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Football does not improve mental health: a systematic review on football and mental health disorders

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Abstract

Objective: Both football (also called association football or soccer) and mental health disorders have a global impact on the lives of billions of people. Football has been used to approach and support subjects with or at risk of mental health disorders. However, it is not clear if football itself has any beneficial effect on the mental health of players, fans or spectators. Consequently, the aim of the current systematic review was to examine if playing or watching football impacts on the frequency of mental health problems in people who are involved in playing or watching the game.

Methods: We performed a systematic review on the relationship between football and mental health disorders. A total of 662 abstracts were screened initially. We identified 17 relevant papers assessing the prevalence of mental health disorders in current and previous football players, referees or spectators.

Results: The prevalence and 12 months incidence of mental health problems in active and retired professional players and referees were similar to or higher than those found in the general population, possibly as response to osteoarthritis, severe injuries, career dissatisfaction, low social support and poor employment status after retirement. Studies in adolescent amateurs and spectators indicate that playing and watching football games may negatively affect subjective mental health, even though qualitative studies indicate mental health benefits of playing or watching football.

Discussion: Players, referees and spectators are unlikely to present with fewer mental health problems than other members of society as a result of their involvement with football. It appears that some of the infrastructure that supports resilience in mental health such as a sense of inclusion, shared purpose and positive peer identification might be developed by playing in or supporting a team. Strategies that may use the assumed positive aspects of football need to be validated before implementation of large projects.

Keywords

Football, soccer, mental health, depression, anxiety, players, referees, spectators.

INTRODUCTION

Football is a global game and a huge international business. The game is played for 90 min by two teams of 11 players, both teams trying to score by hitting the one ball with the foot (or leg or head, but not the hands) into the opponents' goal. The game is called football in Europe, Asia and South America, but soccer (shortened form Association football) in North America, Australia and South Africa, essentially to distinguish football, respectively soccer, from other versions of regional football games such as American or Australian football. The latter have some commonalities with Rugby and thus will not be addressed in the current paper.

Football in society

Football affects billions of people in the world, that is, from the world famous, very well paid professionals down to the unpaid amateur players on a wet muddy pitch on a cold December morning. It impacts sometimes highly significantly on the lives of fans and spectators who watch avidly by attending matches or watching on TV. It is often a defining characteristic of a person's self-identity. Early 'getting to know you' conversations can include questions about your job, whether you have children, your marital status and 'which team do you support?' Having a successful team can increase awareness of a town or city anywhere in the world and can have a huge economic impact on that town or city.

The incredible passion, loyalty and fanaticism that supporting a team can engender in some individuals has led to an interest in how the active process of supporting a club can impact on the physical and mental health of supporters and participants. Some studies suggest that football may induce a feeling solidarity and togetherness amongst players and fans (McKeown et al. 2015) or can create a sense of belonging and a catharsis of stress and tensions amongst spectators (Pringle 2004). However, not all games are won and Vallerand et al. (2008) suggest that football may induce both positive, that is, harmonious, and negative, that is, obsessive behaviours.

For players, there might be the success, the rewards of promotion and the rewards of higher income if games are won frequently by their team. On the other hand, losses of games may cause distress and disappointment and thus might negatively affect the well-being of the losing side. High-profile suicides in players and managers have recently raised the awareness of the necessity to look at mental health issues in those involved in the professional game (Pringle 2012).

Negative effects of football appear more pronounced when physical health problems from football-related injuries affect the well-being and performance of players, a notable example being the current research into heading the ball and the development of dementia (Faden and Loane 2015). Thus, the physical and mental health of players needs to be focussed on by managers, teams and football associations.

Physical health problems and neuropsychological impairment of soccer players

Accidents and injuries in football may affect the whole body but most frequently involve the legs, knees, arms and the head with one long-term effect of football and other sports appearing to be an increased risk of osteoarthritis (Schuring et al. 2016).

Severe and repetitive concussion in sports may lead to chronic traumatic encephalopathy (Janssen et al. 2017, Manley et al. 2017). In some cases, dementia might be the late consequence of severe brain injury (Shively et al. 2012, Faden and Loane 2015). Such damage might not, however, necessarily be permanent with recovery from concussion not being uncommon (Iverson et al. 2017). Neuropsychological impairments in soccer may also be the consequence of minor repetitive concussions during games and especially when heading the ball. However, the effects of heading on long-term outcome are less than clear. Studies that could form the basis for such conclusions including the effects of heading are

of mostly limited methodological standards or of low sample size and need improved research methodology (Rutherford et al. 2003, Maher et al. 2014).

This suggests that even though brain damage can affect subjective mental health and well-being as well as being a cause for depression or dementia, there is as yet limited unequivocal evidence that neuropsychological damage to the brain causes significant increases in mental disorders in groups of active or retired professional or amateur players. However, it is not clear which mental health disorders may be caused or affected.

Football and mental health

For those playing the game, much of the literature has focused on performance and psychological or mental health symptoms of professional players. Wiggins and Brustad (1996) found that anxiety may influence performance expectations both positively and negatively depending on the participant's response. Different groups of football players vary in their anxiety levels and how they manage anxiety. High competitive anxiety may increase the risk of injury (Junge et al. 2000). Not just performance anxiety but anxiety connected to negative life-stress and daily hassle were predictors of injuries amongst professional soccer players (Ivarsson and Johnson. 2010, Ivarson et al. 2013). It was not just the presence of anxiety but the ineffective coping mechanisms to deal with everyday anxiety that were found by predictors of injuries in young players in Johnson and Ivarsson's study (2011), whilst athletes who perceived their anxiety to be debilitating showed higher levels of burnout (Wiggins et al. 2005). Laux et al. (2015) suggested early signs of this process could be found by monitoring stress-related fatigue and poor sleep in professional football players.

