STUDY PROTOCOL

An international, Delphi consensus study to identify priorities for methodological research in behavioural trials: A study protocol [version 1; peer review: 2 approved]

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Abstract

Background: Effective behaviour change interventions are needed to impact important health outcomes, including morbidity and mortality. However, the uptake and impact of behavioural interventions have been limited by methodological challenges. The International Behavioural Trials Network (IBTN) was established in 2013 to facilitate global improvement in methodological quality of behavioural trials. There has been no formal process, within the network or in the broader literature, to define the most important research priorities to achieve this aim. In this project, we will conduct an international, Delphi consensus study to identify and achieve consensus on priorities for methodological research in behavioural trials among IBTN members.

Methods: Fifteen core members of IBTN, who are experts in the field of behavioural intervention research, will be invited to brainstorm a complete list of all items they consider priority areas for methodological research in trials of behavioural interventions. The IBTN Research Prioritisation team (the authors) will review all items generated, removing duplicates and merging similar topics, and generate a 'long-list' of items. This long-list will be sent to the 15 IBTN core members for approval.

We will then administer two online Delphi surveys to all IBTN members. In the first survey, respondents will be asked to rate the importance of each item on a nine-point scale and rank their top five priorities. In the second survey, respondents will receive feedback on others’ responses and a reminder of their own responses in survey 1, and will be asked to re-rate items and re-select their 'top five'.

Discussion: Findings from the project will be used to develop the research agenda of the IBTN and to make recommendations for
future research.

**Keywords**
Behaviour change interventions, Research prioritisation, Randomised controlled trials, Methodological research, Delphi study

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**Author roles:** Byrne M: Conceptualization, Data Curation, Funding Acquisition, Methodology, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; McSharry J: Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; Meade O: Methodology, Writing – Review & Editing; Lavoie KL: Funding Acquisition, Methodology, Resources, Software, Writing – Original Draft Preparation, Writing – Review & Editing; Bacon SL: Investigation, Methodology, Resources, Software, Writing – Original Draft Preparation, Writing – Review & Editing

**Competing interests:** No competing interests were disclosed.

**Grant information:** Health Research Board Ireland [RL-2013-8], Research Leadership Award 2013 to MB. Ireland Canada University Foundation James M. Flaherty Visiting Professor Award 2016-17 to MB. The IBTN was developed with funding from the Canadian Institutes of Health Research [MPE 309504] and is supported by SLB’s CIHR SPOR Chair [SMC 383472] and KLL’s UQAM Behavioral Medicine Chair and Salary Award from the Fonds de la recherche du Québec – Santé (FRQS). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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Introduction
There is now compelling evidence that behaviour change is central to global reduction of chronic disease prevalence, mortality, and burden of disease1. However, despite the significant potential for interventions that target behaviour to improve health and clinical outcomes, the reach and impact of behavioural interventions remains limited2. Behavioural interventions are “interventions that require the active participation of a target group (e.g., the patient/individual, health professional, health care systems) in a program delivered by a trained interventionist with the proximal or ultimate goal of changing health-related behaviour”3. Experts in the area have concluded that the uptake and impact of behavioural interventions have been limited by methodological challenges specific to the design and conduct of behavioural trials3 and a lack of investment from funders to conduct research to tackle these issues4.

Improving the quality and potential of behavioural trials requires methodological issues in this area to be identified and research conducted with the specific aim of addressing these issues. Previously identified methodological issues include intervention development and piloting, intervention reporting, identifying suitable comparison groups, selection of appropriate outcome measures and intervention fidelity5. A formal process to identify and specify methodological priorities is now needed to facilitate the development of an international and cohesive behavioural trials research agenda.

Research prioritisation provides a process for key stakeholders to generate ideas and reach consensus on important research topics. The prioritisation process has been used to identify priorities across conditions and populations5,6. In the area of trials, research prioritisation has been conducted with Directors of UK Clinical Research Collaboration Clinical Trials Units to inform the broader trials methodological research agenda7. In addition, a priority setting exercise has recently been reported to inform the global health trials methodology research agenda8.

