Medical examinations in Dutch professional football (soccer): A qualitative study

Mr Afram Akturk, MSc, Dr Han Inklaar, MD, PhD, Dr Vincent Gouttebarge, PhD, Professor Monique HW Frings-Dresen, PhD

1Coronel Institute of Occupational Health, Academic Medical Center, Amsterdam, The Netherlands
2Dutch Association for Sports Medicine, Bilthoven, The Netherlands

*Corresponding author. Address at the end of text.

Abstract

Background: There is no recent scientific information available on the perceptions of active and former professional football players on medical examinations during and after their careers.

Research question: The aim of this study was to explore which kind of medical examinations are currently addressed during and after a career as professional football players in the Netherlands and what are the needs towards improvement in these medical examinations.

Type of study: cross sectional study.

Methods: A qualitative research was conducted based on semi-structured, audio-recorded telephone interviews with eight active professional football players, eight former professional football players and eight club physicians.

Results: At present, the contents of medical examinations are directed to the cardiovascular, pulmonary and musculoskeletal systems. All three target groups criticize the current organization and content of the medical examinations. After a career in professional football, sport-specific medical examinations are still lacking. Proposals were made focusing more on the prevention of physical and psychosocial problems preferably organized more centrally.

Conclusion: The content of the current medical examinations in Dutch professional football is criticized by all participant groups. Recommendations were made towards improvements of the medical examinations during and after the career of a professional football player, especially with regard to the prevention of potential long-term health problems. Centrally organized medical examinations for former professional football players were proposed.

Keywords: soccer, sports medicine, health surveillance program, football player, qualitative research

Mr Afram Akturk, MSc
Mr Akturk’s main research interests are sport sciences; football.
Email: afram.akturk@student.uva.nl

Dr Han Inklaar, MD, PhD
Dr Inklaar’s main research interests are sport injuries; (professional) football.
Email: han.inklaar@hotmail.com

Dr Vincent Gouttebarge, PhD
Dr Gouttebarge’s main research interests are socio-medical counselling of (former) professional athletes; long-term adverse effects of professional sports.
Email: v.gouttebarge@amc.nl

*Professor Monique MW Frings-Dresen, PhD
Professor Frings-Dresen's main research interests are occupational diseases, aetiology and prevention of work-related diseases.
Introduction

Professional football (soccer) is a contact sport, where players are exposed to high intensity workloads, such as sprinting, jumping and landing with frequently abrupt changing of direction.\(^1\) Consequently, players are at high risk for acute, recurrent or overuse injuries with emphasis on the lower extremities.\(^1,4\) Due to these injuries 10% of players are not able to participate in training and/or matches.\(^1\) Also, these injuries may result in psychosocial and mental disorders, such as distress, depression and anxiety.\(^6,7\) In addition, even though its overall incidence is low, professional athletes, including professional football players, are at higher risk for sudden cardiac death compared with age-matched non-sporters.\(^8,9,10\)

Acute injuries, recurrent or overuse injuries can lead to long-term health problems and disability; however, the scientific evidence supporting this idea appears outdated, limited and contradictory.\(^11,12,13\) A recent literature study performed by Kuitt et al.\(^14\) shows that former professional football players have a higher prevalence of knee and ankle osteoarthritis (OA) compared to the general population and other occupations. The prevalence of knee and ankle OA in former professional football players are 60-80% and 12-17%, respectively.\(^14\) Recent findings showed that up to 20% of former professional football players with knee and/or ankle OA reported suffering from joint pain and discomfort during activities such as squatting, walking or climbing stairs, while nearly 30% of them reported work-related limitations.\(^15\) In some cases, professional football appears to lead to long-term cardiovascular, neuropsychological or cognitive health problems in former players.\(^14,16,17\) Furthermore, retiring from a professional sport itself is a potential risk factor for psychosocial and mental problems following the professional career.\(^18,19\)

Nowadays, when injuries occur, professional football players are medically treated and guided by physicians and physical therapists hired or (partially) employed by professional football clubs.\(^20,21\) Subsequently, interventions related to the occurrence of these injuries can be applied, aiming to empower the return to play, i.e. the work of the professional football players, as soon as possible.\(^22\) With regard to short- and long-term health consequences other than those related to injuries, scientific knowledge about the availability of medical examinations during and after a professional football career is scarce or even unavailable. In the occupational context, medical examinations are seen as essential to detect and identify any abnormality, aiming to protect and promote the health of both individual and working population.\(^23\)

In the context of health research, in addition to physicians’ opinions, patients’ views and experiences are important aspects in reviewing and appraising the content and quality of the medical examinations they receive, and are observed as a potential driver of health quality improvements.\(^24,25\) There is no recent scientific information available on the perceptions of active and former professional football players on medical examinations during and after their careers. Moreover, studies of improvements in the content of medical examinations during and after professional football careers according to the perspectives of active and former professional football players, as well as club physicians, have not been conducted.

