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EDITORIAL

BY: MONÈM JEMNI AND BESSEM MAKAOUER

The ISAFA commitment towards promoting the science and the scientists behind football throughout good and difficult times

2020 and 2021 have been two years of severe and extreme challenges for some people, in particular those who have lost friends, family members and beloved ones because of the global Covid-19 pandemic. The ISAFA, its board members and volunteers are sympathetic about the situation. Significant number of sectors have totally transformed their working habits/methods and endorsed working from home. The academic sector is obviously one of these sectors that has accepted the fact that the only way forward is by adopting online teaching and remote delivery. Some have completely cancelled any face-to-face teaching and shifted students' experience of the higher education to a virtual one. Although some have found the experience quite painful from the mental health side, it is a fact that remote learning has significantly helped reducing spreading the virus.

In this context, the ISAFA 2020 Conference has been postponed to 2021. It has been scheduled as a live and face-to-face conference to be held at Oxford Brookes University by the end of March 2020. However, this was right in the middle of the pandemic. Together with the local organizing committee, we are working on the best compromises between health and safety whilst considering the government sanitary guidelines to find the right dates but also the right format to deliver the conference this year. We hope the dates will be shared soon together with a few other significant events for 2022 and 2023.

This 5th edition of the ISAFA Newsletter Magazine contains neat manuscripts juggling between technologies applied to football analysis to mental health conditions that could affect footballers. Qixiang He from Singapore has written a ship-shape paper where he has used big data to identify trends in team playstyles, whereas Dimitrios Koukouras from the UK has presented a short efficient review highlighting the pros and cons of the GPS tracking in Football.

Our colleague and board member François Billaut and his team in Laval, Canada have been very active exploring ways to improve the anaerobic metabolism, hence providing new experimental recipes to coaches. Shannon Cyr-Kirk trialled Hyperoxia and found out that it improves repeated-sprint ability and other associated training load, whereas Stéphan Bouffard confirmed that sprint training combined with ischemic preconditioning enhances the anaerobic capacity.

For those who have interest in female football, they will find some handy considerations for coaching practice put together by Benjamin Franks from the UK. Our regular contributor and board member Sean Malcolm was very kind and continued to share his club experience of coaching online after his first paper in the 4th edition. He described the multiple tools they have used, the feedback and up to the return to play in this edition.

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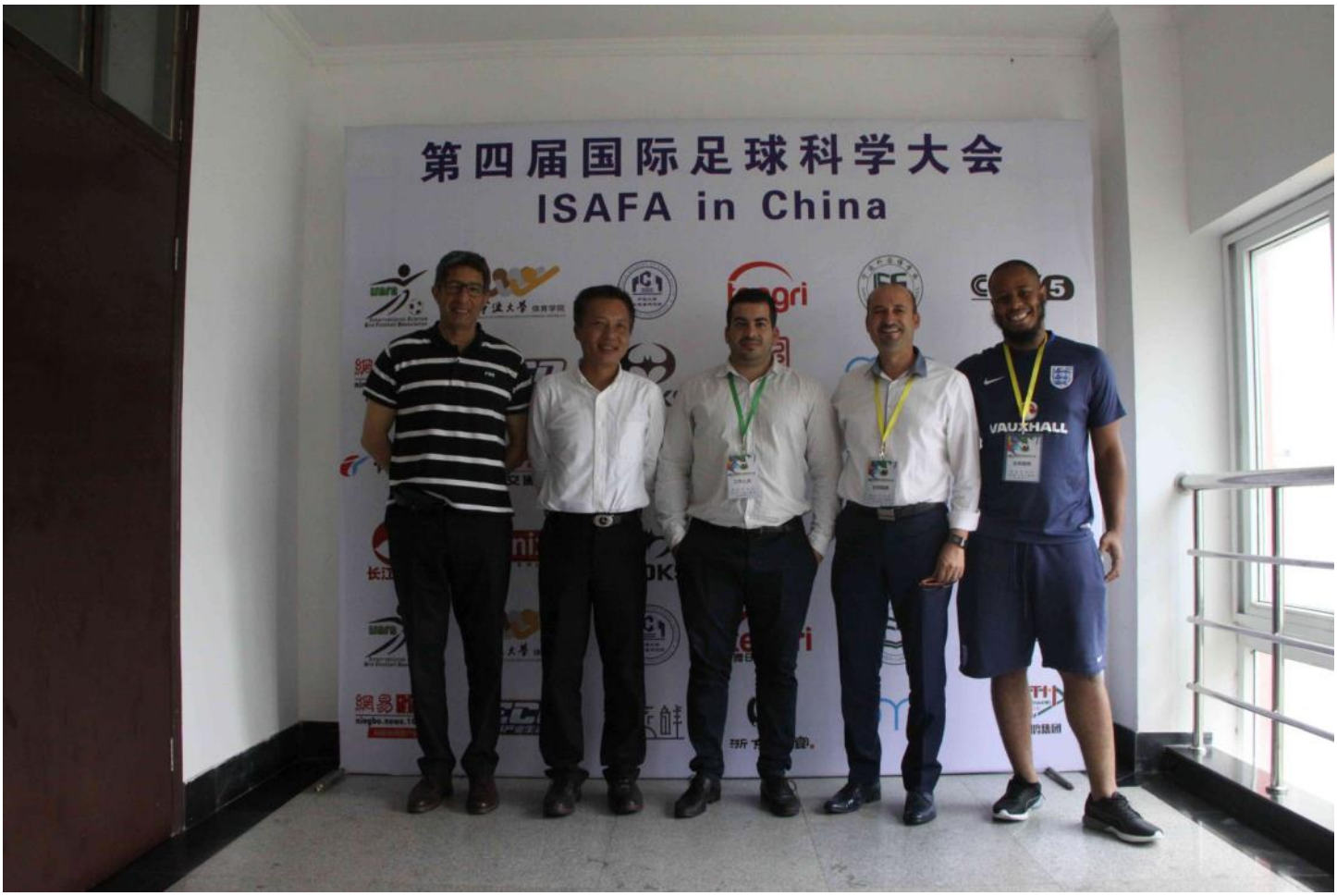
Similarly, our regular Canadian contributor Harry Hubball, together with Jorge Diaz-Cidoncha Garcia and Scott Robertson from the FIFA, Switzerland have shared some strategic educational inquiry for coach leaders/administrators to enhance amateur/grassroots football. From another side, Harry and his group of the 60+ Masters Small-Sided Football World Cup have been sat back and slowed down under the effect of the Covid-19 pandemic. Harry and his colleagues have suggested some health and safety guidelines to re-starting the 2021 International competition in Denmark During the Covid-19 Pandemic.

The readers of this edition will also discover the effects of the Attention Deficit Hyperactivity Disorder (ADHD) in football players presented by Dr Abbass Mohammadinasab from the UK.

Finally, in closure of this editorial, we would like to thank all the board members, the volunteers and the editorial office for their dedication, efforts and commitment to come-up with this great output for the 5th consecutive year. We would also like to welcome our new members: Khaled Khalifa Dougman (Abu Dhabi), Mr Radhi Jaidi (Belgium), Dr Ahmet Hamdi Caglar (Turkey), and in particular our first-ever female member Dr Luciana De Martin Silva (UK).

Our best wishes for health and wealth

Monèm and Bessem .