Away from the professional game, much of the research on playing and watching football has focused on the mental health benefits that are generated primarily from being part of a supportive group that generates a feeling of warmth, purpose and social inclusion (McElroy et al. 2008, Smith and Pringle 2010, Pringle 2009). These very subjective issues are very difficult to identify, measure and compare between samples or over time. Consequently, for this systematic review, we focussed on major mental health disorders, if possible, and their differences between groups or changes over time.

The present paper, therefore, plans to assess the effects of football on the mental health of players, referees or spectators by reviewing and evaluating cross-sectional studies that assess

the frequency, respectively, prevalence of major mental health disorders in groups of professional and non-professional players, referees or spectators, if possible, compare these with relevant comparison groups, and by also reviewing cohort studies that measure the changes of frequencies of mental health disorders before and after a football-related event.

METHODS

Search strategy for relevant publications

To investigate the relationship between football/soccer and common mental health disorders, we performed a systematic review on using the following databases: PubMed, Medline and CINAHL (Cumulative Index to Nursing and Allied Health Literature). The relevant literature search was performed during July and August 2017. The search terms were football/soccer and mental health/mental disorder or schizophrenia/depression or anxiety/obsessive compulsive disorder. These disorders were selected as they are the most common and severe mental health disorders that, therefore, would be most easy to identify and measure in their frequencies.

Paper selection strategy

The question of interest addressed the effect of participation in or watching football on the frequencies of major mental health disorders.

Consequently, we chose the following criteria for the inclusion of studies in the review:

- Study participants must include subjects exposed to football such as football players, football referees, spectators (directly and via TV).
- We included only papers focussing on the above-mentioned major psychiatric disorders as these are easy to assess and are sufficiently frequent to observe differences between subject and control samples, or changes over time. Relevant papers must provide details of the methods on how the diagnoses and frequencies of mental disorders were assessed.
- Interventions to be included were short- or long-term active or passive exposition to football (i.e. playing or watching).
- Relevant papers should be either cross-sectional studies providing estimates of frequencies of mental health disorders in exposed groups and, if possible, control subjects, or cohort studies assessing the changes in those frequencies over time, that is, before, during or after football events.

Exclusion criteria were the following:

- Studies focussing on subjects exposed to American football and Australian Rules football were excluded as these games share the name but are different from football/soccer, they are contact sports sharing commonalities with Rugby.
- As we focussed on common mental health disorders, we excluded papers covering temporary and short-term emotional states or responses to football involvement.
- Papers focussing only on neuropsychological or psychological symptoms without reference to any major psychiatric disorders were excluded as the high variability in applied study methods, assessment and interventions would prevent any sensible comparison of studies.
- We excluded papers focussing on the neuropsychological and cognitive deficits of head trauma as this has been sufficiently reviewed previously.
- We also excluded studies on alcohol and drug abuse during soccer games (e.g. Vaso et al. 2015), as this need to be dealt with in a wider context than football.
- Studies relating to any major catastrophic event such as the Hillsborough disaster in 1989 were excluded as the consequences for the participants and victims were most likely related to the accidents or loss of relatives but not the football-specific part of the event.
- Papers reviewing or reporting personal experiences, respective qualitative data that did not include any quantitative estimates of frequencies of mental disorders, were also excluded.
- Non-English papers were excluded because of our limited language abilities.

Data extraction and assessment of bias

The extracted data included names of authors, year of publication, study design, sample size and demographics, country of study, type of diagnostic instruments, definition of caseness, frequency respectively prevalence of mental health disorders, overall and specific study results and potential bias. Biases were assessed using Cochrane criteria (Higgins et al. 2017).

RESULTS

Outcome of literature search

A total of 662 papers were identified from the literature search using the above-mentioned search terms in three scientific publication data bases: PubMed, Medline and CINAHL.

Titles and abstracts of these papers were screened for their relevance on the interaction between mental health disorders and football.

The following papers were excluded from this systematic review for the following reasons:

- 6 papers were in other languages, but not English.
- 178 papers were without any relevance to mental health.
- 117 papers focussed on American football.
- 57 papers focussed on Rugby.
- 91 papers focussed on other sports, but not soccer

Of the remaining 213 papers on football and mental health issues,

- 65 papers focussed on trauma, concussions and its neuropsychological consequences.
- 19 papers focussed on imaging, neurobiology or neurophysiology of cognition.
- 58 papers focussed on the short-term psychological effects of sports performance.
- 30 papers dealt with alcohol and drug abuse during soccer games and its management.
- 6 papers reported on individual major accidents that were related to individual football events.

The full manuscripts of the remaining 35 papers were received and their contents were assessed for their relevance to the study question and for their compliance with the inclusion/exclusion criteria.

- 12 papers were excluded as they did not include any quantitative estimates of mental disorders, such papers dealt with the use of football to improve mental health in different groups including spectators, soccer fans and patient groups, that is, subjects with schizophrenia or learning disability (e.g. Hudson et al. 2017). The majority of these studies were experience reports of different football-related projects without quantitative data.
- 6 publications were editorials or comments without any data.

