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ORIGINAL ARTICLE

A 12-month prospective cohort study of symptoms of common mental disorders among professional rugby players

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Abstract

The primary aims were to determine the 12-month incidence (and comorbidity) of symptoms of common mental disorders (CMD) among male professional rugby players and to explore their association with potential stressors. A secondary aim was to explore the view of male professional rugby players about the consequences of symptoms of CMD and related medical support/needs. An observational prospective cohort study with three measurements over a 12-month period was conducted among male professional rugby players from several countries. Symptoms of CMD (distress, anxiety/depression, sleep disturbance, eating disorders and adverse alcohol use) and stressors (adverse life events, rugby career dissatisfaction) were assessed through validated questionnaires. A total of 595 players (mean age of 26 years; mean career duration of 6 years) were enrolled, of which 333 completed the follow-up period. The incidence of symptoms of CMD were: 11% for distress, 28% for anxiety/depression, 12% for sleep disturbance, 11% for eating disorders and 22% for adverse alcohol use (13% for two simultaneous symptoms of CMD). Professional rugby players reporting recent adverse life events or career dissatisfaction were more likely to report symptoms of CMD but statistically significant associations were not found. Around 95% of the participants stated that symptoms of CMD can negatively influence rugby performances, while 46% mentioned that specific support measures for players were not available in professional rugby. Supportive and preventive measures directed towards symptoms of CMD should be developed to improve not only awareness and psychological resilience of rugby players but also their rugby performance and quality-of-life.

Keywords: Professional rugby, distress, anxiety, depression, sleep disturbance, adverse alcohol use

Highlights

- The incidence of symptoms of common mental disorders among professional rugby players ranges from 11% for distress and eating disorders to 28% for anxiety/depression.
- Professional rugby players reporting adverse life events or career dissatisfaction are more likely to report symptoms of common mental disorders.
- Raising self-awareness about symptoms of common mental disorders in professional rugby should be empowered.
- Measures should be developed to improve the psychological resilience, performance and quality of life of professional rugby players.

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Introduction

Symptoms of distress, anxiety/depression, sleep disturbance or substance abuse/dependence, also known as common mental disorders (CMD), are associated in the general population with several generic stressors, especially adverse life events (American Psychiatric Association, 2013; Krueger, Caspi, Moffitt, & Silva, 1998). Professional athletes are also exposed to adverse life events, but also to sport-specific stressors such as career dissatisfaction (Arnold & Fletcher, 2012; Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009). Previous studies conducted across different sports showed that professional athletes exposed to either adverse life events or career dissatisfaction were more likely to report symptoms of CMD than those unexposed (Gouttebarga, Aoki, Verhagen, & Kerkhoffs, 2017b; Gouttebarga et al., 2017c; Gouttebarga & Kerkhoffs, 2017d; Gouttebarga, Tol, & Kerkhoffs, 2016). Consequently, it seems that professional athletes are vulnerable to develop symptoms of CMD, especially those exposed to adverse life events and career dissatisfaction.

In professional rugby, most studies have focused on the occurrence of injuries and concussion, with less emphasis placed on understanding the symptoms of CMD among rugby players (Brown et al., 2013; Williams, Trewartha, Kemp, & Stokes, 2013). An international cross-sectional study of professional rugby players across countries showed that the prevalence (4-week) of symptoms of CMD ranged from 13% for sleep disturbance to 30% for anxiety/depression (Gouttebarga et al., 2017a). The study also showed that about 17% of the participants reported a comorbidity of two simultaneous symptoms of CMD (Gouttebarga et al., 2017a). In this study, associations between potential stressors and symptoms of CMD were not assessed, furthermore, the incidence and comorbidity of symptoms of CMD have not yet been investigated prospectively previously in professional rugby. Also lacking in the literature is information about the thoughts and needs of rugby players towards symptoms of CMD and related medical support. Gaining an understanding of these issues might enable the development of early intervention strategies for those identified at increased risk of, or showing early signs of, symptoms of CMD. Finally gaining a better understanding of these issues may have implications for service planning.

