What Are the Effective Behaviour Change Techniques Used to Improve General Health Check Attendance: A Systematic Review Protocol

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Abstract

Background

The general health check serves as an important preventive service to manage chronic illness. While previous studies have identified interventions used to improve utilization, few have provided evidence on the techniques used within an intervention. This has limited the scope of evaluating the intervention's effectiveness. This systematic review aims to use the Behaviour Change Wheel to identify the intervention options and identify the specific behaviour change techniques implemented. The result is expected to provide comprehensive evidence-based information to inform future intervention development.

Methods

A search strategy has been developed using the relevant keywords. Literature searches on four electronic databases have proceeded on 18 August 2021. No data analysis has been carried out yet. The search strategy will be updated towards the end to ensure all relevant literature is included in this review. The retrieved studies will be screened for eligibility following the PRISMA guideline. The quality of the included articles will be appraised using an appropriate quality assessment tool. For data analysis, intervention functions will be identified using the Behaviour Change Wheel (BCW). A content analysis will be followed, by using the Behaviour Change Technique Taxonomy (BCTTv1) to identify the techniques implemented in each intervention. The result will be presented in a narrative synthesis, summarizing the key techniques used, their frequency of identification and possible patterns of techniques implemented across different studies. Where deemed appropriate, a meta-analysis will be performed.

Discussion

This systematic review may provide evidence for explaining intervention effectiveness in more detail by providing a detailed comparison of intervention components. The results are expected to aid future intervention design to improve the general health check attendance and promote universal health coverage.

Systematic review registration

This protocol is registered on PROSPERO (ref: CRD42021221041).

Background

The global population in industrialized economies is aging rapidly resulting not only in demographic transition but epidemiological transition which implies that more people will experience multiple chronic diseases in the future [1]. While modifying risky lifestyle behaviours such as excessive alcohol intake, smoking, lack of physical activities and unhealthy diets are important in non-communicable disease management, it is increasingly recognized that preventive care plays an important role in it as well [2].

Health authorities recommend preventive services for older people to prevent and detect diseases early and receive prompt treatment when needed [3-5]. Primary preventive care may alleviate the burden on the healthcare system as healthcare delivered at the primary care level is more cost-effective than healthcare delivered in secondary or tertiary care [5, 6]. One example of the benefit of preventive health care, such as a general health check carried out at the primary care level, is estimated to prevent an additional 1,000 cases of cardiovascular disease per year in the United Kingdom (UK) [7]. However, the uptake rate of the general health check is only around 40% [8]. By increasing the uptake rate by 30 %, the estimated benefit in terms of prevention of cardiovascular diseases may improve three-folds [7]. Hence, there is an advantage in improving the uptake rate.

Most reviews of preventive health focused on disease-specific preventive services, such as cancer screening [9, 10]. Although these reviews provide valuable evidence for supporting intervention development for particular diseases, it is unclear whether these could be generalized for general health check screening. Unlike disease-specific screening which used a specific test to obtain a disease diagnosis, a general health check is to identify risk factors of an asymptomatic person who believed they are healthy [11].

Systematic reviews have identified interventions that work to improve general health check utilization. Reminders, invitation letters are some of the interventions found to be effective in increasing the uptake rate for the general health check [12, 13]. These reviews have focused on the national health service in the UK. The healthcare system in other countries may be different which may require the modification of the proved intervention in the literature or other intervention options for the local circumstance. However, the limited description of the intervention components in these reviews means understanding intervention effectiveness is limited (e.g. why and how an intervention might or might not work). This hinders the opportunity for study replication or further empirical testing in other healthcare settings [14]. It is recommended that intervention studies should provide a detailed characterization of intervention components to improve the quality of results being reported [15, 16].

The Behaviour Change Wheel (BCW) is a framework that guides intervention development from identifying what needs to change, to suggesting effective intervention options and possible policy for implementation [17]. The Behaviour Change Technique Taxonomy (BCTTv1)[18] was developed to provide a system to specify the characteristics ('active ingredient') of a behaviour change intervention. This taxonomy involves 16 behaviour change groups with 93 possible behaviour change techniques which can be exploited to bring about desired behaviour change. The BCTTv1 can be used with the BCW when considering to design a new intervention, or in evidence synthesis [17-19]. The BCTTv1 has been used in systematic reviews on a range of health promotion interventions [20-23]. A recent study using the BCW, BCTTv1 and Theoretical Domain Framework suggested theoretical effective strategies to improve health check behaviour [24]. These suggested theoretical strategies can either implemented into an existing intervention or to inform future intervention design. While the identified theoretically effective strategies from this review await future empirical testing in their effectiveness, in the meantime, it will be

useful to analyze the existing empirical evidence and understand what strategies have been implemented in the existing interventions and determine their effectiveness [24].

