JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data

Reviewer_____Date_____

Author _____Year_____Record Number_____

		Yes	No	Unclear	Not applicable
1.	Was the sample frame appropriate to address the target population?	☐	☐	☐	☐
2.	Were study participants sampled in an appropriate way?	☐	☐	☐	☐
3.	Was the sample size adequate?	☐	☐	☐	☐
4.	Were the study subjects and the setting described in detail?	☐	☐	☐	☐
5.	Was the data analysis conducted with sufficient coverage of the identified sample?	☐	☐	☐	☐
6.	Were valid methods used for the identification of the condition?	☐	☐	☐	☐
7.	Was the condition measured in a standard, reliable way for all participants?	☐	☐	☐	☐
8.	Was there appropriate statistical analysis?	☐	☐	☐	☐
9.	Was the response rate adequate, and if not, was the low response rate managed appropriately?	☐	☐	☐	☐

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Comments (Including reason for exclusion)

Appendix A – Search Strategy

Search Strategy Pubmed

#1: "rugby"[MeSH] OR "rugby*"[tiab]
#2: “Retirement”[Mesh] OR “Retire*”[tiab] OR Former[tiab] OR “Ex”[tiab]
#3: "Musculoskeletal system"[Mesh] OR "Musculoskeletal Diseases"[Mesh] OR Tendon*[tiab] OR Bone*[tiab] OR Muscle[tiab] OR Ligament[tiab] OR Cartilage [tiab] OR Joint[tiab] OR Osteoarthritis[tiab] OR OA[tiab] OR Musculoskeletal[tiab]
#4: “Cardiovascular System”[Mesh] OR “Cardiovascular Diseases”[Mesh] OR Cardiovascular[tiab] OR Heart[tiab] OR Blood[tiab] OR Artery[tiab] OR Vein[tiab] OR Capillary[tiab] OR Cardiac[tiab] OR Arrhythmia[tiab] OR Vessel[tiab] OR Coronary[tiab] OR Cardio*[tiab] OR “Heart Arrest”[MeSH]
#5: “Mental Disorders”[Mesh] OR “Mental Processes”[Mesh] OR Cogniti*[tiab] OR Psychological[tiab] OR Neurocogniti*[tiab] OR Mental[tiab] OR Brain[tiab] Neuropsychological[tiab] OR Neurological[tiab] OR “Mental health”[tiab] OR "Chronic Traumatic Encephalopathy"[Mesh] OR “CTE”[tiab] OR “depression”[MeSH] OR “anxiety”[MeSH] OR “Substance-related disorders”[MeSH] OR “Sleep Wake Disorders"[MeSH]
#6: "Relative Energy Deficiency in Sport”[MeSH], “Reproductive Physiological Phenomena”[Mesh] OR Reproduct*[tiab] OR Menstrua*[tiab] OR Fertil*[tiab] OR Ovulation[tiab] OR Menarche[tiab] OR Pregnan*[tiab] OR Amenorrhea[tiab] OR Oligomenorrhea[tiab] OR Estrogen[tiab] OR Oestrogen[tiab] OR Menses[tiab] OR Menorrh*[tiab] OR Folic*[tiab] OR Luteal[tiab] OR Period{tiab}
#7: #1 AND #2 AND (#3 OR #4 OR #5 OR #6)

