Title: Raising teenagers' awareness of musculoskeletal health through LifeLab: a collaboration between school students, teachers and clinical academic researchers.

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Background:
Musculoskeletal (MSK) disease is the major cause of years lived with disability in the UK. The UK is behind other comparable countries in confronting consequences of long-term diseases. One potentially effective approach is by educating people to become more health literate. Early life interventions relating to exercise and good MSK health practices may be an effective addition to traditional approaches.
LifeLab is a science-based approach to improving teenagers' health-related attitudes and behaviour. The LifeLab approach was developed at the University of Southampton and combines educationalists, scientists, clinical researchers and school children and has been effective in improving young peoples' understanding of the nature of diseases and reasoning about health issues. However, no specific MSK health education components have previously been included in LifeLab.

Methods:
In 2014 the first MSK LifeLab workshop was designed with educationalists and researchers in biomechanics, occupational therapy, podiatry, and physiotherapy from the MSK Research Cluster at Southampton for year 8 (age 12-13) school students. The workshops aimed to promote young peoples' health literacy in musculoskeletal health and integrated experiential learning using 3D motion analysis, real-time ultrasound scanning of muscles contracting; radiographs of normal and osteoarthritis foot joints; anatomy models and hand and hip joint implants.

The workshops covered a) the impact of osteoarthritis joint disease on daily life b) capturing and illustrating joint movement using state of the art 3D motion analysis technology and c) an in-depth look at muscles using ultrasound imaging. Learning objectives included students being able to:

1. Identify key components of active healthy living for bones, muscles and joints
2. Observe patterns in how healthy joints can move and contrast patterns with injured joint movement
3. Discover what role muscles play in healthy joints
4. Compare healthy joint structures with arthritic joint structures

Results:
58 students from 3 state secondary schools, attended a university widening participation outreach day within which the MSK LifeLab workshop was run. On the same day the students also attended workshops in Humanities and Oceanography. When asked which workshop of the outreach day was their favourite 43 % of the students identified the MSK workshops. Feedback on why the workshops were enjoyable included; "I enjoyed biomechanics because I like looking at how things work and move"; "Ostioarphritus. I'm into sports & find the body interesting"; "The bones because you got to find

out about the body". The interactive nature of the workshop with teenagers having hands on learning was also well received "My favourite was bones because they made it fun"; "The bones experiments because the technology involved was awesome."

Conclusions:
Using interactive MSK workshops as part of LifeLab presents an exciting health literacy approach to encourage young people to start to engage in understanding their MSK health.

Acknowledgements These are not included in the abstract but will appear if we get a paper accepted.
LifeLab, has been developed as a joint initiative, involving, in addition to the University of Southampton and the University Hospital Southampton NHS Foundation Trust; the MRC Lifecourse Epidemiology Unit, the University of Southampton (UoS) Faculty of Medicine and Southampton Education School, the Mathematics and Science Learning Centre (MSLC), the NIHR Southampton Biomedical Research Centre and the Garfield Weston Foundation.
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