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# **BMJ Open**

# Identifying the barriers and facilitators of community indoor walking programs: protocol for a realist synthesis

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nue.	Identifying the barriers and facilitators of community indoor walking program protocol for a realist synthesis
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Astra Zeneca Cardiovascular Health Promotion and Disease Prevention Chair awarded to Dr. Hude Quan

# Keyboards:

Realist Review; Realist Synthesis; Health Promotion; Risk Reduction; Walking Program; Community Engagement; Community Walking; Indoor Walking; Mall Walking; Group Walking; Physical Activity; Sedentary Lifestyle

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### Abstract

 **Introduction:** Physical inactivity is a costly and leading health risk factor. Engaging in moderate level or more intense regular physical activity reduces premature mortality at the population level. Walking is a viable option of achieving the recommended level of physical activity. Yet, the sedentary lifestyle is trending. Determinants of physical activity may be both behavioral and contextual. Health promotion endeavors aiming to enhance population-level physical activity are reported in the literature. However, a full range of factors influencing community engagement in physical activity is unclear. The current review protocol is aimed to describe a process of realist synthesis that may uncover contexts, mechanisms, and outcomes of indoor walking intervention programs.

Methods and Analysis: We will employ a realist synthesis to determine what works (or not) in certain circumstances for specific populations, which will aid in developing a mall walking health promotion and community engagement program. We plan to conduct a systematic search for both academic as well as grey literature sources. Qualitative, quantitative, and mixed-method articles and reports will be screened for social intervention theories and models in order to identify elements of the programs that may be linked with the success or failure of the interventions. Data related to the context, mechanism, and outcome of the interventions will be collected, analyzed, and synthesized iteratively until a theoretical understanding develops explaining the intricacies of the success and failure of identified indoor walking programs. The review process will be conducted and evaluated by utilizing the recommended tools. Ethics and Dissemination: The process of the realist synthesis will be reported transparently for critics, researchers, and implementation specialists. The resulting

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knowledge will be disseminated to the community through the program website, social media, and radio and will be communicated with stakeholders to develop and implement a community engagement mall walking program.

Strengths and limitations of this study:

- The research questions are the guiding tools to initiate the realist synthesis and are subject to modification as new knowledge emerges in the review process.
- This protocol lacks a step-by-step review procedure because the realist synthesis is inherently an iterative and interactive process and it is not practical to outline the review process precisely and in advance, yet it establishes the transparency of its process.
- In addition to reporting the outcomes, the realist synthesis is designed to explore contexts and mechanisms to review the success and failures of the programs.

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# Background

Physical inactivity is a foremost risk factor of chronic illnesses (such as vascular diseases and cancer)[1] and mortality[2], which costs an estimated INT\$53.8 billion globally in 2013 [3]. Engaging in regular moderate physical activity (such as a 20 minute daily brisk walking) can reduce 16-30% risk of premature mortality at population level [4]. In order to reap the health benefits of being active, the Canadian Society for Exercise Physiology recommended adults to engage in at least 150 minutes of weekly aggregated physical activity performed in a minimum of 10 minutes sessions with a moderate intensity or more, which can be defined as an intensity of more than three times than rest such as brisk walking or jogging [5, 6].

Walking requires no specific skills or equipment and can be an accessible way of engaging in physical activity for its health benefits[7]. Walking a daily average of approximately 7,500 steps or more was associated with significantly reduced mortality risk for older women (Mean age 72 years; Hazard Ratio .33; P<.01; 95% CI)[8]. In harsh weather conditions, like winter in Canada, indoor walking is a much more attractive option for physical activity. Farren et al.[9] found that people engage in indoor physical activities such as mall walking programs for their indoor climate-controlled, safe, and comfortable environments. In a literature review, Hanson and Jones[10] located 42 studies reporting walking programs from 14 countries with most conducted in the USA (n=15) and attended by 19 and older individuals (n=1843) that yielded improved health outcomes with no adverse effects of attending.

However, a sedentary lifestyle is trending globally[11] despite its established links with health risks[1, 5], its public awareness[12], and accessibility of low-cost physical

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activity such as walking. People tend to overestimate their activity levels evidenced by the discrepancies found in self-reported levels of physical activity and that of monitored objectively with accelerometry[13]. Nearly half Canadian adult responders of a community health survey claimed to engage in recommended physical activity[14], yet in a comparable study, it was confirmed for merely 17.6% adults and 8.2% children and youth are currently meeting[15] the national guideline-recommended minimum levels of physical activity.

Physical activity may be determined by the individual, the context, or both[16]. A majority of the respondents of a Canadian survey (67%; *n* = 2519) attributed physical inactivity to both individual and public health responsibility[12]. Community walking programs may enhance physical activity at the population level[17]. However, Foster et al., 2011[18] noted that walking programs tend to attract predominantly middle-aged, white, and women. A poor understanding of the health benefit of walking program[18]. These findings are important and suggesting that majority of existing community indoor walking programs are disproportionally reaching sociodemographic sub-groups, likely due to the lack of consideration of population-level implementation factors. We aim to design and implement an effective walking program that is accessible to a wide population. However, we are unaware of a full range of barriers and facilitators of indoor community walking programs, which warrants an updated review of current literature.