Search Strategy SPORTDiscus

S1: TI(Rugby) OR AB(Rugby)
S2: TI(Retire* OR Former OR Ex) OR AB(Retire* OR Former OR Ex)
S3: TI(Musculoskeletal OR Muscle OR Bone OR Tendon OR Ligament OR Cartilage OR Joint OR Osteoarthritis OR OA) OR AB(Musculoskeletal OR Muscle OR Bone OR Tendon OR Ligament OR Cartilage OR Joint OR Osteoarthritis OR OA)
S4: TI(Cardiovascular OR Heart OR Blood OR Vein OR Vessel OR Artery OR Capillary OR Cardio OR Coronary OR Arrhythmia OR Cardiac) OR AB(Cardiovascular OR Heart OR Blood OR Vein OR Vessel OR Artery OR Capillary OR Cardio OR Coronary OR Arrhythmia OR Cardiac OR Heart Arrest)
S5: TI(Mental OR Cogniti* OR Psychological OR Neurocogniti* OR Neuropsychological OR Neurological OR Brain) OR AB(Mental OR Cogniti* OR Psychological OR Neurocogniti* OR Neuropsychological OR Neurological OR Brain OR Chronic Traumatic Encephalopathy OR CTE OR Depression OR Anxiety OR Substance-related Disorder OR Sleep Wake Disorder)
S6: TI(RED-S OR Reproduct* OR Menstrua* OR Fertil* OR Ovulation OR Menarch OR Pregnan* OR Amenorrhea OR Oligomenorrhea OR Estrogen OR Oestrogen OR Menses OR Menorrhea OR Folic* OR Luteal) OR AB(Reproduct* OR Menstrua* OR Fertil* OR Ovulation OR Menarch OR Pregnan* OR Amenorrhea OR Oligomenorrhea OR Estrogen OR Oestrogen OR Menses OR Menorrhea OR Folic* OR Luteal OR Period)
S7: S1 AND S2 AND (S3 OR S4 OR S5 OR S6)

Search Strategy EMBASE

#1: rugby
#2: rugby (Title or Abstract)
#3: retirement OR retire* OR former OR ex
#4: musculoskeletal system OR musculoskeletal disease OR tendon OR bone* OR muscle OR ligament OR cartilage OR joint OR osteoarthritis OR OA
#5 cardiovascular system OR cardiovascular diseases OR cardiovascular OR heart OR blood OR vein OR capillary OR cardiac OR arrhythmia OR vessel OR coronary OR cardio* OR Heart Arrest
#6 Mental Disorders OR Mental Processes OR Cogniti* OR Psychological OR Neurocogniti* OR Mental OR Brain OR Neuropsychological OR Neurological OR Mental health OR Chronic Traumatic Encephalopathy OR CTE OR Depression OR Anxiety OR Substance-related Disorder OR Sleep Wake Disorder
#7 Relative Energy Deficiency in Sport OR Reproductive Physiological Phenomena OR Reproduct OR Menstrua* OR Fertil* OR Ovulation OR Menarche OR Pregnan* OR Amenorrhea OR Oligomenorrhea OR Estrogen OR Oestrogen OR Menses OR Menorrh* OR Folic* OR Luteal OR Period
#8: #1 AND #2 AND #3 AND (#4 OR #5 OR #6 OR #7)

Search Strategy APA PsycInfo

S1: TI(Rugby) OR AB(Rugby)
S2: TI(Retire* OR Former OR Ex) OR AB(Retire* OR Former OR Ex)
S3: TI(Mental OR Cogniti* OR Psychological OR Neurocogniti* OR Neuropsychological OR Neurological OR Brain) OR AB(Mental OR Cogniti* OR Psychological OR Neurocogniti* OR Neuropsychological OR Neurological OR Brain OR Chronic Traumatic Encephalopathy OR CTE OR Depression OR Anxiety OR Substance-related Disorder OR Sleep Wake Disorder)
S4: S1 AND S2 AND S3

Appendix C – Critical Appraisal

Article	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Brauge et al, 2015	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Davies et al, 2017	Yes	Yes	No	Yes	Unclear	Yes	Yes	No	Unclear
Decq et al, 2015	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Gardner et al, 2016	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Gallo et al, 2022	No	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Yes
Gouttebarge et al, 2015	No	Yes	Yes	No	Unclear	Yes	Yes	No	Yes
Hind et al, 2020	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	No	Unclear
Hind et al, 2021	Yes	Yes	Yes	No?	Unclear	Yes	Yes	No	Unclear
Hume et al, 2022	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Unclear
Iverson et al, 2021	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Jones et al, 2019	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Unclear
McMillan et al, 2017	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Unclear
Paget et al, 2020	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes
Van Pattern et al, 2021	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Stanwell et al, 2022	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear
Wright et al, 2021	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Unclear