Finally, we identified 17 papers that investigated the influence of soccer on the prevalence of depression and other mental health problems in different group. These were summarised in Table 1.

Fourteen of these studies focussed on previous players or current professional players or referees or a mixture of these groups.

- 12 of these 14 studies focussed on active professional players,

- 5 of 14 these studies investigated previous players
- 1 of these 14 studies focussed on referees.

Only three studies looked at other non-professional samples.

- One paper looked at the mental health of adolescents involved in football training.
- Two papers were looking at the mental health effect of a major football event (the World Cup tournaments of 2006 and 2016) in the general public including possible spectators during the events.

No paper looked specifically at the mental health of football fans.

Mental health in professional football players and referees

Table 1 provides a description and a summary of results of the studies assessing the prevalence of depression and anxiety in active, retired male and female players. Mental health problems were prominent in all active and retired professional groups, that is, players and referees, even though the results were not completely consistent. There was a suggested relationship between osteoarthritis, the number of severe injuries, recent life events, career dissatisfaction, low social support, employment status and hours of work after retirement and the prevalence of anxiety and depression in active and retired football players and referees. Some studies indicated that playing position and the level of performance might also impact on the mental health.

None of the studies have used psychiatric instruments that would result in a specific psychiatric diagnosis. The used scales, that is, the Health-Related Quality of Life Scale, the 12-item General Health Questionnaire (GHQ-12) and Centre of Epidemiological Studies Depression Scale are meant to be screening instruments for mental health problems that should then trigger the use of interviews that allow making diagnoses according to international criteria such as the International Classification of Diseases . The team from FIFA (The Federation of International Football Associations, Gouttebauge, being first or senior author, see Table 1) used the GHQ-12 to diagnose anxiety/depression. They also assessed distress, sleep disturbance, adverse alcohol behaviour, adverse smoking behaviour and adverse nutrition behaviour, which are important to assess present problems in comparison with other populations. The relationships with the above-mentioned risk factors usually go in the same negative direction as the ones with anxiety/depression. However, because of the varying prevalences of the disorders and the

Table 1.

Authors	Year	Study design	Sample	Mean age, SD (years)	Country	Diagnostic instruments	Prevalence of mental health problems	Results	Potential bias
studies in professional players/referees									
Turner AP, Barlow JH, Heathcote-Elliott C.	2000	Cross-sectional survey	284 former professional football players, 138 with osteoarthritis	56.1 (11.8)	United Kingdom	Health-related Quality of life (EuroQuoL)	19% of those without osteoarthritis and 37 % of those with osteoarthritis suffered current problems with anxiety/depression	Osteoarthritis increases the prevalence of depression and anxiety in former professional football players	High non-response, selection bias
Gouttebauge, Aoki, Kerkhoffs	2015	Cross-sectional	607 professional soccer players	26.8 (4.4)	random sample from national players unions Belgium, Chile, Finland, France, Japan, Norway, Paraguay, Peru, Spain, Sweden and Switzerland	12-item General Health Questionnaire, 2 or more points indicating caseness	37.9 % suffering anxiety/ depression	Significant associations were found for a higher number of severe injuries and career dissatisfaction with distress, anxiety/ depression	37% response rate
Gouttebauge, Backx F, Aoki, Kerkhoffs	2015	Cross-sectional	540 active professional players	25 (Finland) to 28.2 (France)	Finland, France, Norway, Spain or Sweden	12-item General Health Questionnaire, 2 or more points indicating caseness	Anxiety/ depression between 25.0% (Spain) and 40.0% (Finland)	Life events and career dissatisfaction related to anxiety/ depression in some but not in all countries.	34% response rate
Gouttebauge, Ooms, Tummers, Inklaar	2015	Observational prospective study	active and recently retired football players	30 years at death	world-wide (FIFA)	completed suicide between 2007-2013	214 deaths, 11.3% from suicide	suicide is prevalent in active and recently retired players	Unknown reference sample
Gouttebauge, Frings-Dresen, Sluiter	2015	Cross-sectional assessment	149 current professionals, 104 former football players	27 (5) current, 36 (5) former	members of World Footballers Union and national union members from Australia, Ireland, Netherlands, New Zealand, Scotland and United States	12-item General Health Questionnaire, 2 or more points indicating caseness	26% of current and 39% of former player suffered anxiety/ depression.	There is considerable mental health morbidity in current and former players. Mental health problems were associated with low social support and recent life events.	Low response rate of only 29%

Continued
Table 1.