Restarting the 2021 International 60+ Masters Small-Sided Football World Cup in Denmark During the Covid-19 Pandemic

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Introduction: In the context of the current global Covid-19 pandemic, coaches and international event leaders around the world are mindful of the added health and safety needs of grassroots seniors' (55-70+) athletes. As part of the strategic organizational leadership for the restart of the 2021International Masters 5-a-side Football World Cup in Denmark, case study research methodology was employed over a 4-month period to develop a customised and evidence-based Covid-19 safety protocol for this annual event. Drawing on analyses of relevant documentation (e.g., WHO, FIFA and Danish Health Ministry Covid-19 guidelines) and focus group interviews with key multi-disciplinary and multinational tournament stakeholder representatives (e.g., medical doctors, tournament host leaders, football scholars, match officials, volunteer coaches and players), this paper highlights key findings for implementing a strategic safety protocol during the Covid-19 pandemic for the 2-day International 60+ Masters Small-Sided Football World Cup Tournament in Denmark, 2021. Due to rapidly changing Covid-19 pandemic circumstances during the months of tournament planning and writing this article, the following strategies are intended relevant and customised measures for consideration. Ultimately, implementation will be based on Danish Government regulations, football association recommendations, and practical possibilities at the time of the international tournament, thus requiring constant adjustment (including alternative strategies) according to the situation:

Pre-tournament Travel Assessments

- Check WHO guidelines;
- Check Danish and national government travel advisory and restrictions (e.g., pre-trip vaccinations and/or pre-during-post tournament Covid-19 testing requirements);
- Check airline, travel agent, hotel and insurance advisory and restrictions;
- Check FIFA/DFA & host Club football advisory and restrictions;
- All tournament attendees are required to consult their primary care providers/GPs about any personal health risks that need to be considered (Covid-19 related and non-Covid-19 related diseases).

On-site Tournament Leadership

- The 2-day international tournament will strictly adhere to Danish Government/FIFA/DFA/host Football Club Covid-19 related health and safety regulations and guidance to minimise risks of spread of common infective diseases, such as common cold, influenza and the Covid-19 virus
- For tracing purposes, only teams, players, officials and guests that have been registered with the international tournament committee prior to the event may attend the 2-day tournament and masters football research symposium
- Host club officials, including the designated Covid-19 health and safety officer, medical doctor(s) and volunteer staff, will provide regular public health reminders, rules and communications throughout the event, such as whether players and match officials are required to wear face covers and maintain 1.5m physical distancing

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(e.g., 3-touch only ball rule) during warm-ups and competitive games.

On-Site Tournament Health Assessments

- Covid-19 risk awareness waivers recommended by Danish authorities will be collected at onsite registration;
- If authorised by Danish authorities, tournament attendees will be required to demonstrate a negative Covid-19 test document within 3 days prior to entry to the tournament venue;
- Tournament attendees experiencing any Covid-19 symptoms or are at risk, will not be permitted in the tournament venue;
- All tournament attendees will receive health screening via a questionnaire and touch-less thermometer that must record below 37.7oC (100.4 oF) to enter the tournament venue each day.

On-site Tournament Facilities

- Dressing room and shower facilities will not be open at the host venue. Tournament participants will change clothes prior to entering the tournament venue and outside the venue after each day of games. Tournament participants are required to bring their own towels and water bottles (any water bottles left behind will be discarded at the end of each day). Toilet facilities will be regularly sanitised during the 2-day event, and hand sanitiser will be widely available at the tournament venue for the use of all those in attendance;
- The indoor host Club venue will be closed for group meetings. All presentation/group meeting areas will be conducted outdoors, and the 'Entry' and 'Exit' points at the venue will be modified with increased signage to facilitate 1-way traffic flow;
- Match officials and volunteer staff will wipe down football equipment with disinfectant before and after use; balls will be properly spaced to support 1.5m physical distancing guidelines; and, tournament participants will warm-up and cool-down on separate pitches (one per team) for the same reason.

On-site Tournament Physical Distancing

- All tournament attendees (spectators, volunteers, club staff, players, officials etc) must adhere to physical distancing guidance and remain 1.5 meters apart, as well as, use hand-washing hygiene and wear face covers at the tournament venue where appropriate;
- Tournament spectators will be located in separate marked areas at the host venue allowing no contact with tournament participants;
- Tournament teams will arrive at the host venue at specified time-slots and will stay in specified (marked) areas. Each team will move as a group from their designated area to a scheduled game and avoid any on-or-off-pitch physical contact with opponents (including handshakes etc) and officials. Team benches will be placed on each side of the pitch;
- In order to avoid exposed time to opponents or team mates during small-sided games, players will be required to execute sideline kicks within a 2-second maximum, and execute corner kicks within a 5-second maximum;
- Minor injuries will be self-treated where appropriate, otherwise first-aid/trainer/medical personnel will be equipped with appropriate protection to provide assistance.

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Summary

Significant developments and commitments to modified safety protocols have been made in order to meet the unique age-related health and safety needs and circumstances of competitive seniors' athletes in the 2-day international 60+ Masters Small-sided Football World Cup in Denmark, 2021. Data suggest that adapted safety-protocols for amateur/grassroots international 60+ seniors football events during the Covid-19 pandemic focus on responsive age-appropriate risk assessment practices, as well as related concerns such as facilities, equipment, travel, budgeting and restricted-play adaptations for limited physical contact. Furthermore, critical leadership contributions (inclusive of multinational stakeholder representatives and complex "Plan B-D contingencies), key organizational supports, and evidence-based practice is essential for the science, politics, and art of implementation .

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Research methods to enhance amateur/ grassroots football: Strategic educational inquiry for coach leaders/administrators

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Introduction: Around the world, coach leaders and administrators in amateur and grassroots football organizations (AGFO) with limited resources are increasingly under scrutiny and required to account for the sustained quality, impact, efficiency, and/or ongoing improvements to their coaching programs and initiatives. While accountability for program effectiveness is nothing new to coach leaders and administrators in these settings, in practice, seldom is enough attention paid to strategic, systematic, and rigorous quality assurance and enhancement processes. Clearly, the strength of AGFO coach leaders and administrators lies in their deep understanding of their specific football organizational contexts and stakeholders; their vested interests with respective programs, practices, and priorities; and their related background experience, all of which are critical to assessing positive change in these settings.

More often than not, however, AGFO coach leaders and administrators in settings with limited resources face myriad challenges even to conduct strategic, systematic, and rigorous quality assurance and enhancement of their coaching programs and initiatives. Such challenges include a lack of available time, support, and/or research expertise as well as organizational cultures in which evidence-based quality assurance and enhancement are not expected. Furthermore, these coach leaders and administrators are often unfamiliar with the relevant research methodologies and methods for maximizing program innovations, sustaining ongoing improvements, and disseminating high impact outcomes, i.e. tournament, program, team, and individual performances.

Strategic educational inquiry (SEI) is a flexible, systematic, and rigorous approach to practitioner research and is particularly effective and efficient for coach leaders and administrators in complex AGFO settings. Depending on the nature of organization-specific research objectives, SEI can draw upon an eclectic range of research methodologies in order to provide relevant evidence-based data for quality assurance and enhancement purposes, i.e. to sustain state-of-the-art coaching program innovations, improvements, and/or high impact program outcomes. Grounded in interdisciplinary research and case study methodology using multiple case design, this article highlights key findings and practical examples of applied SEI for quality assurance and enhancement purposes in diverse AGFO coaching contexts .

Practical examples: Applied SEI for quality assurance and enhancement of coaching programs and initiatives in diverse AGFO coaching contexts

- To ground specific coaching programs and initiatives, AGFO coach leaders and administrators reviewed relevant SEI research and professional literature in international and professional journals, many of which have free access to online articles, as well as football organization website information, e.g. International, Regional, National, and/or Provincial Football Associations.