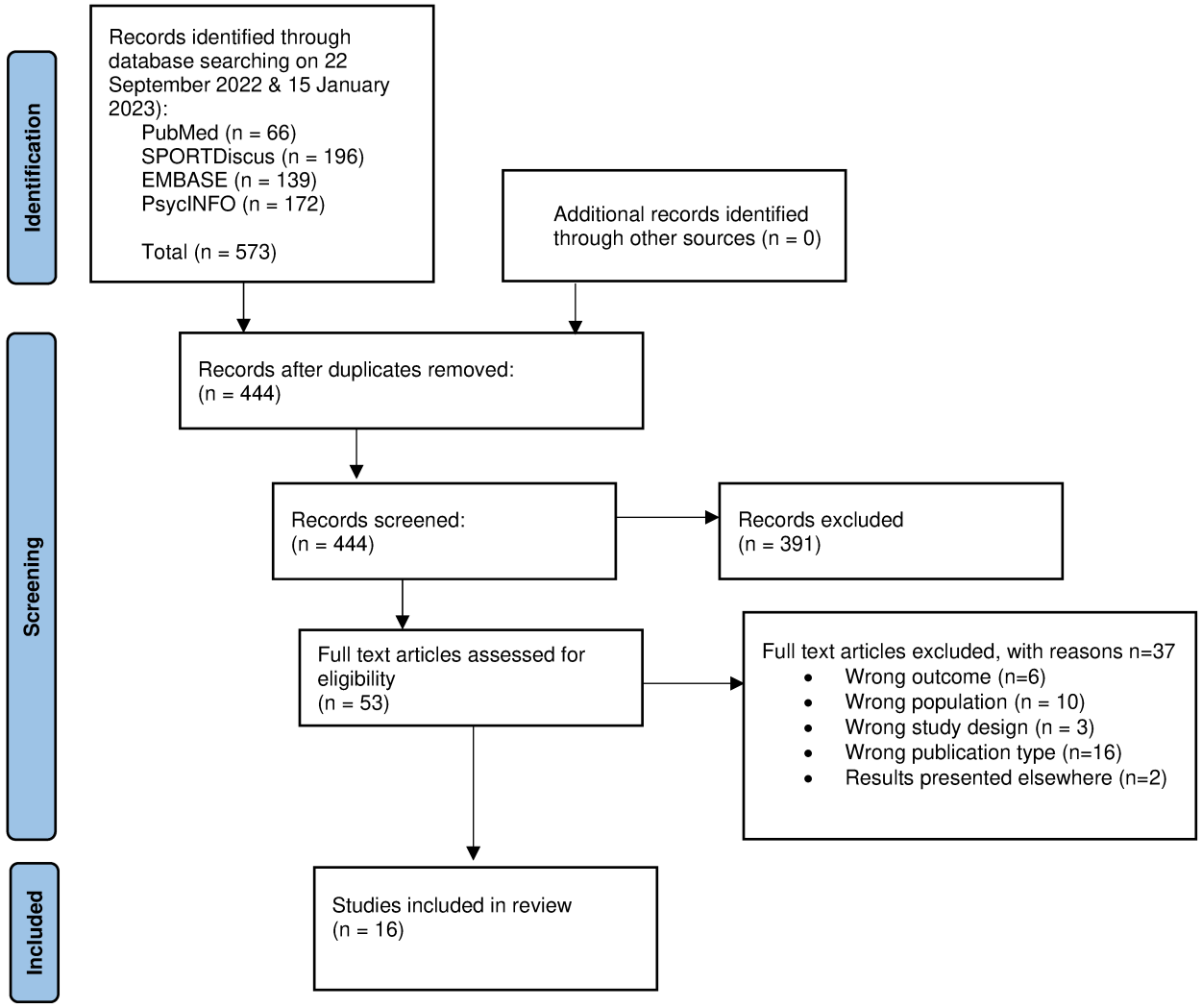

Figure 1: PRISMA flow chart displaying the study selection process

Table 1: Musculoskeletal health conditions in retired elite rugby players

Author (Year)	**Population**				**Control Group (Yes/No); Description of Control Group**	**Study Design and Aim**	**Assessment Method (and Scoring System used where relevant)**	**Health condition reported on**	**Outcome**	**Comparator group**
	No of participants & Age	Nationality & Gender	Rugby Union or League	Mean career duration (in years) & Years retired						
Brauge et al, 2015	N=101 40.4 (SD 2.3)	France Male	Union	C: 16.4 (SD 3.1) R: 5.8 (SD 3.5)	Yes N=85 Age: 41.6 (SD 4.5) Matched for sex, age, job, current sport training and smoking habits	Cross sectional study: To find out if retired professional rugby players experienced more serious degenerative cervical spine symptoms than the general population.	Questionnaire Neck disability Index (NDI) > 15	Neck pain Disabling neck pain	50.50% Statistically sig (p = 0.01) 2.97%	31.76% 1.18%
Davies et al., 2017	N=259 60.1 (SD 16.1)	United Kingdom Male	Union	C: NI R: NI	No	Cross sectional study: To assess morbidity and health related quality of life amongst former rugby players, compared to an age-standardised general	Questionnaire self-reported, physician diagnosed	Osteoporosis Osteoarthritis Joint replacement Hip replacement Knee replacement	4% 60% 24% 15% 9%	NI

						population sample				
Hind et al., 2020	N=83 43.4 (SD 9.4)	United Kingdom Male	League & Union	C: NI R: NI	Yes N=106 Former amateur rugby players (AR) Age: 48.3 (SD 11.0) N=65 retired non-contact sport athletes (NC) Age: 48.7 (SD 12.9)	Cross sectional study: To describe cumulative injuries and their perceived effect in retired professional rugby players compared to retired non-contact athletes.	Questionnaire	Back pain Severe and regular joint pain Osteoarthritis	80% 64% 51% p<0.05)	AR: 75% NC: 69% AR 53% NC: 47% AR 36% NC: 22%
Jones et al., 2019	N=127 60.4 (SD 16.0)	United Kingdom Male	Union	C: NI R: 27.7 (SD 16.0	Yes N=127 Former professional cricket players Age: 56.4 (SD 14)	Cross sectional study: To establish the prevalence of hand and wrist osteoarthritis in retired elite rugby and cricket players	Questionnaire Questionnaire Questionnaire National Health and Nutrition Examination Survey (NHANES)	Hand OA (physician diagnosed) Wrist OA (physician diagnosed) Hand pain	3.6% (95% CI 1.5-8.4%) 2.1% (95% CI 0.7%-6.5%) 10.0% (CI 6.0-16.3%)	2.4% (95% CI 0.8-7.2%) 1.6% (95% CI 0.4-6.2%) 19.7% (95% CI 13.6-27.6%)
