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Symptoms of common mental disorders among professional football referees: a one-season prospective study across Europe

Vincent Gouttebarge, Urban Johnson, Pierre Rochcongar, Philippe Rosier, and Gino Kerkhoffs

ABSTRACT

Objective: The primary aim of this study was to determine the prevalence and one-season incidence of symptoms of common mental disorders (CMD; distress, anxiety/depression, sleep disturbance, eating disorders, and adverse alcohol use) among European professional football referees. A secondary aim was to explore the view of European professional football referees on consequences, support and needs related to these symptoms.

Methods: An observational prospective cohort study with three measurements over a follow-up period of one season (2015–2016) was conducted among central or assistant professional football referees from Belgium, Finland, France, Germany, Norway, Russia, Scotland and Sweden. Using validated questionnaires to assess symptoms of CMD (self-reported and not clinically diagnosed), an electronic questionnaire in English and French was set up and distributed by the eight football federations involved.

Results: A total of 391 referees (mean age of 33 years old; mean career duration of 7 years) were enrolled, of which 292 completed the follow-up period. Baseline 4-week prevalence rates were 6% for distress, 12% for anxiety/depression, 9% for sleep disturbance, 19% for eating disorders and 17% for adverse alcohol use. The one-season incidence of symptoms of CMD was 10% for distress, 16% for anxiety/depression, 14% for sleep disturbance, 29% for eating disorders and 8% for adverse alcohol use.

Conclusion: While symptoms of CMD occur among professional football referees and can influence negatively refereeing performances, the development of specific support measures for referees is needed in order to manage properly these symptoms of CMD.

1. Introduction

Within professional football (soccer), most of the scientific health studies have been directed toward players’ physical health. By contrast, empirical evidence about the health of referees, another essential actor within professional football, remains limited. As a consequence of high biomechanical and energetic loads combined with increasing age, professional football central (being within the field of play) and assistant (being on the sideline) referees have an incidence of noncontact match injuries similar to players, namely 18 injuries per 1000 match hours [1,2]. Three-quarters of the injuries among professional referees are to the lower leg and around 55% to muscles [1,2].

Recently, several studies have shown that symptoms (self-reported and not clinically diagnosed) of distress, anxiety, depression, eating disorders, or substance abuse/dependence—typically referred to as common mental disorders (CMD)—are prevalent among professional footballers [3,4]. In Finland, France, Norway, Spain, and Sweden, the prevalence of symptoms of CMD ranges from nearly 20% for distress and adverse alcohol use to 43% for anxiety/depression [5]. In Switzerland, the prevalence of depression in elite male and female football was found to be similar to the general population, reaching nearly 8% for mild-to-moderate depression [6]. By contrast, to our knowledge, scientific evidence about symptoms of CMD among professional football referees is not available yet. This is surprising because as elite athletes, professional football referees are functioning in a difficult psychosocial environment and exposed to both physical and psychosocial stressors such as energetic and physical load, injuries, social pressure, and media scrutiny [7]. In addition, professional football referees are exposed to stressors related to having a dual career as they generally combine their refereeing career with another occupational career, a situation being shared with elite athletes in various sports [8].

It is therefore likely that professional football referees might suffer from symptoms of CMD as well as elite athletes from
other sports, while support measures directed toward these symptoms of CMD might not be available yet. Consequently, the primary aim of this study was to determine the prevalence and one-season incidence of symptoms of CMD (distress, anxiety/depression, sleep disturbance, eating disorders, adverse alcohol use) among European professional football referees. A secondary aim was to explore the view of European professional football referees on consequences, support, and needs related to these symptoms of CMD.

2. Methods

2.1. Design

An observational prospective cohort study with three measurements over a follow-up period of one season (from July 2015 to May 2016) was conducted among professional football referees. Ethical approval for the study was provided by the Medical Ethics Review Committee of the Academic Medical Center (W15_050#15.0061; Amsterdam, The Netherlands). The present research was conducted in accordance with the Declaration of Helsinki [9].

2.2. Study setting and participants

Because of their interest in the mental health of their referees, the football federations from Belgium, Finland, France, Germany, Norway, Russia, Scotland, and Sweden participated in the study and assisted in the recruitment of participants. Inclusion criteria were: (i) being active as central or assistant referee in a professional football league; (ii) being 18-years old or older; and (iii) being able to read and comprehend texts fluently in either English or French. With regard to the primary aim of the study, sample size calculation indicated that at least 138 participants were needed to detect with a precision of 5% that one out of 10 professional football referees suffer from a mental health condition (power of 80%; confidence interval of 95%) [10]. Expecting a response rate of around 40% (based on recent similar studies in professional sports) and a loss to follow-up at 20%, we intended to invite at least 440 referees [3,4]. The eight European football federations were asked to invite between 40 and 80 referees per country fulfilling the inclusion criteria. Contact details of potential participants were blinded to the responsible researchers for reasons of privacy and confidentiality. Potential participants were invited by the football federations in June–July 2015.

