Systematically analysing behaviour change techniques used in 44 interventions to reduce unprofessional behaviour between healthcare staff

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Background: Interventions intending to modify human behaviour, such as unprofessional staff behaviours (UBs), can be strengthened by use of behavioural and implementation science frameworks. This would improve understanding of intervention effectiveness, improve replicability, and enhance transparency of intervention reporting. Unprofessional behaviours can be defined as “Any interpersonal behaviour by staff that causes distress or harm to other staff in the healthcare workplace” and this includes behaviours such as rudeness and bullying. Interventions to reduce UB between healthcare staff - which negatively impact patient safety and staff wellbeing – have to date not made sufficient use of behavioural or implementation science in their design or reporting. This study aimed to synthesise and align existing interventions with the behaviour change technique (BCT) ontology to improve understanding of the ‘active ingredients’ of these interventions.

Methods: This study built on a prior realist review [1], including updating the systematic search to July 2024 using MEDLINE, Embase, and CINAHL databases as well as the top 20 Google Scholar entries. To understand BCTs used in interventions, we extracted intervention descriptions from study reports and two independent screeners coded these using directed content analysis [2] against the Behaviour Change Techniques Ontology by Marques et al. [3], using the May 2024 version, which contains 284 hierarchically clustered BCTs.

Results: Our search update identified 5 new studies. Together with 42 papers from the prior review, 47 papers were included, reporting 44 unique interventions. Interventions were classified into five types: single-session (n=15), multi-session (n=12), combined session (n=6), professional accountability (n=7), and structured culture change (n=4). We found that the median number of BCTs used increased as intervention complexity increased. Session-based interventions used more awareness-raising and roleplaying related BCTs, while professional accountability interventions used BCTs oriented around providing negative consequences. Structured culture change interventions drew on goal-oriented BCTs. Some BCTs were not used by existing interventions. Examples included ‘restructuring of the physical environment’ (e.g. providing more spaces to relax during the workday) and ‘making a goal public’ BCTs. It was not possible to improve understanding of which BCTs drive intervention effectiveness, due to few interventions reporting negative outcomes.

Conclusion and implications: This is the first study (to our knowledge) applying the BCT ontology to interventions in health services research. We found that the BCT ontology is broadly applicable to organisational behaviour change interventions. More complex interventions employ consequence-based and goal-oriented BCTs, but effectiveness of particular BCTs versus others is unclear due to poor evaluations. To address UB, researchers need to develop more evidence-based interventions following behavioural science principles. Future intervention architects could use the BCT ontology to (1) improve understanding of why the intervention is intended to work, (2) enhance reportability and standardisation of their interventions, and (3) improve ability for others to synthesise findings.

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NIHR SafetyNet Symposium 2025
psrc-network.nihr.ac.uk

Background

• Unprofessional behaviours (UBs) like rudeness and bullying are any staff behaviours that cause distress or harm to colleagues. They damage staff wellbeing, undermine teamwork, and threaten patient safety.

• Our 2024 realist review (BMC Medicine) identified 42 acute care interventions worldwide aiming to reduce UB. However, none systematically applied behavioural or implementation science frameworks.

• The BCT Ontology (BCTO) is a comprehensive behavioural framework that classifies Behaviour Change Techniques (BCTs) in a standardised way. **BCTs are "coordinated sets of activities designed to change specified behaviour patterns."**

Using the BCTO can improve understanding of an intervention's 'active ingredients,' enhance replicability, and increase transparency in reporting.

• This study aligns existing UB interventions with the BCTO using directed content analysis to:

1. Demonstrate the feasibility of applying behavioural science to health services research
2. Encourage uptake of these frameworks
3. Inform how future interventions can be designed for greater effectiveness

Methods

• This research built on an initial realist review, and included updating the systematic search to July 2024.
• Screening was conducted in Rayyan.ai by two independent reviewers. Studies of any design were included, if they reported an intervention in an acute care setting that aimed to address UB between staff.
• This process (Figure 1) resulted in **47 studies** being included in the final analysis.

• To understand BCTs used in interventions, we:
  • extracted intervention descriptions from study reports.
  • two trained researchers, read and independently coded the excerpts of each study line by line against the May 2024 version of the BCT Ontology which contains 284 BCTs.