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A systematic search and screening[19] of the existing literature of indoor community walking programs and its realist synthesis[20] may offer an opportunity to expose the links between contexts and processes of the programs while highlighting its barriers and facilitators. The objective of our realist synthesis is to determine the barrier and facilitators of indoor community walking programs. We plan to utilize resulting knowledge in designing indoor community walking programs by addressing potential barriers and enhancing the anticipated facilitators.

**Search Method** 

The initial review questions were:

1. How well realist evaluation components are used to report indoor community walking programs?

2. What are the barriers and facilitators of indoor community walking programs?

3. What characteristics of indoor community walking programs make it both successful and unsuccessful in enhancing physical activity?

4. For whom do indoor community walking programs work (or not), at what extent, and in what ways?

5. What are the processes and mechanisms of successful indoor community walking programs, and in what way they are meaningful for future initiatives?

In order to select search terms, the review questions were divided into two categories[19]: (i) community walking programs (ii) barrier or facilitators. Table 1 contains a detailed list of the two categories of search terms. A community walking program is defined as an organized group walking health promotion initiative available for all people at minimal cost to the participants. We will include all indoor community walking programs open for all people to attend and designed to increase physical activity for public health promotion and that offer insights into the barriers or facilitators of joining, sustaining, conducting, or maintaining the programs. We will exclude non-

English articles and the walking programs that were (i) designed for people with specific illnesses or health conditions (ii) aimed at rehabilitation, (ii) conducted as the one-time or an occasional walking events, (iii) including adjutant activities with walking such as breathing activities, Yoga, or Tai Chi.

The search sources will include academic databases and grey literature with no restriction to a timeframe. Table 2 consists of the list of both the sources. Specialized databases will be searched to identify relevant articles based on predetermined search terms presented in Table 1. Grey literature is especially important for the review because the government and non-government organizations develop, modify, and utilize community walking programs may not necessarily publish their reports in specific databases. Snowballing (citation tracking) and purposive sampling (to find answers of specific questions) strategies will be used to search relevant program theories (set of assumptions an intervention describing its features) in the grey literature. A backward and forward reference list of identified articles will be searched.

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# Identification and Screening Process of the Studies

The identified articles through the comprehensive search will be collected in a bibliography database, and the duplicates will be removed by comparing identical articles based on embedded metadata of the items as well as by manual selection. The inclusion and exclusion criteria are described in Table 3.

The collected articles will be further selected for review based on the inclusion and exclusion criteria. The selection procedure will consist of two related steps: (i) identification by title and abstract screening and (ii) full text for screening. The titles and abstracts reveal key information about a research article to identify its relevancy for the

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review. Articles will be selected based on titles and abstracts, and a selection consensus will be made between at least two reviewers. In the case of a disagreement between the reviewers, similar to Brown et al. [21], a third reviewer will resolve any discrepancies. Articles will be excluded upon the agreement of at least two of the reviewers. The article identification and screening process are based on PRISMA flow diagram[22], which is illustrated in Figure 1.

Reviewers will read and tabulate data from the finally selected articles in Table 4. Data will be extracted related to the study characteristics (year of publication, country) as well as the barriers and facilitators of the walking programs. A multitude of qualitative methods can be used to explore the processes and experiences of an intervention, such as mall walking. The reviewers will extract the information related to methods used in the articles, the number of participants and their gender, recruitment strategies used and its frequency and duration, type of walking group (e.g., mall or school) and its duration, transportation provided or arranged by the participants, other incentives offered, and use of technology such as mobile app or accelerometers. The reviewers will read and infer barriers and facilitators of the walking programs. Each reviewer will identify and list all the barriers and facilitators of attending, sustaining, conducting, or maintaining the walking programs. A consensus will be made among at least two of the reviewers in order to keep the inferences for the realist synthesis. The data will be recorded and saved in Microsoft Excel<sup>®</sup> sheet.

# **Quality Assessment**

All the included studies will be scrutinized for quality assessment. The quality of quantitative studies will be assessed utilizing strategies similar to Brown et al.[21]. The

first two authors will assess the quality of the intervention programs using Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies - a recommended tool to assess content and construct validity of the studies. The quality assessment tool will be used to rate quantitative studies by rating weak, moderate, or strong on six aspects: design, blinding, bias, cofounders, methods of data collection, and dropouts and withdrawals. The aggregate assessment will be taken into account while reporting the quality of the selected studies. The results will be reported using Table 5.

The reviewers will assess the qualitative studies by the rigor and relevance of the included articles[20]. The Cochrane Qualitative and Implementation Methods Group (CQIMG)[23] recommended the reviewers' transparency in reporting the shared decision-making process of the quality assessment. We will assess and report the quality of the synthesized qualitative studies using Table 6, which is based on CASP®( Critical Appraisal Skills Programme)[24]. CASP® is the most frequently used tool to synthesize qualitative evidence in the World Health Organization and Cochrane guideline[23]. We will use the CASP® as a guiding tool to assess and not as a scoring checklist because the score-based consensus is impractical while synthesizing qualitative research as the included articles may consist a variety of methods with incomparable theoretical and philosophical frameworks[23]. Instead of the cut-off points, the CQIMG [23] recommended two or more reviewers to develop an understanding of the strengths and limitations of the included studies using guidelines such as the CASP®.