McMillan et al., 2017	N=127 53.5 (SD 13.0)	United Kingdom Male	Union	C: 22.4 (5.0)	Yes N=29 Matched for age and	Cross sectional study: To explore long term health	Self-report inventory	Chronic orthopaedic problems	14%	3%

				R: 20.3 (12.8)	social deprivation	outcomes after exposure to repeated concussions in elite level rugby union players				
Paget et al., 2020	N=152 40.0 (SD 6.0)	Inter-national Male	Union	C: 10 (2-20) R: 8 (0–22)	Yes N=401 Retired professional football players Age: 36 (25-50)	Cross sectional study: To establish the prevalence of ankle osteoarthritis in former professional rugby and football players	Questionnaire	Ankle OA (physician diagnosed)	4.6% (95% CI 1.2-8.0%)	9.2% (95% CI 6.4 – 12.1%)

N = number of participants, SD = Standard Deviation, NI = Not identified, AR = former amateur rugby players, NC = retired non-contact athletes, C= mean career duration (year), R= mean years since retirement, OA= osteoarthritis.

Table 2: Cardiovascular health conditions in retired elite rugby players

Author (Year)	**Population**				**Control Group (Yes/No); Description of Control Group**	**Study Design and Aim**	**Assessment Method (and Scoring System used where relevant)**	**Health condition reported on**	**Outcome**	**Comparator group**
	No of participants & Age	Nationality & Gender	Rugby Union or League	Mean career duration (in years) & Years retired						
Davies et al., 2017	N=259 60.1 (SD 16.1)	United Kingdom Male	Union	C: NI R: NI	No	Cross sectional study: To assess morbidity and health related quality of life amongst former rugby players, compared to an age-standardised general population sample	Questionnaire self-reported, physician diagnosed	Heart problems Hypertension	18% 28%	NI
Gallo et al., 2021	N=143 70	United Kingdom Male	Union	C: 15.8 (SD 5.4) R: NI	No	Cross sectional study: To assess long term association between concussions and cognitive function among retired elite rugby players	Questionnaire	Hypertension	31.5%	