2.3. Symptoms of CMDs

2.3.1. Distress

Distress in the previous 4 weeks (baseline) and in the previous 6 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?’) [11]. The 4DSQ i.e. Distress Screener in English and French 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) [11,12]. 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 [11,12].

2.3.2. Anxiety/depression

The 12-item General Health Questionnaire (GHQ-12) was used to assess psychological symptoms related to anxiety/depression in the previous 4 weeks (baseline) and in the previous 6 months (follow-up) (e.g. ‘Have you recently felt under strain?’) [13]. The GHQ-12 in English and French 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) [13]. 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) [13].

2.3.3. Sleep disturbance

Based on the PROMIS (short form), sleep disturbance in the previous 4 weeks (baseline) and in the previous 6 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’) [14,15]. The PROMIS in English and French 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 [14,15].

2.3.4. Eating disorders

The Eating disorder Screen for Primary care (5-items scored as ‘yes’ or ‘no’; ‘0’ for favorable answer, ‘1’ for unfavorable 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?’) [16]. The Eating disorder Screen for Primary care has been validated in English and French (criterion-related validity: sensitivity 100%, specificity 0.71) [16]. 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 [16].

2.3.5. Adverse alcohol use

Level of alcohol consumption at the present time (baseline) and in the previous 6 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?’) [17]. The AUDIT-C in English and French 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) [17,18]. 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 [17].
2.4. View on consequences, support, and needs

Four single statements were used to explore the view of the participants on consequences, support, and needs related to symptoms of CMD, namely (i) whether symptoms of CMD can influence negatively refereeing performances, (ii) whether participants have ever sought medical help for their symptoms of CMD, (iii) whether specific support measures for referees are available by their Football Association in order to manage properly symptoms of CMD, and (iv) whether the development of specific support measures for referees are needed in order to manage symptoms of CMD. These statements were measured on a 5-point scale, from ‘strongly disagree’ to ‘strongly agree’.

2.5. Procedures

A baseline and two follow-up electronic questionnaires available in English and French were set up (FluidSurveysTM), involving the following descriptive variables: age, height, body mass, duration of professional football referee career, main function (central or assistant referee), level of education, and any occupation beside refereeing (hours per week). Each questionnaire took about 15–20 min to complete. Information about the study was sent per email to potential participants by the European football federations. Participants interested in the study gave their informed consent and were given access to the baseline online questionnaire, which they were asked to complete within 1 week. 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 five and 10 months later, being asked to complete them within 1 week. Reminders at baseline and follow-up were sent after one and two weeks. The responses to baseline and follow-up questionnaires were coded and anonymized 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. Referees participated voluntarily in the study and did not receive any reward for their participation.

2.6. 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, range) were performed with all descriptive variables measured at baseline. To explore whether loss to follow-up was selective, we compared baseline characteristics (all descriptive variables) of nonresponders and responders at follow-up by means of independent T-tests [10]. For our primary aim, prevalence (4-week) and incidence (one-season) of symptoms of CMD were calculated, using the Wald method (sample size of more than 150 persons) or adjusted Wald method (sample size of 150 persons or less) for 95% confidence intervals (95% CI) [10]. Prevalence (expressed as a percentage) was calculated as the proportion of the number of participants with a given symptom of CMD relative to the total number of participants [10]. 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 one-season follow-up relative to the total number of participants without any symptom of CMD at baseline [9]. For our secondary aim, frequencies were calculated for the four single statements.

3. Results

3.1. Participants

A sample of 646 professional football referees were contacted by the football federations from Belgium, Finland, France, Germany, Norway, Russia, Scotland, and Sweden. Of those, 391 gave their written informed consent to participate in the study (response rate of 61%). After the one-season follow-up period, a total of 292 professional football referees had completed the follow-up questionnaires (follow-up rate of 75%). No statistically significant difference was found between nonresponders and responders at follow-up. The mean age of the 391 participants at baseline was 33-years old and they were refereeing in professional football for 7 years on average (45% as central referee; 55% as referee assistant). More than nine out of 10 participants were employed aside refereeing, working on average for 36 h a week in addition to refereeing. All characteristics of the participants are presented in Table 1.