Consequently, the primary aims of the present study were to determine the 12-month incidence (and comorbidity) of symptoms of CMD (distress, anxiety/depression, sleep disturbance, eating disorders and adverse alcohol use) among male

professional rugby players and to explore the association of potential stressors (adverse life events, rugby career dissatisfaction) with the health conditions under study among those rugby players. A secondary aim was to explore the view of male professional rugby players about the consequences of symptoms of CMD and related medical support/needs.

Methods

Design

An observational prospective cohort study with three measurements over a follow-up period of 12 months was conducted. Ethical approval for the study was provided by the Human Research Ethics Committee of the Faculty of Health Sciences, University of Cape Town (HREC REF 013/2016; South Africa) and the Medical Ethics Review Committee of the Academic Medical Center (W15_060#15.0072; Amsterdam, The Netherlands). This study was done in accordance with the Declaration of Helsinki (World Medical Association, 2013).

Study setting and participants

Participants were professional rugby players fulfilling the following inclusion criteria: being (i) an active male professional player in rugby (Union, League, Sevens); (ii) 18 years or older and (iii) able to read and comprehend texts fluently in either English, French or Spanish. Professional rugby players were defined as players committing significant time (more than any other occupational activity) to rugby training and competing at the highest and second highest professional rugby level. The International Rugby Players' Association (IRPA) asked 9 national players' associations in Australia, England, France, Ireland, Italy, New Zealand, Pacific Islands (including Fiji, Samoa, Tonga), South Africa and Wales to assist in recruiting participants. In addition, the rugby unions from Argentina, Canada and United States were asked to assist in recruiting participants. Sample size calculation indicated that at least 196 participants were needed after follow-up (confidence interval of 95%; precision of 5%) to reach an anticipated and assumed population prevalence of 15% (Woodward, 2013). Considering a response rate of 33% (analogous with the response rate achieved in other prospective studies among professional athletes) and hypothesizing a loss to follow-up rate of 20% or less, we strived to invite at least 765 potential participants (Gouttebarga et al., 2017b; Gouttebarga & Kerkhoffs, 2017d). Recruitment procedures were

blinded to the researchers for reasons of privacy and confidentiality. Potential participants were invited for baseline measurement between March and August 2016.

Symptoms of CMD

Distress. Distress in the previous four weeks (baseline) and in the previous six months (follow-up) was measured using the Distress Screener (3 items scored on a 3-point scale), which is based on the four-dimensional symptom questionnaire (4DSQ) (e.g. 'Did you recently suffer from worry?') (Braam et al., 2009). The 4DSQ i.e. Distress Screener in English, French and Spanish has been validated for a recall period of up to several weeks (internal consistency: 0.6–0.7; test-retest coefficients: ≥ 0.9 ; criterion-related validity: Area Under ROC Curve ≥ 0.79) (Braam et al., 2009; Terluin et al., 2006). A total score ranging from 0 to 6 was obtained by summing up the answers on the three items, a score of 4 or more indicating the presence of distress (Braam et al., 2009; Terluin et al., 2006).

Anxiety/depression. The 12-item General Health Questionnaire (GHQ-12) was used to assess psychological symptoms related to anxiety/depression in the previous four weeks (baseline) and in the previous six months (follow-up) (e.g. 'Have you recently felt under strain?') (Goldberg et al., 1997). The GHQ-12 in English, French and Spanish has been validated for a recall period of up to several weeks (internal consistency: 0.7–0.9; criterion-related validity: sensitivity ≥ 0.70 , specificity ≥ 0.75 , Area Under ROC Curve ≥ 0.83) (Goldberg et al., 1997; Salama-Younes, Montazeri, Ismaïl, & Roncin, 2009). Based on the traditional scoring system, a total score ranging from 0 to 12 was calculated by summing up the answers on the 12 items, with a score of 3 or more indicating signs of anxiety/depression (Area Under Curve = 0.88) (Goldberg et al., 1997).

