A Systematic Review of the Prevalence of Mental Health Symptoms and Disorders in Rugby Players

Abstract

The aim of this systematic review was to investigate the prevalence of mental health symptoms and disorders in rugby players. Six electronic databases were searched in December 2020. Studies were included if they provided quantitative data on mental health symptoms and disorders and consisted of adult rugby players. Eight studies were included, covering symptoms of anxiety, depression, alcohol use/misuse, distress, sleeping/sleep disturbance and eating disorders/adverse nutrition behaviours. Prevalence of mental health symptoms ranged from 6% (depression) to 68.8% (alcohol use/misuse). Most rates were similar to the general population, whilst symptoms of sleeping/sleep disturbance were lower, and symptoms of eating disorders/adverse nutrition behaviours and alcohol use/misuse were higher than the general population. One study included female rugby players. Epidemiological evidence comprising of rigorous diagnostic data and inclusive of gender, race, ethnicity, sexuality, and other protected characteristics is needed to inform future mental health support in this population.

Rugby is a physically and psychologically demanding sport. Most studies which focus on rugby have traditionally examined the occurrence of physical injuries with little emphasis on the mental health of rugby players (Gouttebarge et al., 2018). Consequently, our understanding of rugby players' mental health remains limited. The World Health Organisation (WHO; WHO, 2018a) has defined mental health as "a state of wellbeing in which every individual realises his or her own potential, can cope with normal stresses of life and can work productively." Mental health disorders are defined as "conditions causing clinically significant distress or impairment that meet certain diagnostic criteria, such as the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM-5; American Psychiatric Association, 2013) or International Classification of Diseases (ICD; WHO, 2018b)" (Reardon et al., 2019, p. 668). Whereas, mental health symptoms are "more common, may be significant, but do not occur in a pattern meeting specific diagnostic criteria and do not necessarily cause significant distress or functional impairment" (Reardon et al., 2019, p. 668). Mental health symptoms and disorders are characterised in ways that may negatively affect one's cognitions, emotions, behaviours, relationships, occupational functioning, and functions in life. Some individuals, including athletes, may be genetically predisposed to certain forms of mental health symptoms and disorders (Smoller, 2016). Particular aspects of sport, such as environmental, organisational and competitive stressors and the potential onset of injuries may contribute to an athlete's poor mental health (Gulliver et al., 2015). Additionally, environmental factors such as economic hardship, substance use, and sport specific demands can have long lasting effects on the onset of mental health symptoms and disorders (Sousa et al., 2018). Understanding the prevalence of mental health symptoms and disorders is the first step to better acknowledging how interventions may be designed for athletes of particular sports (Gorczynski & Webb, 2021).

In comparison to the general population, and other athletic populations, particularly contact sport athletes, the demanding nature of rugby places players at a high risk with threats to both physical and mental health. The recurrent engagement in high velocity collisions during each game and training session, with little to no form of physical protection, may result in long-term musculoskeletal system injuries, as well as severe head injuries (e.g., concussion, post-concussion syndrome; Kilic et al., 2019; King et al., 2010). As a result of long-term injuries, some rugby players are forced into early retirement without any form of career-transition plans. Consequently, retirement, and thus transition out of elite sport, may increase athletes' susceptibility to mental health symptoms and disorders and raise challenges with post-career life (Cosh et al., 2020).

Masculinity contests are prevalent in male-dominated spaces such as sport teams and sporting organisations (Doherty et al., 2016). The hypermasculine environment of rugby often encourages players to deny 'weakness' and supress emotional expression in order to display emotionless traits indicative of a 'mentally tough' athlete (Doherty et al., 2016). Such attitudes could become detrimental to the player's mental health as rugby players may not seek support for mental health symptoms and disorders, due to self and public stigma, a lack of understanding about mental health, the perception of help seeking as a sign of weakness or interpreted as an un-masculine process (Gulliver et al., 2012; Rice et al., 2019a). However, unlike many sports that mirror similar pressures and hardships to rugby (e.g., soccer), rugby players' mental health has not been equally explored (Gouttebarge et al., 2017a). The absence of such data can lead to an absence of evidence-based interventions.

