

Football Quaterly 01/2024

Benedict Gondwe: A survey of organizational structure and operational practices of elite youth football academies and national federations from around the world: A performance and medical perspective.

What did they do?

The cross-sectional study aimed to gather knowledge related to the organisational structures and operational practices within professional youth academies and national federations around the world, with specific focus on the medical and performance departments. The nature of operational processes adopted by practitioners working in clubs and national federations remains largely unknown. The areas of focus investigated in this research included structure and strategy, knowledge management processes, return to play and injury prevention processes, how data is managed, and the activities related to research and development.

Why is it important?

Medical and performance units are integral components of multidisciplinary teams in football clubs and national federations, especially in the prevention and management of sport injuries which may pose significant challenges. Given the substantial monetary investment of recruiting professional footballers, investment into talent identification and development through youth academies is gaining strategic significance in many football teams globally. Holding vital roles in the long-term development of athletes, performance and medical departments have increased importance in maximising player development. Results show that there is strategic alignment between medical and performance departments across the majority of clubs (90%) and national federations (60%). Use of internal staff knowledge and external sources of knowledge in day-to-day practise was prevalent across most clubs (80%) and national federations (56%).

Things to consider

The respondents of the survey represented three groups: medical staff, performance staff and senior club and academy management. From a club perspective, majority of the respondents (19 of 25) were from European countries (Austria, Belgium, England, France, Italy, Netherlands, Portugal, Russia, Spain, Switzerland, Ukraine), South America (Argentina, Brazil, Chile), North America (United States of America) and Africa (Tunisia). 10 respondents from national federations were from Europe (England, France, Italy) North America (Honduras, Mexico), South America (Argentina, Chile), Africa (South Africa) and Asia (Qatar

South Korea). Whilst these findings cannot be generalised to all clubs around the world, it provides some insight into the working practises of clubs and federations playing in the most competitive leagues in the world.

Take home message

This study provides a general basis for researchers and practitioners to work towards optimising the functioning of important areas in medical and performance departments. The results also provide insights to which clubs and federations may compare their own internal medical and performance structures to.

Why I chose this article

The topic of operational practices and organisational structures in elite football has rarely been explored in a global context and especially in Germany. This research presents a qualitative study on facts, perceptions and opinions of staff members working in elite youth academies and national federations covering topics that are current and relevant for medical and performance teams regardless of their country of operation.

Reference

Gregson, W., Carling, C., Gualtieri, A., O'Brien, J., Reilly, P., Tavares, F., Bonanno, D., Lopez, E., Marques, J., Lolli, L., & Salvo, V. Di. (2022). A survey of organizational structure and operational practices of elite youth football academies and national federations from around the world: A performance and medical perspective. *Frontiers in Sports and Active Living*, 4, 1031721. <https://doi.org/10.3389/FSPOR.2022.1031721/BIBTEX>

Rilind Obertinca: Attitudes, beliefs and factors influencing football coaches' adherence to the 11+ injury prevention programme.

What did they do?

The objective of this study was to examine the perspectives and attitudes of football coaches regarding injury prevention, and the 11+ injury prevention programme as well as to investigate factors that may influence adherence to the 11+ injury prevention programme. This was conducted through a web-based nationwide survey.

Why is it important?

Findings from this study suggest that the injury prevention benefits of the 11+ are well understood by football coaches. However, coaches with less experience appear less inclined to use the 11+.

Things to consider

Even though this study reported satisfactory data on the coaches' understanding of the benefits of injury prevention in general and the 11+ program in particular, those results may be directly influenced by the New Zealand Football (NZF) injury prevention workshop in which they previously participated. Moreover, the final sample size (158 out of 538 respondents) cannot be considered satisfactory to draw strong conclusions on this topic. Therefore, these factors may influence the results, which may not accurately represent the real-world situation.

Take home message

This study showed promising results regarding the coaches' knowledge about injury prevention and the 11+ injury prevention programme after their participation in an injury prevention workshop. Additionally, based on their perspectives, adherence could be improved by encouraging modifications (e.g., addition of a ball) to injury prevention programmes.

Why I chose this article

This study presents valuable insights from end users regarding injury prevention in general, with a specific focus on the 11+ programme. Workshops on injury prevention can be a valuable tool for increasing the knowledge of end users toward injury prevention. Finally, the results, particularly in terms of enhancing adherence, provide a solid foundation for future injury prevention programmes.

Refernce

Shamlaye J, Tomšovský L, Fulcher ML. Attitudes, beliefs and factors influencing football coaches' adherence to the 11+ injury prevention programme. *BMJ Open Sport & Exercise Medicine* 2020;0:e000830. doi:10.1136/bmjsem-2020-000830

Ana Ukaj: Sudden Cardiac Death Caused by a Fatal Association of Hypertrophic Cardiomyopathy (MYH7, p. Arg719Trp), Heterozygous Familial Hypercholesterolemia (LDLR, p.Gly343Lys) and SARS-CoV-2 B.1.1.7 Infection.