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# **Realist synthesis**

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Health promotion community interventions uniquely interplay with a context, which may not invoke similar dynamics when replicated in a different community and at another place and time. Therefore, synthesis of such knowledge requires a perspective to appreciate the contextuality of an intervention that can respond to the question of "What works for whom under what circumstances, how and why?" [20] We plan to utilize realist synthesis suggested by Pawson et al. [20] for the review, which will be appraised based on RAMESES standards [25].

Pawson et al.[20] proposed that rather than being a method, the realist synthesis offers a "logic of inquiry" to explore a phenomenon of interest. The review process includes hypothesizing and testing the mechanics (M), context (C), and the outcomes (O) of the social interventions[20]. Realist synthesis examines the successes and failures of the interventions as well as to inquire about the processes and their respective contexts, including the salient features of the programs and the social reality surrounding it. Realist synthesis utilizes all methods of inquiry, such as qualitative, quantitative, or mixed methods.

The search process, identification, screening, and analysis are parallel and iterative processes in the logic of realist synthesis[20]. The review process begins with a background literature search and identification of existing program theories, which exposes its features such as administrative ideologies, places, environments. The initial research questions are subject to modification as the new knowledge uncovers about the phenomenon in the literature. Snowballing and purposive sampling will aid finding answers of the analytic questions emerged from the ongoing review of the identified program theories, which further mobilizes the synthesis process in order to resolve

unanswered questions. Components of the program theories will be searched, identified, and tested through the literature search, which may modify the research question, data analysis, and synthesis, making it an interactive and iterative process.

Pawson et al.[20] argued that realist synthesis is "refining theory," which is achieved through parallel processes of data collection and analysis. Data will be extracted by tracking the components of the program theories and analysis will be carried out by constant comparing between what works in what circumstances and what are the conditions it did not work[20]. Reviewers will strive to locate the program ideologies and frameworks and implementation processes, including evolution in the intervention strategies. With the beginning understanding of a program intervention, the reviewers will raise questions and find their answers in the empirical literature to develop a better understanding of what works in what circumstances. BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool .

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# Discussion

This article is an account of our reflection on the process of a realist synthesis that we plan to undertake in order to understand what works (or not) for an indoor walking program and what are the challenges, for whom, and in what circumstances. We hope the resulting realist synthesis of literature will provide a comprehensive understanding of the potential barriers and facilitators exist in literature. This knowledge will be shared with local community liaisons and stakeholder consultations, which will be instrumental in planning and implementing a walking program for health promotion and disease risk reduction.

The outcome of this review is expected to be a better understanding of what elements of indoor walking programs were successfully adopted by whom and in which

circumstances. The resulting knowledge will help the reviewers to design an indoor community walking program by selecting the potentially appropriate setting and intervention components that will be deemed to have an optimum positive influence on population-wide participation and behavior change.

The traditional models of analysis and synthesis of intervention programs primarily rely on clinical trials and, which are aimed to understand the causal relationship of an event on an outcome. However, such reviews tend to omit contextual knowledge about the intervention because clinical trials focus on outcomes and strive to control extraneous variables that can not be removed in real-life interventions. Realist synthesis, on the other hand, facilitates to explore the underlying mechanisms of complex intervention programs by taking its context and outcomes into account [20, 26].

The planned realist synthesis will be a critical step in the process of reducing the prevalence of physical inactivity at the population level. The review is expected to reveal components of an indoor walking program that may be suitable for various groups of individuals, which will help develop an accessible and sustainable indoor walking program in the shopping malls consisting variations of a combination of its components based on "what works for whom in what circumstances." The realist synthesis is aimed at moving research evidence to practice, which is essentially a knowledge translation endeavor. The review will help develop the walking program, which will be appraised by a realist evaluation in order to refine the program further and it might be a stepping-stone for an ongoing knowledge translation development process aiming to reduce population physical inactivity.

# Limitations

The iterative realist synthesis may not provide definitive answers to the research questions[20]. The realist synthesis is not designed to report the success of the intervention programs based on outcomes only. Instead, it will review the processes and its contexts and outcomes, which will be instrumental in building an informed framework of intervention.

Another limitation of this protocol is the absence of a step-by-step review procedure. The realist synthesis is inherently open-ended and subject to take turns and twists as the synthesis matures, so it is not feasible to delineate the review process precisely and in advance. Instead, this protocol is a guiding tool to initiate the process, to keep the aim of the synthesis into focus as the review progresses, and to establish transparency of the review and synthesis process.

# Dissemination

The barriers and facilitators uncovered from the study will inform the development of a community indoor walking health promotion program. The findings of the study will be shared with the academic community through the peer-reviewed publication, conferences, and formal and informal meets. We will disseminate the findings to the community through the program website, social media, and conventional media such as radio and use it to communicate with stakeholders while developing the indoor walking program.