Our aim is to identify priorities for methodology research specific to trials of behavioural interventions and to inform and guide the direction of the behavioural trials research agenda internationally. We will use a Delphi priority setting consensus approach, inviting all members of the IBTN to participate.

Methods
The Delphi process
An electronic Delphi (e-Delphi), with online administration of questionnaires, will be used for this research prioritisation to facilitate international participation9. The Delphi process is a structured group facilitation technique to obtain consensus among anonymous respondents through iterative rounds with feedback10. The Delphi approach has been widely used in health research. The features of the Delphi process that make it suitable for gaining consensus include: anonymity to facilitate balanced participation and iterative rounds to allow participants to change their opinion in response to controlled feedback where participants are provided with information on the distribution of overall group responses from previous rounds11. The Delphi process has been identified as valuable for large groups or when participants are separated geographically11.

Participants
Three levels of participants will be included in the process.

- The IBTN Research Prioritisation Team (Molly Byrne, Jenny Mc Sharry, Oonagh Meade, Simon Bacon and Kim Lavoie) will develop the research prioritisation tasks, pilot test tasks and manage the research prioritisation process.
- Core IBTN members (n = 15), selected by the research team as individuals within the Network with extensive expertise in behavioural trials, will be invited to participate in the expert topic generation process.
- Current IBTN members (n = 295) will be invited to take part in the two-stage e-Delphi survey.

Delphi phases
Delphi Phase 1: Expert topic generation. A member of the research team (MB) will email core IBTN members and experts in behavioural trials (n = 15) to invite them to generate a list of all possible topics or research questions that they think are important for behavioural trials methodology research. Demographic details of participants including job title and years of experience will also be requested.

Two members of the research team (MB and JMS) will review generated items initially and propose a ‘long-list’ of items. These will be reviewed, discussed and approved by the full IBTN Research Prioritisation Team. This list will be sent by email to the full list of core IBTN members for comment and approval in advance of Phase 2.

Delphi Phase 2: E-Delphi survey. All members of the IBTN will be invited by email to participate in two online surveys, using LimeSurvey online survey software. In survey 1, participants rate their agreement with the importance of the items identified in Phase 1. They will be asked to assign a score between 1 and 9 to indicate the priority they place on each topic. The cut-off scales proposed by the RAND group and used in similar research prioritisation exercises3 will be used, with scores of 1–3 indicating a topic is not important, scores of 4 to 6 indicating that the topic is important but not critical, and scores of 7 to 9 indicating that the topic is critical. In addition, participants will be asked to select and rank their ‘top-five’ overall priorities. Participants will also be invited to add any items that they believe are important and missing from the list in a free text comment box at the end of the survey. Participants will be asked to provide
demographic information including: sex, current professional position, country of residence, age group and number of years of experience of working in the area of trials of behavioural interventions.

In the second survey (administered 3 weeks after the closing of survey 1), participants will receive information about how others rated and ranked the items in survey 1 (a bar chart plotting total ratings for each item, the mean rating score for each item and the percentage of all respondents placing each item in their ‘top-five’ priority selection). They will also receive a reminder of how they rated each item and what items they selected and ranked as their ‘top-five’. Any additional items proposed in the free-text comment box in survey 1 will be discussed by the research team and included for rating in survey 2 if the team agrees that the item is a unique, novel, previously excluded item. Respondents will be asked to re-rate each item and re-select and rank items to indicate their ‘top-five’ priorities. Ratings and levels of consensus from survey 1 and 2, as well as endorsement of items as ‘top-five’, will be collated and presented.

**Ethical approval**

Ethical approval was granted by the National University of Ireland Galway Research Ethics Committee (reference: 17-Jun-13). Participation in the surveys is taken to indicate participant consent; this is explicitly stated on the introductory page of the surveys.