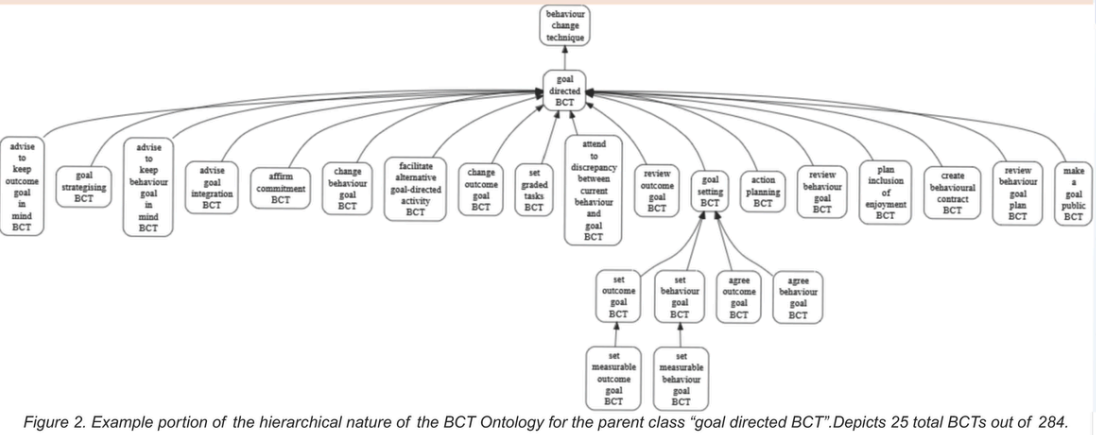

Figure 2. Example portion of the hierarchical nature of the BCT Ontology for the parent class "goal directed BCT".Depicts 25 total BCTs out of 284. Generated at https://bciovis.hbcptools.org/.

• Figure 3 illustrates the frequency of BCTs used across different intervention types.
• As intervention complexity increases, the frequency of BCTs rises, with advanced interventions utilising more consequence-based and goal-oriented BCTs.
• However, **understanding which BCTs drive effectiveness was not possible** due to few interventions reporting negative outcomes.
• Additionally, poor intervention reporting may have led to BCTs misinterpretation or omission in manuscripts despite being incorporated in interventions.

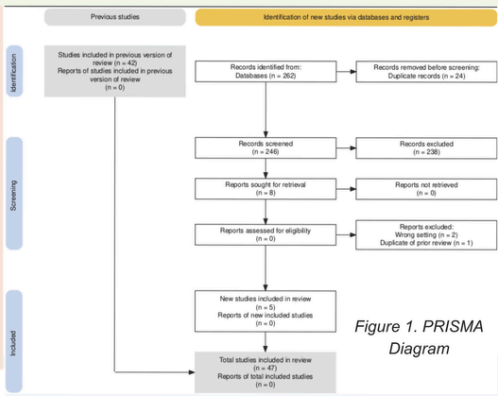

Figure 1. PRISMA Diagram

Results

• Across all studies, **477 individual uses of BCTs were coded.**

• We deduplicated four papers that reported the same Ethos intervention resulting in n=44 unique interventions.

• We have categorised these into the five intervention types from our previous work (see Figure 3).

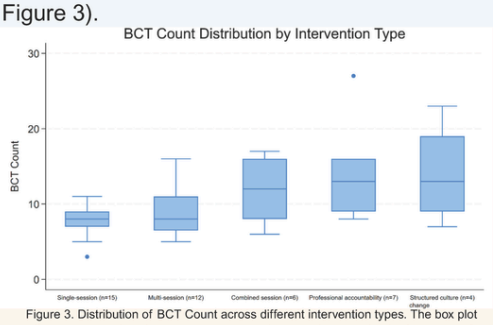

Figure 3. Distribution of BCT Count across different intervention types. The box plot displays the median, interquartile range, and potential outliers for the frequency of BCT use in each study type.

Implications

• Behavioral science frameworks can enhance health services research by improving the reportability and standardization of interventions.
• Developing evidence-based interventions based on behavioral science principles will help **reduce research waste.**
• A key strength of this research is the choice of BCTO used, which offers widely applicable BCTs and is designed to be a `live` resource with continuous updates. This should ensure our findings remain relevant in future research.

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This study is funded by the National Institute for Health and Care Research (NIHR) Midlands Patient Safety Research Collaboration. The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care.