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# Table 1. A detailed list of search terms

# Keywords of Indoor Community walking programs:

(walk\* adj2 (interven\* or program\* or promo\* or initiat\* or group\* or communit\* or indoor or mall or campaign\* or impact\* or project\* or servic\* or pattern\*)).tw,kf.

# Keywords for barriers and facilitators:

barrier\*; challeng\*; hurdle\*, Obstacl\*, Obstruct\*, Concern\*, issue\* problem\*, impediment\*, hinder\*, alleviat\*, enable\*, opportunit\*, facilitat\*; promot\*,

2 3 4

# Table 2. List of searched databases

5								
7 8 9 10 11 12 13 14 15 16 17 18	Academic databases: MEDLINE (Ovid) EMBASE Scopus CINAHL SocINDEX PsycINFO Health Source: Nursing/Academic Edition Web of Science Urban Studies Abstracts SPORTDiscus	Grey literature: Google Google Scholar ProQuest (theses & dissertations) Canadian Institute for Health Information Public Health Agency of Canada (PHAC) Health Canada National Institutes of Health (NIH)						
20   21   22   23   24   25   26   27   28   29   30   31   32   33   34   35   36   37   38   39   40   41   42   43   44   45   46   47   48   49   50   51   52   53   54   55   56   57   58		18						
59 60	For peer review only - http://bmjope	n.bmj.com/site/about/guidelines.xhtml						

# Table 3. Inclusion and exclusion criteria for searched articles

# Inclusion criteria (must meet all):

- 1. An organized indoor walking program
- 2. Open for all people to attend
- 3. Targeted to increase physical activity for health promotion
- 4. Indicated at least one barrier or facilitator to attend, sustain, conduct, or maintain the walking program

# Exclusion criteria (at least met one):

- 1. The one-time or an occasional walking event
- 2. Designed for people with specific illnesses or health conditions
- 3. Aimed at rehabilitation
- 4. including adjutant activities with walking such as breathing activities, Yoga, or Tai Chi
- 5. Non-English Articles

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# **BMJ Open**

# Identifying the Facilitators, Constraints, and Barriers of Community Indoor Walking Programs: Protocol for a Realist Synthesis

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# Title:

Identifying the facilitators, constraints, and barriers of community indoor walking programs: protocol for a realist synthesis

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# Abstract

#### Introduction

Physical inactivity is a costly and leading health risk factor. Engaging in moderate or more intense regular physical activity reduces premature mortality at the population level. Walking is a viable option for achieving the recommended level of physical activity. Yet, the sedentary lifestyle is trending. Determinants of physical activity may be both personal or social. Health promotion endeavours aiming to enhance populationlevel physical activity are reported in the literature. However, a full range of factors influencing the development and implementation of sustainable indoor walking programs is unclear. The current review protocol is aimed at describing a process of realist synthesis to uncover contexts, mechanisms, and outcomes of indoor walking intervention programs, which might reveal facilitators, constraints, and barriers of building, implementing, and participating in indoor walking initiatives.

# **Methods and Analysis**

We will employ a realist synthesis to determine what works (or not) in certain circumstances for specific stakeholders, which will aid in developing a sustainable mall walking health promotion and community engagement program. Qualitative, quantitative, and mixed-method articles and reports will be screened for intervention theories and models in order to identify elements of programs that may be linked to the success or failure of the interventions. Data related to the context, mechanism, and outcome of the interventions will be collected, analyzed, and synthesized iteratively until a theoretical understanding develops, which might explain the intricacies of the success

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and failure of identified indoor walking programs. The review process will be conducted and evaluated by utilizing the recommended tools.

# **Ethics and Dissemination**

Ethical approval was not required for the study because no direct interaction with patients will occur for data collection and analysis. We will disseminate directly to the scholarly community through publication and presentation, and may post on social media, blogs, or websites.

# Strengths and Limitations of the Study

- In addition to reporting the outcomes, the realist synthesis is designed to explore contexts and mechanisms to review the success and failures of the programs.
- The exclusion of non-English literature and programs designed for a population with specific illnesses, disabilities, or health conditions may cause missing relevant facilitators, constraints, and barriers of community indoor walking programs.
- The initial program theory may introduce selection bias, however, a wide range of expertise of our transdisciplinary team might be helpful in developing an inclusive initial program theory.
- The research questions are the guiding tools to initiate the realist synthesis and are subject to modification as new knowledge emerges in the review process.
- This protocol lacks a step-by-step review procedure because the realist synthesis is inherently an iterative and interactive process and making it impractical to outline the review process precisely and in advance, yet it establishes the transparency of its process.

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# Identifying the Facilitators, Constraints, and Barriers of Community Indoor Walking Programs: Protocol for a Realist Synthesis

# Background

Physical inactivity is a foremost risk factor of chronic illnesses (such as vascular diseases and cancer)[1] and mortality[2], which costs an estimated 2013 Int'l \$53.8 billion globally [3]. Engaging in regular moderate physical activity (such as a 20-minute daily brisk walking) can reduce the risk of premature mortality by 16-30% at the population level [4]. However, a sedentary lifestyle is trending globally[5] despite its established links with health risks[1, 6], public awareness[7], and accessibility of low-cost physical activity such as walking.