**Dissemination of research**

Findings from this research prioritisation project will be shared with members of the IBTN at the IBTN Conference 2018 to guide the development of a research agenda for the Network. All data will be stored anonymously on password protected computers to which only members of the research team have access. The findings will be published in a high quality, open-access international journal to promote visibility of the findings among behavioural trialists internationally, enabling them to focus research on high priority methodological questions, which will improve the quality of behavioural trials into the future.

**Current study status**

The first e-Delphi survey was launched in late January 2018.

**Data availability**

No raw data are associated with this article.

**Competing interests**

No competing interests were disclosed.

**Grant information**

Health Research Board Ireland [RL-2013–8], Research Leadership Award 2013 to MB.

Ireland Canada University Foundation James M. Flaherty Visiting Professor Award 2016-17 to MB.

The IBTN was developed with funding from the Canadian Institutes of Health Research [MPE 309504] and is supported by SLB’s CIHR SPOR Chair [SMC 383472] and KLL’s UQAM Behavioral Medicine Chair and Salary Award from the Fonds de la recherche du Québec – Santé (FRQS).

*The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.*

**Acknowledgements**

We acknowledge the assistance of Dr Geneviève Szczepanik and Ms Thalie Labonté, of the Montreal Behavioural Medicine Centre, who helped with online survey support.

**References**


Open Peer Review

Current Peer Review Status: ✓ ✓

Version 1

Reviewer Report 28 June 2018

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Claire Pentecost
Exeter Clinical Trials Unit, University of Exeter Medical School, Exeter, UK

This is a clearly written summary of a study protocol. The findings will help health behaviour change researchers to prioritise areas of research methodology to improve the quality and impact of health behaviour change interventions.

I have some minor suggestions to improve the paper.

Abstract

1. ‘experts in the field of behavioural intervention research, will be invited to brainstorm a complete list of all items they consider...’

This could be interpreted as they will compile a list or they will be given a list to consider. The Full methods explain that the list will be generated by the invited experts but it is not clear here.

Also the term ‘brainstorm’ Is not used in the main methods section. For consistency and clarity the term should be used in both places and or removed from the abstract.

2. The methods should state that the generated lists will be summarised and approved by the research team.

3. Should the discussion say ‘Findings from the project will be used to ‘inform’ rather than to ‘develop’ the research agenda?

Introduction

1. The methodological issues examples given in the 3rd paragraph are common issues for any complex interventions. To highlight the issue of methodological problems within the behaviour change field, and the importance of this Delphi consensus study, I would like to see more evidence of specific issues with behaviour change interventions that we already know about, within disease areas or types of interventions. For example fidelity in weight loss interventions.
Methods
1. 5th paragraph – does LimeSurvey software need to be cited with LTD or a web address?

2. Last paragraph - how will the team agree that free text items are novel? Will everyone agree or a majority? How will any disagreements be resolved?

3. Will you be following any Delphi quality reporting guidelines?

4. How do you envisage the results will be presented? A simple list or a list linked to particular disease areas, or something else?

Is the rationale for, and objectives of, the study clearly described?
Yes

Is the study design appropriate for the research question?
Yes

Are sufficient details of the methods provided to allow replication by others?
Yes

Are the datasets clearly presented in a useable and accessible format?
Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Behaviour change and other complex interventions

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 13 Jul 2018
Molly Byrne, National University of Ireland, Galway, Ireland

Referee Report 28 Jun 2018
Claire Pentecost, Exeter Clinical Trials Unit, University of Exeter Medical School, Exeter, UK

The authors would like to thank Dr Pentecost for her review and helpful comments. We have addressed these as outlined in bold font below.

Approved

VIEWs 2
DOI: 10.21956/hrbopenres.13855.r26134
This is a clearly written summary of a study protocol. The findings will help health behaviour change researchers to prioritise areas of research methodology to improve the quality and impact of health behaviour change interventions.

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Also the term ‘brainstorm’ is not used in the main methods section. For consistency and clarity the term should be used in both places and or removed from the abstract.

