain a strong identity as a rugby player during retirement and they are more avoidant of their difficulties compared to those experiencing less distress. The final hypothesis was also supported with psychological flexibility and valued living predicting variance in subjective well-being after controlling for factors such as age, gender, length of retirement, and levels of psychological distress and athletic identity.

These findings suggest that focusing on promoting both psychological flexibility and valued living is important for interventions that aim to improve subjective well-being while also reducing psychological distress. This finding suggests that interventions which focus solely on symptom reduction may be less effective for improving well-being.

This study is the first to explore subjective well-being with retired elite rugby players using MHC-SF. Forty-nine (64%) participants reported less than functional levels of subjective well-being. Suboptimal levels of subjective well-being (i.e., anything less than flourishing) have consistently been linked to poor health outcomes and reduced psychosocial functioning (for a review see Keyes, 2014). Thirty-three (43%) retired elite rugby players reported clinical levels of psychological distress. This is higher than previous findings (Gouttebarge et al., 2016) which used similar approaches to recruitment and the same measure (GHQ-12) to report that 28% of retired professional rugby union players from Ireland, France and South Africa experienced distress. Differences in results may be accounted for due to heterogeneity between samples. For example, Gouttebarge et al's (2016) study comprised an all-male sample, whereas the current sample included both male and female retired players. Additionally, data for the current study was collected between March 2021 and December 2021 (i.e., between the initial lifting of lockdown measures in the UK due to the COVID-19 pandemic and the spread of Omicron variant; Haddon et al., 2021) with social determinants perhaps contributing to high prevalence rates. Comparable data collected at a similar timepoint for a study carried out by Knowles et al. (2021), showed 53% of active athletes reported experiencing at least mild anxiety symptoms with the authors suggesting that "having to provide for children or care for those suffering from COVID-19 amid an unprecedented economic crisis" meant the pandemic placed incredible additional pressures on people (Knowles et al., 2021, p. 7).

When considered alongside the 64% of respondents who reported less than optimal levels of subjective well-being in this sample, the clinical levels of distress reported by 43% of retired players in this study are worrisome. Additionally, post-hoc results showed that those who sought mental health support reported statistically significant higher levels of distress and statistically significant lower levels of subjective well-being. These results are in keeping with previous research around help-seeking behaviour in professional RFL players in the UK which reported higher psychological stress compared to those who had not sought help (Kola-Palmer et al., 2020). In Kola-Palmer et al. (2020) study, players also reported several barriers to seeking help which included feeling embarrassment, pride, fear and shame. Despite recent mental health campaigns to tackle stigma from within the sport (e.g., The Rugby Players' Association (2018) *#LifeTheWeight* and Rugby Players Ireland (2020) *Tackle Your Feelings*) these findings persist. The results suggest more effort is required from rugby stakeholders and organisations to help reduce stigma, promote help-seeking behaviour for mental health and increase subjective well-being for their players.

Strengths and limitations

This is the first study to explore the role of athletic identity and psychological flexibility on psychological distress and subjective well-being with retired elite rugby players and helps to address the lack of evidence on the prevalence of mental health and well-being in this population. Despite disruption to recruitment caused by the COVID-19 pandemic and a lack of support from rugby governing bodies and organisations throughout the UK and Ireland, a respectable sample size was recruited and ensured analysis was adequately powered. It is also important to highlight the important role experts by experience (EbE) played in this study. Retired rugby players from Rugby Players Ireland were approached and agreed to offer advice and consultation around the recruitment process as well how to increase engagement with the social media campaign. This was particularly helpful given the

stigma around mental health problems and help seeking behaviours in the rugby industry (Kola-Palmer et al. 2020). However, there are some limitations which should be taken into account when interpreting the results of this study. Firstly, as the study relied on convenience sampling, the results may not be representative of all retired elite rugby players. Particularly, there is a lack of representation of female, non-White retired players and major world religions other than Christianity making the sample unrepresentative of the population which limits the generalisability of the results. Second, the cross-sectional design makes it difficult for causal links to be drawn from the findings. Future research should consider a longitudinal design to ensure higher-quality evidence of relationships between variables. Finally, as the data was collected during a period of major life adjustment (COVID-19 pandemic), it is important to consider the confounding impact these extraneous events may have had on the outcomes of this study.