Given the nature of the sport, professional rugby players are at risk of experiencing mental health symptoms and disorders (Gouttebarge et al., 2017a). From an epidemiological perspective, very little is known about the incidence or prevalence of mental health symptoms and disorders amongst rugby players. Consequently, collecting data on prevalence enables

researchers to understand the distribution of mental health symptoms within this population of athletes (descriptive epidemiology), explore their particular health needs, and plan how best to address those health needs with a tailored approach in mind (Gorczynski & Webb, 2021). Epidemiological evidence allows us to move forward in terms of any designs of behavioural, social and pharmacological interventions for a specific targeted population. In turn, the aim of this systematic review was to investigate the prevalence of mental health symptoms and disorders in rugby players.

Methods

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009) guidelines. The following search engines were searched for relevant literature in December 2020: SPORT Discus; PubMed; Web of Science; MEDLINE; and PsycINFO. Search terms for SPORTDiscus, MEDLINE and PsychINFO included: "*Rugby" OR "rugby players", AND "mental health" OR "mental disorder" AND "depress*" AND "wellbeing" OR "well being"*. For searches in Web of Science, the following terms were used: "*Rugby*" AND "mental*"*. For searches in PubMed, the following keywords were used: "*Rugby" NOT "Football" AND "mental*"*. Google Scholar was also searched using the following key terms to locate relevant studies: *"Rugby" OR "rugby players", AND "mental health" OR "mental disorder"*. Citations were screened by the authors.

The studies were required to meet the following inclusion criteria: 1) included a study population of rugby players who competed at any level (e.g. amateur, Rugby Union, Rugby League) and were over the age of 18 years; 2) provided quantitative outcome data on the prevalence of mental health symptoms and disorders of rugby players; and 3) written in English. Studies were excluded from the review if they involved a heterogenous sport sample

(i.e. a mix of sports where one sport was rugby and data could not be extracted). Review articles, book chapters, qualitative studies, and commentaries were also not included.

To identify potentially relevant articles, titles and abstracts were screened independently using the eligibility criteria. If the title and abstract did not provide adequate information to determine whether the eligibility criteria were met, it was included for full text review. Then, all full text articles were assessed independently using the eligibility criteria. To avoid missing any relevant publications, the references of the included studies were screened.

A standardised data extraction template was designed for this review (Table 1). The following information was extracted: authors; date; country/countries; sample and sex ratio; mean age of rugby players; mental health symptoms and disorders and the measures used; and prevalence rates.

A 10-item risk of bias in prevalence studies tool was used to assess the internal and external validity of the included studies (Hoy et al., 2012). The risk of bias assessment provided an overview of the main methodological characteristics of each study. The results are presented in Table 2 in Appendix A.

Results

A total of 765 research papers were identified from the electronic search. After screening the titles and abstracts, seven articles were excluded due to duplicates, whilst 735 articles did not meet the inclusion criteria and were excluded. Thereafter, 23 full-text articles were assessed for eligibility. Articles were excluded for the following reasons: a book chapter (*n* = 1; Riley, 2016), a review (*n* = 2; Kuettel & Larsen, 2020; Rice et al., 2016), physiological measures were only reported (*n* = 1; Kavaliauskas, 2010), use of heterogeneous

sport samples (*n* = 1; Schuring et al., 2017), mental health was not the topic of investigation (*n* = 3; Edwards & Edwards, 2012; Nicholls et al., 2009; Ojio et al, 2020), qualitative study (*n* = 2; Kruyt & Grobbelaar, 2019; Marsters & Tiatia-Seath, 2019), incomplete reporting of prevalence rates (*n* = 2; Kola-Palmer et al., 2020; McMillan et al., 2017) and overlapping samples due to previously reported samples (*n* = 3; Brown et al., 2017; Gouttebarge et al., 2016; Gouttebarge et al., 2018). A total of eight articles were included in the systematic review (Figure 1). Full study details are presented in Table 1. All studies had an overall low risk of bias (see Table 2 in Appendix A).