Authors’ response: The sentence in the abstract has been changed to: ‘Fifteen core members of IBTN, who are experts in the field of behavioural intervention research, will be invited to generate a list of all items they consider priority areas for methodological research in trials of behavioural interventions.’

1. The methods should state that the generated lists will be summarised and approved by the research team.

Authors’ response: The following sentence has been added at the of the methods section Phase 1: ‘The final list of items will be approved and agreed by the IBTN Research Prioritisation Team.’

1. Should the discussion say ‘Findings from the project will be used to ‘inform’ rather than to ‘develop’ the research agenda?

Authors’ response: The sentence in the abstract has been changed as follows, using the word ‘inform’ rather than ‘develop’: ‘Findings from the project will be used to inform the research agenda of the IBTN and to make recommendations for future research.’

Introduction

1. The methodological issues examples given in the 3rd paragraph are common issues for any complex interventions. To highlight the issue of methodological problems within the behaviour change field, and the importance of this Delphi consensus study, I would like to see more evidence of specific issues with behaviour change interventions that we already know about, within disease areas or types of interventions. For example fidelity in weight loss interventions.

Authors’ response: We acknowledge that the terms ‘behavioural trials’ has significant overlap with the term ‘complex intervention trials’. Indeed, it could be argued that the terms could be used interchangeably, that all behavioural trials are complex, and that all complex intervention trials involve behaviour change. In this section of the protocol, we reference a paper specifically discussing challenges to ‘behaviour change interventions’, so we have used this terminology here. In the final reporting of this study, we will incorporate a more elaborate discussion around the definition of behaviour change intervention trial, and how it relates to complex interventions. However, we consider such a discussion to be beyond the scope of this protocol paper.

Methods

1. 5th paragraph – does LimeSurvey software need to be cited with LTD or a web address?
Authors’ response: We have added the following citation for LimeSurvry: Limesurvey GmbH. / LimeSurvey: An Open Source survey tool /LimeSurvey GmbH, Hamburg, Germany. URL http://www.limesurvey.org

1. Last paragraph - how will the team agree that free text items are novel? Will everyone agree or a majority? How will any disagreements be resolved?
Authors’ response: The sentence in the methods section has been changed as follows: ‘Any additional items proposed in the free-text comment box in survey 1 will be discussed by the research team and included for rating in survey 2 if the majority of team members agrees that the item is a unique, novel, previously excluded item.’

1. Will you be following any Delphi quality reporting guidelines?
Authors’ response: The following reference has now been included and we have added that the results will be written up in accordance with these reporting guidelines: Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. Palliative Medicine. 2017;31(8):684-706.

1. How do you envisage the results will be presented? A simple list or a list linked to particular disease areas, or something else?
Authors’ response: The following sentences have been added to the 'Dissemination of Research' section: ‘Items will be reported according to importance ratings for individual research items in surveys 1 and 2. The numbers and percentages of participants who rated each item as their top priority in surveys 1 and 2 will also be reported.’
  ○ Is the rationale for, and objectives of, the study clearly described? Yes
  ○ Is the study design appropriate for the research question? Yes
  ○ Are sufficient details of the methods provided to allow replication by others? Yes
  ○ Are the datasets clearly presented in a useable and accessible format? Not applicable

Competing Interests: No competing interests were disclosed.
Referee Expertise: Behaviour change and other complex interventions
I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.
This is a well written protocol of a timely study, the authors are conducting important and vital work to further advance behaviour change science. I have only minor comments for consideration by the authors.

Abstract:
The authors use the term brainstorm in the abstract, but not the methods. It might be good to use the same terms for the proposed activities.

The definition of behavioural intervention on p. 3 is very useful (“interventions that require the active participation of a target group (e.g., the patient/individual, health professional, health care systems) in a program delivered by a trained interventionist with the proximal or ultimate goal of changing health-related behaviour”). However, might this definition omit interventions which are delivered remotely and electronically, such as ehealth and mhealth interventions which are typically delivered automatically and not by a trained interventionist?