Case description: The 32-year-old male football player (amateur level) died after suffering ventricular fibrillation during the game. According to family members, he had no known cardiovascular disease or flu – like symptoms of SARS-CoV-2. Macroscopic examination of the heart during autopsy revealed increased weight of the heart (550 g), increased wall thickness of the cardiac septum (1.8 cm) and left posterior/lateral wall (~2.0 cm). Non-obstructive early diffuse coronary artery disease was also noted. Microscopic examination

revealed degenerative changes in cardiomyocytes, the presence of lymphocytic infiltrate suggestive of myocarditis and pulmonary thromboembolism. A myocardial sample from the interventricular septum was tested positive for a high concentration of SARS – CoV – 2 particles (severe acute respiratory syndrome coronavirus 2) using real – time PCR. In addition, a mutation in the LDL (low density lipoprotein) receptor gene (*LDLR*) was detected in 13 maternal family members and in the affected player, indicating the presence of familial hypercholesterolaemia. A mutation in the gene for the heavy beta-myosin chain (*MYH7*), which is associated with hypertrophic cardiomyopathy, has also been identified.

Why is this article important? This case might show that HCM can remain unrecognized until the age of 32, even though the septal thickness is considerable. It may also show that infection/inflammation can be a trigger for acute cardiac arrhythmias in the presence of other structural heart disease. In addition, the importance of a structured forensic medical examination with morphological, histological and genetic evaluation to determine the exact cause of death was demonstrated.

Things to consider? This case report suggests that two common genetic cardiovascular diseases such as HCM and familial hypercholesterolaemia can remain undetected until a trigger such as SARS-CoV-2 infection provokes an exacerbation of the underlying diseases and a lethal outcome.

Take home message: An acquired disease such as SARS – CoV – 2 infection can expose a previously unrecognized inherited cardiovascular diseases.

Why I chose this article? This case report was selected because the investigation of the cause of death was developed and conducted in an accurately defined manner. In this study, multidisciplinary collaboration between cardiologists, clinical pathologists and geneticists led to detailed information about the causes of sudden cardiac death. The information presented in this article enhances understanding of the complexity of the causes of sudden cardiac death in football players.

References: Marziliano N, Medoro A, Mignogna D, Saccon G, Folzani S, Reverberi C, Russo C, Intrieri M. Sudden Cardiac Death Caused by a Fatal Association of Hypertrophic Cardiomyopathy (*MYH7*, p.Arg719Trp), Heterozygous Familial Hypercholesterolemia (*LDLR*, p.Gly343Lys) and SARS-CoV-2 B.1.1.7 Infection. *Diagnostics* (Basel). 2021 Jul 7;11(7):1229. doi: 10.3390/diagnostics11071229.

Mahnaz Davarnia: Value of screening for the risk of sudden cardiac death in young competitive athletes.

What did they do?

This study aimed to report the long-term findings of the Italian programme of cardiovascular preparticipation screening (PPS) in young (age range, 7–18 years), competitive athletes. The study enrolled a cohort of 22,324 children who underwent a mean of 2.9 annual preparticipation screenings that included history, physical examination, resting ECG, and exercise testing (Limited bicycle ECG stress testing, which was originally required by the Law for the calculation of the heart rate recovery as an index of athlete's physical fitness, is now used to evaluate the occurrence of effort-dependent ventricular arrhythmias. This test lasts ~3 min and is performed on a cycle ergometer starting abruptly with a workload of 2 W/kg in females or 3 W/kg in males with load adjustments, if necessary, until reaching at least 85% of maximal heart rate. The test ends abruptly and is followed by 3 min of post-exercise monitoring).

Over an 11-year study period, 22324 children [62% males; mean age, 12 (interquartile range, 10–14) years at first screening] underwent a total of 65397 annual evaluations (median 2.9/child). Cardiovascular diseases at risk of SCD were identified in 69 children (0.3%) and included congenital heart diseases (n=17), channelopathies (n=14), cardiomyopathies (n=15), non-ischemic left ventricular scar with ventricular arrhythmias (n=18), and others (n= 5). At-risk cardiovascular diseases were identified over the entire age range and more frequently in children ≥ 12 years old (n= 63, 91%) and on repeat evaluation (n=44, 64%).

Why is it important?