Authors	Year	Study design	Sample	Mean age, SD (years)	Country	Diagnostic instruments	Prevalence of mental health problems	Results	Potential bias
Gouttebauge, Aoki, Ekstrand, Verhagen	2016	Cross-sectional study	540 professional footballers	26.7 (4.4)	Finland, France, Norway, Spain or Sweden	12-item General Health Questionnaire, 2 or more points indicating caseness	The number of severe injuries in a football career was positively correlated with distress and sleeping disturbance but not with anxiety/depression.	The number of injuries only slightly increases the risk of mental health problems.	See Gouttebauge, Backx F, Aoki, Kerkhoffs 2015
Gouttebauge, Aoki, Kerkhoffs	2016	Cross-sectional	219 retired male professional footballers	35.0 (6.4)	11 countries from three continents	12-item General Health Questionnaire, 2 or more points indicating caseness	35% one-month prevalence for anxiety/depression	Life events in the previous six months increased the risk of anxiety/depression (odds ratio 1.6, confidence interval 1.2-2.1)	Selection bias
Gouttebauge, Aoki, Verhagen, Kerkhoffs 2016	2016	Cross-sectional survey	607 current and 219 retired football players	27 versus 35	11 countries from 3 continents	12-item General Health Questionnaire, 2 or more points indicating caseness	As above	Only amongst retired professional footballers, employment status as well as a higher number of working hours was weakly correlated to symptoms of distress and anxiety/depression.	Selection bias
Gouttebauge, Aoki, Verhagen, Kerkhoffs	2016	12 months follow-up	384 male footballers	27 (5)	Finland, France, Norway, Spain and Sweden	12-item General Health Questionnaire, 3 or more points indicating caseness	12 months incidence of 37% for anxiety/depression.	No significant association between adverse life events, conflict with trainer or career satisfaction with anxiety/depression.	Selection bias, loss to follow up.
Gouttebauge, Johnson, Rochongar, Rosier, Kerkhoffs	2016	Cross-sectional, one season incidence	391 European professional football referees	33 (7)	Belgium, Finland, France, Germany, Norway, Russia, Scotland and Sweden	12-item General Health Questionnaire, 3 or more points indicating caseness	4-week prevalence rate of 12% for anxiety/depression, one season incidence of 16% for anxiety/depression	Mental health in referees needs addressing	45.2% response and completion rate, selection bias

Table 1.
Continued

Authors	Year	Study design	Sample	Mean age, SD (years)	Country	Diagnostic instruments	Prevalence of mental health problems	Results	Potential bias
Junge and Feddermann-Dermont	2016	Cross-sectional	289 male and 182 female football players	18.4 to 24.8	Switzerland	CES-D (above 16, GAD-7 (above 10)	7.6% mild to moderate depression, 3.0% major depression, 1.4% suffered anxiety disorders	Swiss FL football players had the same prevalence of depression as the general population, whilst male U-21 players had a higher prevalence; anxiety disorders were less prevalent than the general population. Players characteristics and playing positions influenced prevalences.	High response rate (above 92%), possible minor selection bias,
Prinz, Dvořák, Junge	2016	Cross-sectional	157 female players	33 (6.3)	Germany	Centre for epidemiological studies depression scale (CES-D) above 16	32% career time prevalence of depression.	The depression score varied significantly by playing positions and levels of play. Important reason for low mood were conflicts with coach/management (49.7%), low performance/ injury (48.4%), too little support/ acknowledgement by the coach (40.0%).	64% response rate
Kiliç, Aoki, Goedhart, Hägglund, Kerkhoffs, Kuijer, Walder, Gouttebarga	2017	12 months follow-up	384 professional footballers	27 (5)	Finland, France, Norway, Spain or Sweden	12-item General Health Questionnaire, 3 or more points indicating caseness	See Gouttebarga, Aoki, Verhagen, Kerkhoffs 2016	Anxiety/ depression was not significantly related to musculoskeletal time-loss injuries during 12-month follow-up.	Selection bias, follow-up only completed in 68%
van Ramele, Aoki, Kerkhoffs, Gouttebarga	2017	12 months follow-up incidence	194 retired male football players	35 (6)	Members of World and national players' unions	12-item General Health Questionnaire, 3 or more points indicating caseness	29% 12 months' incidence for anxiety/ depression	Life events increased the risk to develop anxiety/depression.	54 % response rate, unclear nationalities

Table 1.
Continued

Authors	Year	Study design	Sample	Mean age, SD (years)	Country	Diagnostic instruments	Prevalence of mental health problems	Results	Potential bias
Studies in amateurs									
Richards, Foster, Townsend, Bauman	2014	Randomised case-control	1,462 adolescents, 74 in the male intervention group	11-14	Uganda	Acholi Psychosocial Assessment Instrument for local depression-like and anxiety-like syndromes	Depression-like syndromes and anxiety-like syndromes higher in boys' intervention group compared to wait-listed and non-registered group	The study challenges the blanket statements that physical activity improves mental health in young people.	Open intervention, use of local concept of mental health
Studies in spectators/ general population									
Lau, Tsui, Mo, Mak, Griffiths	2015	2 cross sectional surveys before and after 2006 World Cup Finals	500/530 male members of the general population	65% between 18 and 44 years, 35% between 45 and 60 years	Hong Kong	Telephone interviews, GHQ-12, caseness above 74 percentile in first phase of interview, above 11 points	27% versus 20% had a high GHQ score (above 11)	The subjective mental health of men slightly improved after the 2006 World Cup.	51% response rates
Hassanian-Moghaddam, Ghorbani, Rahimi, Farahani, Sani, Lewin, Carter	2017	Time-series analysis	2,930 cases hospital-treated deliberate self-poisoning before, during and after 2014 World Cup.	Not provided	Iran	Hospital admission for overdose	Increased hospital admissions for deliberate self-poisoning during world Cup	The increase was only prominent in 12- to 20-year old subjects	Unclear population age

outcomes, minor differences and the differences between significant versus non-significant correlations are impossible to interpret adequately.