Sleep disturbance. Based on the PROMIS (short form), sleep disturbance in the previous four weeks (baseline) and in the previous six months (follow-up) was assessed through four single questions (e.g. 'Have you recently had problems sleeping?') scored on a 5-point scale (from 'not at all' to 'very much') (Buysse et al., 2010; Yu et al., 2011). The PROMIS in English, French and Spanish has been validated for a recall period of up to several weeks (internal consistency: >0.9 ; construct validity: product-moment correlations ≥ 0.96) (for detailed information, see www.nihpromis.org). A total score ranging from 1 to 20 is obtained by summing up the answers to the four questions, a score of 13 or

more indicating the presence of sleep disturbance (Buysse et al., 2010; Yu et al., 2011).

Eating disorders. The Eating disorder Screen for Primary care (5-items scored as 'yes' or 'no'; '0' for favourable answer, '1' for unfavourable answer) was used as a screening instrument to detect eating disorders in the previous four weeks (baseline) and in the previous six months (follow-up) (e.g. 'In the past four weeks, were you satisfied with your eating patterns?') (Cotton, Ball, & Robinson, 2003). The Eating disorder Screen for Primary care has been validated in English and French (criterion-related validity: sensitivity 100%, specificity 0.71) (Cotton et al., 2003). A total score ranging from 0 to 5 is obtained by summing up the answers on the five items, a score of 2 or more indicating the presence of eating disorders (Cotton et al., 2003).

Adverse alcohol use. Level of alcohol consumption at the present time (baseline) and in the previous six months (follow-up) was detected using the 3-item AUDIT-C (e.g. 'How many standard drinks containing alcohol do you have on a typical day?') (Dawson, Grant, Stinson, & Zhou, 2005). The AUDIT-C in English, French and Spanish has been validated for a recall period of up to several weeks (test-retest coefficients: 0.6–0.9; criterion-related validity: Area Under ROC Curve 0.70–0.97) (Dawson et al., 2005; De Menezes-Gaya, Waldo Zuardi, Loureiro, & Crippa, 2009). A total score ranging from 0 to 12 was obtained by summing up the answers on the three items, a score of 5 or more indicating the presence of adverse alcohol use (Dawson et al., 2005).

Stressors

Adverse life events. The validated Social Athletic Readjustment Rating Scale was used to explore the occurrence of adverse life events (e.g. 'Death of spouse', 'Change in financial state') in the previous six months (14 single questions; yes or no) (Bramwell, Masuda, Wagner, & Holmes, 1975). The sum of all recent adverse life events occurred was transformed into a categorical variable: 0 adverse life events, 1 or 2 adverse life events, and 3 or more adverse life events.

Rugby career dissatisfaction. Professional rugby career dissatisfaction was explored at baseline through the validated Greenhaus scale (e.g. 'I am satisfied with the success I have achieved in my career') (5 items on a 5-point scale) (Greenhaus, Parasuraman, & Wormley, 1990). A total score (5–25) was obtained by summing up the answers to the five items and subsequently transformed into a dichotomous variable: 5–12 as being dissatisfied with rugby career and 13–25 as being satisfied (Greenhaus et al., 1990).

View on consequences, support and needs

Four single statements, previously used in a similar study and developed by the research team and representatives from the professional rugby community, were used to explore the view of the participants on consequences, support and needs related to symptoms of CMD, namely (Goutteborge & Kerkhoffs, 2017d): (i) whether symptoms of CMD negatively can influence rugby performances; (ii) whether symptoms of CMD have negatively influenced their own rugby performances; (iii) whether they have ever had the need to seek medical help for their symptoms of CMD; (iv) whether specific support measures for players are available in professional rugby to properly manage symptoms of CMD. These statements were measured on a 5-point scale, from 'strongly disagree' to 'strongly agree'.

Procedures

A baseline and two follow-up electronic anonymous questionnaires were set up in English, French and Spanish (FluidSurveys™), including all variables from the study. In addition, the following descriptive variables were added: age, height, body mass, duration of professional rugby career, field position (forward or back), level of play, level of education, other employment and family history of mental disorders. Each questionnaire took about 15–20 minutes to complete. Information about the study was sent via email to potential participants by the participating countries. Players interested in participating in the study gave their informed consent and were given access to the baseline online questionnaire, which they were asked to complete within two weeks. At the end of the baseline questionnaire, participants could leave their email address and give their informed consent for the follow-up online questionnaires. Follow-up questionnaires were sent per email 6 and 12 months later; participants were asked to complete them within 2 weeks. Reminders at baseline and follow-up were sent after two and four weeks. The responses to baseline and follow-up questionnaires were anonymised for reasons of privacy and confidentiality. Once completed, the electronic questionnaires were saved automatically on a secured electronic server that only the principal researcher could access. Players participated voluntarily in the study and did not receive any reward for their participation.