Physical activity may be determined by personal (e.g., awareness, perception, health status) or social factors (e.g., context, accessibility, services) [7–11]. A majority of respondents in a Canadian survey (67%; n = 2519) attributed physical inactivity to both personal and public health responsibility[7]. Community walking programs may enhance physical activity at the population level[12]. Walking requires no specific skills or equipment and can be an accessible way of engaging in physical activity for its health benefits[13]. In a literature review, Hanson and Jones[14] located 42 studies reporting outdoor walking programs from 14 countries with most conducted in the USA (n=15) and attended by 19 and older individuals (n=1843) that yielded improved health outcomes with no adverse effects of attending. Walking has shown population-level physical and mental health benefits [15–18].

Farren et al.[19] found that people engage in indoor physical activities such as mall walking programs for their indoor climate-controlled, safe, and comfortable

environments. In places like Canada, where harsh winter weather conditions can limit outdoor activities, low or no-cost indoor walking programs at publicly accessible spaces can be a feasible option to increase physical activity among people of the populationlevel. Local stakeholders' engagement in program development and implementation, such as involving mall-managers and members of catchment communities, may enhance the adoption of indoor walking initiatives. We aim to develop a model that may help local communities to build and implement sustainable indoor walking programs. However, we are unaware of facilitators, constraints, and barriers of indoor community walking programs, which warrants an updated review of current literature.

A systematic search and screening[20] of the existing literature of indoor community walking programs and its realist synthesis[21] may offer an opportunity to expose the links between contexts and processes of the program development, implementation, and evaluation. We plan to utilize the knowledge created from this proposed study to engage various community stakeholders for designing indoor community walking programs by enhancing facilitators, negotiating constraints, and addressing potential barriers. BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool .

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#### Method

The initial review questions are:

1. How well realist evaluation components are used, if any, to report indoor community walking programs?

2. What are the facilitators, constraints, and barriers of indoor community walking programs for participants as well as organizers and service providers?

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3. What characteristics of indoor community walking programs make it both successful and unsuccessful in enhancing physical activity?

4. For whom do indoor community walking programs work (or not), to what extent, and in what ways?

5. What are the processes of program development and promotion as well as mechanisms of successful implementation and adoption of indoor community walking, and in what way are they meaningful for future initiatives?

In order to select search terms, the review questions were divided into two categories[20]: (i) community programs (ii) indoor walking. Figure 1 contains a detailed list of the two categories of search terms. A community walking program is defined as an organized walking group available for all people at minimal or no cost to the participants. We will include indoor community walking group programs open for all people to attend, which are designed to increase the physical activity of members of the general public, and that may offer insights into the facilitators, constraints, or barriers of joining, sustaining, conducting, or maintaining the programs. A group program must contain two or more regular members walking at a relatively consistent frequency, time, and location. We will exclude non-English articles and walking programs that were (i) designed for people with specific illnesses or health conditions such as aimed at rehabilitation, (ii) conducted as a one-time or an occasional walking event, (iii) combined with other structured physical activities such as breathing patterns, Yoga, or Tai Chi. However, non-physical activities, such as information sessions or interventions related to diet and nutrition, will not be excluded.

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The search sources will include academic databases and grey literature with no restriction to a timeframe. Table 1 consists of a list of both sources. Specialized databases will be searched to identify relevant articles based on predetermined search terms presented in Figure 1. Grey literature is especially important for the review because the government and non-government organizations who develop, modify, and utilize community walking programs may not necessarily publish their reports in specific databases. Snowballing (citation tracking) and purposive sampling (to find answers to specific questions) strategies will be used to search relevant program theories (set of assumptions that highlight features of intervention) in the grey literature. A backward and forward reference list of identified articles will be searched.

### **Patient and Public Involvement**

No patient involved in this study.

#### Identification and Screening Process of the Studies

The identified articles through the comprehensive search will be collected in a bibliography database, and the duplicates will be removed by comparing identical articles based on embedded metadata of the items as well as manual selection. The inclusion and exclusion criteria are described in Table 2.

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The collected articles will be further selected for review based on the inclusion and exclusion criteria. The selection procedure will consist of two related steps: (i) identification by title and abstract screening and (ii) full text for screening. The titles and abstracts reveal key information about a research article to identify its relevance for the review. Articles will be selected based on titles and abstracts, and a selection consensus will be made between at least two reviewers. In the case of a disagreement
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between the reviewers, similar to Brown et al. [22], a third reviewer will resolve any discrepancies. Articles will be excluded upon the agreement of at least two of the reviewers. Both the article identification and screening process are based on the PRISMA flow diagram[23], which is illustrated in Figure 2.

Reviewers will read and tabulate data from the finally selected articles in Table 3. Data will be extracted related to the study characteristics (year of publication, country) as well as the facilitators, constraints, and barriers of the indoor walking programs. A multitude of qualitative methods can be used to explore the program development processes and experiences of an intervention, such as mall walking. The reviewers will extract the information related to methods used in the articles, the number of participants and their gender, recruitment strategies used (frequency and duration), and the type of walking group (e.g., mall or school) and its duration, and other qualitative aspects such as transportation provided or arranged by the participants, incentives offered, and use of technology such as mobile app or accelerometers. Each reviewer will identify and list all the facilitators, constraints, and barriers of attending, sustaining, conducting, or maintaining the walking programs. A consensus will be made among at least two of the reviewers in order to keep the inferences for the realist synthesis. The data will be recorded and saved in a Microsoft Excel<sup>®</sup> sheet.