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- To prioritise coaching program innovations and improvements, AGFO coach leaders and administrators considered a wide range of situation-specific, time-phased investigative SEI research objectives.
    - ◊ Coaching Context questions, e.g. issues pertaining to program recruitment, promotion, cost-benefit analysis
    - ◊ Coaching Process questions, e.g. issues pertaining to coaching effectiveness, team and player experiences
    - ◊ Coaching Outcome questions, e.g. issues pertaining to team and player development, skills improvement
    - ◊ Coaching Long-term Impact questions, e.g. issues pertaining to participant and program sustainability, growth, expansion, reputation
- To address ethical concerns, i.e. informed consent, anonymity, confidentiality, conflict of interest considerations, appropriate research methodologies, and/or to align such concerns with situation-specific SEI research objectives, AGFO coach leaders and administrators selected from an eclectic range of methodologies, including action research, appreciative inquiry, case study research, ethnographic inquiry, phenomenological inquiry, and self-study methodology.
- For example, action research methodology provided AGFO coach leaders and administrators a systematic and cyclical process of inquiry that involves criteria- / hypothesis-testing, planning, data collection, data analysis, and ongoing monitoring of evidence-based improvements, e.g. participant recruitment strategies, program facilities, participant experience, strategic team selection, team and player development, coaching effectiveness.
- To collect relevant evidence-based data during SEI research, AGFO coach leaders and administrators selected from a range of systematic data collection methods: qualitative, e.g. relevant documentation, focus group interviews, video recordings, semi-structured surveys, coaching field notes; quantitative, e.g. Likert scale surveys, numeric participation records, program budgetary projections, physiological measures, performance analysis variables; and mixed methods data collection.
- To disseminate evidence-based coaching programs and initiatives within and beyond the communities they serve, AGFO coach leaders and administrators took part in different SEI-related networking opportunities, such as periodically informing key organizational stakeholders about cutting-edge best-practice program implementation and/or improvement; providing program-specific presentations to local and broader coaching communities; providing program-related newsletter and journal publications; and developing program-specific research grant applications.
- To assist AGFO coach leaders and administrators to conduct SEI in their coaching settings, some key organization-specific supports included strategic visioning documents; strategic football coach education and skills training; strategic communications and encouragement; and strategic forums and related networking opportunities for disseminating best practices.

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For example, strategic football coach education and skills training within these contexts included:

(i) state-of-the-art customized technology-enabled professional development experiences, i.e. responsive to the needs and circumstances of coach leaders and administrators in complex AGFO settings;

(ii) expert mentoring support to ground specific coaching programs and initiatives within relevant research and professional literature.

Summary: Longitudinal data suggest that SEI provides strategic, effective, and efficient quality assurance and enhancement practices, i.e. coaching programs and initiatives, for AGFO coach leaders and administrators in diverse settings. SEI can foster an organizational culture for cutting-edge research and coaching excellence as well as help AGFOs to become better known within and beyond the communities they serve. Given significant implementation challenges to conduct SEI in these complex settings, critical organization-specific supports for AGFO coach leaders and administrators are required, including access to state-of-the-art customized technology-enabled professional development experiences and expert mentoring support. Despite significant challenges, increasing levels of organizational support are testimony to the growing value placed on SEI for quality assurance and enhancement practices within amateur and grassroots football settings .

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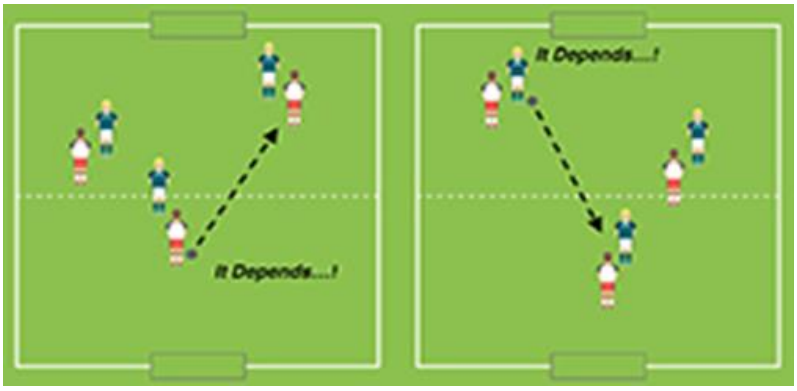

Considerations for Coaching Female Football Players: A Brief Review and Implications for Practice

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Keywords: Football, Female, Coaching, Gender

Introduction: With the recent surge in professionalisation of female football in the United Kingdom (UK), there is a need to better consider how best to facilitate positive learning and developmental experiences. Within the UK, the FA Women's Super League and Championship have taken significant steps towards professionalisation through full-time and part-time status. With an increase in the contact time with athletes, coaches must become better equipped in providing and creating appropriate and effective programmes for female athletes.

Despite the necessity for greater consideration when structuring appropriate programme designs, traditional coach education sites have failed to provide an appropriate climate for coaches to construct appropriate knowledges. As scholars have frequently noted over the past two decades, the coaching landscape is characterised by ambiguities and an array of dynamic social interactions (Bowes and Jones, 2006). However, coach education strategies have typically placed importance on coaching practice through the development of tools and methods that attempt to serve the needs of athletes, often without appreciation of the sometimes subtle and complex nuances (Cushion, Armour and Jones, 2006).

In dealing with such complexity, questions have been raised as to the coach's considerations of gender during training and competition (Kristiansen et al., 2012). Idealised or gender blind conceptions of the coaching process do little in helping coaches make sense of the myriad of factors at play. In pursuit of finding clarity on the core contextual parameters at play, we will briefly review a number of areas identified by the authors, all of whom are active practitioners within female football or elite female sport within the UK. We do not wish to prescribe a coaching approach, instead we aim to bring to light our current understanding of how gender differences may shape the coaching process .

The Gender Order within football coaches knowledge's

Coaches learn through construction of knowledges in a variety of formal, non-formal and in-formal learning sites (Nelson, Cushion and Potrac, 2006). Within these sites of education, coaches become socialised to an accepted discourse that is deemed to hold value or befitting with common-sense practice. Within football specifically, coach education sites have been seen to lead to the construction of norms, rules and practices that coaches act upon. One such construction is the inherent differences between male and female athletes.

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As explored by Adams et al. (2010), male athletes were seen as the norm, with coaching practice being heavily influenced by the construction of desired athletic masculinity. These constructions are seen as an objective truth (Norman, 2016) which are used to legitimise and (re-)construct existing discourses which have become manifest within female football environments. Further, coaches have constructed a discourse surrounding the preferences and athletic practices of female athletes.

The (re-)construction of gender discourses within coaching have subtly interfered with how coaches approach coaching female athletes. Coaches believe they engage in gender blind practices, treating athletes in similar ways irrespective of their gender. However, de Haan and Knoppers (2020) note these indifferences as an empty ideology. Female athletes tend to be problematized, constructed as the other and frame "women's failure as intrinsic and exonerate organizational culpability" (Fielding-Lloyd and Mean, 2011; 351). Work conducted by Felton and Jowett (2013) illustrated that when working with male athletes, coaches would promote a winning at all costs mentality, however when working with female athletes they advocated female athletes try their best, assuming that female athletes are not capable of high-level performance. Many coaches within female football in the UK are male, were male athletes, and were coached by males, having been embedded in masculinised environments. Coaches are likely to inadvertently reproduce the very same discourses about gender that have been socialised upon them.

It is important that coaches question how well prepared they are to respond to their athletes on an individual basis considering the deeper social and gendered contexts (De Haan and Knoppers, 2019).

Constraints on the Coach-Athlete Relationship

An important consideration for coaches of female athletes in football is to consider the power imbalances manifested within the coach-athlete dyad. Importantly, to ignore such imbalance is to disregard what doing gender is within the social context the relationship is situated in. Doing gender in this regard, is how one acts in accordance with the normalising cultural and social practices that define the role played by an individual, and the relationship they have to their gender. Thus, it is crucial that coaches should pay significant attention to who they are coaching, not just what they are coaching. Research exploring effective coach-female athlete relations have debated how the coach may shape the efficacy of the relationship. In particular, Norman and French (2013) argued that female athletes want more support as a person as well as a performer, consequently needing a more power-equal coach-athlete dyad.

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Therefore, constructing supportive relationships becomes central to a positive learning climate, where female athletes may respond more effectively to positive behaviours that underpin mutual communication (Longshore and Sachs, 2015). Research by Stewart (2016) states that when a coach creates a learning climate consisting of punishment, reduced positive feedback and less social support, athletes perceived greater internal conflict. These negative learning climates may increase performance-related worry, reduce self-confidence, and may live on after leaving that team (Pensgaard and Roberts, 2002).

Female health considerations for coach and player

Central to an effective coach-athlete dyad is the mutual understanding of constraints placed on the female's athletic experience. Obvious anatomical difference occurs between sexes, but differences also occur in physiology, endocrinology, and psychology, which can also vary significantly between individual females. Understanding the female bodily experience is essential, yet currently insufficient evidence exists to suggest training at certain times of the menstrual cycle or hormonal contraceptive cycle is more or less optimal. Therefore, coaches should see the menstrual cycle and hormonal cycle as an individual, and not a collective experience (Pitchers and Elliott-Sale, 2019). Armour et al. (2020) researched symptoms and performance perception in 124 elite female athletes, with 82% of athletes reporting period plain and 83% reporting premenstrual symptoms. This resulted in 50% and 59% of responders alluding to a perceived reduction in performance in practice and match play because of their cycle. These topics should not be viewed as taboo, given the menstrual cycle offers a unique and early detection system for low energy availability and the role of oestrogen in bone health.

