



## Guest editorial

## Recreational team sports: The motivational medicine

Remember way back when? When we were kids? We played games like soccer, basketball, rugby, and volleyball because they were fun. If we stayed with it long enough (and became good enough) we might have played competitively, where the objective was to win. Herman Edwards, a former head coach in the National Football League (NFL), has become well known for answering a reporter's question with an emphatic, "You play TO WIN THE GAME." Sure, the game was still fun, but enjoyment took a back seat to outcome. Eventually, most of us stopped playing for any number of reasons—we retired. But don't you still miss the youthful joy of playing your game? The pure fun?

Maybe you have found some other people feeling a similar loss and you have started just messing around again. What you may have discovered (or re-discovered) is just how much fun you have playing the game. And you look forward to playing a couple times a week. You justify playing as a break, a release from the stress of daily life.

We have some exceptional news. News that is so good that you will want to share it. Share the good news with friends who bemoan the repetitive boredom associated with traditional aerobic exercises like jogging, cycling, swimming, or walking. The good news is this: Team games are more than an activity reserved for the young. Team sports are still genuinely fun. And the most important benefit is that participation in recreational ("spontaneous" or "pick-up") team sports is good for you. Sure, jogging improves your aerobic fitness. But so do team sports. And the neat thing about team sports as an acceptable mode for fitness development is that team sports improve far more than just endurance. The type of running and movement inherent in team sports means that almost all aspects of fitness are improved, not only endurance but also the fitness factors needed to support intermittent exercise performance and musculoskeletal fitness. There is a considerable body of published knowledge supporting the health and fitness benefits associated with recreational participation in team sports.

The first published research reports on the effects on the cardiovascular system of spontaneous playing of team sports included one that examined high-school students playing 5-a-side soccer in a school gym and a second that examined untrained young men with little prior experience with soccer.<sup>1,2</sup> With the help of state-of-the-art technology, it was

possible to measure acute exercise responses that were in line with those assumed to be effective for maintaining and improving cardiovascular fitness in sedentary individuals using motivation-proof cyclic exercises (jogging, running, walking, cycling, *etc.*).<sup>3</sup> After that encouraging descriptive start, a massive number of training studies, mainly dealing with recreational soccer in the form of small-sided games, have been published in scholarly journals by Danish researchers.<sup>4</sup> They have provided rigorous proof of the benefits achieved by recreational soccer players across genders, ages, and health status within a wide range of health-related variables.<sup>4</sup> Players wearing their soccer boots for just 2 times per week and spontaneously interacting with teammates and opponents for 40–60 min were able to improve their baseline maximal oxygen uptake by 8%–18%.<sup>5</sup> In addition to showing greater improvement than that reported for the running control groups for the same volume of training, the soccer players also had a 10% increase in lower limb strength and a concomitant significant positive change in body composition. Additionally, spontaneously played recreational soccer proved to positively affect social interactions and psychological well-being. The effect of playing soccer in 3 v 3 to 7 v 7 games produced results that were similar to, or superior to, the results for physical activities where participants trained separately with specific interventions.<sup>4</sup> The corresponding savings in time was an added benefit of this novel training intervention. The wide spectrum of benefits in aerobic and anaerobic fitness was achieved with just 12 weeks of participation, and the effect on heart anatomy was surprisingly achieved in just 10 weeks among schoolchildren.<sup>6</sup> Female and male recreational soccer players won their battle against the detrimental effects of a sedentary lifestyle on health status, regardless of whether the teams were composed of players with type 2 diabetes, cardiovascular disease, hypertension, or prostate cancer, and regardless of their social status.<sup>4,5,7,8</sup> The accumulated research in just a decade of interest on the health and wellness benefits associated with recreational soccer is so plentiful that several narrative and systematic reviews have been published.<sup>4–8</sup> The encouraging results of recreational soccer across healthy and clinical populations has prompted sport scientists and exercise physiologists to explore the potential of other team sports in an attempt to find other novel exercise modes that would be as effective at combating diseases brought on by lifestyles in industrialized countries. Despite the interest of extending

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the scenario to other team sports, only a few studies involving other sports have been published in the last 5 years. Vorup et al.<sup>9</sup> and Póvoas et al.<sup>10</sup> pioneered the spread of the recreational soccer fever to floorball and team handball, providing encouraging training and descriptive results, respectively.