All studies were observational in design. Most studies used a cross-sectional design (Davies et al., 2017; Decq et al., 2016; Du Preez et al., 2017; Gouttebarge et al., 2017a; Gouttebarge et al., 2017b; Kilic et al., 2019; Kola-Palmer et al., 2019; Nicholls et al., 2020). Kilic et al. (2019) implemented a 12-month prospective cohort study, examining the impact of concussion and severe musculoskeletal injuries at the onset of mental health symptoms and disorders in professional rugby players.

Prevalence data on depressive and anxiety symptoms (combined) were reported by four studies (of which one, Kola-Palmer et al., 2019, produced two survey results; Gouttebarge et al., 2017a; Gouttebarge et al., 2017b; Kola-Palmer et al., 2019; Kilic et al., 2019) representing 2103 athletes (Male = 2054, Female = 49). Prevalence of depressive and anxiety symptoms (measured together) ranged from 28% (Gouttebarge et al., 2017b) to 45.5% (Kola-Palmer et al., 2019). The most common measurement tool was the 12-item General Health Questionnaire (GHQ-12). Prevalence data on anxiety symptoms alone were reported by three studies (Davies et al., 2017; Du Preez et al., 2017; Nicholls et al., 2020) representing 879 rugby players (Male = 879). Prevalence of anxiety symptoms alone ranged from 7% (Davies et al., 2017) to 18.9% (Nicholls et al., 2020). Prevalence data on depressive symptoms alone were reported by four studies (Davies et al., 2017; Decq et al., 2016; Du

Preez et al., 2017; Nicholls et al., 2020) representing 1117 athletes (Male = 1117), and ranged from 6% (Davies et al., 2017) to 67.7% (Decq et al., 2016), with the Patient Health Quesionniare-9 Scale (PHQ9) being the most common measurement tool.

Prevalence data on alcohol use/misuse symptoms were reported by four studies (Du Preez et al., 2017; Gouttebarge et al., 2017a; Gouttebarge et al., 2017b; Kilic et al., 2019) representing 2224 rugby players (Male = 2175, Female = 49). Prevalence data ranged from 15% (Gouttebarge et al., 2017a) to 68.6% (Du Preez et al., 2017). The 3-item AUDIT-C was used in all four studies.

Prevalence data on distress symptoms were reported by three studies (Gouttebarge et al., 2017a; Gouttebarge et al., 2017b; Kilic et al., 2019) representing 1858 rugby players (Male = 1809, Female = 49). Prevalence data ranged from 17% (Gouttebarge et al., 2017a) to 25% (Gouttebarge et al., 2017b), with the Distress Screener (based on the four-dimensional symptom questionnaire; 4DSQ) used in all studies.

Prevalence data on sleeping/sleep disturbance symptoms were reported by three studies (Gouttebarge et al., 2017a; Gouttebarge et al., 2017b; Kilic et al., 2019) representing 1858 rugby players (Male = 1809, Female = 49). Prevalence of sleeping/sleep disturbance symptoms ranged from 12% (Kilic et al., 2019) to 28% (Gouttebarge et al., 2017b). The Patient-Reported Outcomes Measurement Information System (PROMIS; short form) was used in all studies.

Prevalence data on symptoms of eating disorders/adverse nutrition behaviours were reported by two studies (Gouttebarge et al., 2017a; Kilic et al., 2019) representing 1563 rugby players (Male = 1514, Female = 49). Prevalence of eating disorders/adverse nutrition behaviours ranged from 22% (Kilic et al., 2019) to 23% (Gouttebarge et al., 2017a), and the Eating Disorder Screen for Primary care was used in both studies.