Implications for research and practice

It is hoped the findings from this study will increase understanding and awareness of the issues surrounding the transition to retirement for elite rugby players and encourage further empirical investigations into the mental health and well-being of this population. This study provides preliminary evidence for planning a future advanced investigation in this area which can be achieved by replicating the results of this study with larger samples with better representation of the population. In addition, longitudinal studies informed by an ACT framework would allow for better understandings around how the relationships between psychological flexibility, valued living and subjective well-being and psychological distress change over periods of time.

A recommendation of this study is that rugby governing bodies and organisations in the UK and Ireland show a greater willingness to support academic research in terms of

recruitment to improve the evidence base in this area and quality of interventions offered to current and retired players, as well as tackling the stigma of mental health within the game.

In terms of clinical implications of this study, it is important that those involved in supporting retiring and retired rugby players are vigilant about their mental health and wellbeing. This could include staff involved in supporting retiring rugby players using mental health screening tools to detect any difficulties. Findings also point to the potential importance of making psychological interventions aimed at promoting subjective wellbeing available to former elite rugby players. Both psychological flexibility and valued living were significantly correlated with high levels of subjective well-being, and both were shown to be strong predictors of subjective well-being. Whilst causality cannot be inferred from cross-sectional data, an intervention designed to promote psychological flexibility and valued living such as ACT may be helpful for increasing subjective well-being while decreasing psychological distress among former elite rugby players. With this in mind, future studies should consider examining the acceptability and effectiveness of a protocol for athletes e.g., *Flexible Mind* approach (White et al., 2021) at different time points during the transition to retirement aimed at building their identities and values outside of the rugby player role, facilitating psychological flexibility, and improving overall mental health and well-being.

Conclusion

This study is the first to investigate psychological distress and subjective well-being with retired elite rugby players. Seventy-seven people participated in the study. Forty-three percent of participants showed clinically important levels of psychological distress and 64% demonstrated suboptimal levels of subjective well-being. 34% of respondents reported that they had received mental health support in the past. Higher levels of subjective well-being were linked to increased levels of psychological flexibility and increased levels of valued living. Psychological distress was related to increased levels of athletic identity and reduced

levels of psychological flexibility. Psychological flexibility and valued living were shown to be significant predictors of subjective well-being.

The findings from this study propose that promoting psychological flexibility and valued living may be important for increasing subjective well-being in retired elite rugby players. Additional longitudinal research may offer further insight into how variations in psychological flexibility impact on changes to subjective well-being over time.

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Appendix A

Author guidelines for Journal of Contextual Behavioural Science

Journal of Contextual Behavioural Sciences: Author guidelines

Further information on author guidelines is available at:
https://www.elsevier.com/journals/journal-of-contextual-behavioral-science/2212-1447/guide-for-authors

Types of article
All manuscripts must clearly and explicitly be of relevance to CBS. Articles should fall into one of seven categories:

1. Empirical research (up to 6000 words)
2. Brief empirical reports (up to 3000 words)
3. Review articles (up to 10,000 words)
4. Conceptual articles (up to 6000 words)
5. In practice (up to 3000 words)
6. Practical innovations (up to 3000 words)
7. Professional interest briefs (up to 3000 words)

Word limits exclude references, tables and figures but include the abstract

Empirical research
JCBS welcomes manuscripts across a breadth of domains from basic behavioral science to clinical trials. Research concerning the measurement and testing of process of change is particularly welcome. Potential methodologies include but are not limited to: randomized controlled trials, single case experimental designs, cross-sectional and prospective cohort studies, mixed-methods designs, small scale analog studies. Papers reporting null findings are also welcome if their methodology is sound and their power sufficient. Authors of such papers will need to emphasize the implications of their findings for future research and practice.

Review articles
Manuscripts reviewing a wide range of topics are encouraged as long as their content is directly relevant to CBS. Systematic reviews and meta-analyses are particularly welcome. Authors are advised to consult relevant MARS (http://www.apa.org/pubs/authors/jars.pdf) and PRISMA resources (http://www.prisma-statement.org/) when preparing such manuscripts.