In understanding the female athlete experience, coaches should interpret individual menstrual/contraceptive symptoms (physical and psychological) the same way they would when receiving any form of athlete wellbeing data (sleep, muscle soreness etc) (Clarke et al., 2021). Research determining the effects of long-term monitoring within the club environment have shown mixed results (Pitchers et al., 2020). Athletes reported that monitoring enabled them to discuss their own cycle with other athletes (80%), strength and conditioning coach (100%) and medical staff (65%), but not their football coaches (30%). This highlights a failure for some coaches in forming functional relationships with their athletes, leading to an inability to understand the female athletic experience, and how this may interact with their training and matchday performances.

Concluding remarks and implications for practice

Whilst we are cautious not to further perpetuate the position of female athletes as 'other', we have provided a brief case for the need to understand how gender may influence how the coach-female athlete relationship is practised. Given that a significant portion of the workforce in women's football has been - and continue to be - socialised within masculinised spaces, we urge coaches working with female athletes to carefully reflect on how their knowledge of the female athlete shaped their practices and interactions. Normalising the female athletic experience within the coaching environment can allow coaches to engage with their athletes to better understand the individual and collective needs and requirements at a given moment. Equally, coaches should be supported to further seek how differences between genders are constructed and the ramifications for the ordering of gender in a social hierarchy. Coach Education programmes should seek to drop the one-size fits all approach, and instead adopt gender as an important organising constraint on coaching practice.

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Through a deeper and more critical understanding of how gender constructs shape the athletic experience; team managers, coaches and practitioners can effectively tailor their daily personal interactions and performance programmes to provide supportive and stretching development environments for female football players.

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Sprint training combined with ischemic preconditioning enhances anaerobic capacity

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Key words: blood-flow restriction, HIIT, hypoxia, NIRS, peripheral adaptation

Introduction: Anaerobic capacity is a key component of performance, and athletes develop that quality with high-intensity interval training. Recently, ischemic preconditioning (IPC) has attracted interest in enhancing otherwise -reliable training methods like sprint interval training (SIT). Such improvements are mostly derived from blood flow and O2 kinetics changes (Paradis-Deschênes et al., 2016; Kilding et al., 2018). IPC has been shown on multiple occasions to enhance physiological responses and both aerobic and anaerobic performances acutely (Salvador et al., 2016). For example, when applied acutely, IPC improves power output during short (6 s, Patterson et al., 2015), medium (15-30 s, Lindsay et al., 2017) and long (60 s, Cruz et al., 2016) sprints, as well as key qualities associated with sprinting such as maximal concentric force (Paradis-Deschênes et al., 2016). However, the ergogenicity of its chronic use remains to be examined consistently before making practical training recommendations. If vascular, metabolic and contractile responses to IPC have been explored, the neuromuscular activation of a contracting muscle, which is a hallmark characteristic from SIT, is still poorly understood. Information about muscle electrical activity (EMG), both in amplitude and frequency spectrum, would provide further knowledge about the effects of IPC on muscle recruitment and the devel**opment** of neuromuscular fatigue.

Adding ischemic preconditioning to sprint interval training sessions

IPC consists of alternating cycles of ischemia and reperfusion in order to restrict blood flow and O2 delivery. Exposition of a tissue to ischemic (and hypoxic) conditions can make it more resistant to future hypoxic events, such as found in sport. Typically, 1 to 4 compression cycles lasting 2 to 5 minutes can be used 5 minutes to 24 hours prior to an effort (Paradis-Deschênes et al., 2016). Before using this technique, athletes should familiarize themselves with it. Although it is not painful, it can be uncomfortable for certain individuals. Once the athlete is accustomed to the cuff pressure, coaches and trainers can use the technique prior to SIT sessions. The coach/trainer would place a non-elastic nylon blood pressure cuff on each upper thigh. They would then rapidly inflate the cuff to a pressure of 220mmHg for 5 min on one leg, then release it when the other leg is being compressed for 5 min. The process is repeated 3 to 4 times, allowing 5 min of reperfusion between compressions to each leg, adding up to a total IPC time of 30-40 min (Paradis-Deschênes et al., 2016). Following the intervention, the athlete would perform a session consisting of 4 to 7 maximal 30-s sprints interspersed with 4 min of passive recovery. Such training may be performed 2 to 3 times per week, up to 4 weeks, and therefore fits well within a pre-competitive or competitive macrocycle (Paradis-Deschênes et al., 2020).

The study

To examine if IPC can increase exercise intensity and training load and optimise physiological adaptations to training, twelve endurance-trained males (VO2peak 60.0±9.1 ml.kg-1.min-1, age 29.6±9.9 years) were assigned in a randomized crossover design into an IPC or placebo group to perform the same eight SIT training (4-7 Wingate tests) over 4 weeks. Wingate sprint performance and neuromuscular activity were measured before and after training.

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The root mean square (RMS) and mean power frequency (MPF) of the electromyographic (EMG) signal from three lower-limb muscles were continuously measured during the Wingate. All data were averaged over six 5-s intervals and analysed with Cohen's effect sizes. The study was approved by the Ethics Committee of University Laval and respected the principles of the Declaration of Helsinki.

Results

We observed greater gains in Wingate performance following 4 weeks of SIT combined with IPC compared to the control group. Mean power output (MPO) increased in the last third of the test (interval 20:25s: +1.4±6.7%, effect size (ES) 0.51; interval 25:30s: +2.9±7.1%, ES 0.58). This enhancement in power led to a difference of 9% in the fatigue index between the groups (Figure 1).

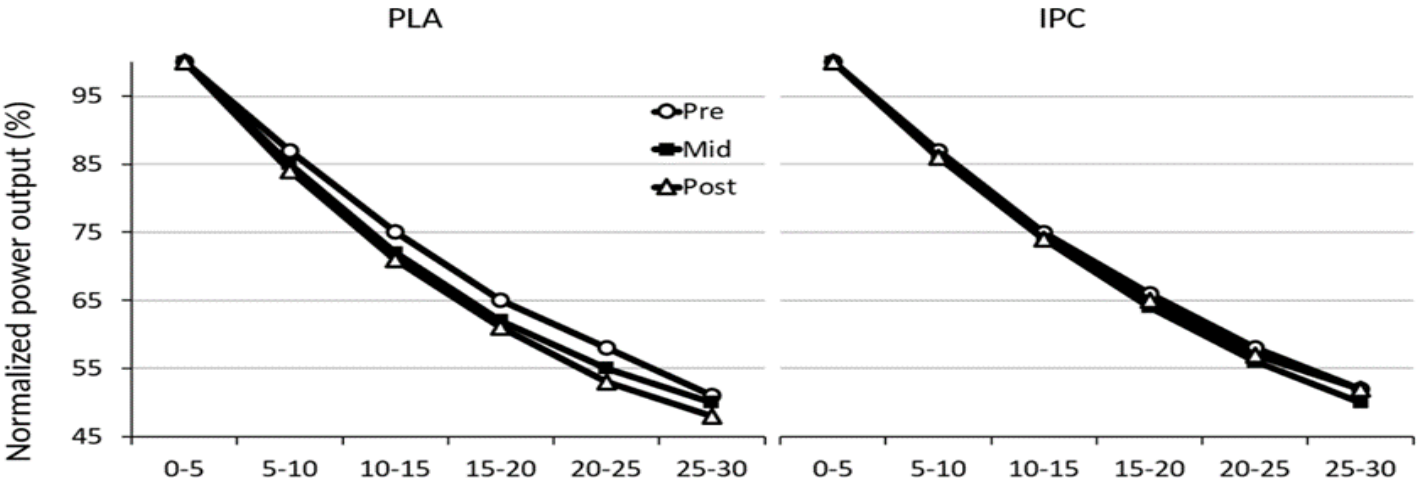

Figure 1. Changes in mean power output (MPO) during the six 5-s segments of the Wingate test with placebo (PLA) and ischemic preconditioning (IPC) before (Pre), after 2 weeks of training (Mid), and after 4 weeks of training (Post). From pre- to post-, no clear difference was noted in the fatigue index between groups (table 1). However, from mid- to post-, it decreased in IPC (↓5.8 ± 10.0%), while it increased in PLA (↑4.6 ± 15.1%), yielding a clear group difference (-10.0 ± 10.2%, ES -0.46, 1/14/85%).