The aim of this study was to explore which kind of medical examinations are currently addressed during and after a career as a professional football player in the Netherlands and what are the needs towards the improvement in these medical examinations according professional football players and club physicians.

Methods

Design

A qualitative study based on a cross-sectional design was conducted using semi-structured interviews.

Study population

According to this study’s research questions, three different groups of participants were involved in the study. The first group consisted of football players who had been active for at least five years in the premier league and first division in the Netherlands. The second group consisted of former professional football players who had played for at least five years in the premier league and first division in the Netherlands and had been retired for a maximum five years. The third group consisted of physicians associated with professional football clubs in the Netherlands.
Medical examinations in professional football

Procedure
Potential participants were selected by the Dutch Players’ Union (VVCS; largest union for Dutch professional football players) and from the College of Club Physicians and Consultants in Dutch professional football (CCC) from their members. Blinded to the researcher for privacy reasons, both VVCS and CCC were asked to select participants from different football clubs, striving to have an equal repartition between premier league and first division clubs. After obtaining their contact information from the VVCS or CCC, information about the study was sent by email to potential participants. If interested and after informed consent was obtained, an appointment for an interview was scheduled at a convenient time and date for the participants. In qualitative research based on interviews, it has been shown that data saturation may occur after seven to ten interviews. Therefore a minimum of eight interviews per group of participants was performed, and a control for data saturation was implemented from the fifth interview. After a test interview, all interviews were conducted by telephone and recorded by means of a digital recording device; written notes were also made by the interviewer (AA). The interviews started with an introduction about the aim and procedures of the study and ended with additional questions and comments from the respondent. Each interview was approximately 20-30 minutes. Official ethical approval from the medical ethical committee of the Academic Medical Center was not needed because this study involved healthy participants. This study was approved by the VVCS and CCC board, and carried out in accordance with the Declaration of Helsinki (2008).

Interview
The semi-structured interview was divided into three main sections, each involving the same questions for all three target groups. Personal details included questions about age, number of active years in the premier league and first division in the Netherlands, number of years retired and reason for retirement.

The content of the medical examinations during the professional football player’s career and potential improvement to the content were investigated using three questions, medical examinations being operationalised in terms of periodical health check-ups. These questions included what kind of medical examinations were covered during the career, the instruments used to assess these aspects (if present), and needs for potential improvements in the medical examinations during a professional football career.

The content of medical examinations received after a professional football player’s career were investigated using three questions, medical examinations being operationalised in terms of periodical health screening and check-ups. These questions included the kind of medical examinations covered after a career, how medical examinations (if present) after a career are conducted, and needs for potential improvements in medical examinations following a professional football career.

Data-analysis
Analysis was performed in accordance with the COREQ criteria. The audio-recorded interview and notes made by the interviewer were transcribed verbatim by one researcher (AA). Another author (VG) controlled 25% of the interview transcriptions per participant group, and any disagreements were solved by consensus involving a third author (MF). The transcribed interviews were divided into different fragments, and open codes were given. The codes were based on the answers given by the respondents or produced by the research team. The coded fragments were checked for relevance in relation to subcategories, and synonyms were combined. This step resulted in a schematic sorting of the interview content. Finally, the contents of the categories and subcategories were discussed by the research team and linked to the research questions.

Results
Participants
The study population included eight active professional football players, equally divided over the premier league and the first division, eight former professional football players from which five have played most of their career in the premier league and three in the first division, and eight club physicians from which four were working in the premier league and four in the first division. Characteristics of the participants are displayed in Table 1. After the fifth interview, data saturation was confirmed, and no new themes emerged from the data collected from the professional football players. For the former professional football players and physicians, data
A total of six interviews were conducted with professional football players. Saturation occurred after the sixth interview. Because all interviews were arranged and appointments had already been scheduled, these authors interviewed eight participants in each group (24 in total).