McMillan et al., 2017	N=127 53.5 (SD 13.0)	United Kingdom Male	Union	C: 22.4 (5.0) R: 20.3 (12.8)	Yes N=29 Matched for age and social deprivation	Cross sectional study: To explore long term health outcomes after exposure to repeated concussions in elite level rugby union players	Self-report inventory	Cardiovascular disorder	2%	21%

N = number participants, SD = Standard Deviation, NI = Not identified, C= mean career duration (year), R= mean years since retirement

Table 3: Neurocognitive health conditions in retired elite rugby players

Author (Year)	**Population**				**Control Group (Yes/No); Description of Control Group**	**Study Design and Aim**	**Assessment Method (and Scoring System used where relevant)**	**Health condition reported on**	**Outcome**	**Comparator group**
	No of participants & Age	Nationality & Gender	Rugby Union or League	Mean career duration (in years) & Years retired						
Brauge et al, 2015	N=101 40.4 (SD 2.3)	France Male	Union	C: 16.4 (SD 3.1) R: 5.8 (SD 3.5)	Yes N=85 Age: 41.6 (SD 4.5) Matched for sex, age, job, current sport training and smoking habits	Cross sectional study: To find out if retired professional rugby players experienced more serious degenerative cervical spine symptoms than the general population.	Japanese Orthopaedic Association (JOA)	Neurological abnormalities	0.99%	NI
Davies et al., 2017	N=259 60.1 (SD 16.1)	United Kingdom Male	Union	C: NI R: NI	No	Cross sectional study: To assess morbidity and health related quality of life amongst former rugby players, compared to an age-standardised general	Questionnaire self-reported, physician diagnosed	Dementia	1%	NI

						population sample				
Decq et al., 2015	N=239 52 (49-55.75)	France Male	Union	C: NI R: NI	Yes N=138 Retired sportsmen registered on "high-level" lists	Cross sectional study: To evaluate the prevalence of major depressive disorder, mild cognitive disorders and headache in retired high level sportsmen and rugby players	Self-questionnaire Telephone Interview for Cognitive Status (TICS)	Reported Neurological disease Mild cognitive disorders (TICS-m ≥ 30)	2.93% 56.59%	3.68% 40.35%
McMillan et al., 2017	N=127 53.5 (SD 13.0)	United Kingdom Male	Union	C: 22.4 (5.0) R: 20.3 (12.8)	Yes N=29 Matched for age and social deprivation	Cross sectional study: To explore long term health outcomes after exposure to repeated concussions in elite level rugby union players	Self-report inventory	Parkinson's	1.92%	0.0%
Stanwell et al., 2022	N=41 NI	Australia Male	League	C: NI R: NI	Yes N=41 Healthy community controls similar in age and education	Cross sectional study: To explore the Cavum Septum Pellucidum (CSP) anatomic features and lateral ventricle size in retired elite rugby league players and controls	Magnetic resonance imaging (MRI) scan	Abnormal Cavum Septum Pellucidum (CSP)	61%	41.5%

Van Patten et al., 2021	N=133 55.0 (SD 13.9)	Australia Male	League	C: NI R: NI	No	Cross sectional study: To explore predictors and correlates of perceived cognitive decline in retired national rugby league players	Information questionnaire on Cognitive Decline in the Elder (IQCODE-Self) IQCODE-Self	Cognitive decline (cut-off = 3.88) Cognitive decline (cut-off 3.38)	7.5% 28.6%	

N = number participants, SD = Standard Deviation, NI = Not identified, C= mean career duration (year), R= mean years since retirement

