

Parallel Session RTD Line 4 / Psychological Predictors of weight loss

Lecture 5: Modelling complex systems and the development of a obesity risk and behavioural advice screening tool

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Abstract

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In DiOGenes, obese/overweight adult volunteers initially followed an 8 week low calorie diet (LCD). Adults who lost $\geq 8\%$ of initial body weight were then randomised to one of 5 ad libitum intervention diets designed to prevent weight regain (WR): Low Protein [LP]/Low GI [LGI]; LP/High GI [HGI]; High Protein (HP)/LGI; HP/HGI and Control (CTR). Subjects completed a large battery of dietary, behavioural and psychological measures on 3 occasions (i) the beginning of the mandatory weight loss period (ii) the end of weight loss, beginning of the intervention period, (iii) end of 6 month intervention period (which immediately followed the weight loss period).

1118 adults (406 males, 712 females; mean age 41 years, mean BMI 34kg/m²) from 8 European countries were initially screened. Of these 570 adults remained at the end of the intervention period. A total of 2800 psychological/behavioural variables, using a web based questionnaire delivery platform (QDP), were recorded for use as predictors and correlates of (i) weight loss and (ii) WR. This paper focused initial exploratory analyses, primarily on 316 eating behaviour and dietary related variables, to illustrate patterns in outcomes and their potential for use in developing an Obesity Risk and Behaviour Advice Screening Tool (ORBAST). The ORBAST will help individual consumers better match the many available behaviour change options to their individual lifestyle needs. For comparative purposes we are also studying a similar sized group of slimmers from Slimming World, UK, (data in preparation).

In almost every case, univariate analysis showed weight loss and regain were described by many predictors, each explaining only 1-2% of the variance. Many more were non-significant. A few explained up to 4-7% of the variance. This is without penalisation of the data for the multiple comparisons. A good example was the main dietary intervention itself, which alone accounted for 2% of the variance in WR. There were some exceptions to this in the main body of the psychological data - e.g. motivation to continue by the end of the study accounted for 21% of the variability in weight regain alone. Taking the quantitatively more important variables and adding them in a stepwise manner to multifactor models increased the variance accounted for considerably. Thus a model incorporating self-confidence, social support, screening BMI and gender explained 14% of the variance in WR. Adding "motivation to continue" explained 25% of the variance in WR, but decreased the degrees of freedom, as this measure was based on a sub-sample (Copenhagen and Maastricht). Adding in the additional psychological and behavioural variables will increase the predictive power of the models further. We have also provisionally explored regression tree models that may be useful in identifying specific pathways of weight control success for certain sub-groups of consumers.

These psychological/behavioural measures, and biomedical data from the DiOGenes/Slimming World cohorts will be used to develop a software prototype ORBAST, which will give general estimates of risk and predictors of weight control success at the level of the study population. The advice will be constructed to show general trends and risks for the whole population. By completing a short questionnaire, based on these data, the ORBAST will also make weighted estimates of behaviour changes, using a 10-point scale for salient predictive behaviours. These will be focused at an individual level to maximize the chance of successful weight control, by tailoring behavioural solutions to specific lifestyle needs.