Discussion

The purpose of this systematic review was to investigate the prevalence of mental health symptoms and disorders in rugby players. This descriptive epidemiological process was implemented to measure and better understand the proportion of mental health symptoms in the sport of rugby. The search gathered eight articles with specific data on the prevalence of depressive and anxiety symptoms (combined), anxiety symptoms, depressive symptoms, alcohol use/misuse symptoms, distress symptoms, sleeping/sleep disturbance symptoms and symptoms of eating disorders/adverse nutrition behaviour. Prevalence rates ranged from 6% (Davies et al., 2017) for depressive symptoms to 68.6% (Du Preez et al., 2017) for alcohol use/misuse symptoms. Prevalence rates for anxiety and depressive symptoms, when examined together through instruments such as the General Health Questionnaire, ranged from 28% to 45.5%. This is the first systematic review to evaluate the prevalence rate of mental health symptoms and disorders among rugby players. Findings of this review highlight an interest in this field of research, with all included studies published within the last six years.

In a recent systematic review, Golding et al. (2020) reported somewhat similar prevalence rates of depressive symptoms in athletes from Western countries (23.7%) in comparison to the findings from this systematic review where the prevalence of depressive symptoms ranged from 6% (Davies et al., 2017) to 67.7% (Decq et al., 2016). The disparity between the large prevalence rates within this review could be due to several factors such as inconsistent use of measurement tools, unequal representation of male and female participants and clarity on whether participants were diagnosed and/or experienced other mental health symptoms and disorders. In line with previous research (Gorczynski et al., 2017) where high-performance athletes were just as likely as non-athletes to report depressive symptoms, the rugby player's prevalence rate of depressive symptoms is generally

comparable to both the male general population (7% to 12%) and the female general population (20% to 25%).

In support of the current findings, Rice et al. (2019b) noted that elite athletes experience a broadly comparable risk of high-prevalence of anxiety relative to the general population. However, subgroups of athletes have been identified to be at increased risk of experiencing depressive and anxiety symptoms, including female athletes, those in the retirement phase of their careers, and those who experience performance failures (e.g., failed attempts during training, losing a competition, not performing the behaviours desired by a coach; Hammond et al., 2013; Pluhar et al., 2019). Additionally, athletes who have been forced to retire are at a higher risk of experiencing symptoms of mental disorders such as anxiety, depression and distress (Cosh et al., 2013). As highlighted in the findings, female rugby players (who fall under the subgroup of at-risk athletes) are underrepresented within this area of research, with little to no information of the prevalence of mental health symptoms and disorders within this population.

Prevalence of alcohol use/misuse calculated in this review ranged from 15% (Kilic et al., 2019) to 68.6% (Du Preez et al., 2017), with an average rate of 30.65%, which is higher than the reported prevalence rates of alcohol misuse/adverse alcohol use in current (18.8%, 95% CI: 11.1 to 26.6) and former (21.1%, 95% CI: 14.7 to 27.4) elite athletes (Gouttebarge et al., 2019). The current findings revealed that the average prevalence of symptoms of alcohol misuse/adverse alcohol use in rugby players is also higher than the UK general population (21% adult male and 14% adult female; NICE, 2011). Higher rates of alcohol use/misuse may occur in elite athletes relative to the general population, as a result of binge drinking during non-competitive or holiday periods (Rice et al., 2016). As suggested from the current findings, the prevalence of symptoms of distress in rugby players (17% - 25%; Gouttebarge et al., 2017a; Gouttebarge et al., 2017b) is similar to current elite athletes (19.6%, 95% CI: 16.0 to 23.3) yet

higher than former elite athletes (15.8%, 95% CI: 11.3 to 20.3; Gouttebarge et al., 2019). The difference in prevalence rates could be due to the competitive nature of elite sports and traits of athletic perfectionism in current elite athletes (Sagar & Stoeber, 2009). Rugby players also indicated similar prevalence rate of symptoms of distress in comparison to the UK general population (18.9%, 95% CI: 17.8 to 20.0; Pierce et al., 2020).