Article structure
Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.
Material and methods
Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.
Results
Results should be clear and concise.
Discussion

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

1. ***Title.*** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
2. ***Author names and affiliations.*** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
3. ***Corresponding author.*** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials.
4. ***Present/permanent address.*** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Appendix B

Demographic and rugby participation variables

Demographic information

1. **Age (in years)**
2. **Gender:**
    1. Male
    2. Female
    3. Genderqueer/Non-binary
    4. Intersex
    5. Gender Non-conforming
    6. Other
3. **Ethnicity:** Please choose one option that best describes your ethnic group or background:

    White
    1. English / Welsh / Scottish / Northern Irish / British
    2. Irish
    3. Gypsy or Irish Traveller
    4. Any other White background

    Mixed / Multiple ethnic groups
    1. White and Black Caribbean
    2. White and Black African
    3. White and Asian
    4. Any other Mixed / Multiple ethnic background

    Asian / Asian British
    1. Indian
    2. Pakistani
    3. Bangladeshi
    4. Chinese
    5. Any other Asian background

    Black / African / Caribbean / Black British
    1. African
    2. Caribbean
    3. Any other Black / African / Caribbean background

    Other ethnic group
    1. Arab
    2. Any other ethnic group

4. **Religion:** What is your religion? Please choose one option that best describes your religion:
    1. No religion
    2. Christian (including Church of England, Roman Catholic, Protestant and all other Christian denominations)
    3. Buddhist
    4. Hindu
    5. Jewish
    6. Muslim
    7. Sikh
    8. Prefer not to say
    9. Any other religion

5. **Relationship status:**

1. Single (never married or never registered a civil partnership)
2. Married
3. In a registered civil partnership
4. De facto/Living together
5. Partnered
6. Separated (but still legally married or still legally in a civil partnership)
7. Divorced or formerly in a civil partnership which is now legally dissolved
8. Widowed or surviving partner from a civil partnership
9. Other

6. **Parental status:** Do you have children?
    1. Yes
    2. No
    3. Prefer not to say

7. **Sexuality:** Which of the following options best describes how you think of yourself?
    1. Heterosexual or Straight
    2. Gay or Lesbian
    3. Bisexual
    4. Pansexual
    5. Asexual
    6. Prefer not to say
    7. Other

8. **Education:** What is your highest level of educational qualification?
    1. No qualifications: No academic or professional qualifications.
    2. 1-4 GCSEs or equivalent: 1-4 O Levels/CSE/GCSEs (any grades), Entry Level, Foundation Diploma, NVQ level 1, Foundation GNVQ, Basic/Essential Skills.
    3. 5+ GCSEs or equaivalent: 5+ O Level (Passes)/CSEs (Grade 1)/ GCSEs (Grades A*-C), School Certificate, 1 A Level/ 2-3 AS Levels/VCEs, Intermediate/Higher Diploma, Welsh Baccalaureate Intermediate Diploma, NVQ level 2, Intermediate GNVQ, City and Guilds Craft, BTEC First/General Diploma, RSA Diploma. Apprenticeship: Apprenticeship.
    4. 2+ A Levels or equivalent (Level 3 qualifications): 2+ A Levels/VCEs, 4+ AS Levels, Higher School Certificate, Progression/Advanced Diploma, Welsh Baccalaureate Advanced Diploma, NVQ Level 3; Advanced GNVQ, City and Guilds Advanced Craft, ONC, OND, BTEC National, RSA Advanced Diploma.
    5. Degree level or above (Level 4 qualifications and above): Degree (for example BA, BSc), Higher Degree (for example MA, PhD, PGCE), NVQ Level 4-5, HNC, HND, RSA Higher, Diploma, BTEC Higher level, Foundation degree (NI), Professional qualification (for example teaching, nursing, accountancy).
    6. Other qualifications: Vocational/Work-related Qualifications, Foreign Qualifications / Qualifications gained outside the UK (NI) (Not stated / level unknown)
    7. Prefer not to say

9. **Mental Hhealth support:** Have you ever received support (e.g. counselling, psychotherapy, or medication) for mental health difficulties?
    1. Yes
    2. No
    3. Prefer not to say