These performance improvements indicate a greater anaerobic performance. The acute use of IPC has been reported to increase the performance of a supramaximal exercise; here we add that this manoeuvre can further enhance physiological adaptations and performance when applied chronically during training. While this combination has proven successful to boost endurance time-trial performance (Paradis-Deschênes et al., 2020), it remained poorly understood whether it could also enhance anaerobic capacity and sprint performance. Our results of improved power output in the latter stages of the Wingate test in the IPC training group coincided with changes in the recruitment of higher -frequency motor units (MPF: +9.9%) but not overall muscle activity amplitude (RMS). These neuromuscular adjustments may be attributed to the metabolic substances (e.g., adenosine, opioids, nitric oxide) released in the hypoxic tissues and the circulation to a great extent during IPC cycles. These substances may attenuate the signaling of type III and IV afferent fibers, which causes a disruption to the central feedback loop mechanism (Cruz et al. 2017). The central nervous system can then continue stimulating type 2 skeletal muscle fibers and maintain power. We conclude that the combination of IPC and SIT induces additional adaptations by maintaining high-threshold motor unit recruitment, which could increase sprint performance.

Take-home message

Current research literature suggests that combining ischemic preconditioning with high-intensity training enhances physiological determinants of sprint ability to ultimately reduce neuromuscular fatigue development towards the end of the sprint. Therefore, we encourage athletes and coaches looking to improve anaerobic capacity or sprint endurance to implement ischemic preconditioning before sprint training sessions.

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Hyperoxia improves repeated-sprint ability and the associated training load in trained

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Keywords: Oxygen supplemented air, multiple sprints, team sports, muscle oxygenation, electrical activity .

Introduction: Physiological adaptations obey the so-called training load principle. As such, the nature and the magnitude of a training effect are dictated by the frequency, duration and intensity of the exercise. Enhancement in athletic performance is well known to be attributable to the controlled fluctuation of the training load (TL) throughout the year (Busso, Denis, Bonnefoy, Geyssant, & Lacour, 1997; Fitz-Clarke, Morton, & Banister, 1991). Therefore, the understanding and quantification of the impact of varied stimuli on TL represent a key element to sport performance optimization (Foster et al., 2001). Soccer players typically repeat brief maximal or near-maximal efforts (i.e., sprints, changes of direction, jumps) with short recoveries at low to moderate intensity. The ability to maintain high-intensity efforts throughout the duration of the game, called repeated-sprint ability (RSA), is an essential determinant of performance. Improvement in RSA and other physical qualities such as aerobic capacity, sprint speed and jump height can be achieved by repeated-sprint (RS) training (Taylor, Macpherson, Spears, & Weston, 2015).

Among the multiple stimuli used by athletes and coaches to increase TL and force physiological adaptations, oxygen supplementation (hyperoxia, HYP) appears very attractive due to nearly all physiological functions relying on this gas, and has proven to be ergogenic on sport performance. With growing popularity since its approbation by the World Anti-Doping Agency (WADA) in 2001, HYP can be obtained by increasing the inspired oxygen fraction (FIO2, normobaric HYP) and/or the barometric pressure (hyperbaric HYP). It is robustly demonstrated that performance during aerobic exercise such as time trials, time to exhaustion, graded exercise tests and dynamic muscle function tests is acutely improved under HYP conditions (Amann et al., 2006; Peltonen et al., 1997; Richardson et al., 1999). Performing a RSA training session while breathing a hyperoxic gas mixture may therefore possibly enhance performance and the associated TL.

Adding oxygen to the breathing mixture during repeated -sprint session

Normobaric hyperoxia can be obtained from an air compressor and administered via a rig of Douglas bags connected to a facemask. This technique can be easily used during a RSA training session on a cycle ergometer or a treadmill. The facemask can be installed before or after the warm-up. The deadspace between the mixture bags and the facemask should be limited to the minimum to reduce any breathing difficulties. Before using this modality, athletes must be familiar with the technique by performing one or two sessions of familiarisation with the facemask. Coaches must be attentive to the breathing pattern and must ask the athletes about the difficulty of the task. The variety of RSA training sessions that can be performed using this modality is really limitless. Coaches and sport scientists may use a combination of sets and repetitions of short (6-10 s) sprints at maximum intensity with limited (< 30 s) passive recovery (Billaut & Bishop, 2009) .

Relevance of hyperoxia on performance

Some studies using 100% pure O2 reported acute improvements in mechanical output such as peak (Sperlich et al., 2011) and mean power output (Porter, 2019; Sperlich et al., 2011) during repetead high-intensity intervals, but RS exercises have not been examined yet. In our study, eighteen athletes (including 6 women) with RSA training experience volunteered to perform two experimental trials of repeated cycling sprints in HYP and normoxia.

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Mechanical (via an electronically-braked cycle ergometer), physiological (via near-infrared spectroscopy, electromyography and pulse oximetry) and perceptual (via rating of perceived exertion) data were collected throughout the tests to assess the acute effects of hyperoxic air supplementation on RSA. The study was approved by the ethics committee of University Laval and adhered to the principles established in the Declaration of Helsinki. Our data (Figure 1) demonstrated clear enhancement in total work produced (13.6 ± 6.8%, effect size (ES) 0.30) and the associated training load (16.7 ± 7.4%, ES 0.33) during an ergocycle RSA test with only FIO2 40% (Cyr-Kirk & Billaut, unpublished observations).

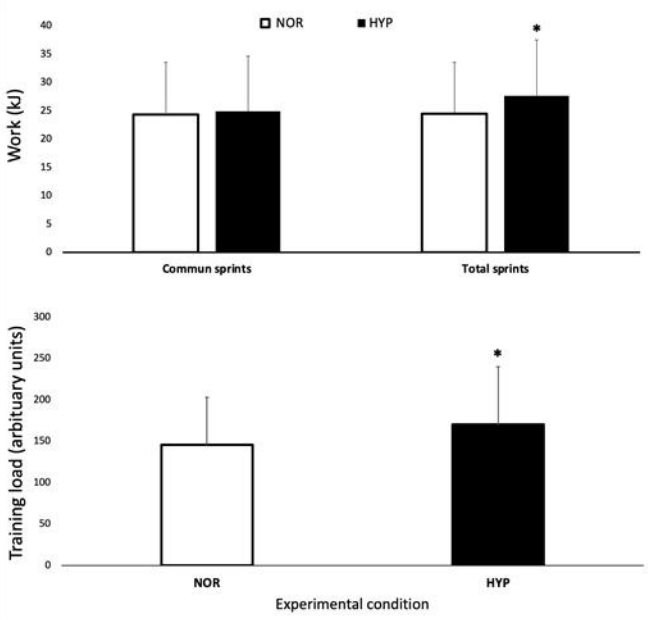

*Fig. 1. Mechanical work performed over the same number of sprints (Commun sprints) the entire series of sprints (Total sprints) and session training load over the repeated-sprint ability test in normoxia and hyperoxia (FIO2: 0.40). Data are presented as means ± SD. * denotes clear small effect between conditions.*

Those improvements were due to athletes being able to perform one more sprint on average in HYP before reaching a pre-identified exhaustion criteria. Therefore, for the same performance deterioration score, athletes were able to perform more sprints and a greater mechanical output in HYP than in normoxia. We attributed these performance improvements to a greater oxygenation throughout the exercise. In fact, the availability of O2 is generally accepted to play an important role during repeated sprints. In our study, HYP prevented the fall in arterial O2 saturation throughout the test compared to normoxic condition, and this effect was also observed down in muscle fibers with a greater muscle reoxygenation between sprints (+14.6%) in HYP. A better reoxygenation facilitates the resynthesis of phosphocreatine (PCr) during short recovery periods (McMahon & Jenkins, 2002). PCr availability is highly critical to RSA and becomes the major sources of energy (with the aerobic pathway) as sprints are repeated while anaerobic glycolysis contribution progressively fades (Billaut & Bishop, 2009). Furtheremore, O2 supplementation during repeated sprints helped maintain higher muscle recruitment and neuromuscular efficiency (expressed as work/EMG activity) compared to normoxic breathing. The most likely explanation would be that the higher arterial and muscular O2 availability during repeated sprints in HYP could have potentially reduced the accumulation of metabolic by-products in the working muscles (Linossier, Dormois, Arsac, Denis, & Lacour, 2000) and diminished the reflex inhibition from group III and IV metaboreceptors, thereby attenuating the development of central fatigue (Billaut & Smith, 2010).