In the context of elite sport, the prevalence of sleep disturbance has been well established. Previous research has suggested that 49% of elite athletes (e.g. Olympic level) are classified as poor sleepers (a term that includes several sleep problems) and experience poor sleep quality, with associated high level of daytime sleepiness and sleeping for longer hours (1.1 hour) only during the offseason (Reardon et al., 2019). Gupta and colleagues' systematic review (2017) found that athletes show a high overall prevalence of insomnia symptoms characterised by longer sleep latencies and excessive daytime fatigue with reports of sleep disturbance ranging from 13% to 70%, whilst higher levels of sleep disturbance were reported among female athletes. Gouttebarge et al. (2019) found that 26.4% (95% CI: 21.6 to 31.2) of current elite athletes reported symptoms of sleep disturbance versus 20.9% (95% CI: 15.2 to 26.6) of former elite athletes, suggesting that pre-competition stress, night-time sports events, early morning training and travel may contribute to these high levels of sleep disturbance. In comparison to the general population, our findings (12% - 28%; Kilic et al., 2019; Gouttebarge et al. 2017b) were lower than the general population in UK (30%; The Great British Bedtime Report, 2017) and lower than the general population globally (30%; Zhang et al., 2019), concluding that rugby players in this review generally have better sleep quality than the general population. The variance between the prevalence rates could be due to several factors such as the variance between each population (i.e., whether females were included in the population), the discrepancy between sleep disturbance definitions in each study (Nowicki et al., 2016), the

type of assessment tool (Zhang et al., 2019) and inclusion of obese participants, since the prevalence of sleep disorders are greater in obese males and females (Senaratna et al., 2017).

Prevalence rates for disordered eating are elevated among athletic populations, with estimations between 16% to 45%, whilst 20% of female athletes in comparison to 8% of male athletes are clinically diagnosed with an eating disorder (Gouttebarge et al., 2019; Sundgot-Borgen & Torstveit, 2004). In team based sports, teammates could negatively influence athletes' eating attitudes and behaviours through normalising disordered eating attitudes and behaviours, making critical remarks regarding weight and encouraging weight and shape comparison (Thompson & Sherman, 2011). The prevalence of symptoms of eating disorders/ adverse nutrition behaviours reported in this review (22% - 23%; Kilic et al., 2019; Gouttebarge et al., 2017a) fall within the higher bracket of prevalence rates reported in previous sport specific research. Eating disorders are common in Western countries, with females at a higher risk of developing symptoms of eating disorders than males (Le et al., 2017). Worldwide prevalence of eating disorders range between 0.21% - 2.22% and are therefore significantly lower than the prevalence rates reported for rugby players (Qian et al., 2013). However, prevalence rates of symptoms of eating disorders/adverse nutrition behaviours in this review is profoundly influenced by a male athletic population, where rates of clinical diagnosis of eating disorders are low in comparison to the female athletic population. A female dominated sample of rugby players may produce different prevalence rates of symptoms of eating disorders/ adverse nutrition behaviours than the current prevalence rates.

The prevalence rates presented in this study are not marginally different to those of the general population. Perhaps the one area of difference concerns alcohol use. However, all comparisons should be treated with caution as these were not direct comparisons (i.e. where

two distinct populations were evaluated in the same study) and are based on observational, self-report studies.

Women competing in sports traditionally considered ‘male dominated’ such as rugby, may experience being marginalised and stereotyped, whilst others may also face unequal training opportunities and resources (Blodgett et al., 2017). Sexualisation, traditional gender roles, religion and ethnic beliefs all dictate the opportunities presented to female athletes (Pfister, 2010). On top of these unique and gender specific challenges, female athletes are more likely to report depressive symptoms, social anxiety and eating disorder symptoms increasingly more than their male counterparts (Wolanin et al., 2016; Gorczynski et al., 2017). Our findings have highlighted a lack of diversity and a clear gendered imbalance whereby female rugby players are underrepresented within the sport of rugby and within academic research. In turn, there is an inequitable approach to research and inequitable approach to the creation of intervention for female rugby players. Given 2.7 million women participate in rugby globally (England Rugby, 2019), only 49 women players (< 0.002%) were included in this systematic review. It is crucial to highlight this imbalance, as well as the lack of diversity across the participant pool and recommend future research to address these deficiencies, as interventions may be created with the absence of evidence and most likely conducted with information pertaining to male athletes only.

