BEHAVIOURAL CHANGE INTERVENTIONS ENCOURAGING CLINICIANS TO REDUCE CARBON EMISSIONS IN CLINICAL ACTIVITY: A SYSTEMATIC REVIEW

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BACKGROUND

- Clinical activity accounts for 70-80% of the carbon footprint of healthcare(1,2).
- A critical component of reducing emissions is shifting clinical behaviour towards reducing, avoiding, or replacing carbon-intensive healthcare(3).
- This review aimed to identify, map and assess behaviour change (BC) interventions implemented in healthcare settings to encourage clinicians to reduce their clinical activity's greenhouse emissions.

METHODS

- Six databases were searched in Nov 2021 (updated Feb 2022).
- **Inclusion/exclusion criteria:**

Inclusion	Exclusion
RCTs, cohort studies, case-control studies, case series, case studies, audit. Studies explicitly describing interventions for changing individual clinician behaviour towards environmentally sustainable healthcare choices which reduce emissions. Interventions delivered in primary care/health clinics, hospitals, allied health centres, online.	Studies describing interventions targeting supply chains/procurement (beyond individual clinician behavioural change). Studies on interventions to reduce emissions outside of clinical activity in health care (e.g., waste/recycling). Animal/veterinary studies. Letters, editorials, reviews or commentaries, opinion pieces, protocols.

- A pre-determined template was used to extract data from the studies, and risk of bias was assessed.
- The behaviour change techniques (BCTs) used in the interventions were coded using the BCT Taxonomy (4).
- The BCT taxonomy relates to a BC model commonly used when designing interventions, the Capability-Opportunity-Motivation-Behaviour (COM-B) model (5) (see Figure 1 for this relationship).

Figure 1 Part of the BC Wheel, COM-B definitions and example BCTs
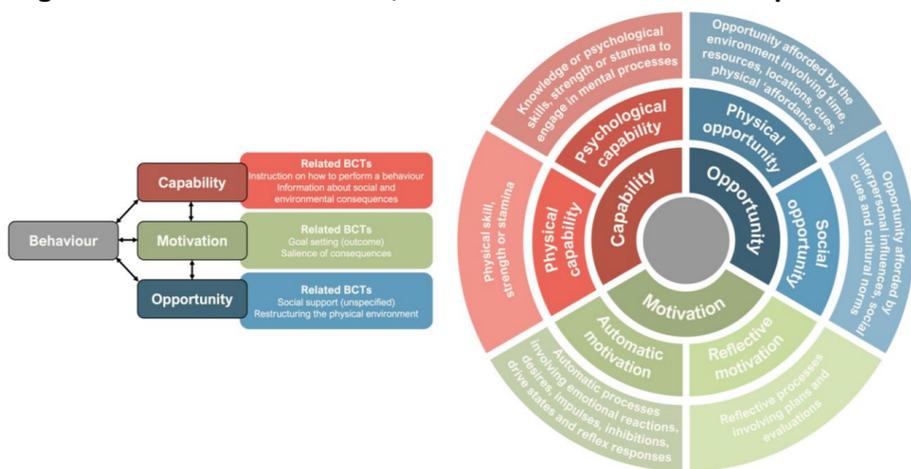
RESULTS