Take-home message

Using HYP during a RSA training session induces greater training load and greater stimulation of physiological systems, likely leading to greater adaptations over time. This occurred while using only 40% O2. However, although these data appear promising, the long-term physiological and performance effects of weeks of training in HYP compared to normoxia or hypoxia will have to be investigated. In conclusion, we encourage coaches and sport scientists to implement hyperoxia during their scheduled sprint sessions to increase training stimulus.

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Identifying trends in team playstyles across Europe using big data

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Keywords: *clustering, playstyle, big data, actions,*

Introduction: In the highly globalized, modern era of football, the sharp increase in economic returns from succeeding at the elite level has seen football organizations seeking out ways to edge out their competitors (Deloitte, 2019). An approach that has become exponentially crucial is the use of big data to inform decision-making processes within football organizations (Pappalardo et al., 2019). Perhaps due to the direct implications on match outcomes, the use of data to quantify team playstyles in football has been of particular interest (Liu et al., 2015, 2016).

This may be attributed to the fact that being able to statistically evaluate, compare or predict how an opposing team plays in relation to one's own team allows for football organizations to gain a significant advantage. However, mathematically quantifying team playstyles in a dynamic sport such as football is a highly complex task due to the influence of an almost limitless number of external, contextual influences such as match location (home or away), or match situation (in or out of possession; match score).

Taking a novel, big data approach towards quantifying playstyles in football, the current exploratory study examines match action data from the top five European football leagues (English Premier League, French Ligue 1, German Bundesliga, Italian Serie A, and Spanish La Liga) from the 2010/11 to 2019/20 seasons. The match action dataset comprises of actions performed by players in each match (detailed in Table 1). For this study, data from a total of 26,802 matches were collected from football data website Whoscored.com.

The aims of the study were to (1) identify the different playing styles that were employed by top tier teams and to (2) reveal any trends in playing styles employed throughout the season for each team

Table 1. Match actions examined in current study

Defensive match actions	Offensive match actions	Possession match actions
Aerial duels	Dribbles	Ball touches
Clearances	Shots from fast break	Passes from free kick
Interceptions	Shots from open play	Passes from crosses
Blocked shots	Shots from set piece	Passes from corner
Blocked crosses	Shots from six-yard box	Passes in defensive third
	Shots from outside box	Passes in midfield third
	Shots from penalty area	Passes in final third
	Shots on target	Key passes

Clustering playing styles across Europe

A Gaussian Mixture Model (GMM) clustering algorithm was used to identify the different playing styles that were performed by the teams. Based on the results of the GMM clustering analysis, four distinct playstyles were identified. As there were 21 match actions used to conduct the clustering and each match action had a different weightage on the clustering model, it was necessary to identify the match action that most clearly distinguished between these four playstyles.

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This was done using a bootstrapping approach, where the clustering analysis was repeated 21 times, each time with one match action removed from the model. For each repetition, the new clustering model was checked against the original model to see how much the fit of the model improved or worsened. Based on this approach, the number of ball touches was the match action that most clearly distinguished the four playstyles as the fit of the clustering model dropped most significantly when this variable was removed. For clarity in discussion, we can label these four playstyles based on the critical indicator of average number of ball touches each game (Table 2).

crosses, tackles) and shots from fast breaks compared to the other playstyles. In other words, teams with very-low touches were able to win if they defended well and scored on the counter-attack. Conversely, in matches where teams with very-high touches won, they demonstrated significantly more match actions in attacking (shots on target, shots from outside box, inside box, and six-yard) and possession (passes in defensive, midfield and attacking third). This supports the notion that there is no one 'true' way of winning in football, and each playstyle has its own unique process towards winning. Due to space constraints, the specific differences between team playstyles cannot be discussed in greater detail.

Table 2. Classification of playstyles and average ball touches per match

No.	Team playstyle classification	Average number of ball touches per match
1	Very-low touches (↓↓ Touch)	489.4
2	Low touches (↓ Touch)	596.6
3	High touches (↑ Touch)	698.8
4	Very-high touches (↑↑ Touch)	844.0

It is important to note that although the number of ball touches best distinguished the four playstyles, each of these playstyles differed significantly from each other in other areas. For example, in matches where teams won with a very-low touches playstyle, these teams demonstrated a significantly greater number of defensive match actions (aerial duels, clearances, interceptions, blocked shots, blocked

Playstyles throughout each season

If we chart the playstyles performed by each team throughout the season, there does not seem to be a clear pattern of playstyles for each team (Figure 1). However, a GMM cluster analysis done on the number of playstyle occurrences for each team revealed three clear clusters or archetypes of playstyles exhibited throughout the season (Figure 2).

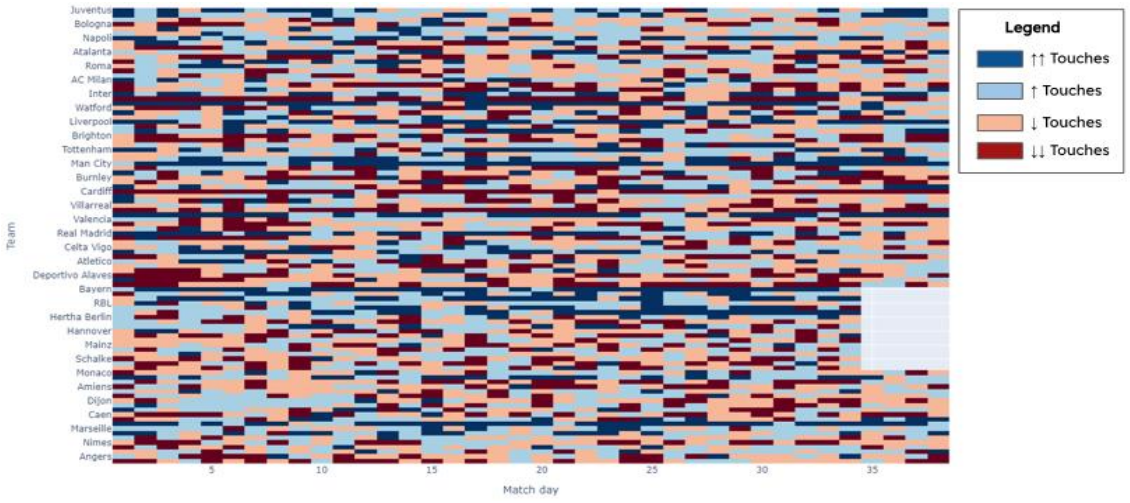

Figure 1

Non-clustered team playstyles throughout season

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These findings indicate that across teams in the top five European leagues, team playstyles throughout the season can be clustered into three archetypes. These three archetypes are: (1) alternating between very-low and low touches throughout the season, (2) alternating between very-high and high touches throughout the season, and (3) a mix of all four playstyles.