A number of limitations with the systematic review need to be stated. First, studies in this systematic review included data on self-reported mental health symptoms. Studies did not report whether participants received clinical diagnoses. Second, some studies within this systematic review examined depressive and anxiety symptoms together rather than individually, resulting in higher prevalence rates than when such symptoms were evaluated individually. These findings reinforce the need for the use of valid and reliable instruments of evaluating mental health symptoms in athletic populations (e.g. SMHAT-1 & SMHRT-1;

Gouttebarge et al., 2021). Our findings have presented the first opportunity to accumulate and synthesize this knowledge and provide a baseline to move forward from and something to work from in the future. Third, inconsistent definitions of mental health symptoms and disorders were used for symptoms of sleeping/sleep disturbance, alcohol use/misuse and/or adverse alcohol behaviours, and eating disorders/adverse nutrition behaviours. Future studies should aim to explore mental disorders based on clinical terms that are defined as conditions that meet diagnostic criteria, such as the DSM-5 or ICD. Lastly, one study included female rugby players. Future research should focus on high quality epidemiological research, with specific attention on female rugby players.

As observed from the findings, rugby players are likely to experience mental health symptoms and disorders. Consequently, mental health promotion in rugby is warranted. Lift the Weight is a mental health campaign promoted by the Rugby Players Association (RPA; RPA, n.d.), which provides a platform for rugby players to seek information on mental health and other personal issues such as sexuality and coping with injuries. However, access to psychotherapy is only offered to RPA members, who are generally professional rugby players. Mental health literacy strategies aimed at improving mental health knowledge, attitudes toward mental health symptoms and disorders, and improving intentions to seek support may be designed across various ages and levels of play and consider the unique cultural and organisational aspects of the sport (Gorczynski et al. 2020). In line with good epidemiological practice, future research should consider exploring analytic epidemiology to better understand the risk factors of illness (Gorczynski & Webb, 2021). This form of epidemiology comprises identification of risk factors and determinants of disease in a defined population (e.g., rugby players; Gorczynski & Webb, 2021). Risk factors for a disease may vary by age, sex, gender, sexuality, class, race, ethnicity, (dis)ability, type of work and geographic location. Analyses that allow for both the examination of disease correlates, and

causal factors are crucial and can include both retrospective and prospective studies (Gorczynski & Webb, 2021).

Clinical implications:

- Rugby players are likely to experience symptoms of mental disorders at a similar rate to the general population, however, almost all the data we have is with male rugby players.
- Mental health promotion is needed in rugby to help players seek guidance from health care professionals and better understand the concept of mental health.
- One strategy to help raise awareness of mental health is in the form of mental health literacy. A mental health literacy programme may enable rugby players to have a better understanding of poor mental health, increase their awareness of symptoms of mental disorders and address players' intentions to seek help from appropriate health care professionals.