#### **Quality Assessment**

All the included studies will be scrutinized for quality assessment. The quality of quantitative studies will be assessed utilizing strategies similar to Brown et al.[22]. The first two authors will evaluate the quality of the intervention programs using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies - a

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recommended tool to assess the content and construct validity of the studies. The quality assessment tool will be used to rate quantitative studies by a rating of weak, moderate, or strong on six aspects: design, blinding, bias, cofounders, methods of data collection, and dropouts and withdrawals. The aggregate assessment will be taken into account while reporting the quality of the selected studies. The results will be reported using Table 4.

The reviewers will assess the qualitative studies by the rigour and relevance of the included articles, which will be appraised based on RAMESES standards[21, 24] The Cochrane Qualitative and Implementation Methods Group (CQIMG)[25] recommended the reviewers' transparency in reporting the shared decision-making process of the quality assessment. We will assess and report the quality of the synthesized qualitative studies using Table 5, which is based on CASP®( Critical Appraisal Skills Programme)[26]. CASP® is the most frequently used tool to synthesize qualitative evidence in the World Health Organization and Cochrane guidelines [25]. We will use the CASP® as a guiding tool to assess and not as a scoring checklist because the score-based consensus is impractical while synthesizing qualitative research. In doing so, the included articles may consist of a variety of methods with incomparable theoretical and philosophical frameworks[25]. Instead of the cut-off points, the CQIMG [25] recommended two or more reviewers to develop an understanding of the strengths and limitations of the included studies using guidelines such as the CASP®.

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# **Realist Synthesis**

Health promotion community interventions uniquely interplay with a context, which may not invoke similar dynamics when replicated in a different community and at

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another place and time. Therefore, synthesis of such knowledge requires a perspective to appreciate the contextuality of an intervention that can respond to the question of "What works for whom under what circumstances, how and why?"[21] We plan to utilize realist synthesis suggested by Pawson et al.[21] for the review.

Pawson et al.[21] proposed that rather than being a method, the realist synthesis offers a "logic of inquiry" to explore a phenomenon of interest. The review process includes hypothesizing and testing the mechanics (M), context (C), and the outcomes (O) of the social interventions[21]. Realist synthesis examines the successes and failures of the interventions as well as inquiring about the processes and their respective contexts, including the salient features of the programs and the social reality surrounding it. Realist synthesis utilizes all methods of inquiry, such as qualitative, quantitative, or mixed methods.

The search process, identification, screening, and analysis are parallel and iterative processes in the logic of realist synthesis[21]. The review process begins with a background literature search and identification of existing program theories, which exposes its features such as administrative ideologies, places, environments, and social interactions. Low or no-cost publicly available health promotion (including non-rehabilitative) indoor walking programs may exist widely, but they are rarely theorized from the perspective of program development, implementation, participation, and sustainability. We conducted an environmental scan in Calgary (Alberta, Canada) and found several (un)supervised walking groups available for the members of the general public that run for years without being theorized. Currently, we are conducting a preliminary literature search to build initial program theory for publicly accessible mall

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walking programs that are unrestricted based on people's age, gender, ethnicity, diseases, or disability.

The initial program theory will inform further literature search in a focused manner based on the features of the identified indoor walking programs. Further, the primary research questions may be modified as the new knowledge uncovers about the phenomenon in the literature. Snowballing and purposive sampling will aid in finding answers to the analytic questions that may emerge from the ongoing search of the identified program theories, which may further mobilize the review and synthesize process in order to resolve unanswered questions. Components of the program theories will be searched, identified, and tested through the literature search, which may modify the research question, data analysis, and synthesis, making it an interactive and iterative process.

Pawson et al.[21] argued that realist synthesis is a "refining theory," which is achieved through parallel processes of data collection and analysis. Data will be extracted by tracking the components of the program theories and analysis will be carried out by constant comparing between what works in what circumstances and what are the conditions it did not work[21]. Reviewers will strive to locate the program ideologies and frameworks as well as implementation processes, including evolution in the intervention strategies. With a new understanding of program intervention, the reviewers will raise questions and find their answers in the empirical literature to develop a better understanding of what works (or not), and in what circumstances.

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### Discussion

This article is an account of our reflection on the process of a realist synthesis that we plan to undertake in order to understand what works (or not) for an indoor walking program and discovering the challenges, for whom, and in what circumstances. We hope the resulting realist synthesis of literature will provide a comprehensive understanding of the potential facilitators, constraints, and barriers existing in the literature. This knowledge will be shared with local community liaisons and stakeholder consultations, which will be instrumental in planning and implementing a walking program for health promotion and disease risk reduction.