A first step to develop a behaviour change intervention to improve health check attendance rate is to understand the current evidence supporting existing interventions, from the perspective of the BCTTv1. Evaluating the BCTs used in an intervention will enrich the understanding of intervention effectiveness by knowing why an intervention may or may not work. To date, no review has been conducted on this area. Addressing this research gap will aid future intervention development. Consequently, this review will aim to answer the following research questions: "What intervention(s) have been used to improve health check attendance of older people and what behaviour change techniques are associated with these interventions?". The objectives of this review are as follow:

1. To review systematically the empirical evidence and identify the interventions that have been used to increase uptake of general health check in the older population
2. To determine the effectiveness of these interventions quantitatively using meta-analysis
3. To use the Behaviour Change Wheel (BCW) to synthesize and appraise interventions used to improve general health check attendance
4. To identify the behaviour change techniques used in these interventions using the Behaviour Change Techniques Taxonomy (BCTTv1)

The intended result would improve the understanding of the existing intervention components and is expected to aid future intervention development.

Methods

This systematic review protocol follows the PRISMA-P reporting guideline [25]. The PRISMA-P Checklist can be found in the supplementary material. This review is registered on PROSPERO (ref: CRD42021221041).

Eligibility criteria

We will include studies that are written in English and fulfill the following criteria.

Topic of interest

The topic of interest will focus on the general health check, defined as "a service that aims to look at the general risk factors of different diseases using several screening tests to assess the general health" [11]. Using this definition, disease-specific screening such as cancer screening of any kind will be excluded.

Population

We will include studies with a target population that is inclusive of the population aged 50 years or above. We will exclude healthcare providers because this review aims to understand what interventions have been implemented on the service-users side to increase the uptake rate. We will also exclude people with diagnosed diseases, as the health-seeking behaviour of this population is likely to be cue by symptoms, which does not align with the definition of prevention, where the individual is asymptomatic.

Intervention

Intervention that is designed to improve the uptake of the general health check will be included. The intervention must be targeted at changing behaviour (e.g. general health check attendance behaviour). Intervention studies that compare the effectiveness of different screening modalities will be excluded unless screening modalities are adopted as a way to increase the uptake rate (as a way to change the targeted behaviour).

Outcome

The primary outcome will be the actual uptake rate. An actual uptake/attendance is defined as the full *completion* of a general health check service. We will exclude studies with a primary outcome measure of intention rather than action, for instance, intention to attend general health check attendance. These outcome variables will be excluded as these do not reflect an actual uptake behaviour.

Type of studies

We will consider empirical experimental studies that consisted of a control group and a comparison group, e.g. randomized controlled trials. We will exclude studies that were not published as empirical research articles, e.g. systematic review and research protocol.

Information sources

A literature search will be developed using the key terms related to "general health check", "intervention", "uptake". These key terms will be combined with their alternative terms and together a search strategy will be developed. This search strategy will be entered into four electronic databases (e.g. PubMed, PsychINFO, EMBASE, and Web of Science) to obtain a list of potentially relevant literature. We chose these databases because of their relevance to social science, psychology and health-care related topics.

Search

The search strategy was developed and was discussed with a university librarian who has expertise in developing search strategies. The search strategy was discussed and moderated by the research team

(WL, JL, MY). An example of the search strategy entered into PubMed is as follows:

(((("general" AND "health check") *OR* "health check?" *OR* "health check" *OR* "preventive health check?" *OR* "medical checkup?" *OR* "medical check?" *OR* "comprehensive health check?")

AND

("uptake" *OR* attend* *OR* participat* *OR* utili?ation *OR* adher* *OR* appointment?)) **AND**

("intervention" *OR* "strategy" *OR* "strategies" *OR* "method?" *OR* "technique?")

The search strategy was entered into PubMed, PsychINFO, EMBASE and Web of Science on 18 August 2020. At this stage, no language and study design limits were imposed on the search strategy.

Study records

Data management

The retrieved records from the four databases will be imported to EndNote, where duplicates of records will be discarded. After this, a list of retrieved records will be generated and exported to Excel for titles and abstracts screening. The reason for any exclusions will be documented.

Selection process

Two reviewers (WL, AL) will independently screen the title and abstract of the retrieved articles by following the eligibility criteria. Any articles with uncertainty in their eligibility will be included in the full-text screening. The full-text screening will be conducted independently. When a source is not accessible on the publication website, additional help will be sought from the university librarian to get a copy. The reason for any exclusion will be recorded. Any discrepancies in the selection process will be discussed between the two reviewers. The final selection process will be illustrated in a PRISMA flow diagram [25].

Data collection process

A standard table will be used to collect the study characteristics of the included articles [26]. One reviewer will initially extract the study characteristics independently and the results will be checked by another reviewer to ensure accuracy. Other than extracting the generic information of the intervention study, we will also identify the behaviour change techniques used in each intervention.