3.2. Prevalence and incidence of symptoms of CMD

Baseline prevalence (4-week) of symptoms of CMD (self-reported and not clinically diagnosed) among professional football referees was 6% for distress, 12% for anxiety/depression, 9% for sleep disturbance, 19% for eating disorders, and 17% for adverse alcohol use. The incidence of symptoms of CMD among professional football referees over the follow-up period of one season was 10% for distress, 16% for anxiety/depression, 14% for sleep disturbance, 29% for eating disorders and 8% for adverse alcohol use. All prevalence and one-season incidence rates (and 95% CI) are presented in Table 2.

3.3. View on consequences, support, and needs

More than 90% of the European professional football referees thought that symptoms of CMD can influence negatively their participation.

Table 1. Baseline characteristics of the participants (N = 391).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years; mean ± SD)</td>
<td>33 ± 7</td>
</tr>
<tr>
<td>Height (in cm; mean ± SD)</td>
<td>180 ± 7</td>
</tr>
<tr>
<td>Weight (in kg; mean ± SD)</td>
<td>76 ± 9</td>
</tr>
<tr>
<td>Duration refereeing career (in years; mean ± SD)</td>
<td>7 ± 5</td>
</tr>
<tr>
<td>Main refereeing function (%)</td>
<td>45</td>
</tr>
<tr>
<td>Central referee</td>
<td>55</td>
</tr>
<tr>
<td>Assistant referee</td>
<td></td>
</tr>
<tr>
<td>Educational level (%)</td>
<td>2</td>
</tr>
<tr>
<td>Nursery/Elementary school</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>15</td>
</tr>
<tr>
<td>Vocational/technical school</td>
<td>9</td>
</tr>
<tr>
<td>College, university (equivalent)</td>
<td>74</td>
</tr>
<tr>
<td>Employed aside refereeing (%)</td>
<td>92</td>
</tr>
</tbody>
</table>
| Working hours per week (mean ± SD) | 36 ± 8          

N: number of participants; SD: standard deviation; cm: centimeters; kg: kilograms; %: percentage.

Table 2. Prevalence and incidence rates of symptoms of CMD (N = 391).

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Prevalence (4-week)</th>
<th>Incidence (one-season)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distress</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>12%</td>
<td>16%</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>9%</td>
<td>14%</td>
</tr>
<tr>
<td>Eating disorders</td>
<td>17%</td>
<td>29%</td>
</tr>
<tr>
<td>Adverse alcohol use</td>
<td>8%</td>
<td>8%</td>
</tr>
</tbody>
</table>
refereeing performances but only 18% of them did seek medical help for their symptoms of CMD. Around 17% reported that specific support measures are available by their Football Association in order to manage properly symptoms of CMD, and almost 70% stated that the development of specific support measures for referees was needed.

4. Discussion

The main finding of this study was that the prevalence of symptoms of CMD (self-reported and not clinically diagnosed) among professional football referees ranged from 6% for distress to 31% for eating disorders, and the one-season incidence from 8% for adverse alcohol use to 29% for eating disorders. While symptoms of CMD can negatively influence refereeing performances, professional football referees reported that the development of specific support measures for them are needed in order to manage these symptoms of CMD properly.

4.1. Comparison with athlete populations

In recent years, studies on symptoms of CMD using the same scales as those used in our study were conducted among current and retired athletes from several sports, allowing us to make some valid, that is, licit comparisons. In professional football, studies conducted from 2013 to 2015 among current and retired players showed that 4-week prevalence ranged from 9–19% for adverse alcohol use to 26–38% for anxiety/depression, while 12-month incidence ranged from 11–12% for distress to 29–37% for anxiety/depression [3–5,19–21]. A prospective cohort study conducted among 204 elite Gaelic athletes showed 4-week prevalence of symptoms of CMD ranging from 23% for adverse alcohol use to 48% for anxiety/depression, while 6-month incidence ranged from 11% for sleep disturbance to 21% for anxiety/depression [22]. Among retired professional Rugby Union players, 4-week prevalence of symptoms of CMD ranged from 24% to 29% [23]. All the prevalence rates found in our study among European professional football referees are similar to the ones found among athletes. In the previously mentioned studies, since eating disorders were not assessed using the same scale as in our study, a comparison is difficult to make. However, we do not have any reasons to believe that football referees are at greatly increased risk for eating disorders compared to other sports.

4.2. Comparison with other populations

It has been estimated that around 38% of the European population suffer yearly from a mental disorder but it is essential to mention that outcome measures related to CMD were not assessed using the same scales as those used in our study [24]. In other studies, prevalence of anxiety/depression was found to range from 13% to 19% in Australia (general population), from 17% to 21% in Denmark (practice population), and from 17% to 25% in the Netherlands (general and practice population, young male employees) [25–28]. Prevalence of distress in both young and older working populations was reported to range from 5% to 18% [25]. In all these studies, outcome measures were assessed using similar scales to our study, which might suggest that symptoms of CMD among professional football referees might parallel scores from other populations. However, one might be cautious with these comparisons as matched data (for instance on age and gender) were not used.

