

# The effect of an online exercise programme on bone health in paediatric cancer survivors (iBoneFIT): Study protocol of a multi-centre randomized controlled trial

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## Abstract

**Background:** New approaches on paediatric cancer treatment aim to maintain long-term health. As a result of radiotherapy, chemotherapy or surgery, paediatric cancer survivors tend to suffer from any chronic health condition. Endocrine dysfunction represents one of the most common issues and affects bone health. Exercise is key for bone mass accrual during growth, specifically plyometric jump training. The iBoneFIT study will investigate the effect of a 9-month online exercise programme on bone health in paediatric cancer survivors. This study will also examine the effect of the intervention on body composition, physical fitness, physical activity, calcium intake, vitamin D, blood samples quality of life and mental health. **Methods:** A minimum of 116 participants aged 6 to 18 years will be randomized into an intervention (n = 58) or control group (n = 58). The intervention group will receive an online exercise programme and diet counselling on calcium and vitamin D. In addition, five behaviour change techniques and a gamification design will be implemented in order to increase the interest of this non-game programme. The control group will only receive diet counselling. Participants will be assessed on 3 occasions: 1) at baseline; 2) after the 9 months of the intervention; 3) 4 months following the intervention. The primary outcome will be determined by dual energy X-ray absorptiometry (DXA) and the hip structural analysis, trabecular bone score and 3D-DXA softwares. Secondary outcomes will include anthropometry, body composition, physical fitness, physical activity, calcium and vitamin D intake, blood samples, quality of life and mental health. **Discussion:** Whether a simple, feasible and short in duration exercise programme can

improve bone health has not been examined in paediatric cancer survivors. This article describes the design, rationale and methods of a study intended to test the effect of a rigorous online exercise programme on bone health in paediatric cancer survivors. If successful, the iBoneFIT study will contribute to decrease chronic health conditions in this population and will have a positive impact in the society. Trial registration: Prospectively registered in isrctn.com: isrctn61195625. Registered 2 April 2020.

Author keywords

Bone

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