Statistical methods

All data analyses were performed using the statistical software IBM SPSS Statistics 23.0 for Windows. Descriptive data analyses (mean, standard deviation, frequency and range) were performed with all

variables measured at baseline. To explore whether loss to follow-up was selective, we compared baseline characteristics (all descriptive variables) of non-responders and responders at follow-up by means of an independent *T*-test (Woodward, 2013). Incidence (and comorbidity) of symptoms of CMD were calculated over the follow-up period of 12 months, using the Wald method (sample size of more than 150 persons) for 95% confidence intervals (95% CI) (Woodward, 2013). Incidence was expressed as a percentage and calculated as the proportion of the number of participants with a newly given symptom of CMD during the 12-month follow-up relative to the total number of players without any symptom of CMD at baseline. Comorbidity of two, three, four or five simultaneous symptoms of CMD was defined as the simultaneously presence of two, three, four or five symptoms of CMD (respectively) among the participants. Comorbidity was expressed as a percentage and calculated as the proportion of the number of participants with newly developed two, three, four or five simultaneous symptoms of CMD during the 12-month follow-up relative to the total number of players without any symptom of CMD at baseline. The relative risks (RR) and related 95% CI were calculated in the group of players without any mental health problems at baseline to explore the strength of the association between potential baseline stressors and the onset of symptoms of CMD during the subsequent 12-month follow-up (Woodward, 2013). For our secondary aim, frequencies were calculated for the four single statements.

Results*Participants*

From the 941 participants available at baseline, 595 gave their written informed consent to participate in the follow-up study (response rate of 63%). After the follow-up period of 12 months, a total of 333 players had completed the follow-up (follow-up rate of 56%). The flowchart of the recruitment of the participants is presented in [Figure 1](#). The mean age, height and body mass of the participants at baseline was 26 years (SD = 4), 185 cm (SD = 9) and 101 kg (SD = 15), respectively. Participants (62% forwards, 37% backs) were playing professional rugby for 6 years on average, 74% playing at the highest club level in their country (mostly in Rugby Union). All characteristics of the participants are presented in [Table I](#).

Incidence and comorbidity of symptoms of CMD

The incidence of (newly developed) symptoms of CMD among professional rugby players over the