Rugby participation information

1. Are you currently retired from elite level rugby?
    a. Yes
    b. No

2. What type of rugby did you play?
    a. Rugby Union
    b. Rugby League

3. When did you retire?
    a. 6 months ago
    b. 12 months ago
    c. 1-3 years ago
    d. 3-5 years ago
    e. 5+ years ago

4. What age were you when you retired? (years)

5. Have you represented your country at senior level?

6. What was your highest playing level?
    a. International - World Cup/Six Nations/Rugby League World Cup/ Rugby League Four Nations or equivalent
    b. Level 1 Premiership Rugby/Premier 15s or equivalent/RFL Super League or equivalent
    c. Level 2 Men's RFU Championship/Women's Championship North 1/South 1/RFL Championship or equivalent
    d. Level 3-5 Men's National league or equivalent/Women's Championship Midlands 2/North 2/South East 2/South West 2/RFL League 1/ RFL Women's Championship 1 or equivalent
    e. Men's Regional league/Women's National Challenge 1&2 or equivalent/National Conference League or equivalent
    f. Other

7. What level were you playing at when you retired?
    1. International - World Cup/Six Nations/Rugby League World Cup/ Rugby League Four Nations or equivalent
    2. Level 1 Premiership Rugby/Premier 15s or equivalent/RFL Super League or equivalent
    3. Level 2 Men's RFU Championship/Women's Championship North 1/South 1/RFL Championship or equivalent
    4. Level 3-5 Men's National league or equivalent/Women's Championship Midlands 2/North 2/South East 2/South West 2/RFL League 1/ RFL Women's Championship 1 or equivalent
    5. Men's Regional league/Women's National Challenge 1&2 or equivalent/National Conference League or equivalent
    6. Other

8. Why did you finish playing at elite level?
    a. Voluntary retirement
    b. Forced retirement (e.g., retired due to injury)
    c. Released by team/club
    d. Prefer not to say

e. Other

9. Highest weekly wage (£ or equivalent)
   a. Enter amount
   b. Prefer not to say

10. Are you currently employed?
   a. Yes
   b. No
   c. Prefer not to say

11. Is your current employment related to rugby?
   a. Yes
   b. No
   c. Prefer not to say

12. Have you ever been convicted of a crime?
   a. Yes
   b. No
   c. Prefer not to say

13. Have you ever been declared bankrupt?
   a. Yes
   b. No
   c. Prefer not to say

Appendix C

Mental Health Continuum-Short Form

Mental Health Continuum – Short Form (MHC-SF)

During the past month, how often did you feel the following ways?

During the past month, how often did you feel ...	**NEVER**	**ONCE OR TWICE**	**ABOUT ONCE A WEEK**	**ABOUT 2 OR 3 TIMES A WEEK**	**ALMOST EVERY DAY**	**EVERY DAY**
Happy						
Interested in life						
Satisfied with life						
That you had something important to contribute to society						
That you belonged to a community (like a social group, or your neighbourhood)						
That our society is a good place, or is becoming a better place, for all people						
That people are basically good						
That the way our society works makes sense to you						
That you liked most parts of your personality						
Good at managing the responsibilities of your daily life						
That you had warm and trusting relationships with others						
That you had experiences that challenged you to grow and become a better person						
Confident to think or express your own ideas and opinions						
That your life has a sense of direction or meaning to it						

Appendix D

General Health Questionnaire-12

Mental General Health Questionnaire-12 (GHQ-12)

We would like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer all the questions simply by selecting the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those you had in the past.

Over the past few weeks, have you...

Been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
Lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
Felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
Felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less capable
Felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
Felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
Been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
Been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
Been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
Been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
Been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
Been feeling reasonably happy, all things considered?	More so than usual	About the same as usual	Less so than usual	Much less than usual

Appendix E

Acceptance and Action Questionnaire-II (AAQ-II)

Acceptance and Action Questionnaire (AAQ-II)

Below you will find a list of statements. Please rate how true each statement is for you.