The outcome of this review might yield expected to be a better understanding of what elements of indoor walking programs were successfully adopted by whom and in which circumstances. The resulting knowledge will help the reviewers to design an indoor community walking program by selecting a potentially appropriate setting and utilizing intervention components that will be deemed to have an optimum positive influence on population-wide participation and behaviour change.

The traditional models of analysis and synthesis of intervention programs primarily rely on clinical trials, which are aimed to understand the causal relationship of an event or an outcome. However, such reviews tend to omit contextual knowledge about the intervention because clinical trials focus on outcomes and strive to control extraneous variables that can not be removed in real-life interventions. Realist synthesis, on the other hand, facilitates to explore the underlying mechanisms of complex intervention programs by taking its context and outcomes into account [21, 27].

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The planned realist synthesis will be a critical step in the process of reducing the prevalence of physical inactivity at the population level. The review is expected to reveal components of an indoor walking program that may be suitable for various groups of individuals, such as mall managers and the members of the catchment community. The resulting knowledge might help them develop accessible and sustainable indoor walking programs in shopping malls by combining its components. The proposed review is aimed at synthesizing knowledge for its application into the real world by developing and implementing a community indoor walking program, which is essentially a knowledge translation endeavour as we will use research evidence into practice. The walking program will be appraised by a realist evaluation in order to refine the program further, and it might be a stepping-stone for an ongoing community engagement aiming to reduce population physical inactivity.

### Limitations

The iterative realist synthesis may not provide definitive answers to the research questions[21]. The realist synthesis is not designed to report the success of the intervention programs based on the outcomes only. Instead, it will review the contexts and mechanisms leading to the outcomes, which will be instrumental in building an informed framework of intervention.

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The initial program theory development is underway, which will further determine the search and review directions. The initial program theory will be developed based on the systematic search explained in this review, which may introduce a selection bias as we will likely to select the features of the model based on the research team's

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experiences and expertise. However, our transdisciplinary research team brings wide variety of expertise, which might aid in developing an inclusive initial program theory.

Another limitation of this protocol is the absence of a step-by-step review procedure. The realist synthesis is inherently open-ended and iterative, and subject to take turns and twists as the synthesis matures, so it is not feasible to delineate the review process precisely and in advance. Instead, this protocol is a guiding tool to initiate the process, keep the aim of the synthesis into focus as the review progresses, and to establish transparency of the review and synthesis processes.

### Ethics and Dissemination

Recruitment or direct interactions of patients or members of the general public will not take place in the proposed study. Ethical approval was not required for the study. The process of the realist synthesis will be reported transparently for critics, researchers, and implementation specialists.

The facilitators, constraints, and barriers uncovered from the study will inform the development of a community indoor walking health promotion program. The findings of the study will be shared with the academic community through peer-reviewed publications, conferences, and formal and informal meetings. We will disseminate the findings to the community through the program website, social media, and conventional media such as radio and use it to communicate with stakeholders while developing the indoor walking program.

# **Funding Statement**

This work was supported by Astra Zeneca Cardiovascular Health Promotion and Disease Prevention Chair awarded to Dr. Hude Quan.

# **Registration Details and Dates**

The study protocol was submitted to Prospero on September 13. 2019 and the registration is pending. Currently, we are conducting a preliminary literature search that will help us develop an initial program theory. We anticipate completing the study by June 2020.

### Contributors

SS, TCT, LY, SB, and HQ conceptualized the work and critiqued the study protocol. SS and TCT designed the protocol and drafted the initial version of the manuscript, as well as developed data extraction and appraisal strategy and the tables. The study problem, objectives, and the search terms were defined in team meetings where SS, TCT, LY, SB, and HQ directly contributed. Similarly, the whole team defined and refined the inclusion and exclusion criteria and contributed to the manuscript with critical revisions of the initial draft.

### Patient consent for publication

Not required

# **Competing Interest Statement**

No competing interest to declare.

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51 52		Activity 2012;5(1):66–75.
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# Table 1. List of Searched Databases

Academic databases:	Grey literature:
MEDLINE (Ovid)	Google
EMBASE (Ovid)	Google Scholar
PSycINFU	ProQuest (theses & dissertations)
Web of Science	Public Health Agency of Canada (PHAC)
CINAHL	Health Canada
SocINDEX	National Institutes of Health (NIH)
Urban Studies Abstracts	Canadian Electronic Library
SPORTDiscus	

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6	Table 2. Inclusion and Exclusion Criteria for Searched Articles
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0	Inclusion criteria (must meet all):
0	
9	1. A walking program organized in an indoor public
10	space
11	2 Indicated at least one barrier facilitator constraint to
12	attend sustain conduct or maintain the walking
13	
14	program
15	3. Open for the members of the general public
16	4. Any study design
17	
18	
10	Exclusion criteria (at least meet one):
19	1. A one-time or a seasonal walking event
20	2. Designed for a population with specific illnesses.
21	disabilities or health conditions
22	4. Compliand with other structured players of estivities
23	4. Combined with other structured physical activities
24	such as Yoga, Tai Chi, or breathing patterns
25	5. Non-English Articles
26	6 Non-primary research articles
27	
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Table 3.	Data Extra	cted from the	Studies Inclu	ided in the	Review		pyright, inc		
Article (First	Method	Participants (n. women.	Recruitment (strategy.	Walking g	group	Qualitative features:	Facilitato	Constraints	Barriers
author, years, country		mean (range) age)	frequency)	Frequen cy, duration	Location	e.g., transportatio n, delivery characteristi	for uses relat		
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	Table 4. F	Results of the	Quality Asses	sment Tool			1jopen-2019-03434 pyright, including		
	Article (First author, years, country	Intervention	Study design	Bias	Confounders	Blinding	Data Duly 2020. Dow methods related to text	Drop- out/ Withdra wal	Ra
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 • Legend