Sudden cardiac death (SCD) in young competitive athletes is caused by a wide spectrum of cardiovascular conditions, including congenital heart diseases, genetic cardiomyopathies and channelopathies and acquired conditions. Cardiovascular evaluation of athletes before participation in competitive sports offers the possibility to identify athletes with cardiovascular disease at risk of SCD and to prevent sport-related fatalities. This study results suggest that the Italian PPS programme starting at a variable age of 7–14 years may allow earlier identification of cardiovascular diseases at risk of SCD during sports and the results showed that repeat cardiovascular evaluations increased the diagnostic yield of cardiovascular disease at risk of SCD compared with once-only PPS. The diagnostic yield of each repeat evaluation was similar to that of the first evaluation. Consequently, after a mean of three annual screening sessions, the number of athletes who received a diagnosis of an at-risk condition increased nearly by two-thirds (from 25 to 69) in comparison with the initial

evaluation. Inherited cardiomyopathies and NILVS with ventricular arrhythmias were the heart diseases more frequently identified on repeat evaluation.

Things to consider?

The optimal preparticipation screening (PPS) protocol is still debated. The appropriate starting age, frequency of repeat evaluations, and the long-term screening expenses for PPS are points of discussion.

Take home message?

The preparticipation cardiovascular screening program in young athletes, as implemented in Italy, demonstrates the ability to identify cardiovascular diseases at risk of SCD. Serial evaluations, starting at a younger age, increase the diagnostic yield, supporting the value of early detection and appropriate management. The long-term outcomes suggest that this screening approach contributes to the overall well-being and survival of the screened population.

Why I chose this article?

This study emphasizes the significance of PPS and the importance of annual repetition of these screening. It's very interesting how each year brings new discoveries in abnormal findings detection for PPS.

Reference

Patrizio Sarto, Alessandro Zorzi, Laura Merlo, Teresina Vessella, Cinzia Pegoraro, Flaviano Giorgiano, Francesca Graziano, Cristina Basso, Jonathan A Drezner, Domenico Corrado. Value of screening for the risk of sudden cardiac death in young competitive athletes. *European Heart Journal*, Volume 44, Issue 12, 21 March 2023, Pages 1084–1092, <https://doi.org/10.1093/eurheartj/ehad017>

Edgar Schwarz: Thermoregulatory, Cardiovascular and Perceptual Responses of Spectators of a Simulated Football Match in Hot and Humid Environmental Conditions.

What did they do?

This study investigated the thermal, cardiovascular, and perceptual responses of spectators watching a football match in an environmental chamber (32° C, 76% RH). 30 males and 18 females were recruited and were divided into a younger (< 50 years: n = 27, 29 ± 11 years) and older subgroup (> 50: n=21, 62 ± 7 years). The participants sat in close rows mimicking a football stadium and watched a game on TV (historic match: participants already knew the

outcome). Skin temperatures rose significantly during the match. This rise did not differ between gender or age groups. Nevertheless, there were no effects on body core temperature, heart rate or blood pressure. Thermal discomfort was reported by 52% of the young group and 38% of the older group at baseline which increased to 56% and 71% by the end of the game. Over the 2h protocol, participants lost 0.1 ± 0.2 kg of body mass, which turned into 4 participants being considered dehydrated according to their urine specific gravity.

Why is it important?

Spectators need to be considered when thinking about implementing heat policies for football matches. Although they are not physically active, spectators, who are on average more unfit, with higher body fat and older than active players, might be more susceptible to heat. This study is the first to examine spectators' responses to hot environmental conditions and has shown that, at least within this laboratory setting, a group of fans can preserve thermal homeostasis in $\sim 32^{\circ}$ C and 76% relative humidity.

Things to consider.

It needs to be considered that environmental conditions in this study were not extremely high ($\sim 28^{\circ}$ C WBGT). Further, due to the laboratory nature of the study, there was no influence of solar radiation, lower arousal (as it was a historic match) and no exposure to potential matchday hassles of prolonged travelling to the venue, moving in the stands, alcohol intake, hypohydration, poor nutrition, etc. Therefore, this study should be considered to be repeated within spectators of an actual football match in hotter conditions.

Take home message?

Although spectators perceived thermal discomfort, they did not show signs of any concerning physiological responses in the represented thermal conditions.

Why did I choose this article?

Spectators should be considered when thinking about thermal and cardiovascular strain when football matches are held in the heat.

Reference

de Korte JQ, Eijsvogels TMH, Hopman MTE, Bongers CCWG (2023). Thermoregulatory, Cardiovascular and Perceptual Responses of Spectators of a Simulated Football Match in Hot and Humid Environmental Conditions.

Sports, 11(4), 78; <https://doi.org/10.3390/sports11040078>

Rina Meha: Brain endurance training improves physical, cognitive, and multitasking performance in professional football players.

What did they do?