- Six full-text studies were included (see Figure 2).
- All studies used a before-after intervention design. Majority were USA studies (n=3), followed by UK (n=2) and Australia (n=1).
- Four studies focused on reducing anaesthesia-related emissions, and two aimed at reducing unnecessary test ordering.
- The most common BCTs were social support, salience of consequences, restructuring the physical environment, prompts and cues, feedback on outcome of behaviour, instruction on how to perform a behaviour and information about environmental consequences (see Table 1 for BCTs used).
- All interventions successfully reduced emissions, prescribing, ordering, and/or financial costs; however, only two studies reported magnitude significance.
- All studies scored at least one item as unclear or at risk of bias.
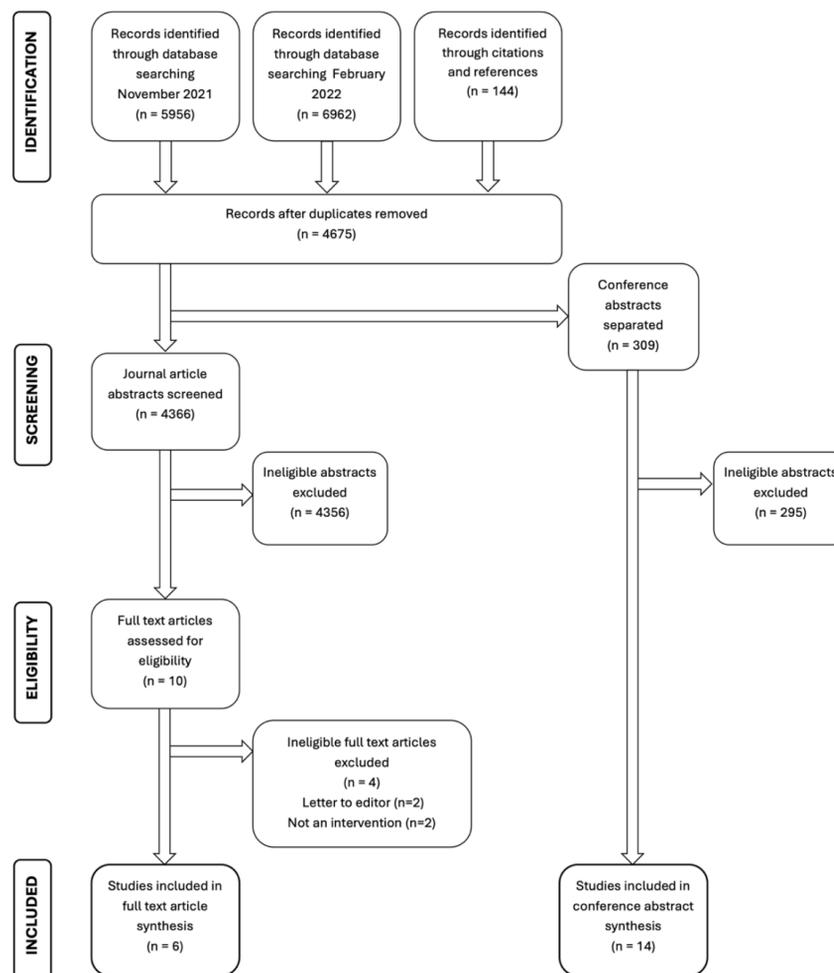
Figure 2 PRISMA diagram

Table 1 BCTs for full text papers

Author, year	1.3 Goal setting (outcome)	1.6 Discrepancy between current behaviour and goal	2.1 Monitoring of behaviour by others without feedback	2.7 Feedback on outcome(s) of behaviour	3.1 Social support, unspecified	4.1 Instruction on how to perform a behaviour	5.2 Salience of consequences	5.3 Information about social and environmental consequences	7.1 Prompts / cues	9.1 Credible source	10.8 Incentive (outcome)	12.1 Restructuring the physical environment	12.5 Adding objects to the environment	Total number of BCTs used
Epstein et al, 2016		✓		✓		✓			✓	✓		✓	✓	7
Regan et al, 2018	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	10
Carter et al, 2019						✓	✓	✓	✓	✓		✓	✓	9
Zuegge et al, 2019					✓	✓	✓	✓	✓	✓			✓	7
Gliecki et al, 2020		✓	✓		✓	✓	✓	✓	✓	✓		✓		10
McAlister et al, 2021					✓	✓	✓			✓			✓	5

Note – number corresponds to the code in the Behaviour Change Technique Taxonomy[31]

DISCUSSION & CONCLUSION

- Most interventions have targeted anaesthesia or pathology test ordering in hospital settings.
- Due to the diverse study outcomes and consequent inability to pool the results, this review is descriptive only, limiting our ability to conclude the effectiveness of interventions.
- Multiple BCTs were used in each study, but these were not compared, evaluated, or used systematically.
- All studies lacked rigour in their study design and measurement of outcomes.

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