Coding of behaviour change techniques

Behaviour change technique is the "observable, replicable and irreducible" component of an intervention [18]. Behaviour Change Technique Taxonomy (BCTTv1) is a 93-item hieratically structured system that helps to characterise intervention components. These 93 BCTs are grouped into 16 behaviour change groups [18].

Two reviewers will receive online BCT coding training before conducting the content analysis [27]. The coding process will adopt the following sequences:1) the reviewers will read the intervention description line by line until they feel familiar with the content; 2) they will follow the description and identify the 'active ingredient' and label the relevant BCTs.

A content analysis using the BCTTv1 will be conducted to code the BCTs implemented in each intervention. Content analysis is chosen because there is an established taxonomy, i.e., BCTTv1, used to identify the intervention components. By knowing the frequency of BCT identified, we could explore the possible relationship between BCTs in individual studies and across different studies.

Data items

We will extract the following study characteristics:

- Study design (control/ comparison group; sample size)
- Participant characteristics (such as age, gender, sample size)
- Setting (e.g. general practice setting)
- Intervention characteristics (intervention type, mode of delivery)
- Primary outcome measures
- Results (e.g. uptake rate for each intervention)

Outcomes and prioritization

The primary outcome is the general health check uptake rate. If a study has measured uptake rate at different time points, these variables will be reported in ascending order, e.g. 3-month period, 6-month period and 12-month period. This review will not specify any secondary outcome measures at this stage. If the eligible studies have included any secondary measures, we will also present them in the Results section.

Risk of bias in individual studies and across studies

We will use the Cochrane Risk of Bias tool for quality assessment [28]. This tool collects the following information to determine the risk of bias: 1) random sequence generation; 2) allocation concealment; 3) blinding of participants and personnel; 4) blinding of outcome assessment; 5) incomplete outcome data;

6) selective reporting. RevMan 5 will be used to document verbatim quotations from the eligible studies as evidence for the quality assessment. Two reviewers will assess the study quality independently based on the Cochrane Risk of Bias criteria [15]. They will label the study as 'high risk', 'low risk' or 'unclear risk' accordingly. Any discrepancies will be resolved through discussion between the two reviewers. The risk of bias graph of individual studies and across studies will be generated using RevMan 5.

Data analysis

Data analysis will include two sections to address the objectives. Objectives 1,3 and 4 will be addressed using narrative synthesis. Objective 2 will be addressed, if possible, by a meta-analysis.

Identification of intervention functions

Objective 3 aims to identify the intervention used to increase general health check uptake. A description of each intervention condition of the study will be presented narratively and which of the nine intervention functions in the BCW each intervention serves [17].

Identification of behaviour change technique

Objective 4 aims to identify the behaviour change techniques used to increase the general health check uptake rate. Content analysis will be used to identify the BCT and the result will be presented in the form of narrative synthesis. The result of the content analysis will be entered into the NVivo software. The inter-rater reliability of the result will be compared using Cohen's Kappa [29], with an acceptable agreement level defined as a coefficient 0.6 or higher [30]. Any discrepancies will be discussed between the two reviewers. For any unresolved discrepancies, a third reviewer will be engaged in the final discussion. The final result will be presented in a table with illustrative quotations to support data synthesis. The narrative synthesis will address from three perspectives in the following sequence: the frequency of BCT identified, BCT reported effectiveness, and the possible BCT combination identified across studies.

Statistical analysis

The primary outcome will be compared using the absolute difference in the uptake rate between the randomized groups.

If there are sufficient data, a meta-analysis will be conducted to address Objective 2 to provide quantitative analysis for the overall intervention effectiveness. The heterogeneity between studies will be firstly assessed by visual inspection of forest plots. Then a formal statistical test of heterogeneity by

using the chi-square test and the I^2 statistic will be used. The I^2 statistic implies the proportion of variation between studies not due to chance, varying from 0% to 100%.

The random-effect model which assumes the effect size could vary between studies will be used to estimate the pooled difference in the uptake rate across studies. In the case of multiple interventions within a trial, the groups will be combined to create a single pairwise comparison [31-33].

Discussion

Although there are existing systematic reviews on the use of intervention to increase general health check uptake [12, 13], no systematic review has been conducted using BCTTv1 to analyze existing intervention. This suggests that the BCTTv1 can be utilized in a systematic review to provide evidence to guide intervention development for improving general health check service utilization. This review may contribute additional information on the effectiveness of existing interventions. This is achieved by conducting a meta-analysis and by analyzing their intervention components in more detail. By knowing how the interventions were designed and implemented (Objective 3 and Objective 4), we have the evidence to support what intervention works and which ones to avoid.

Abbreviations

BCW	Behaviour Change Wheel
BCT	Behaviour Change Technqiues
BCTTv1	Behaviour Change Taxonomy

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Competing interests

Authors' contributions

WY wrote the protocol and developed the search strategy. JL and MY provided guidance throughout and critically reviewed the manuscript. All authors agreed on the final manuscript.

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