UK Society for Behavioural Medicine 19th Annual Scientific Meeting

Title

Introducing the multiphase optimisation strategy (MOST) and optimisation trials

Workshop Leader & other facilitators / convenors

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Complex interventions contain several potentially interacting components. They are often evaluated as a single package of components within a parallel group randomised controlled trial (RCT). These designs are an excellent way of establishing the effect of one package versus a suitable comparator. However, parallel group RCTs cannot easily answer questions about the effect of individual components and whether they are operating via the anticipated mechanisms. This can lead to complex interventions being implemented that contain ineffective components, thereby limiting their efficiency and affordability.

The Multiphase Optimisation Strategy (MOST) can overcome these limitations. MOST is an engineering-inspired framework for preparing, optimising, and evaluating complex interventions. While the preparation and evaluation stages largely mirror the NIHR/MRC framework for complex intervention research, the optimisation stage goes further and advocates for the use of highly efficient experimental designs to refine intervention packages, with the aim of producing more effective, affordable, scalable and efficient complex interventions. Delegates attending the course will learn about the strengths and weaknesses of MOST, and how it complements the existing NIHR/MRC framework.

The workshop will describe different types of intervention design (e.g. fixed and adaptive interventions), and will provide an overview of the range of experimental designs suitable for optimising different intervention designs. We will have a particular focus on designs within the family of factorial trials, including full factorials, fractional factorials and sequential multiple assignment randomised trials (SMARTs), with signposting to other possible designs (e.g. micro-randomised trials and hybrid experimental designs). These are fully powered experimental designs that enable the efficient and robust estimation of the main and interaction effects of intervention components. The data from trials using these experimental designs allow complex interventions to be refined by removing ineffective components or increasing the dose of effective components, prior to definitive evaluation. Use of an additional optimisation phase incorporating factorial and other associated designs could lead to more effective complex interventions, and faster scientific progress.

Using formal presentations, small group work, feedback and group discussion, this workshop will provide an understanding of how MOST and associated experimental designs can be incorporated into the evaluation of complex interventions.

Objectives

After attending the workshop, we aim for participants to:

1. Understand the MOST framework (preparation, optimisation, evaluation) and be able to describe its key strengths and limitations;
2. Learn about experimental designs that could be used to optimise complex interventions;
3. Have an awareness of relevant methodological/trial conduct challenges and potential solutions.

Rationale

Applying scientifically rigorous methods to support the development and evaluation of complex interventions in health care settings is an emerging area of scientific inquiry. In the UK, guidance has been published by the Medical Research Council / National Institute of Health and Social Care Research (herein referred to as the MRC guidance). The MRC guidance is hugely influential for funders and researchers.

There are however limitations with the approach advocated in the MRC framework, with potentially widescale consequences for how complex intervention are developed, evaluated and implemented into society. A major limitation is the focus on definitive evaluation of complex interventions prior to fully understanding which components of the intervention are effective and whether they operate in the hypothesised manner.

A major problem with encouraging widespread adoption of the MOST framework among applied health scientists in the UK is that there is a lack of training on how to design, deliver, analyse and report trials using the type of experimental designs advocated for by MOST. In the US, where the framework originated, in-person and remotely delivered training has been created by a team at New York University. However, this course is not available for researchers outside the US. Our brief training will introduce UK researchers to MOST and the associated experimental designs, and enable intervention scientists to get an alternative perspective on how complex interventions can be designed and evaluated.