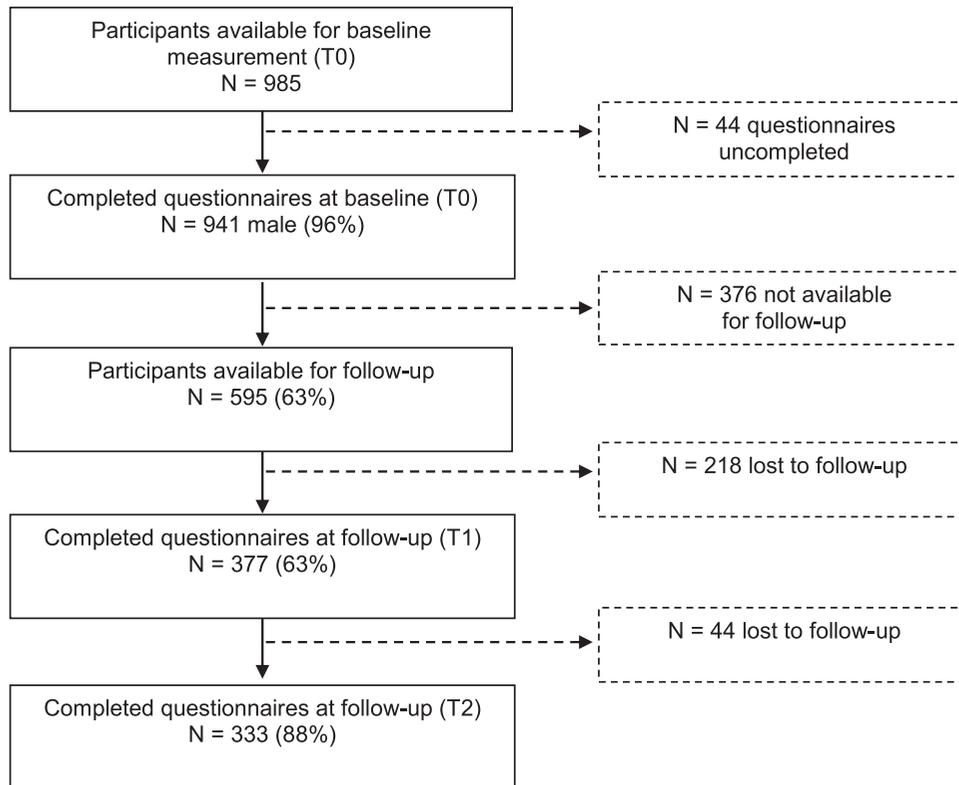


Figure 1. Flowchart of the recruitment and follow-up of the professional rugby players.

follow-up period of 12 months was 11% for symptoms of distress and eating disorders, 12% for sleeping disturbance, 22% for adverse alcohol use and 28% for symptoms of anxiety/depression. About 13% of the participants reported two simultaneous symptoms of CMD, 5% three simultaneous symptoms of CMD and 1% four simultaneous symptoms of CMD. All incidence rates are presented in Table II.

Potential association between stressors and symptoms of CMD

The stressors under study inferred with most symptoms of CMD but none of the associations were statistically significant. For instance, one or two adverse life events occurred in the previous six months inferred with symptoms of anxiety/depression (RR = 2.1; 95% CI = 0.6–7.0). Rugby career dissatisfaction inferred with sleeping disturbance (RR = 1.9; 95% CI = 0.2–17.9), eating disorders (RR = 1.4; 95% CI = 0.3–8.3) and adverse alcohol use (RR = 2.5; 95% CI = 0.4–15.4). All RR and related 95% CI are presented in Table III.

View on consequences, support and needs

Most of the professional rugby players (94%) stated that symptoms of CMD could negatively influence

the performances of players. Around half of the players (47%) revealed that their mental health had negatively influenced their performances at some point(s) during their professional rugby career. Only 15% of the professional rugby players reported that they had sought (medical) support during their career because of their symptoms of CMD. Almost half of the players (46%) mentioned that the support measures they had access to for managing their mental health problems were inadequate.

Discussion

The incidence of symptoms of CMD among professional rugby players ranged from 11% for distress and eating disorders to 28% for anxiety/depression. Around 13% of the participants reported two simultaneous symptoms of CMD over the follow-up period. Although professional rugby players reporting recent adverse life events or career dissatisfaction were more likely to report symptoms of CMD, there were no statistically significant associations. Around 95% of the participants stated that symptoms of CMD can negatively influence rugby performances, while 46% mentioned that specific support measures for players were inadequate in professional rugby.

Table I. Baseline characteristics of the professional rugby players

	Total (N = 595)	No CMD (N = 267)	CMD (N = 328)
Age (in years; mean \pm SD)	26 \pm 4	26 \pm 5	26 \pm 4
Height (in cm; mean \pm SD)	185 \pm 9	185 \pm 9	185 \pm 9
Weight (in kg; mean \pm SD)	101 \pm 15	100 \pm 14	102 \pm 15
Career duration (in years; mean \pm SD)	6 \pm 4	6 \pm 4	6 \pm 4
Field position (%)			
<i>Forward</i>	62	59	64
<i>Back</i>	38	41	36
Level of rugby (%)			
<i>Highest club level</i>	74	70	76
<i>Second highest club level</i>	26	30	24
Educational level (%)			
<i>No schooling completed</i>	1	2	1
<i>Nursery/elementary school</i>	0	0	0
<i>High school</i>	39	37	41
<i>Vocational/technical school</i>	8	7	9
<i>College, university or equivalent</i>	52	54	49
Adverse life events (%)			
<i>None</i>	35	42	29
<i>One or two</i>	51	47	55
<i>Three or more</i>	14	11	16
Career dissatisfaction (%)	10	5	13
Baseline prevalence (%)			
<i>Distress</i>	20		
<i>Anxiety/depression</i>	32		
<i>Sleep disturbance</i>	12		
<i>Eating disorders</i>	21		
<i>Adverse alcohol use</i>	15		

Note: N, number of participants; no CMD, group without symptoms of common mental disorders at baseline; CMD, group with symptoms of common mental disorders at baseline; SD, standard deviation; cm, centimetres; kg, kilograms; %, percentage.

