

Executive summary: disseminating and implementing a platform for recreational football training as medicine

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We are very pleased to present the third supplement of the Scandinavian Journal of Medicine and Science in Sports fully dedicated to Football for Health. The two previous supplements were landmarks on establishing the scientific evidence for recreational football training as an effective strategy for the prevention and treatment of non-communicable diseases across the lifespan [1, 2]. The current supplement focuses on recreational football training as a therapy. The six original investigations aim to tackle three main topics, including diabetes, cancer, and obesity and inactivity in children. Overall, the results are overwhelming and launch the platform for disseminating and implementing recreational football training as medicine.

The World Health Organization (WHO) projects that diabetes will be the 7th leading cause of death by 2030 [3]. Prediabetes is an intermediate condition in the transition between normality and diabetes, characterized by impaired glucose tolerance and impaired fasting glycaemia. However, the progression to type 2 diabetes is not inevitable and recreational football training is a feasible, cost-saving strategy for the prevention and treatment of this condition [4, 5]. Recreational football training combined with nutritional counseling promotes metabolic and cardiovascular health in patients with prediabetes [6]. Blood glucose, mean arterial pressure and body fat were effectively reduced after 16 weeks of recreational football training twice per week, whereas lean body mass and maximal oxygen consumption were enhanced. Similarly, the positive osteogenic effects of should be highlighted (Skoradal et al 2). Sixteen weeks of two weekly 30–60-min sessions improved lower-limb bone mineral density and leg bone mineral content, although total body bone mineral density and bone mineral content were unchanged over the 16-week intervention. Additionally,

recreational football training markedly improved plasma osteocalcin, PINP and CTX-1.

The positive effects of long-term recreational football in bone health were also examined in a group of patients with prostate cancer (Uth et al). The study resulted from a 5-year follow up assessment of the original FC Prostate Randomized Controlled Trial, where patients with prostate undergoing androgen deprivation therapy practiced football for 12 weeks [7]. The first original results have been actually published in the 2nd supplement dedicated to Football for Health of Scandinavian Journal of Medicine and Science in Sports [8]. The current follow-up report shows that patients with prostate cancer can sustain recreational football training at the long-term. Interestingly, the participants continued football training in self-organized contexts, with one-to-two sessions per week over 4.5 years. Body composition and physical fitness deteriorated over the 5-year period regardless of football training. However, the elderly men with prostate cancer managed with androgen deprivation therapy that continued football training over the 5 years preserved femoral neck bone mineral density.

The promotion of physical activity within school-children is key for reducing the burden of non-communicable diseases, as articulated in the WHO's *Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013-2020* [9]. The WHO highlights that children and adolescents should include daily physical activities that strengthen muscle and bone, at least 3 times per week, but 81% school-going youths are still not active enough. We are therefore happy that the current supplement of the Scandinavian Journal of Medicine and Science in Sports dedicates three original investigations on the health effects of school-based football practice in children.

It is now well established that football training is effective in improving health-related fitness parameters and self-esteem in overweight and obese children [10, 11]. In fact, recreational football training, organized as small-sided games, elucidates high heart rates and a high number of intense actions [12]. Here, Cvetkovic et al (2018) compared the effects of 12 weeks of recreational football and standard high-intensity interval training, showing that both programmes enhanced physical fitness in obese 11–13 year-old boys. Both activities enhanced lean body mass and muscle mass by 3–4%, with a

concomitant reduction of 6–7% in body fat. Also, diastolic blood pressure was reduced by 9–10% in both training programmes. On the other hand, the non-training control group, which were involved in mandatory school-based physical education classes, increased body mass, body mass index and fat mass over the 12-week period.

Larsen et al (2018) examined the cardiovascular adaptations of school-based physical training throughout the full school year (i.e. 10 months). The study involved 291 8–10 year-old children from 8 schools. The children were cluster-randomized by school in team-based ball games (including not only football, but also basketball and floorball), circuit strength training and a control group, which was instructed to retain their normal curricular routines. Again, both standard training programmes were effective on reducing diastolic blood pressure, interventricular septum thickness, left atrial volume index and tricuspid annular plane systolic excursion, while no changes were detected in reactive hyperaemia index regardless of training programme over the 10-month period. Therefore, the authors concluded that intense physical exercise should be incorporated in standard school-based activities to elicit positive adaptations in cardiac structure and function in children.

Over the last years, the Federation Internationale de Football Association (FIFA) has promoted developed a comprehensive standardized programme using football-based exercises to educate children about health, hygiene and contamination, and to introduce regular physical activity in order for the children to gain from the benefits of football practice [13]. The *FIFA 11 for Health* initiative has gained cultural adaptations. Children from Africa and Latin America involved with the *FIFA 11 for Health* programme improved their knowledge about health behaviours [13-16], while the European version was first implemented in Denmark, with improved cardiovascular and metabolic health profile effects in children [17, 18]. Here, Skoradal et al (2018) present the results of a school-based intervention using the *FIFA 11 for Health* for Europe in a small-scale society in the Faroe Islands. The intervention comprised 2-weekly sessions of the *FIFA 11 for Health* during 11 weeks. The activities were included in the school curriculum of 10-12-year old children, while the control group continued their standard school activities. Overall, the programme was effective on improving systolic body pressure, body

composition and postural balance, and clearly reinforces how football can be used in educational contexts as a primary strategy for prevention of non-communicable diseases.

Thus, recreational football training in the broad sense of football as medicine can be promoted as a therapy. Football training is applicable across several health morbidities, impacting on both young and old and can be shown to affect multiple organs and systems, thereby demonstrating positive treatment outcomes.

Please click on this video link to hear more about the special issue.

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