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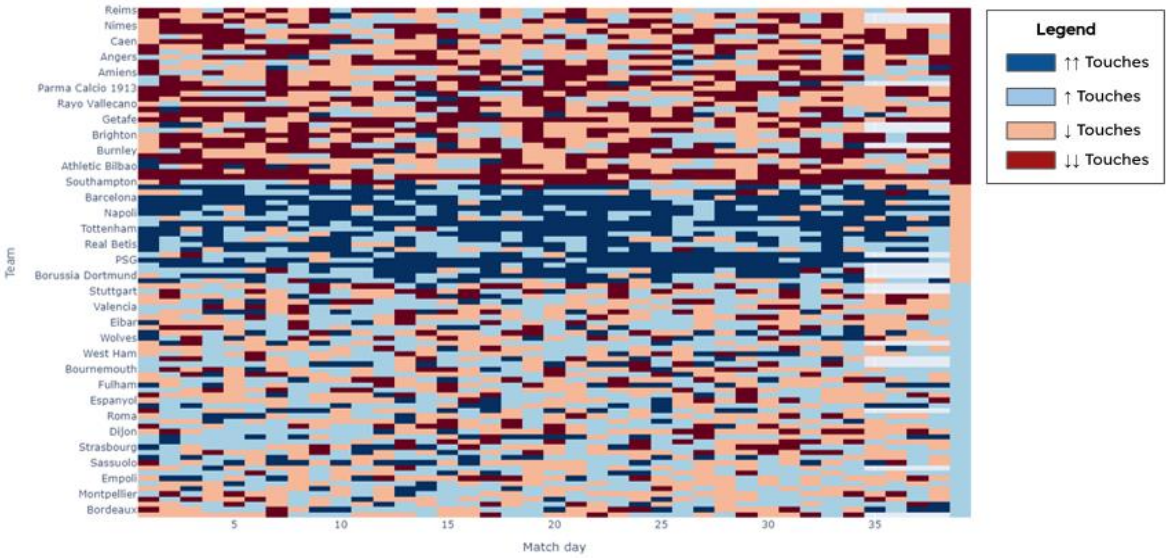

Figure 2

Clustered team playstyles throughout season

Based on these findings, it may be beneficial for practitioners in football organizations to conduct similar analyses for their own leagues to examine which team playstyle archetype best represents their season performances. This is because the determinants of success have been shown to widely defer across team playstyles. Specifically, teams that alternate between very-low and low touches may experience greater returns on team performance by recruiting or featuring defenders with high defensive capabilities. Conversely, teams that alternate between very-high and high touches have more opportunities to go forward and attack, and thus may experience greater returns by recruiting or featuring defenders with high offensive capabilities. Furthermore, these findings can also be applied to opposition analysis by evaluating the team playstyle archetype of upcoming opponents and making the necessary tactical adjustments to allow their teams a greater chance of success.

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Challenges and outcomes delivering coaching sessions online and staying engaged with players during the covivs-19 lockdown

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Introduction: There have been a number of challenges that has survived over the past 100 years. 3 industrial revolutions, 2 world wars and now we have embarked upon a brand-new challenge. A worldwide lockdown that has seen fans barred from stadiums and aside from the elite men's game, all football suspended due to the Covid 19 Pandemic.

The suspension of youth football forced us to be creative in our delivery. Through much discussion amongst our team, speaking with our Co-ordinator Marco Degortis and Head Psychologist Antonio Sacco, we devised a plan on how to stay engaged with our players using virtual tools that stay in line with the Juventus philosophy.

Following on from a previous interview with ISAFA about what approaches we would be taking during the lockdown I will be discussing how each of our approaches played out in each category from; online skill challenges, Instagram live interviews, online zoom classes and finally getting back on the grass, with additional feedback from individual parents and players .

Setting online skill challenges

We designed a program with weekly online sessions with the knowledge that sport wouldn't be returning anytime soon in the country. Each skill had a technical and physical outcome. We also looked at the psychological and social outcomes which is why we made it a weekly competition for the best to have their videos uploaded or on our Instagram live sessions allow our spectators to vote for each participant.

The first few weeks went really well, but it was difficult to sustain over a long period of time and not easy to keep it fresh. The fact is there is no online program that can replace being out on the grass. Online sessions have a good short-term impact but long term can only be delivered in short spurts.

Instagram Live interviews

Instagram live sessions weren't only for skills it was also to discuss experiences that young people had at our academy, on tour at the Gothia Cup where the U18's reached the last 16 of the competition. Also, from some of our former students who went on to become full time professional players as well as special guests who play full time in the UK. This was very well received and gave massive insight into what we do for our students.

Zoom classes

Our zoom classes could have been done sooner and Delivered at specific time slots for each class at usual training times. I feel that we didn't get enough participation in them and if repeated again I would have opened the zoom class into two age categories 5 – 11 and 12 – 18 and invited all participants instead of doing specific classes, but this is something new and never experienced in the history of the world and something we can all learn from.

Continued..

Returning to the grass

We returned to the grass late September and the players couldn't wait to get back! I believe that the engagement during lockdown helped to maintain the passion and desire the young people have for football. It was also a way of helping the mental health challenges with so many people being separated through the effects of Covid-19 as the main part of our ethos is developing people before players. It's a pleasure to be back out their face to face for the coaches as well as the players .

Feedback

Our parents were really enthused by the program we had put together for their children. Many of the parents were concerned that the players would revert back to their games consoles and therefore become inactive

"I think this is a good initiative for our players and will hopefully keep them sharp, fit and ready when they eventually return to the pitch"

Rudy Girgis

In relation to the players it was a lot easier to get players aged between 5 – 12 than anyone 13+ unless it was made mandatory as part of being in our elite squads.

"I really enjoy practicing the skills Juventus have shown us, sometimes I try to be creative and make my own so I can show the coaches what I have done"

Luca Scagnitto

Overall, I saw the program as a success

How effective is GPS tracking in Football A short critical review

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Key words: football, GPS, validity, rehabilitation, injury prevention, performance

Introduction: We are living in the time of great technological advancements and innovations. This evolution and leaps forward was only natural to be introduced in to sports, and especially to the most popular of all sports, according to multiple sources (Statistics and Data, n.d .), football or soccer as it is most commonly known in the United States. Football has evolved drastically within the last 15 years according to multiple research (Barnes et al., 2014, Bush et al., 2015, Bradley et al., 2016, Zhou, 2020, Bush et al., 2015). This coincided with the introduction of highly advanced technologies such as the Catapult GPS tracking system in 2006. Since then it has become an important tool for stakeholders in sport such as coaches, sports scientists, performance analysts, recruiters, physiotherapists and even actively assisting the players to improve their performance and alter their behaviour (Nosek, 2020). This kind of wearable technology was created to "optimise performance", "reduce injury risk" and assist the "return to play" during rehabilitation according to the official website of the device (catapult, n.d.). The purpose of this paper is to review how and if the GPS tracking devices are really serving the purposes claimed, their validity and accuracy

GPS tracking: How useful and valid are they?

Injury prevention .

Ehrmann et al. (2016) has proven suggests that measurements taken from global positioning system can be used in injury prevention, workload increase in the weeks prior to the injury can be an indicator for increased risk. Equally the same research suggests that new body load (NBL, the sum volume of all accelerations and decelerations during a match or a training) can be a factor to assess in the process of injury prevention. Nobari et al. (2020) shown how theorized that starters and non starter playerss in football clubs can be affected on their NBL results. Therefore, the coaches and sports scientists can

use these data collected during trainings and matches to predict (80% of the injuries with 50% precision) the chances of injuries during periods of overload or prolonged under-preparedness.

Other research by Rossi et al. (2018) has successfully provenproposed the ability to predict the risk of injury of professional football players using the data collected by GPS devices during matches and training. This is in line with previous research in other sports such as cricket by Greig and Nagy (2017), and football by Colby et al. (2014; an 2017).

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Rehabilitation

Since the beginning of the GPS technology was introduced in elite sports life, scientists were interested in the assistance it can provide in the process of rehabilitation and the avoidance of re-injury. Foreman and Hanisch (2010) had offered an insightside on how football and rugby teams in Australia use the data gathered during training and matches for injury management and prevention. On the other hand, this system was proven to be very efficient in rehabilitation process and the assessment of readiness after ankle injuries (Greig, Emmerson and McCreadie, 2019).