P. 3 – “The Delphi approach has been widely used in health research.” – please provide a reference.

I wonder if the authors might want to collect the same demographic information between Phase 1 and Phase 2 to allow comparison.

It might be useful to add a sentence on how additional comments from the 15 experts at the end of Phase 1 will be handled.

Similarly, how will new items integrated into Survey 2 following Survey 1 be handled. Will these be rated only once in Survey 2?

When the participants are asked to rate the importance, it might be useful to specify what importance relates to. Someone who is interested in theory development might rate importance different to someone primarily interested in clinical implementation of evidence. The exact phrasing of the question is thus crucial to avoid introducing unwanted variation in the provided ratings and to be specific as to what the IBTN members are asked to judge.

The authors might want to consider removing the year 2018 from the dissemination section (p.4) in case timelines slip and the results are not fully ready in time for this particular conference.

Is the rationale for, and objectives of, the study clearly described?
Yes

Is the study design appropriate for the research question?
Are sufficient details of the methods provided to allow replication by others?
Partly

Are the datasets clearly presented in a useable and accessible format?
Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health psychology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Authors' responses to review by Stephan Dombrowski, Division of Psychology, University of Stirling, Stirling, UK
The authors would like to thank Dr Dombrowski for his review and helpful comments. We have addressed these as outlined in bold font below.

Abstract:
The authors use the term brainstorm in the abstract, but not the methods. It might be good to use the same terms for the proposed activities.

Authors' response: The sentence in the abstract has been changed to: ‘Fifteen core members of IBTN, who are experts in the field of behavioural intervention research, will be invited to generate a list of all items they consider priority areas for methodological research in trials of behavioural interventions.’

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Authors' response: We have added the following sentence following the definition of behavioural interventions to address this point: ‘Behavioural interventions may be delivered in person or digitally, employing digital technologies such as the Internet,’

P. 3 – “The Delphi approach has been widely used in health research.” – please provide a reference.
Authors’ response: The following reference has been added: Jones J, Hunter D. Consensus methods for medical and health services research. BMJ : British Medical Journal. 1995;311(7001):376-80.

I wonder if the authors might want to collect the same demographic information between Phase 1 and Phase 2 to allow comparison.
Authors’ response: The following demographic data will be collected from participants at time 1: sex, current professional position, country of residence, age group and number of years of experience of working in the area of trials of behavioural interventions. As these are not going to change between survey time 1 and time 2, we do not plan to collect this data again for survey 2.

It might be useful to add a sentence on how additional comments from the 15 experts at the end of Phase 1 will be handled.
Authors’ response: The following sentence has been added at the of the methods section Phase 1: ‘The final list of items will be approved and agreed by the IBTN Research Prioritisation Team.’

Similarly, how will new items integrated into Survey 2 following Survey 1 be handled. Will these be rated only once in Survey 2?
Authors’ response: The following sentence has been added: ‘New items added to survey 2 will be rated only once.’

When the participants are asked to rate the importance, it might be useful to specify what importance relates to. Someone who is interested in theory development might rate importance different to someone primarily interested in clinical implementation of evidence. The exact phrasing of the question is thus crucial to avoid introducing unwanted variation in the provided ratings and to be specific as to what the IBTN members are asked to judge.
Authors’ response: The following sentence has been added: ‘Participants are asked to rate the perceived importance, from their own individual point of view, of the items for methodological research in trials of behavioural interventions.’

The authors might want to consider removing the year 2018 from the dissemination section (p.4) in case timelines slip and the results are not fully ready in time for this particular conference.
Authors’ response: This sentence has been changed as follows: Findings from this research prioritisation project will be shared with members of the IBTN to guide the development of a research agenda for the Network.
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Partly
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Not applicable

**Competing Interests:** No competing interests were disclosed.

**Referee Expertise:** Health psychology

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