Perhaps the most interesting finding of Gouttebarga's recent work relates to the prevalence of mental health problems in professional players of the game. His 2013 survey of 253 current and former players in 6 different countries found that the 104 (26%) respondents still playing the game reported suffering from mental health symptoms including anxiety and depression (Gouttebarga et al. 2015). These estimates echo findings by Prinz et al. whose study of female football players reported 25.2% of participants suffered a mild or moderate depression at least once during their football career.

The estimates of 26% (Gouttebarga et al.) and 25.2% (Prinz et al.) resonate strongly with the often quoted one in four statistic for the prevalence of mental health problems in the general population. This may suggest that playing at a high level does not impact positively on mental health even though these studies have not included relevant control groups assessed with the same methods, which severely limits the validity of the conclusions.

Mental health in non-professional football players

There is only one study that assessed the effects of soccer training on the mental health of adolescents (see Table 1). Considering the popularity of soccer playing in the general population, that is, around 250 million players in the world, one would have expected more studies on the effect of football on the mental health and well-being in amateur players. The study by Richards et al. (2014) even found that adolescents aged between 11 and 14 years had higher depression-like symptoms than those on the waiting list and those who have not been enrolled at all. There were no positive effects in the female adolescents. Consequently, the common statement that physical activity and sport participation is always good for mental health must be challenged. As highlighted above, it may well be not the process of playing but the ability or inability to find successful coping strategies to the stress this generates that may be at the heart of the findings of this study. The study has the advantage that it assessed local concepts of mental health in post-war Uganda, but, on the other hand, it makes comparisons with future studies in other countries difficult if not impossible. As a summary, the general claim that playing soccer improves mental health and well-being in non-professionals must be challenged before relevant studies can provide the necessary positive evidence.

Mental health in spectators and the general population

Studies on the mental health of spectators of football matches are rare again.

An older Scottish study carried out by Masterton and Mender (1990) at the Edinburgh Royal Infirmary was the first to look for connections between football and mental health presentations. It showed reductions in emergency psychiatric presentations to hospital occurred during and after the finals of the 1990 World Cup, an effect evident in women as well as men. This, they surmised, could arise from enhancement of national identity and from the generation of a sense of belonging and social cohesion. This increase in feelings of inclusion they suggest has an impact on the mental health of some fans. Diagnostic categories were not assessed in this study.

There are two later studies assessing the mental health effects in possible spectators before, during and after a World Cup (see Table 1). Lau et al. (2015) observed a small but significant reduction of GHQ-12 scores in subjects from the general population of Hong Kong after versus before the 2006 World Cup Finals. Hassanian-Moghaddam et al. (2017) reported an increase in hospital admissions in Teheran because of intentional overdoses during the 2014 World cup. The effect was significant in female subjects aged 12–20 years but not in males or other age groups. Both studies thus have contradicting, that is, positive and negative effects on the mental health of spectators. Both of these studies provide no clarity on the possible reasons for the observed outcomes. Consequently, the studies provide some evidence that watching soccer may have an influence on the mental health of possible spectators but is far from clear if possible effects are positive or negative, and if so, under which circumstances.

Pringle's work with fans of Mansfield Town FC in England (Pringle 2002, 2004, 2009) drew some strong correlations between attending football matches and the developing of positive attributes such as a sense of belonging, the opportunity for catharsis, the development of family bonds (especially between fathers and sons) and a sense of hope. Whilst these are positive attributes that can help develop resilience and promote well-being, these studies did not show reduction of symptoms or any significant change for those experiencing active mental health problems.

We could not identify any study that assessed active mental health symptoms in soccer fans and identified a positive

impact on these as a result of supporting a team or attending matches. Even though there are large populations of soccer fans all over the world, we do not know if supporting a football team actually improves their mental health. Such studies might be an easy and a relevant subject of future research.

DISCUSSION

Football and mental health

This systematic review investigated the effects of soccer on mental health in groups of players and spectators. There is no consistent evidence that playing or watching soccer improves the mental health of active or retired professional players and referees or spectators.

However, if we state that there is no evidence that it improves the mental health in these groups, we cannot exclude that individual subjects, either players or fans, find their personal happiness in football and this can be a component in reducing the potential for developing some mental health problems.

We also did not look at the immediate and short term effects of playing or watching a football game on mental health. As far as we are aware, there are very few such studies available (Selmi et al. 2017).

In summary, there is no consistent evidence that playing or watching soccer makes players or spectators happy and reduces the burden of mental health problems.

Use of football to improve mental health and well being

Football catches large audiences globally. Such audiences are frequently used for commercial purposes by product advertisement and promotion. However, more recently, health-promoting organisations have used football as a tool to contact a greater audience and promote engagement with mental health promotional activities (Pringle 2009, Pringle and Sayers 2004, Spandler et al. 2013). Football has been used by nurses providing help for people with mental health problems as a metaphor for life (Duffin 2006, Pringle 2009), and football has been used as a vehicle to facilitate post-war disarmament, demobilisation and reintegration processes in Sierra Leone (Dyck 2011).

Australian rural football club leaders have been trained to serve as mental health advocates with an investigation of the impact of the Coach the Coach project revealing an increased capacity to recognise mental illness and an increased

confidence to respond to mental health difficulties in others (Pierce et al. 2010).