Table 4: Psychological health conditions in retired elite rugby players

Author (Year)	**Population**				**Control Group (Yes/No); Description of Control Group**	**Study Design and Aim**	**Assessment Method (and Scoring System used where relevant)**	**Health condition reported on**	**Outcome**	**Comparator group**
	No of participants & Age	Nationality & Gender	Rugby Union or League	Mean career duration (in years) & Years retired						
Davies et al., 2017	N=259 60.1 (SD 16.1)	United Kingdom Male	Union	C: NI R: NI	No	Cross sectional study: To assess morbidity and health related quality of life amongst former rugby players, compared to an age-standardised general population sample	Questionnaire self-reported, physician diagnosed	Anxiety Depression	7% 6%	NI
Decq et al., 2015	N=239 52 (49-55.75)	France Male	Union	C: NI R: NI	Yes N=138 Retired sportsmen registered on “high-level” lists	Cross sectional study: To evaluate the prevalence of major depressive disorder, mild cognitive disorders and headache in retired high	Self-questionnaire Patient Health Questionnaire (PHQ-telephonic)	Reported depressive episodes Depressive disorder PHQ-9 >9)	12.61% 9.55%	12.32% 6.72%

						level sportsmen and rugby players				
Gardner et al., 2017	N=16 38.3 (SD 4.6)	NI Male	League	C: NI R: 6.9	Yes N=16 Age-and education-matched controls who had no history of neurotrauma or participation in contact sports	Cross sectional study: To assess brain neurometabolite concentrations in retired league players who had a history of self-reported concussions	Alcohol use disorder identification test (AUDIT)	Alcohol use disorder: Abstainer Low Risk Hazardous level Harmful High risk	 0% 23.07% 53.84% 7.69% 15.38%	 7.69% 76.93% 15.38% 0% 0%
Gouttebarge et al., 2015	N=295 38 (SD 6.0)	France, South Africa, Ireland. Male	Union	C: 9 (1-18) R: 8 (1-25)	No	Cross sectional study: To establish the prevalence of symptoms of common mental health disorders among retired professional rugby union players	Four-dimensional symptom questionnaire (4DSQ) 12-item General Health Questionnaire (GHQ-12) Patient reported outcome measurement information system (PROMIS)	Distress Anxiety/ Depression Sleeping disturbance	24.8% (95CI 19.7-29.9) 28.4% (95 CI 23.1-33.7) 28.8% (95 CI 23.1-34.5)	

							AUDIT-C Questionnaire Questionnaire	Adverse alcohol behaviour Adverse smoking behaviour Adverse nutrition behaviour	23.8% (95 CI 18.8-28.9) 15% (95 CI 10.8-19.3) 61.9% (95 CI 56.1-67.7)	
Hind et al., 2022	N=83 43.4 (SD 9.4) United Kingdom Male	League & Union	C: NI R: NI	Yes N=106 Retired Amateur rugby athletes (AR) N=65 Retired Non-contact athletes (NC)	Cross sectional study: To investigate whether there were differences in mental health, sleep, and alcohol use between retired elite and amateur rugby code players compared to retired non-contact athletes		Spielberger Anger Expression Scale General Health Questionnaire (GHQ-12) (GHQ-12) AUDIT-C Insomnia Severity Index	Irritability Depression Anxiety Alcohol consumption (higher risk) (≥5) Difficulty falling asleep Waking in night and taking a long	52% ERvNC p<0.001 49% ERvNC p=0.001 ERvAR p=0.043 42% ERvAR p=0.009 59% 17% 34%	AR 18% NC 43% AR 34% NC 21% AR 23% NC 31% AR 64% NC53% AR 6% NC 7% AR 19% NC 17%

								time to fall back to sleep Waking up too early	 35%	 AR 19% NC 12%
Hume et al., 2022	N=127 43 (SD 8.5)	New Zealand Male	Union	C: NI R: NI	Yes N=271 Retired community (club or regional level) players (CR) N=72 Retired non-contact sport (cricket or hockey) players at any level (NC)	Cross sectional study: To investigate the differences in self-reported sport injury history and current self-reported health characteristics between former New Zealand rugby and non-contact sport players.	Questionnaire Questionnaire AUDIT	Anxiety Depression Hazardous drinking	4.7% 11% 38%	CR: 7.7% NC:6.9% CR: 10% NC: 9.5% CR: 40% NC25%
Iverson et al., 2021	N=141 52.6 (SD 13.8)	Australia Male	League	C: NI R: NI	No	Cross sectional study: To examine predictors and correlates of depression in retired elite level rugby league players in Australia	The Depression, Anxiety and Stress Scale (DASS-21) DASS-21	**Depression** Normal (0-9) Mild (10-13) Moderate (14-20) Severe/extremely severe (21+) **Anxiety** Normal (0-7) Mild (8-9) Moderate (10-14)	 70.9% 14.9% 9.9% 4.3% 80.9% 7.8% 6.4% 5.0%	