Enhance performance

Nosek (2020) has shown how this data information the information from the data when shared with the football players can impact and change their behaviour of football players and help trainers work with them in the common goal of optimising the performance during trainings and matches. The results of this effort by the stakeholders and the assistance provided by the global positioning systems, can bme seen in multiple researchesstudies conducted in English Premier League (EPL) and Chinese Super League (CSL) from 2006 onwards (Barnes et al., 2014, Bradley et al., 2016, Zhou, 2020, Bush et al., 2015).

Reliability and accuracy

To begin with, we should put under our microscope is weather the GPS devices are reliable and accurate in their measurements. The first GPS devices in sports were found to be not so consistent and reliable by Jennings et al. (2010), where it was found that "the reliability improved as distance travelled increased but decreased as speed increased" (p.328) and concluded that the GPS technology of the time was "limited for assessment of short, high speed straight line running and efforts involving change of direction". The findings were not surprising as the 1Hz and 5Hz GPS devices used for the purpose of this research were already in the market for 6 years, and the fourth generation tracking engine with 10Hz GPS was released the same year (2010) by the company (catapultsports.com). Varley, Fairweather and Aughey (2012) using the new 10Hz GPS proved that was up to six times more accurate thant the older models in some measurement and therefore could provide a useful and reliable tool for measuring the performance in team sports. Additionally, Roe et al. (2017) compared all the contemporary methods of measuring maximum velocity; the 50Hz radar gun, the time gates and the 10Hz GPS. His findings suggest that there are minimal differences in measurements between the three, although is suggested the use of the same protocol during time, as well as the same unit and software in order to assess performance more accurately. This technology in recent years was shown to get more widely available by other companies with the same efficiency (Willmott et al., 2019) and also being available for indoor sports assessment (Hodder, Ball and Serpiello, 2020).

Scientist are using these methods to measure workload of acute:chronic ratio can determine the risk of injuries (Colby et al., 2014 and 2017, Murray. et al., 2017, Hulin et al. 2016, Gabbett, 2016). All this research would not be available without the use of GPS technology for the measurement of workload during training and matches. The ability to accurately measure the workload of athletes is widening our understanding of non contact muscle injuries associated with overtraining or under-training, and allow us to debate on the training load-injury paradox as suggested by Gabbett (2016), and Windt and Gabbett (2017). According to their research and the capabilities of the modern technologies, we have a wider understanding on all the factors that can affect the injury risk in athletes, such age, prior injuries, playing surface, poor biomechanics, physical qualities and more (Gabbett, 2020). All this would have been impossible to be scientifically proven as lately as 10 years ago when the global positioning system was not as accurate as nowadays (Jennings et al. 2010).

Injury prevention is only part of the assistance we can have from such devices. Even if someday with the help of technology and Aartificial intelligence we will arrive in thea utopia of theand annihilationbe able to eliminate allof non contact muscle injuries, we canwill never avoid thebe able to prevent contact type of injuries, or injuries cause by the playing surface or by poor biomechanical movement from the players. Therefore, it is of paramount importance to have GPS evaluate and determine if our athletes' rehabilitation has brought them to the required playing level without the risk of re-injury. Blanch and Gabbett (2016) provided an insight on how the measurements of post injury rehabilitation and the acute:chronic training workloads can be combined and give to the stakeholders a safe way to decide if the players are ready to return to play in competitive level of training and matches without the risk of re-injury. Similarly Stares et al. (2018) tried to quantify the amount of workload, as well as the moderate-high sprint distance on the decision making process of return to play (RTP). The findings suggest that a high workload rehabilitation (distance: >49,775m) can delay the RTP when a modetate-high sprint distance (427–710m) can be protective of subsequent injuries.

Last but not least, nowadays we can identify the physiological demand of the players per position (Molinos Domene, 2013, Sanders et al. 2020, Waldron, 2011). This can be important besides the obvious and already well established reasons of injury prevention and rehabilitation, but also to talent identification and recruitment, as well as enhancing performance to reach the highest standards on a safe path of training workload.

Conclusion

Since the early days of global positioning system technology in sports, there was much debate on the validity and accuracy of their measurements. Nowadays, these debates seems to all conclude on the supportive side to GPS, thus we are now capable of using those systems in assessing training loads and match loads with the purposes of optimisation of performance, reduction of injury risk and safe return to play after a well monitored rehabilitation process. Furthermore, they provide a useful tool for recruiters, scouts and coaches. In conclusion, we can agree that the GPS technology has positively assisted our understanding of the physiological demands in various aspects of football (match, training, rehab) and is becoming an integral tool for the stakeholders. Unfortunately this wearable technology is still expensive for the big majority of the football clubs of lower level leagues or less wealthy countries. On the other hand, it is common that new technologies to become more affordable in the course of time and accessible to lower levels. This might generate a new issue as the benefits from these devices rely, at the moment, on professional individuals that have substantial training in order to interpret the data collected. When the time comes that these GPS devices will be introduced to the lower levels of football, there will be a need of more professionals capable to analysing the data or AI that can do the job with lower cost and ensure a high quality of analysis.

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Soccer and ADHD

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Attention Deficit Hyperactivity Disorder (ADHD) is recognised by the Diagnostic and Statistical Manual of Mental Disorders (DSM–5) as a neurodevelopmental disorder. A direct estimation in small subject groups has yielded estimates in the range of 1%–6% (Kessler et al, 2006).

The purpose of this article is it to enable people to identify the symptoms of ADHD (which are present since birth) and get them on treatment, as early treatment is key to improving performance in life and in sporting activities and in reducing stigma and adverse outcomes

The core symptoms for ADHD are inattention, hyperactivity and impulsivity, which can affect different domains of life, at mild to severe levels. The symptoms must be a lifelong pattern and not temporary, must have impairments in at least two domains of functioning in social, educational and occupational fields during childhood (before the age of 12) and adulthood, and should not be better explained by the presence of other psychiatric disorders

Untreated ADHD can lead to poor performance. Inattentiveness can cause problems for a sportsman, e.g. in soccer, following instructions in training and complex sequences on the field (Currie & Owen, 2016). Impulsivity and hyperactivity can lead the sports person to ignore the consequences of their fouls and other risk-taking behaviours (Currie & Owen, 2016).

Other issues affecting soccer and other similar team sports include severe procrastination, making repeated careless mistakes, avoiding tasks which are perceived to be difficult, general disorganization, failure in recapping the details of plans, forgetting appointments, interrupting coaches and peers with a tendency to finish their sentences, frequent misplacing of personal items, and an inability to relax when at rest (playerstrust. blob). They could consume a lot more alcohol and even tempted to use substances.

A 2009 study by Harvey et al revealed that boys with ADHD were not as proficient movers as their peers (William J. H, et al, 2009). Thematic analysis revealed that boys with ADHD, paid little attention to details, possessed superficial knowledge about movement skills, and expressed many negative feelings about physical activity (William J. H, et al, 2009).

The prevalence of this condition is not to be considered lightly. Among American footballers in the National Football League (NFL), the estimate of previously diagnosed ADHD could be as high as 7% (William J. H, et al, 2009).

An emerging specific feature in soccer players with ADHD is their increased susceptibility to the effect of minor head blows, frequently sustained during headers, incidental head-to-head collisions or other head blows. Recent evidence suggests reduced brain tolerance to repetitive sub-concussive head impacts compared to non-ADHD sports persons, as evidenced by transient declines in verbal memory function after 10 repeated headings, and an acute stress-related increase in plasma markers of neurodegeneration such as GFAP and UCH-L1 (Nowak M.K. et al, 2020).

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We are aware of the serious consequences of untreated ADHD on morbidity and mortality and hence we urge readers to identify symptoms and seek treatment for the same (Dalsgaard S. et al 2015). ADD and ADHD are quite common and largely treatable mental health issues among sportsmen and women. Clearly, a better organized effort and planning is needed to prepare guidelines for screening and detection of these conditions in sportspersons, and provide them with the right support and management. The support could include one to one sessions with the coach, using clear instructions which can in turn improve their performance, and incorporating social, psychological and pharmaceutical interventions as appropriate. Coaches and sport's governing bodies also have an important role in destigmatizing mental health issues, and fostering an environment of mental health treatment-seeking (BMJ.com/newsroom/stigma).

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