### Table 1: Characteristics, including number of participants, gender, age, career length and retirement length, of the study participants

<table>
<thead>
<tr>
<th></th>
<th>Professional football players</th>
<th>Former professional football players</th>
<th>Physicians associated with professional football clubs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Gender</td>
<td>8 male</td>
<td>8 male</td>
<td>7 male, 1 female</td>
</tr>
<tr>
<td>Age (years)</td>
<td>31 (SD = 2.0)</td>
<td>39 (SD = 2.6)</td>
<td>51 (SD = 8.4)</td>
</tr>
<tr>
<td>Career length (years)</td>
<td>13 (SD = 2.6)</td>
<td>18 (SD = 1.7)</td>
<td>11 (SD = 9.3)</td>
</tr>
<tr>
<td>Club level</td>
<td>4 premier league 4 first division</td>
<td>5 premier league 3 first division</td>
<td>4 premier league 4 first division</td>
</tr>
<tr>
<td>Retired (years)</td>
<td>4 (SD = 1.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SD, Standard Deviation

**Contents of the medical examinations during the player’s career**

The content of the current medical examinations during a professional football player’s career are displayed in Table 2. Some medical examinations, such as testing the cardiovascular and pulmonary system, were mentioned by all of the target groups. Other aspects, such as testing the gastrointestinal system, were only mentioned by club physicians. The tests carried out as part of medical examinations during professional football players’ careers are also presented in Table 2.
### Table 2: Content of medical examinations during a professional football player’s career

<table>
<thead>
<tr>
<th>Aspects</th>
<th>APF</th>
<th>FPF</th>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiovascular system</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pulmonary system</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Circulatory system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Musculoskeletal system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Podiatry</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Physical fitness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vision, body composition</strong></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Psychological condition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mental condition</strong></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Gastrointestinal system</strong></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Cardiovascular tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VO2 max. test</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Electrocardiogram</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Echocardiogram</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Blood pressure</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Auscultation heart</strong></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>X-thorax</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pulmonary tests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VO2 max. test</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Spirometry</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Auscultation lung</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>X-thorax</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood tests, urine tests</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Musculoskeletal system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical examination joint</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Podo-analysis</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>X-ankle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>X-knee</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biometry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visual acuity</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Body weight, height, % body fat</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psychological test</strong></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

APF, active professional football player; FPF, former professional football player; CP, club physician; VO2 max, maximal oxygen consumption.

### Contents of the medical examinations after the player’s career

All three target groups acknowledged that following a professional footballer’s career, a retired professional football player can consult his own general practitioner in case of health problems as a part of regular medical care in the Netherlands. All three target groups also stated that currently no medical examinations from clubs, club physicians or the players’ union were available following a football career despite the fact that often health problems are related to the career in professional football.

### Needs towards changes in medical examinations during the player’s career

Professional football players, former professional football players and club physicians all noted that they would like some changes to be implemented in the medical examinations they receive, especially with regard to the early identification of risk factors for long-term health problems. Club physicians would like some changes to be implemented in the medical examinations, such as a more preventive policy with regard to possible complications. All three participant groups noted that they would like to see changes in the medical counselling provided during a professional football player’s career. At present, long-term health care is
neglected. The target groups would like to see changes in the medical counselling provided during a professional football player’s career. Because they experienced psychosocial problems later on in life former professional football players stated that psychosocial care during a professional football player’s career should be given more attention by club physicians in order to prevent these problems. All three target groups also advocated organisational changes such as a more centrally organised medical examinations on different levels, for example, by the Royal Dutch Football Association (KNVB) or the VVCS. Former professional football players added the possibility of receiving medical examinations during a career aside of the medical staff of their club. Clubs often are reluctant when a player searches for medical examinations aside of the club. Professional football players mentioned that the quality of medical examinations varies between football clubs and that this variation is related to the financial resources of the clubs. These budgetary limitations could be circumvented with a more centrally organised medical care. Box 1 contains examples of quotes relevant to potential changes during a career.

Box 1: Quotes regarding needs in medical examinations during a football career

A 003: “All of this should be organised by the National Football Association and not by football clubs. Football clubs look at the short term, the season of play and the eventual active professional career. The National Football Association and Dutch Players’ Union could have, independent of the pressure of play and suchlike, a better look at the long-term health.”

B 006: “As a football player, you don’t think further than the short term. Medical care and health surveillance in view of the long term must be given more attention too.”

C 006: “I notice that football players have trouble in their lives after football. During their career, they are prepared by the players’ union, but I think there is much to be gained on this topic. That they think carefully about what they will do after they are done with playing professional football.”

A, quote from a current professional football player; B, quote from a former professional football player; C, quote from a club physician.