4.3. Implications for professional football

Regarding professional footballers, a necessary first step is to raise the self-awareness among all football stakeholders about symptoms of CMD that might occur during the career of a referee. This needs to be prioritized since stigma and the lack of documentation, that is, information, about such a topic seem to be the most important perceived barriers to seeking help for symptoms of CMD in elite sports [29]. This concurs with our findings: professional football referees stated that symptoms of CMD can negatively influence refereeing performances but only 18% of them actually experienced the need to seek medical help for their symptoms of CMD.

The large majority of professional football referees stated that specific support measures were needed to be specifically developed and tailored for referees in order to manage symptoms of CMD. In our study, we did not gather information about which support measures were needed by referees. Consequently, the needs of professional football referees must be assessed and subsequently be taken into consideration for the development of measures in order to increase the chance of successful implementation. As symptoms of CMD continue to be something one does not openly talk about in sports, evidence-based e-Health interventions available online and based on a self-management approach might be relevant in order to monitor and manage symptoms of CMD and their impacts on refereeing performances, emotions and quality of life. Another potential intervention for referees might be group courses or workshops related to relevant themes, such as the management of motivational/emotional stress, self-confidence and refereeing under pressure. Such courses or workshops might be offered to professional football referees during the pre-
and/or on-season meetings. Whether referees would prefer online e-Health interventions or group courses, that is, workshops as support measures to manage symptoms of CMD remains unknown and should be explored.

4.4. Further scientific directions

Further scientific studies should focus among others on the identification of the psychosocial stressors (and related mediating variables) that play a role in the occurrence of symptoms of CMD among professional football referees [30]. Previous studies among professional, that is, elite, athletes showed that severe musculoskeletal injuries, lack of social support and adverse life events were related to the occurrence of symptoms of CMD [3–5,19–22]. Knowledge on relevant psychosocial stressors during the career of a football referee might allow the early identification of referees at risk for symptoms of CMD and the application of evidence-based interventions. A qualitative study exploring the needs of professional football referees with regard to evidence-based interventions is also imperative.

4.5. Methodological considerations

Several methodological considerations should be acknowledged. As in any longitudinal study, one of our concerns was to include sufficient participants at baseline and avoid loss to follow-up. While an acceptable response rate of 61% at baseline was reached, the follow-up rate after one season was 75%. As far as survey research is concerned, epidemiologists have suggested several acceptable follow-up rates, from 50% as adequate to 70% as very good [31]. Consequently, the 75% follow-up rate in our study can be rated as very good, even more so, knowing that baseline characteristics from the group of responders at follow-up were not different from the group of participants lost to follow-up.

Information about the study was sent to potential participants by the football federations, and for privacy and confidentiality reasons, the contact details of the invited referees were blind to the researcher. Consequently, nonresponse analysis could not be conducted, which is always a limitation in epidemiological studies. In addition, as in any scientific study, participants were free to participate in the study and thus self-selected. This might have led to selection bias as participants with more interest in symptoms of CMD might have been more likely to participate.

We used validated scales that were not time consuming, and that relied on a recall period from 1 week to several months to assess symptoms of CMD. During the one-season follow-up, we retrieved information about the mental health status of the participants over the previous 5 months, while a bi-monthly survey might have generated more valid data. In addition, the scales used to measure symptoms of CMD were validated in English and French, and thus not administered in the native language of the participants from Belgium, Finland, Germany, Norway, Russia, and Sweden. Nevertheless, we do not believe that this aspect was a problem as (i) an inclusion criterion was that the participants were able to read and comprehend texts fluently in either English or French, and (ii) most referees are involved in continental competitions and/or tournaments in which English is the accepted language.

A final limitation worth mentioning is the absence of a control group drawn from the general population in all participating countries. Such a control group would have allowed us to make even more valid comparisons with our study cohort but it was simply not feasible.

5. Conclusion

The 4-week prevalence of symptoms of CMD (self-reported and not clinically diagnosed) among professional football referees ranged from 6% for distress to 31% for eating disorders, and the one-season incidence from 8% for adverse alcohol use to 29% for eating disorders. All the prevalence rates found in our study among European professional football referees are similar to the ones found among elite athletes. While symptoms of CMD can negatively influence refereeing performances, professional football referees reported that the development of specific support measures for them are needed in order to manage properly these symptoms of CMD.

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Declaration of interest

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