Comparison with other professional i.e. elite athletes

Longitudinal studies exploring the occurrence of newly developed symptoms of CMD in professional i.e. elite sports are scarce. In professional football, a 12-month prospective cohort study on symptoms of CMD showed incidence rates ranging from 12% (distress) to 37% (anxiety/depression) among 262 European players (mean age of 27 years; mean career duration of 8 years) recruited in Finland, France, Norway, Spain and Sweden (Goutteborge et al., 2017b). Six-month incidence of symptoms of CMD ranged from 11% (sleeping disturbance) to

21% (anxiety/depression) among Gaelic athletes (mean age of 25 years; mean career duration of 5 years), from 6% (distress and adverse alcohol use) to 22% (eating disorders) among 135 professional ice hockey players (mean age of 26 years; mean career duration of 5 years), and from 9% (distress) to 15% (anxiety/depression, sleep disturbance and adverse alcohol use) among 78 South African professional cricketers (87% male; mean age of 27 years; mean career duration of 6 years) (Goutteborge et al., 2016; Goutteborge & Kerkhoffs, 2017d; Schuring, Kerkhoffs, Gray, & Goutteborge, *In press*). Among Dutch elite athletes across sport disciplines (N = 203; 36% male), 12-month incidence of symptoms of CMD ranged from 6% (adverse alcohol use) to 57% (anxiety/depression), while around 17% reported two simultaneous symptoms of CMD (Goutteborge et al., 2017c). All the incidence rates in our study of professional rugby players are similar to the incidence rates of professional athletes from other sports disciplines.

Players' perceptions related to performances

Most of the professional rugby players enrolled in our study believed that symptoms of CMD could

Table II. 12-month incidence of symptoms of common mental disorders among professional rugby players

	Incidence	95% CI
Distress	11	6–16
Anxiety/depression	28	21–35
Sleep disturbance	12	7–17
Eating disorders	11	6–16
Adverse alcohol use	22	15–29
Comorbidity – 2 symptoms	13	8–19
Comorbidity – 3 symptoms	5	2–9
Comorbidity – 4 symptoms	1	>0–3

Note: 95% CI, confidence interval.

Table III. Association (relative risk and 95% CI) between stressors and symptoms of common mental disorders among professional rugby players

		Distress	Anxiety/depression	Sleeping disturbance	Eating disorders	Adverse alcohol use
Adverse life events	0	1.0	1.0	1.0	1.0	1.0
	1–2	1.8 (0.4–9.1)	2.1 (0.6–7.0)	1.6 (0.3–8.2)	1.3 (0.2–6.5)	1.3 (0.3–5.1)
	≥3	0.5 (0.1–3.1)	1.1 (0.3–3.8)	0.8 (0.1–4.3)	1.0 (0.2–5.0)	1.8 (0.5–7.1)
Rugby career dissatisfaction	No	1.0	1.0	1.0	1.0	1.0
	Yes	0.9 (0.8–1.0)	1.4 (0.3–8.3)	1.9 (0.2–17.9)	2.0 (0.2–19.3)	2.5 (0.4–15.4)

negatively influence their rugby performances, while nearly half of them revealed that their mental health had negatively affected their own performances at some point(s) during their professional rugby careers. This concurs with the authors' assumption and the scientific literature that symptoms of CMD are likely to interfere with several aspects essential to the performance of professional athletes such as, concentration and focus, coordination and emotion (Rice et al., 2016). Professional rugby players, like most professional athletes, are often expected by coaches, general public and media to be 'mentally tough', with the emphasis on their physical performance and physical health at the expense of their mental wellbeing (Bär & Markser, 2013). This seems to be supported by our results, namely that only 15% of the professional rugby players sought (medical) support during their career because of their symptoms of CMD. Further effort is needed to tackle the stigma associated with symptoms of CMD in rugby (including the education of players, coaches, support staff and management) and to further develop appropriate psychological support measures for these players.