	1	2	3	4	5	6	7
	Never true	**Very seldom true**	**Seldom true**	**Sometimes true**	**Frequently true**	**Almost always true**	**Always true**
My painful experiences and memories make it difficult for me to live a life that I would value							
I'm afraid of my feelings							
I worry about not being able to control my worries and feelings							
My painful memories prevent me from having a fulfilling life							
Emotions cause problems in my life							
It seems like most people are handling their lives better than I am							
Worries get in the way of my success							

Appendix F

Valuing Questionnaire (VQ)

Valuing Questionnaire (VQ)

Please read each statement carefully and then circle the number which best describes how much the statement was true for you DURING THE PAST WEEK, INCLUDING TODAY.

	0 Not true at all	**1**	**2**	**3**	**4**	**5**	**6 Completely true**
I spent a lot of time thinking about the past or future, rather than being engaged in activities that mattered to me							
I was basically on "auto-pilot" most of the time							
I worked toward my goals even if I didn't feel motivated to							
I was proud about how I lived my life							
I made progress in the areas of my life I care most about							
Difficult thoughts, feelings or memories got in the way of what I really wanted to do							
I continued to get better at being the kind of person I want to be							
When things didn't go according to plan, I gave up easily							
I felt like I had a purpose in life							
It seemed like I was just 'going through the motions', rather than focusing on what was important to me							

Appendix G

Athletic Identity Measurement Scale (AIMS)

Athletic Identity Measurement Scale (AIMS)

Please select the answer that best reflects the extent to which you agree or disagree with each statement regarding your sports participation.

	1	2	3	4	5	6	7
	Strongly disagree	**Disagree**	**Slightly disagree**	**Neither agree nor disagree**	**Slightly agree**	**Agree**	**Strongly agree**
I consider myself an athlete							
I have many goals related to sport							
Most of my friends are athletes							
Sport is the most important part of my life							
I spend more time thinking about sport than anything else							
I feel bad about myself when I do poorly in sport							
I would be very depressed if I were injured and could not compete in sport							

Appendix H

Ethical approval letter

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1 September 2020

RE: The impact of athletic identity, psychological inflexibility and forms of coping on the mental health and well-being of retired elite level rugby players
Trainee: Jacqui Mooney
Supervisors: Ross White and Andrew Bethell

Dear Jacqui,

Thank you for your notification of amendment to your proposal submitted to the Chair of the D.Clin.Psychol. Research Review Committee.

I can now confirm that your proposal (*version number 6, dated 10th August 2020)* meets the requirements of the committee and have been approved by the Committee Chair.

Please take this Chairs Action decision as ***final*** approval from the committee.

You may now progress to the next stages of your research.

I wish you well with your research project.

Dr Luna Centifanti
Vice Chair D.Clin.Psychol. Research Review Committee

Appendix I

Participant information sheet

Version Number: 4 **Date:2/3/21**

Tackling Next Steps: Exploring mental health in retired elite rugby players

You are being invited to participate in a research study (The impact of athletic identity, psychological inflexibility and forms of coping on the mental health and well-being of retired elite level rugby players). Before you decide whether to participate, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. Please also feel free to discuss this with your friends and relatives if you wish. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to.

Why are we conducting this research?

We are interested in identifying factors that might support mental health and well-being in retired rugby players. We hope that findings from this research will help inform the development of psychological support for both current and retired elite rugby players in the future.

Who is being asked to take part?

We are asking recently (last 25 years) retired elite level rugby players to take part in this study.

Do I have to take part?

You do not have to take part in this study. If you decide to participate, you are free to withdraw from the study at any time without explanation. You can withdraw from the study whilst completing the questionnaire. However, after your responses have been anonymously submitted it will no longer be possible for you to withdraw your data.

What will happen if I take part?

If you decide to take part in the study then you will be directed to our website. Here, you will be asked to complete a series of questionnaires. The questionnaires will take approximately 15 minutes to complete, and you will be asked questions about your rugby identity, happiness, life satisfaction, mental health and ways you cope. You will also be asked whether you would like to be contacted to take part in similar studies in the future.

What are the risks and benefits of taking part?

Whilst there are no anticipated risks to you if you take part in this study, some questions will encourage you to reflect on your mental health and well-being. You will be given details of a number of support organisations on completion of the questionnaires that can contact if for any reason you are feeling distressed.

