Faroe Islands

Photography by May-Britt Skoradal

Football Fitness for women and men with prediabetes in the Faroe Islands

In the Faroe Islands, researchers sought to investigate whether football training combined with dietary advice was a more efficient treatment protocol for patients with prediabetes than dietary advice alone. The research project was initiated in 2015 by the Faroese Professor in exercise physiology, Magni Mohr. It was a collaboration between the Faroese Diabetes Association and Faroese Football Association, funded by The Faroese Research Council.

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Football as Medicine in the Faroe Islands

For this project, a group of participants were recruited from a population-based cross-sectional survey that aimed to determine the prevalence of type 2 diabetes and prediabetes among 40–74-year-olds in the Faroe Islands. From this cohort, 55 prediabetes individuals aged 55–70 volunteered to participate in the research. This study investigated the health effects of 16 weeks of football training and dietary advice compared to the impact of dietary advice alone on men and women with prediabetes. The participants (28 men and 27 women) were overweight and moderately hypertensive with a low level of aerobic fitness. A few participants had played for the Faroese National Football team when they were younger, and some had regularly played recreational football. Others had no experience in playing football whatsoever.

> **"Thank you for dragging me up the couch and start exercising. I would never have done this on my own."**
> 64-year-old male

Study methods

The participants were offered football and group-based dietary advice consisting of a meal plan to improve glycaemic control. The meal plan was semi-low caloric, providing 1,800 (for women) and 2,300 (for men) kilocalories per day. The football training was facilitated by experienced coaches trained in the Football Fitness concept.

A football session typically lasted 30–60 minutes (30 minutes during weeks 0–2; 40 minutes during weeks 3–4; 50 minutes during weeks 5–6; and 60 minutes during weeks 7–16). Each session was organised around a 10-minute warm-up followed by four-a-side or five-a-side matches on an approximately 30x40m grass pitch. The games were played in two halves, separated by 2–3 minutes of recovery time.

Participants were invited to attend four training sessions per week and encouraged to participate in no fewer than two or three as a minimum. Sessions took place three times between Monday and Friday and once at the weekend. If participants missed training for a whole week, they were contacted by phone to support their attendance. Despite playing outdoors during autumn and winter with a lot of wind and even snow on the fields, on average, the participants attended training twice a week over the 16 weeks.

In 73% of participants, indicators of poor bone health such as osteopenia were observed. Special care was taken to advise these participants not to attend practice sessions if they felt unsafe due to poor weather (such as snow on the fields). As a result of these (and other) precautions, no severe injuries occurred over the research period.

Despite the relatively fragile health of the group, participants were able to conduct training sessions at moderate mean intensity (80% of maximum heart rate) and high peak intensity (95% of maximum heart rate) as observed in untrained healthy, hypertensive, type 2 diabetes, and prostate cancer patients.[1-6]

Long-term adherence benefits of a fun intervention

At the project's onset, the coaches took full responsibility for facilitating a proper warm-up at the start of each training session, followed by small-sided games between two teams. However, as the intervention progressed, the participants started facilitating the warm-up themselves. The role of the coaches then became to supervise the matches and divide the group into small, physically well-matched teams. Generally, the sessions were kept light, playful, and spontaneous, with participants encouraged to enjoy themselves. This way, a framework was provided, but participants had the freedom to implement it themselves.

This approach seemed appealing, as participants reported that they kept playing because it was fun and not because they thought they had a disease to fight. This training protocol seemed to be highly effective for engaging prediabetic men and women in the study and may ultimately favour long-term adherence.[7]

Results

Small-sided football in combination with dietary advice twice a week for 16 weeks was shown to promote better metabolic, cardiovascular and bone health in prediabetic men and women than merely providing dietary advice alone.[8,9] Moreover, the positive fitness and health adaptations occurred independently of skill level and gender.[10]
A summary of positive changes is recorded below:

- Blood glucose changed from 6.2 to 5.8 $mmol \cdot L^{-1}$ leaving the blood glucose level below the threshold for impaired glucose control.
- The group went from being moderately hypertensive (138/84 mmHg) to normalising their systolic and diastolic blood pressure to 127/77 mmHg. The mean arterial blood pressure dropped 8 mmHg, which is as effective as managing blood pressure using pharmacological treatment.
- Body fat was reduced by ~3.5 kg compared to when participants followed dietary advice alone.
- Muscle mass increased ~1 kg compared to when participants followed dietary advice alone.
- Blood lipid profile improved, with a decrease in total cholesterol of 0.5 $mmol \cdot L^{-1}$ and a drop in plasma triglyceride concentration.
- Aerobic fitness increased ~3.5 $mL \cdot min^{-1} \cdot kg^{-1}$ (~14% improvement).
- Lower limb bone mineral density and leg bone mineral content increased (whole-body bone mineral density and bone mineral content were unchanged).
- Bone turnover markers (plasma osteocalcin, PINP, and CTX-1) were markedly upregulated.

Despite participants having very different skill levels, it did not seem to affect adherence, intensity or enjoyment on the field. In addition to cardiovascular and bone health benefits, this study showed that men and women with prediabetes who are overweight, moderately hypertensive and of low aerobic fitness found Football Fitness to be an extremely attractive treatment, even when provided as mixed-gender sessions.

"I enjoy the community that comes with the training."
67-year-old women

Key learnings

The researchers in this investigation identified several crucial factors underpinning this intervention's success. Firstly, providing multiple opportunities for participants to attend training during the week was important for ensuring overall adherence. Secondly, keeping the training simple with minor control and a great amount of small-sided game time increased the players' enthusiasm and the likelihood of them wishing to play more. Third, follow-up phone calls to participants when they missed training sessions was found to help with accountability and attendance.

Researchers also discovered that the use of mixed-gender sessions appeared to have no negative impact at all on adherence and may even have helped to support it. Lastly, the collaboration with hospitals and local communities was seen as helpful and advisable for any similar football-related interventions.

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Next steps

Football as Medicine initiatives are already flourishing on the Faroe Islands.

For instance, a study on the Faroese elderly population (+60 years) is underway that investigates the mental health and general well-being effect of practising Football as Medicine. In addition, a U-TURN project that targets patients with type 2 diabetes recruited from the Faroese Diabetes Register is also in operation in collaboration with local hospitals.

Most ambitiously, a 32-week intervention in collaboration with endocrinologists is planned. The researchers will use a progression model that moves from 16 initial weeks of walking football to 16 weeks of full Football Fitness. This investigation will compare the differences between 16 weeks of walking football advancing into jogging with 16 weeks of walking football advancing into Football Fitness and compare these differences with a third inactive control group. This collaboration with endocrinologists will provide important access to patients and strengthen the clinical insights of using football to combat NCDs.

"It is so much fun even though we share very different experiences of playing football."
56-year-old woman with no prior experience in playing football

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