This study evaluated the effects of a 4-week brain endurance training (BET) intervention on the physical, cognitive, and multitasking performance of professional football players. Using a pretest/training/posttest design, with 22 professional football players randomly assigned to BET or a control group. Both groups underwent 40 physical training sessions over a period of 4 weeks. Following each training session, the BET group engaged in cognitive training, while the control group listened to neutral sounds. Physical performance was assessed using the intermittent fitness test, cognitive performance with the repeated sprint ability random test, and multitasking performance with a soccer-specific reactive agility test. The BET group outperformed the control group in posttest assessments.

Why is it important?

This research is significant as it emphasizes that brain endurance training (BET) may enhance psychomotor vigilance, inhibitory control in fatigue conditions, and multitasking performance. This highlights the role of cognitive training in optimizing overall sports performance, with potential implications for athletes requiring multitasking and fatigue resilience.

Things to consider

The sequencing of cognitive tests, with the Stroop test administered after a demanding multitasking performance test, might be a confounding factor, raising questions about whether the observed improvements are attributed to brain endurance training (BET). In addition, the Stroop test is often criticized for its perceived lack of specificity in the context of sports. Additionally, the sample size was relatively small, posing a potential risk of biases.

Take home message

Incorporating mentally-fatiguing cognitive tasks into the regular training regimen of professional football players may improve psychomotor vigilance and inhibitory control in fatigued conditions and multitasking performance. This approach could contribute to performance improvement by raising cognitive load without imposing additional physical demands.

Why I chose this article

This study contributes valuable insights into the relationship of cognitive training and physical performance in professional football players, offering insights into the potential benefits of

mentally fatiguing cognitive training on both the mental and physical aspects of athlete performance.

Provide the reference

Staiano, W., Merlini, M., Romagnoli, M., Kirk, U., Ring, C., & Marcora, S. (2022). Brain endurance training improves physical, cognitive, and multitasking performance in professional football players. *International Journal of Sports Physiology and Performance*, 17(12), 1732–1740. <https://doi.org/10.1123/ijsp.2022-0144>.

Guangze Zhang: Return to play following injuries in pro football: insights into the real-life practices of 85 elite practitioners around diagnostics, progression strategies and reintegration processes.

What did they do?

An online survey was designed to gain insight into the overall organization of return-to-play (RTP) process within Multi-Disciplinary Team (MDT). Questions focused on the aspects of clinical diagnosis, progression criteria, players' reintegration, and the organization of RTP process. Valid responses were received from 85 practitioners (i.e., doctors, head of performance, physios, conditioning coaches, rehab coaches, sport scientists) from first and second football leagues across Europe, the USA, South America, and Asia.

Why is it important?

RTP continuum starts as soon as the occurrence of injury and involves stake holders with multiple backgrounds. Despite some scientific anchors in terms of diagnostics and progression criteria, the actual RTP process is full of complexity, unpredictability, subjectivity, and human interaction. The real-world collaboration on RTP within or outside the MDT in professional football is informative and has only been partially examined.

Things to consider

Following a minor-to-moderate injury (time loss < 28 days), players may be selected for competition even without meeting all the RTP criteria. Training with the team in a non-restricted way for three days to a week was a criterion two times more often missed than reaching near-to-normal group-based baseline strength/mobility/ROM values, which may be related to the fact that the coaching staff generally leads the last part of RTP process instead of MDT practitioners. Besides, external pressure (e.g., playing minutes required in contract and losing place in the starting 11) on players, as well as unavailability of testing tools also hinder

RTP with meeting criteria. Although there have been established descriptions of RTP (e.g., fully available for training and competition), required players' fitness varies across upcoming exposure (e.g., playing 10 minutes in leading match situation differing from 35 minutes).

Take home message

Although RTP goals are often set by medical doctors and physios, consulting performance staff and communication among MDT is frequently adopted (95%) to guarantee a holistic management of players. While "perception and confidence of players" is rated in the top four most important criteria to be used to organise daily work during the entire RTP process, professional psychologists are scarcely involved (< 2%). This psycho-emotional monitoring, in practice, is usually not carried out by specialists but coaching staff. Across all positions, players almost never (75%) play 90 minutes in the first match appearance after severe injuries. As opposed to other positions, central defenders tend to play more than 60 minutes in their first match after RTP, especially following minor-to-moderate injuries.

Why I chose this article

The findings highlight the variety of ways and trends that elite football practitioners manage their injured players. This is also the first study that investigated the minutes played by players in the first match appearance after RTP (based on the reporting from practitioners).

Reference:

Buchheit, M., King, R., Stokes, A., Lemaire, B., Grainger, A., Brennan, D., ... & Hader, K. (2023). Return to play following injuries in pro football: insights into the real-life practices of 85 elite practitioners around diagnostics, progression strategies and reintegration processes. *Sport Perform Sci Rep*, 180. Link: https://sportperfsci.com/wp-content/uploads/2023/01/SPSR180_Buchheit.pdf