Using functional Magnetic Resonance Imaging to assess the impact of Mandolean training on the neural control of obesity in young people: a exploratory study for the Bristol Nutrition BRU.

Key Words: fMRI, Obesity, adolescent, behavioural interventions

Lead: Julian Hamilton-Shield, Elinor Hinton, Laura Birch

Abstract

Mandolean is a device that retrains obese individuals to eat slower and reduce total food consumption. It has been used successfully in a weight management RCT with obese adolescents. This proposal will further investigate the underlying physiological basis of the Mandolean weight reduction by using functional Magnetic Resonance Imaging (fMRI). This will establish whether eating behaviour retraining is associated with long-term changes in brain activity in satiety-related regions, such as the prefrontal cortex. Obese adolescents (n=10) from the Care of Childhood Obesity clinic will be recruited and trained on Mandolean. fMRI at baseline and after six months training will be compared with controls from same clinic (n=10) receiving standard lifestyle intervention alone. An additional component will be to take 10 cases with MC4R variants (most common monogenic condition associated with referral to COCO clinic) and observe if retraining causes similar neural changes compared to those with simple obesity. A normal-weight control group (n=10) will also be recruited to take part in an identical imaging session to provide data for comparison. Blood samples will be taken to examine how eating behaviour retraining influences levels of gastrointestinal hormones and in turn how these relate to brain activity.