Soundy et al. (2015) systematically reviewed sports interventions in patients with schizophrenia indicating that sport has the potential to improve an individual's quality of life through providing a meaningful normalising activity that leads to achievement, success and satisfaction. McElroy et al. (2008) reported marked benefits in self-esteem and engagement for people with psychosis taking part in their football league whilst Battaglia et al. (2013) recommended soccer as an add-on to schizophrenia treatment.

In summary, although a range of studies have observed positive effects on subjective well-being in patient groups, the vast majority of these have been evaluations of interventions that have had small sample groups providing subjective anecdotal evidence. Consequently, the hard evidence for a positive effect of soccer in any population is weak at best.

Under these circumstances, it may be astonishing that football is recommended as a proven method to improve the actual mental health of participants and spectators.

Limitations

All studies assessing the prevalence or 12 months incidence of mental disorders in professional players and referees have used questionnaires and different cut-off scores to define caseness. These questionnaires were not meant to diagnose psychiatric disorders. Consequently, none of the studies have used usual approved diagnostic instruments to diagnose depression and anxiety disorder. In addition, the General Health Questionnaire (GHQ-12) did not allow to distinguish between depression and anxiety disorders. It may be recommended that future studies use acknowledged diagnostic instruments that enable psychiatric diagnoses and thus the comparison with studies in the general population and other samples.

Some of the answers of the players might be influenced by their tendencies to provide socially desirable answers, as shown by Smith et al. (2002). This might also bias the numbers of cases and the calculated prevalence and incidence rates. This effect might most likely reduce the estimated prevalence rates.

Most studies on professional players (see Table 1) may have been prone to possible selection bias because of low recruitment and low retention rates in the follow-up studies. Subjects with possible mental problems and those who

suffered possible triggers might have been more interested to participate in a study on mental health and risk factors than those without. This might lead to an overestimation of the relationships between triggers and poor mental health.

A possible hindsight bias, that is, depressed subjects remembering more injuries, more problems with management and/or less psychological support might also confound and most likely enhance the estimated relationship between possible triggers and mental health problems. This problem is common in cross-sectional studies assessing risk factors and outcome at the same time. Consequently, future studies on possible triggers of mental health, therefore, need to be prospective over several years.

CONCLUSIONS AND THE FUTURE

This review indicates that there are many more studies needed to fully examine the relationship between mental health and playing and watching of football. If possible, studies should be prospective and randomised rather than rely heavily on subjective data. Time-series analyses could be used if randomisation is not possible. The above-mentioned limitations, that is, selection and hindsight bias and the lack of diagnostic instruments, should be overcome with appropriate

methods and study designs. Strategies and programmes that use the assumed positive aspects of football to improve the mental well-being in amateurs and in people with mental health problems need to be validated before implementation. Whilst there is a strong feeling in contemporary society and in some academic circles that football must be a positive force for helping people with mental health problems, it appears that the evidence that shows causation or any positive effects is simply not there. Whilst some evidence is building via an increasing number of evaluations and small studies that the inclusive supportive nature of playing and supporting can offer some benefits in developing self-confidence, a sense of belonging and a greater engagement with other people, this is not the same as suggesting that football is good as a method of helping treat active mental health problems. Thus, we recommend that research on football and mental health using appropriate methodology is needed before implementation of untested programmes using football to improve mental health.

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REFERENCES

- Battaglia G, Alesi M, Inguglia M, Roccella M, Caramazza G, Bellafiore M, Palma. Soccer practice as an add-on treatment in the management of individuals with a diagnosis of schizophrenia. *Neuropsychiatr Dis Treat*. 2013;9:595-603. doi: 10.2147/NDT.S44066. Epub 2013 May 3.
- Dyck CB. Football and post-war reintegration: exploring the role of sport in DDR processes in Sierra Leone. *Third World Q*. 2011;32(3):395-415.
- Faden AI, Loane DJ. Chronic neurodegeneration after traumatic brain injury: Alzheimer disease, chronic traumatic encephalopathy, or persistent neuroinflammation? *Neurotherapeutics*. 2015 Jan;12(1):143-50. doi: 10.1007/s13311-014-0319-5.
- Eichberg H. Laughter in popular games and in sport. The other health of human play. *Gesnerus*. 2013;70(1):127-50.
- Gouttebargue V, Aoki H, Ekstrand J, Verhagen EA, Kerkhoffs GM. Are severe musculoskeletal injuries associated with symptoms of common mental disorders among male European professional footballers? *Knee Surg Sports Traumatol Arthrosc*. 2016 Dec;24(12):3934-3942. Epub 2015 Aug 2.
- Gouttebargue V, Aoki H, Kerkhoffs G. Symptoms of Common mental disorders and Adverse Health Behaviours in Male Professional Soccer Players. *J Hum Kinet*. 2015 Dec 30;49:277-86. doi: 10.1515/hukin-2015-0130. eCollection 2015 Dec 22.
- Gouttebargue V, Aoki H, Kerkhoffs GM. Prevalence and determinants of symptoms related to Mental disorders in retired male professional footballers. *J Sports Med Phys Fitness*. 2016 May;56(5):648-54.
- Gouttebargue V, Aoki H, Verhagen EA, Kerkhoffs GM. A 12-Month Prospective Cohort Study of Symptoms of Common Mental disorders Among European Professional Footballers. *Clin J Sport Med*. 2016 Sep 12.
- Gouttebargue V, Aoki H, Verhagen E, Kerkhoffs G. Are Level of Education and Employment Related to Symptoms of Common Mental disorders in Current and Retired Professional Footballers? *Asian J Sports Med*. 2016 May 28;7(2):e28447. doi: 10.5812/asjms.28447. eCollection 2016 Jun.
- Gouttebargue V, Backx FJ, Aoki H, Kerkhoffs GM. Symptoms of Common Mental disorders in Professional Football (Soccer)