Needs towards changes in medical examinations after a player’s career

The needs of medical examinations after a football career were also discussed. All participants stated they would like a whole-body physical examination and a cardiovascular check-up; club physicians and professional football players would like periodic check-ups. Former professional football players also noticed a lack of attention to the psychosocial aspects of health. All of the target groups supported psychosocial care, whereas club physicians wanted this to be conducted by people who are experienced in the care of (former) professional football players. According to club physicians and former professional football players, counselling on lifestyle and advice for detraining after a professional career should be given. All three target groups stated the need for centrally organised medical examinations after a professional career. Professional football players and club physicians noted that such care is hardly feasible if it is not organised centrally. Club physicians mentioned the obligation of the professional organisation of club physicians to care for the health of former professional football players. Box 2 contains examples of quotes relevant to needs in medical examinations after a professional football career.
Medical examinations in professional football

Discussion

The aim of this study conducted among three target groups (professional football players, former professional football players and club physicians) was to explore which kind of medical examinations are currently included during and after a professional football career, as well as to explore whether needs exist in the medical examinations during and after a professional football career. The content of medical examinations during a career covers the cardiovascular, pulmonary and musculoskeletal system and the treatment of health-related problems accordingly. Nevertheless, according to the three target groups, there is a need for improvement in the content and quality of the medical examinations during a career. After a career in professional football, professional football-related medical examinations are lacking; former players rely principally on their own initiative and regular medical care. According to all three target groups, there is a need for a change in the medical examinations received during a career with regard to the prevention of long-term health problems was acknowledged in this study. In addition, the availability of preventive care for injuries, socio-economic services and general support by clubs were found to be either lacking or inadequate. Confirming the findings of Drawer and Fuller, this study emphasised that professional football players are negligibly or insufficiently informed about the long-term physical and psychosocial health risks arising from their careers. Concordantly, the development and dissemination of information (i.e., empowerment programs) on the long-term effects of professional football appears to be required and should be considered as a necessary innovation by all stakeholders in professional football.

While the majority of professional football players recover and return to their work (i.e., playing professional football), there is also a group of players who develop severe physical complaints.

Box 2: Quotes regarding needs in medical examinations after a football career

<table>
<thead>
<tr>
<th>A 001</th>
<th>“I advocate the introduction of medical care and health surveillance after a career in professional football as a standard.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 003</td>
<td>“I haven’t thought about medical care and health surveillance after my career at all. I would have liked to have medical care, with regard to physical aspects. I could have taken care of it myself, but I think it’s man’s decision to use it earlier when it’s offered to you.”</td>
</tr>
<tr>
<td>C 008</td>
<td>“It’s partially risk of the occupation, but I do think that we as professionals (i.e., physicians) have the responsibility to lead it in the right direction and offer the opportunity of medical care and health surveillance to professional football players after their career. Whether it’s about socio-emotional complaints, problems of the musculoskeletal system or any other complaints.”</td>
</tr>
</tbody>
</table>

A, quote from a current professional football player; B, quote from a former professional football player; C, quote from a club physician.
and psychological problems lead to early retirement or work restrictions.\textsuperscript{6,11,25} As stated by both the World Health Organization and International Labour Organization, active and former professional football players have the same right as any other employee to maintain good health and functioning during and after their career in order to participate in post-career social activities and start a new working career.\textsuperscript{30} Employers are responsible for the protection, promotion, inspection and support of the highest level of physical, mental and social well-being of their employees long after they reach retirement age.\textsuperscript{30}

With regard to the short- and long-term health effects due to a career in professional football and the related consequences for sustainable health, employability and well-being, it is advised that a health surveillance programme should be developed and implemented in professional football, ideally from the start of a career to the time of retirement. Such a programme, based on suitable medical examinations, could enable the early identification of football players at risk for either physical or mental problems and lead to the early application of preventive measures (primary and secondary). As stated in this study, this health surveillance programme (and related medical examinations) is advised to be centrally organised, being the responsibility of all stakeholders within professional football.

Conclusion

At present, the health aspects included in medical care and health surveillance during a professional football career focus on, among others, the cardiovascular, pulmonary and the musculoskeletal systems and are assessed through several tests. After a professional career, no medical care or health surveillance is available. According to professional football players, former professional football players and club physicians, medical care and health surveillance during a professional football career is inadequate at some levels and needs to be adjusted, especially with regard to the potential long-term health effects. All three participant groups emphasised that medical care and health surveillance after a career is lacking and advocated for its development and implementation, especially with regard to information regarding the long-term health consequences of football.

Acknowledgements

The authors would like to thank Danny Hesp, chair of the VVCS, and the CCC executive board for their support. They are also grateful to all of the participants in this study.

Address for correspondence:
Professor Monique Frings-Dresen, Coronel Institute of Occupational Health, Academic Medical Center, P O Box 22700, Amsterdam, The Netherlands.
Email: m.frings@amc.nl

References

11. Turner AP, Barlow JH, Heathcote-Elliott C. Long term health impact of...
Medical examinations in professional football


15. Gouttebarge V, Inklaar H, Frings-Dresen MHW. Risk and consequences of osteoarthritis after a professional football career: a systematic review of the recent literature. Unpublished manuscript