There are no direct benefits for you in taking part in the study. However, we hope that your participation in this study will help us to understand more about mental health in retired elite rugby players. We anticipate that findings from this study will help us to develop better support for players in the future.

In terms of risk of being identified, it will be impossible to identify individual participants because demographic information will only be reported on an aggregate level.

How will my data be used?

The University of Liverpool processes personal data as part of its research and teaching activities in accordance with the lawful basis of 'public task', and in accordance with the University's purpose of "advancing education, learning and research for the public benefit". Under UK data protection legislation, the University acts as the Data Controller for personal data collected as part of the University's research. The Principal Investigator (Dr Ross White) acts as the Data Processor for this study, and any queries relating to the handling of your personal data can be sent to Dr Ross White: rgwhite@liverpool.ac.uk.

Further information on how your data will be used can be found in the table below.

How will my data be collected?	Via an online survey
How will my data be stored?	Your data will be stored on a password protected platform at all times.
How long will my data be stored for?	10 years

What measures are in place to protect the security and confidentiality of my data?	The data will be stored anonymously on the University of Liverpool's secure server and will only be accessible to the research team.
Will my data be anonymised?	Yes
How will my data be used?	Your responses to the online survey will be analysed to produce research reports that will be published in peer-reviewed academic journals.
Who will have access to my data?	Only the research team will have access to your data.
Will my data be archived for use in other research projects in the future?	Only if you show an interest in being contacted for similar studies in the future.
How will my data be destroyed?	Your data will be deleted after 10 years in line with the University of Liverpool's data management policy.

Future research opportunities

If you are interested in being contacted for similar studies in the future then we will ask you to provide us with your email address so that we can keep you informed about future opportunities. This email address will be stored securely and separately from your questionnaire responses. Please note that you are free to decline if you do not want to take part in these other research opportunities – just as you are free to withdraw from this study at any time.

Who can I contact if I have further questions?

If you have any questions regarding the study or would like further information, please contact the lead researcher, Jacqueline Mooney (Trainee Clinical Psychologist, University of Liverpool; j.mooney3@liverpool.ac.uk) or the academic supervisor, Dr Ross White (Clinical Psychologist, University of Liverpool; rgwhite@liverpool.ac.uk).

What if I am unhappy or if there is a problem?

If you are unhappy about any aspects of the research, or if there is a problem, then please let us know by contacting Dr Ross White (rgwhite@liverpool.ac.uk). If you remain unhappy or have a

complaint which you feel you cannot come to use with then you should contact the University of Liverpool Research Governance Officer at ethics@liverpool.ac.uk. When contacting the Research Governance Officer, please provide details of the name or description of the study (so that it can be identified), the researcher involved, and the details of the complaint that you wish to make.

If you experienced any distress during or after the study, we advise that you contact your GP or one of the organisations below:
(all the organisations below provide anonymous services):

Mind
Tel: 0300 123 3393
Email: info@mind.org.uk
Website: https://www.mind.org.uk/

Anxiety UK
Tel: 08444 775 774
Text Service: 07537 416905
Email: support@anxietyuk.org.uk

Samaritans
Tel: 116 123
Find your local branch at: https://www.samaritans.org/branches

Sporting Chance
Tel: 07500 000 777
Email: support@sportingchanceclinic.com
Website: https://www.sportingchanceclinic.com/

Appendix J

Consent form

Version Number: 2 **Date: 24/11/20**

Tackling Next Steps: Exploring mental health in retired elite rugby players

1. I confirm that I have read and have understood the Participant Information Sheet for the above study. I have had the opportunity to consider the information, and confirm that I understand this information clearly.

2. I understand that my participation is voluntary and that I am free to withdraw from the study at any time without giving any reason. I can withdraw from the study whilst completing the questionnaire. However, after my responses have been anonymously submitted it will no longer be possible for me to withdraw my data.

3. I understand that I am not required to provide any identifiable information, apart of my email address if I wish to be included in future research, however this will be stored in a separate database and my questionnaire responses will be processed anonymously and confidentially.

I agree to take part in this study