- Across Five European Countries. *J Sports Sci Med*. 2015 Nov 24;14(4):811-8. eCollection 2015 Dec.
- Gouttebarga V, Frings-Dresen MH, Sluiter JK. Mental and psychosocial health among current and former professional footballers. *Occup Med (Lond)*. 2015 Apr;65(3):190-6. doi: 10.1093/occmed/kqu202. Epub 2015 Jan 31.
- Gouttebarga V, Johnson U, Rochcongar P, Rosier P, Kerkhoffs G. Symptoms of common mental disorders among professional football referees: a one-season prospective study across Europe. *Phys Sportsmed*. 2017 Feb;45(1):11-16. doi: 10.1080/00913847.2017.1248796. Epub 2016 Oct 27.
- Gouttebarga V, Ooms W, Tummers T, Inklaar H. Mortality in international professional football (soccer): a descriptive study. *J Sports Med Phys Fitness*. 2015 Nov;55(11):1376-82. Epub 2014 Oct 7.
- Gouttebarga V, Sluiter JK. Medical examinations undertaken by Dutch professional football clubs. *Occup Med (Lond)*. 2014 Jan;64(1):13-6. doi: 10.1093/occmed/kqt129. Epub 2013 Nov 21.
- Hassanian-Moghaddam H, Ghorbani F, Rahimi A, Farahani TF, Sani PSV, Lewin TJ, Carter GL. Federation Internationale de Football Association (FIFA) 2014 World Cup Impact on Hospital-Treated Suicide Attempt (Overdose) in Tehran. *Suicide Life Threat Behav*. 2017 Jun 13. doi: 10.1111/sltb.12359.
- Henderson C, O'Hara S, Thornicroft G, Webber M. Corporate social responsibility and mental health: the Premier League football Imagine Your Goals programme. *Int Rev Psychiatry*. 2014 Aug;26(4):460-6. doi: 10.3109/09540261.2014.924486.
- Higgins JPT, Altman DG. Chapter 8: Assessing risk of bias in included studies. In: Higgins JPT, Green S, editors. *Cochrane handbook for systematic reviews of interventions version 5.1*. The Cochrane Collaboration; 2017. Available: <http://www.cochrane-handbook.org/>. Accessed 20 September 2017
- Hudson NA, Mrozik JH, White R, Northend K, Moore S, Lister K, Rayner K. Community football teams for people with intellectual disabilities in secure settings: "They take you off the ward, it was like a nice day, and then you get like medals at the end". *J Appl Res Intellect Disabil*. 2017 May 15. doi: 10.1111/jar.12359.
- Ivarsson A, Johnson U, Podlog L. Psychological predictors of injury occurrence: a prospective investigation of professional Swedish soccer players.. *J Sport Rehabil*. 2013 Feb;22(1):19-26.
- Iverson GL, Gardner AJ, Terry DP, Ponsford JL, Sills AK, Broshek DK, Solomon GS. Predictors of clinical recovery from concussion: a systematic review. *Br J Sports Med*. 2017 Jun;51(12):941-948. doi: 10.1136/bjsports-2017-097729.
- Janssen PH, Mandrekar J, Mielke MM, Ahlskog JE, Boeve BF, Josephs K, Savica R. High School Football and Late-Life Risk of Neurodegenerative Syndromes, 1956-1970. *Mayo Clin Proc*. 2017 Jan;92(1):66-71. doi: 10.1016/j.mayocp.2016.09.004. Epub 2016 Dec 12.
- Johnson U, Ivarsson A. Psychological predictors of sport injuries among junior soccer players. *Scand J Med Sci Sports*. 2011 Feb;21(1):129-36. doi: 10.1111/j.1600-0838.2009.01057.x.
- Junge A, Dvorak J, Rösch D, Graf-Baumann T, Chomiak J, Peterson L. Psychological and sport-specific characteristics of football players. *Am J Sports Med*. 2000;28(5 Suppl):S22-8.
- Junge A, Feddermann-Demont N. Prevalence of depression and anxiety in top-level male and female football players. *BMJ Open Sport Exerc Med*. 2016 Jan 19;2(1):e000087. eCollection 2016.
- Kiliç Ö, Aoki H, Goedhart E, Hägglund M, Kerkhoffs GMMJ, Kuijjer PPFM, Waldén M, Gouttebarga V. Severe musculoskeletal time-loss injuries and symptoms of common Mental disorders in professional soccer: a longitudinal analysis of 12-month follow-up data. *Knee Surg Sports Traumatol Arthrosc*. 2017 Jul 11. doi: 10.1007/s00167-017-4644-1. [Epub ahead of print]
- Lau JT, Tsui HY, Mo PK, Mak WW, Griffiths S. World Cup's impact on mental health and lifestyle behaviors in the general population: comparing results of 2 serial population-based surveys. *Asia Pac J Public Health*. 2015 Mar;27(2):NP1973-84. doi:10.1177/1010539513485784. Epub 2013 May 10.
- Laux P, Krumm B, Diers M, Flor H. Recovery-stress balance and injury risk in professional football players: a prospective study. *J Sports Sci*. 2015;33(20):2140-8. doi: 10.1080/02640414.2015.1064538. Epub 2015 Jul 13.
- Maher ME, Hutchison M, Cusimano M, Comper P, Schweizer TA. Concussions and heading in soccer: a review of the evidence of incidence, mechanisms, biomarkers and neurocognitive outcomes. *Brain Inj*. 2014;28(3):271-85. doi: 10.3109/02699052.2013.865269. Epub 2014 Jan 29.
- Masterton, G. and Mander, J.A. (1990) Psychiatric emergencies: Scotland and the World Cup finals. *British Journal of Psychiatry* 156(4): pp.475-478.
- McElroy, P., Evans, P. and Pringle, A. (2008), Sick as a parrot or over the moon: an evaluation of the impact of playing regular matches in a football league on mental health service users. *Pract. Dev. Health Care*, 7: 40-48. doi:10.1002/pdh.245.
- McKeown M, Roy A, Spandler H. 'You'll never walk alone': Supportive social relations in a football and mental health project. *Int J Ment Health Nurs*. 2015 Aug;24(4):360-9. doi: 10.1111/inm.12122. Epub 2015 Feb 11.