In this special issue of the *Journal of Sport and Health Science (JSHS)*, readers will find several research studies that successfully extend the current knowledge of the beneficial effects of recreational team sports on health and wellness. Floorball, team handball, soccer, and basketball are addressed within this special issue of *JSHS*. For some sports, this is the first time they have been tackled from the recreational side. This *JSHS* special issue will surely constitute a reference for all those interested in increasing their knowledge of novel exercise models that can be implemented as effective armor in the fight against non-communicable diseases. These team sports are well established and have the potential to attract more and more recreational players, but the authors have also devoted their attention to other unstructured team sports, with the aim of studying them based on each participant's interest and ability. For example, basketball is played worldwide, and to encourage spontaneous practice, institutions have implemented small courts with 1 basket. The paper by Randers and co-authors<sup>11</sup> shows that although small-sided basketball games may be beneficial to health, those played at half court may not produce the same training outcomes. Basketball as a health-enhancing activity should be carefully prescribed according to the intended aims, given the number of people potentially interested and the sustainability of this team sport as a street game. Further studies are warranted. Hornstrup et al.<sup>12</sup> trained young women using team handball drills and found post-intervention benefits similar to those reported for recreational soccer.<sup>10</sup> In contrast to soccer, however, the use of upper limbs in handball potentially offers an additional benefit to players.<sup>10</sup> The study by Hagman et al.<sup>13</sup> suggests that for bone health, soccer players should never retire. In their study, playing soccer as a lifelong activity was revealed to be a good choice for maintaining good bone health, and their results showed that older soccer aficionados had skeletons comparable to the younger sedentary controls. The results obtained for adolescent team sports players reported in this special issue of *JSHS* also provide further support for this principle.<sup>14</sup> Hammami et al.<sup>14</sup> show that adolescent soccer players had markedly better results for the majority of health-related physical fitness measures (predictors of cardiovascular disease) when compared with untrained adolescents. This finding reinforces the need to keep team sports as a lifelong activity and to include physical fitness testing in health-monitoring systems that deal with youth. As first shown for recreational soccer, long-term benefits in health and wellness profiles were obtained with a low dose of floorball practice (2 × 40 min/week) among 73-year-old recreational players who had retired from their work activities but were still able to stay active and keep themselves healthy, independent, and socially interactive.<sup>15</sup> Based on the publication of this

special issue, all those who resist exercise, regardless of their gender, social status, or age, should be more motivated to play team sports in an effort to reduce their sedentary inertia.

In this special issue of *JSHS*, the benefits and limitations of participating in team sports are discussed, and encouraging directions for the future are outlined. We hope that this Team Sports for Health special issue will not only be of interest to exercise and health practitioners but will also attract the interest of healthcare institutions and team sport federations worldwide. Hopefully, this special issue will convince governing and healthcare organizations to accept responsibility for alerting millions of citizens about the immense health benefits and potential for social capital to be derived from participating in recreational team sports. The evidence collected here is clear and convincing. We hope that this *JSHS* special issue will become a reference for institutions worldwide and convince them to implement recreational team sports on a large scale as a public health intervention. Having healthier and happier citizens should be the aim of all governments across all cultures and economic statuses. Team sports are a viable and sustainable strategy for this laudable goal. The potential number of participants in recreational team sports is staggering, with an estimated 500 million soccer players, 100 million basketball players, and 70 million team handball players.<sup>6</sup> Cities and civic clubs often sponsor youth sport participation, but parents are largely neglected. Offering many different team sports with different basic rules but all supporting the same principles—casual intermittent high-intensity exercise beneficial for health and social interaction—may further enlarge the audience of potential players.