								Severe/extremely severe (15+)		
							DASS-21	**Stress** Normal (0-14) Mild (15-18) Moderate (19-25) Severe/extremely severe (26+)	73% 11.3% 9.2% 6.4%	
							AUDIT	**Alcohol use** Low-risk Risky or hazardous level High-risk or harmful level High-risk (likely dependence)	 55.3% 37.6% 5% 2.1%	
							Questionnaire	Recent cannabis use (past 6 months)	5.0%	
							Questionnaire	Recent illicit drug use (past 6 months)	12.8%	
McMillan et al., 2017	N=127 53.5 (SD 13.0)	United Kingdom Male	Union	C: 22.4 (5.0) R: 20.3 (12.8)	Yes N=29 Matched for age and social deprivation	Cross sectional design: To explore long term health outcomes after exposure to repeated concussions in elite level rugby union players	Self-report inventory	Depression	3.84%	3.44%
Van Patten et al., 2021	N=133	Australia Male	League	C: NI R: NI	No	Cross sectional study: To	DASS-21	Depression mild (10-13)	15.0%	

	55.0 (SD 13.9)					explore predictors and correlates of perceived cognitive decline in retired national rugby league players	DASS-21 DASS-21 AUDIT AUDIT AUDIT Questionnaire Questionnaire	Depression moderate (14-20) Depression severe (21+) Alcohol use risky or hazardous level Alcohol use high-risk or harmful level Alcohol use (likely dependence) Recent cannabis use (past 6 months) Recent illicit drug use (past 6 months)	10.5.5% 4.5% 36.8% 4.5% 2.3% 5.3% 12.8%	
Wright et al., 2021	N=11 37.6 (SD 5.0)	Australia Male	League	C: NI R: 6.8	Yes N=13 Age and education matched controls	Cross sectional study: Explore white matter microstructure using diffusion tensor imaging (DTI) in retired professional Australia National Rugby	AUDIT	**Alcohol use** Abstainer Low risk Hazardous level Harmful level Probable alcohol dependence	 0% 36.4% 45.5% 9.1% 9.1%	 15.38% 69.23% 15.38% 0% 0%

						League players with a history of self-reported concussions compared with age and education matched controls who have had no history of brain trauma				

N = number participants, SD = Standard Deviation, NI = Not identified, AR = former amateur rugby players, NC = retired non-contact athletes, CR = Retired community level rugby players, C= mean career duration (year), R= mean years since retirement

Table 5: Other health conditions in retired elite rugby players

Author (Year)	**Population**				**Control Group (Yes/No); Description of Control Group**	**Study Design and Aim**	**Assessment Method (and Scoring System used where relevant)**	**Health condition reported on**	**Outcome**	**Comparator group**
	No of participants & Age	Nationality & Gender	Rugby Union or League	Mean career duration (in years) & Years retired						
Davies et al., 2017	N=259 60.1 (SD 16.1)	United Kingdom Male	Union	C: NI R: NI	No	Cross sectional study: To assess morbidity and health related quality of life amongst former rugby players, compared to an age-standardised general population sample	Questionnaire self-reported, physician diagnosed	Asthma Diabetes	10% 2%	
Decq et al., 2015	N=239 52 (49-55.75)	France Male	Union	C: NI R: NI	Yes N=138 Retired sportsmen registered on “high-level” lists	Cross sectional study: To evaluate the prevalence of major depressive disorder, mild cognitive disorders and headache in retired high	Head Impact Test (HIT-6 (telephonic)	Disabling headache (HIT-6 ≥ 50)	15.53%	12.82%

						level sportsmen and rugby players				
Gallo et al., 2021	N=143 70	UK Male	Union	C: 15.8 (SD 5.4) R: NI	No	Cross sectional study: To assess long term association between concussions and cognitive function among retired elite rugby players	Questionnaire	Diabetes	4.1%	

N = number participants, SD = Standard Deviation, NI = Not identified, CR = Retired community level rugby players, C= mean career duration (year), R= mean years since retirement.