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Table 1

Summary of Mental Health Studies in Rugby Players

Authors	Country	Sample size (Male: Female)	Mean age (*M*) and standard deviation (*SD*) of rugby players	Mental health symptoms and disorders under investigation and the measures used	Prevalence rate of symptoms of mental disorder/s
Gouttebarge et al. (2017a)	Canada, England, France, Ireland, Italy, New Zealand, Pacific Islands and South Africa	990 (941:49)	*M* = 25.0 *SD* = 4.0	*Distress*: Distress Screener (based on the four-dimensional symptom questionnaire; 4DSQ). *Anxiety/depression*: 12-item General Health Questionnaire (GHQ-12). *Sleep disturbance*: Patient-Reported Outcomes Measurement Information System (PROMIS; short form). *Eating disorders*: The Eating disorder Screen for Primary care. *Adverse alcohol use*: 3-item AUDIT-C.	Distress: 17% Anxiety/depression: 30% Sleep disturbance: 13% Eating disorders: 23% Adverse alcohol use: 15%
Du Preez et al. (2017)	Australia	404 (404:0) Different instruments had different sample sizes 404 (404:0) [Depression and general anxiety disorder] 366 (366:0) [Alcohol misuse]	*M* = 21.3 *SD* = 3.6	*Depression*: Patient Health Questionnaire-9 scale (PHQ 9). *General anxiety disorder (GAD)*: Generalized Anxiety Disorder (GAD-7) scale. *Alcohol misuse*: 3- item AUDIT-C.	Depression: 12.6% GAD: 14.6% Alcohol misuse: 68.6%

Gouttebarge et al. (2017b)	Finland, France, Ireland, Norway, South Africa, Spain, Sweden, and Switzerland.	295 (295:0)	*M* = 38.0 *SD* = 6.0	*Distress*: Distress Screener (based on the four-dimensional symptom questionnaire; 4DSQ). *Anxiety/depression*: 12-item General Health Questionnaire (GHQ-12). *Sleep disturbance*: Patient-Reported Outcomes Measurement Information System (PROMIS; short form). *Adverse alcohol use*: 3-item AUDIT-C.	Distress: 25% Anxiety/depression: 28% Sleep disturbance: 28% Adverse alcohol use: 24%
Decq et al. (2016)	France	239 (239:0)	*M* = 52.3 *SD* = 5.0	*Depressive disorder*: Patient Health Questionnaire-9 scale (PHQ 9).	Depressive disorder: 67.7%
Davies et al. (2017)	United Kingdom	259 (259:0) Number of responses differed on each measure 242 (242:0) [Anxiety] 241 (241:0) [Depression]	*M* = 60.1 *SD* = 16.1	*Anxiety/depression*: Self-reported physician-diagnosed morbidity and health-related quality of life (EQ-5D).	Anxiety: 7% Depression: 6%
Kilic et al. (2019)	Australia, England, France, Ireland, Italy, New Zealand, Pacific Islands (including Fiji, Samoa, Tonga), South Africa, Wales, Argentina, Canada & USA.	573 (573:0)	*M* = 25.9 *SD* = 4.4	*Distress:* Distress Screener (three items scored on a 3-point scale) which is based on the four-dimensional symptom questionnaire (4DSQ). *Anxiety/depression*: The 12-item General Health Questionnaire (GHQ-12) *Sleep disturbance*: Based on the (short form) Patient Reported Outcomes Measurement Information System (PROMIS). *Eating disorder:* The Eating disorder Screen for Primary care. *Adverse alcohol use:* 3-item AUDIT-C.	Distress: 20% Anxiety/depression: 32% Sleep disturbance: 12% Adverse alcohol use: 15% Eating disorder: 22%
Kola-Palmer et al. (2019)	United Kingdom and France	Survey 1 77 (77:0) Survey 2 168 (168:0)	*M* = 25.75 *SD* = 4.28 *M* = 24.89 *SD* = 4.62	*Depression/anxiety:* Five-item Mental Health Index (MHI-5) of the 36-item Short Form health survey (SF-36) was used.	Survey 1: Depression/anxiety: 45.5% Survey 2: Depression/anxiety: 38.5%
Nicholls et al. (2020)	United Kingdom (UK)	233 (233:0)	*M* = 24.35 *SD* = 5.20	*Depression/anxiety:* HADS is a 14-item self-report instrument to screen for clinical depressive and anxiety symptoms.	Depression: 11.6% Anxiety:18.9%

Figure 1

PRISMA Study Selection Flow Diagram