- Pringle A. Can watching football be a component of developing a state of mental health for men? *J R Soc Promot Health*. 2004 May;124(3):12.
- Pringle A. [2002] A view from the terraces. *Mental Health Nursing* 22(5): pp.12-16.2-8.
- Prinz B, Dvořák J, Junge A. Symptoms and risk factors of depression during and after the football career of elite female players. *BMJ Open Sport Exerc Med*. 2016 May 31;2(1):e000124. eCollection 2016.
- Richards J, Foster C, Townsend N, Bauman A. Physical fitness and mental health impact of a sport-for-development intervention in a post-conflict setting: randomised controlled trial nested within an observational study of adolescents in Gulu, Uganda. *BMC Public Health*. 2014 Jun 18;14:619. doi: 10.1186/1471-2458-14-619.
- Rotheram-Borus MJ, Tomlinson M, Durkin A, Baird K, DeCelles J, Swendeman D. Feasibility of Using Soccer and Job Training to Prevent Drug Abuse and HIV/AIDS Behav. 2016 Sep;20(9):1841-50. doi: 10.1007/s10461-015-1262-0.
- Rutherford A, Stephens R, Potter D. The neuropsychology of heading and head trauma in Association Football (soccer): a review. *Neuropsychol Rev*. 2003 Sep;13(3):153-79.
- Schuring N, Aoki H, Gray J, Kerkhoffs GM, Lambert M, Gouttebauge V. Osteoarthritis is associated with symptoms of common mental disorders among former elite athletes. *Knee Surg Sports Traumatol Arthrosc*. 2017, 25(10): 3179-3185.
- Selmi O, Haddad M, Majed L, Ben Khalifa W, Hamza M, Chamari K. Soccer training: high-intensity interval training is mood disturbing while small sided games ensure mood balance. *J Sports Med Phys Fitness*. 2017 May 9. doi: 10.23736/S0022-4707.17.07292-9.
- Shively S, Scher AI, Perl DP, Diaz-Arrastia R Dementia resulting from traumatic brain injury: what is the pathology? *Arch Neurol*. 2012 Oct;69(10):1245-51.
- Smith D, Driver S, Lafferty M, Burrell C, Devonport T. Social desirability bias and direction modified Competitive State Anxiety Inventory-2. *Percept Mot Skills*. 2002 Dec;95(3 Pt 1):945-52.
- Soundy A(1), Roskell C, Stubbs B, Probst M, Vancampfort D. Investigating the benefits of sport participation for individuals with Schizophrenia: a systematic review. *Psychiatr Danub*. 2015 Mar;27(1):2-13.
- Spandler H, Mckeown M, Roy A, Hurley M. Football metaphor and mental well-being: an evaluation of the It's a Goal! Programme. *J Ment Health*. 2013 Dec;22(6):544-54. doi: 10.3109/09638237.2013.819420. Epub 2013 Nov 8.
- Turner AP(1), Barlow JH, Heathcote-Elliott C. Long term health impact of playing professional football in the United Kingdom. *Br J Sports Med*. 2000 Oct;34(5):332-6.
- Vaso M, Weber A, Tscholl PM, Junge A, Dvorak J. Use and abuse of medication during 2014 FIFA World Cup Brazil: a retrospective survey. *BMJ Open*. 2015 Sep 10;5(9):e007608. doi: 10.1136/bmjopen-2015-007608.
- Wiggins MS(1), Brustad RJ. Perception of anxiety and expectations of performance. *Percept Mot Skills*. 1996 Dec;83(3 Pt 1):1071-4.
- Wiggins MS, Lai C, Deiters JA. Anxiety and burnout in female collegiate ice hockey and soccer athletes. *Percept Mot Skills*. 2005 Oct;101(2):519-24.
- Wood S, Harrison LK, Kucharska J. Male professional footballers' experiences of mental health difficulties and help-seeking. *Phys Sportsmed*. 2017 May;45(2):120-128. doi: 10.1080/00913847.2017.1283209. Epub 2017 Feb 1.