Implications towards support measures

The results of our 12-month longitudinal study allow us to assume that a professional rugby team, typically relying on a total size of 40 players, can expect symptoms of CMD to occur among at least four players over the course of one season. While one might argue that these symptoms of CMD reported by the players might be highly volatile over time (much less severe than clinically diagnosed CMD), those symptoms are, as mentioned in our study, likely to affect rugby performances negatively. Consequently, symptoms of CMD should receive as much attention and resourcing as physical health issues in professional rugby. Even if we did not find any statistically significant association in our study, monitoring the occurrence of stressors among professional rugby players during their sport career should remain one of the priorities of their support teams. These support teams should be based on

interdisciplinary experts, including psychologists who can provide psychotherapeutic or clinical interventions to players. Furthermore, such interdisciplinary teams could enable the early identification of players at risk and their timely reference to adequate supportive measures.

Next to the above, the authors believe that this international study plays a significant role in raising awareness about symptoms of CMD among all the different stakeholders in professional rugby. Most of the professional sports, including rugby, continue to struggle against the shadow of stigma commonly associated with symptoms of CMD among athletes. To that end, it remains essential that professional rugby players, as any other human being, appraise and cope optimally with the social and sport-specific stressors that are likely to induce symptoms of CMD. From a club's perspective, as symptoms of CMD are likely to occur among four players over one season, offering multidisciplinary medical care and support to professional rugby players where required should be a minimum standard. This should empower the performances of professional rugby players, as well as their quality-of-life.

Methodological considerations

While 63% of the participants included at baseline were available for the follow-up measurements, a follow-up rate of 56% after 12 months was secured. As far as survey research is concerned, epidemiologists have suggested several acceptable follow-up rates, from 50% as adequate to 70% as very good or 80% as required (Kristman, Manno, & Côté, 2004). Consequently, the modest 56% follow-up rate in our study could be seen as adequate, also because baseline characteristics from the group of responders at follow-up were not different from the group of participants lost to follow-up.

In our study, symptoms of CMD were measured through self-report, which should not be misinterpreted as clinically diagnosed mental disorders. The validated scales used generally rely on a recall period ranging from one to several weeks, involving also a recall period of a few months by exploring a

current health status 'in general'. At follow-up, we retrieved information about the mental health status of the participants over the previous six months, while a monthly survey might have generated more valid data. Furthermore, the measurement's quality of any screening instrument is a common concern. We need to mention that the validated scales used in our study did not have a sensitivity and specificity of 100% and therefore, false positives and false negatives in our study cannot be ruled out. This might have had a slight influence on the outcomes of our study. Another methodological aspect worth mentioning is that the four statements used to explore the view of the participants on consequences, support and needs related to symptoms of CMD, were developed by the research team and representatives from the professional rugby community. The authors cannot exclude that the answer on these statements might differ between the participants with symptoms of CMD and those without symptoms of CMD.

The strengths of our study are the longitudinal design applied to explore a difficult topic in a large group of professional rugby players. To the authors' knowledge, this is the first international prospective cohort study about symptoms of CMD among professional rugby players. In professional rugby as well as in other professional sports, there is still a stigma on symptoms of CMD, which makes it difficult to conduct a large study about the topic among rugby players. In our longitudinal study, we secured the participation of more than 300 players, which is a good sample as indicated by our preliminary sample size calculation.

Conclusion

The incidence of symptoms of CMD among professional rugby players ranged from 11% for distress and eating disorders to 28% for anxiety/depression, while around 13% of the participants reported two simultaneous symptoms of CMD over the follow-up period. Professional rugby players reporting recent adverse life events or career dissatisfaction were more likely to report symptoms of CMD but no statistically significant associations were found. Raising self-awareness about symptoms of CMD in professional rugby should be empowered. Measures should be developed to improve not only the psychological resilience of players but also their performance and quality-of-life.

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