Playing our favorite team sport 2–3 times per week for 1 h with our friends has so many benefits that it is hard to understand why we gave up the games of our youth. We loved playing those games then and there is no reason not to continue playing now. The strong scientific evidence is just too compelling to ignore.

The bottom line is this: Never retire. Keep playing. The benefits are simply too numerous. And it's fun!

## References

1. Castagna C, Belardinelli R, Impellizzeri FM, Abt GA, Coutts AJ, D'Ottavio S. Cardiovascular responses during recreational 5-a-side indoor-soccer. *J Sci Med Sport* 2007;10:89–95.
2. Krustup BR, Rollo I, Nielsen JJ, Krustup P. Effects on training status and health profile of prolonged participation in recreational football: heart rate response to recreational football training and match-play. *J Sports Sci Med* 2007;6:(Suppl. 10):S116–7.
3. American College of Sports Medicine Position Stand. The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility in healthy adults. *Med Sci Sports Exerc* 1998;30:975–91.
4. Bangsbo J, Hansen PR, Dvorak J, Krustup P. Recreational football for disease prevention and treatment in untrained men: a narrative review examining cardiovascular health, lipid profile, body composition, muscle strength and functional capacity. *Br J Sports Med* 2015;49:568–76.
5. Milanovic Z, Pantelic S, Covic N, Sporis G, Krustup P. Is recreational soccer effective for improving  $\text{VO}_{2\text{max}}$ ? A systematic review and meta-analysis. *Sports Med* 2015;45:1339–53.

6. Krstrup P, Bangsbo J. Recreational football is effective in the treatment of non-communicable diseases. *Br J Sports Med* 2015;**49**:1426–7.
7. Krstrup P, Nielsen JJ, Krstrup BR, Christensen JF, Pedersen H, Randers MB, et al. Recreational soccer is an effective health-promoting activity for untrained men. *Br J Sports Med* 2009;**43**:825–31.
8. Krstrup P, Helge EW, Hansen PR, Aagaard P, Hagman M, Randers MB, et al. Effects of recreational football on women's fitness and health: adaptations and mechanisms. *Eur J Appl Physiol* 2018;**118**:11–32.
9. Vorup J, Pedersen MT, Melcher PS, Dreier R, Bangsbo J. Effect of floorball training on blood lipids, body composition, muscle strength, and functional capacity of elderly men. *Scand J Med Sci Sports* 2017;**27**:1489–99.
10. Póvoas SCA, Castagna C, Resende C, Coelho EF, Silva P, Santos R, et al. Physical and physiological demands of recreational team handball for adult untrained men. *Biomed Res Int* 2017;**2017**:6204603. doi: 10.1155/2017/6204603
11. Randers MB, Hagman M, Brix J, Christensen JF, Pedersen MT, Nielsen JJ, et al. Effects of 3 months of full-court and half-court street basketball training on health profile in untrained men. *J Sport Health Sci* 2018;**7**:132–8.
12. Hornstrup T, Wikman JM, Fristrup B, Póvoas S, Helge EW, Nielsen SH, et al. Fitness and health benefits of team handball training for young untrained women—a cross-disciplinary RCT on physiological adaptations and motivational aspects. *J Sport Health Sci* 2018;**7**:139–48.
13. Hagman M, Helge EW, Hornstrup T, Fristrup B, Nielsen JJ, Jørgensen NR, et al. Bone mineral density in lifelong trained male football players compared with young and elderly untrained men. *J Sport Health Sci* 2018;**7**:159–68.
14. Hammami A, Randers MB, Kasmi S, Razgallah M, Tabka Z, Chamari K, et al. Effects of soccer training on health-related physical fitness measures in male adolescents. *J Sport Health Sci* 2018;**7**:169–75.
15. Pedersen MT, Vorup V, Bangsbo J. Effect of a 26-month floorball training on male elderly's cardiovascular fitness, glucose control, body composition, and functional capacity. *J Sport Health Sci* 2018;**7**:149–58.

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