 Figure 1. Systematic Search Strategy. The figure illustrates a systematic strategy to search record and in literature sontaining organized indoor community walking group programs.

 gure 2. Identification and Screening Process of the Studies based on the PRISMA flow diagrees

 tematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria.

containing organized indoor community walking group programs. 

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Figure 1.

# Keywords for programs:

(interven\* or program\* or promo\* or initiat\* or implement\* or group\* or communit\* or indoor or campaign\* or impact\* or project\* or servic\* or pattern\*).tw,kf.

# Keywords for Indoor Walking:

(walk\* and (indoor or inside or built\* or interior\* or mall\* or hall\* or stair\* or atrium\* or atria\* or theatre\* or theater\* or seminary or building\* or facilities or facility or center\* or centre\* or institute\* or school\* or university\* or college\* or campus\* or church\* or synagogue\* or temple\* or mosque\* or gurudwara\* or gurdwara\* or place\* or area\* or office\* or workplace\* or "work place\*" or "at work" or site\* or space\* or spot\*)).tw.kf.

Figure 1. Systematic Search Strategy 



flow diagram[23]

# **BMJ Open**

# Identifying the facilitators, constraints, and barriers of community indoor walking programs: protocol for a realist synthesis

Journal:	BMJ Open
Manuscript ID	bmjopen-2019-034342.R2
Article Type:	Protocol
Date Submitted by the Author:	26-Mar-2020
Complete List of Authors:	Singh, Shaminder ; University of Calgary, Community Health Sciences, Cumming School of Medicine Yang, Lin; Alberta Health Services, Cancer Epidemiology and Prevention Research; University of Calgary, Department of Oncology, Cumming School of Medicine Butalia, Sonia; University of Calgary, Community Health Sciences and Department of Medicine, Cumming School of Medicine Quan, Hude; University of Calgary, Community Health Sciences, Cumming School of Medicine Turin, Tanvir; University of Calgary, Department of Family Medicine and Community Health Sciences, Cumming School of Medicine
<b>Primary Subject Heading</b> :	Public health
Secondary Subject Heading:	Health services research, Nursing, Research methods
Keywords:	Realist Review, Realist synthesis, PUBLIC HEALTH, Health Promotion, Walking, Risk management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT
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# Title:

# Identifying the facilitators, constraints, and barriers of community indoor walking programs: protocol for a realist synthesis

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# Keywords:

Realist Review; Realist Synthesis; Health Promotion; Risk Reduction; Walking Program; Community Engagement; Community Walking; Indoor Walking; Mall Walking; Group Walking; Physical Activity; Sedentary Lifestyle

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# Abstract

#### Introduction

Physical inactivity is a costly and leading health risk factor. Engaging in moderate or more intense regular physical activity reduces premature mortality at the population level. Walking is a viable option for achieving the recommended level of physical activity. Yet, the sedentary lifestyle is trending. Determinants of physical activity may be personal, social, or environmental. Health promotion endeavours aiming to enhance population-level physical activity are reported in the literature. However, a full range of factors influencing the development and implementation of sustainable indoor walking programs is unclear. The current review protocol is aimed at describing a process of realist synthesis to uncover contexts, mechanisms, and outcomes of indoor walking intervention programs, which might reveal facilitators, constraints, and barriers of planning, implementing, and participating in indoor walking initiatives open for the members of the general public.

#### Methods and Analysis

We will employ a realist synthesis to determine successes or failures in certain circumstances for specific stakeholders, which will aid in developing a sustainable mall walking health promotion and community engagement program. Qualitative, quantitative, and mixed-method articles and reports will be screened for intervention theories and models in order to identify elements of programs that may be linked to the success or failure of the interventions. Data related to the context, mechanism, and outcome of the interventions will be collected, analyzed, and synthesized iteratively until a theoretical understanding develops, which might explain the intricacies of the success

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and failure of identified indoor walking programs. The review process will be conducted and evaluated by utilizing the recommended tools.

# **Ethics and Dissemination**

Ethical approval was not required for the study because no direct interaction with patients will occur for data collection and analysis. We will disseminate directly to the scholarly community through publication and presentation, and may post on social media or websites.

# **Study Strengths**

- In addition to reporting the outcomes, the realist synthesis is designed to explore contexts and mechanisms to review the success and failures of the programs.
- The initial program theory may introduce selection bias, however, a wide range of expertise of our transdisciplinary team might be helpful in developing an inclusive initial program theory.

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 The research questions are the guiding tools to initiate the realist synthesis and are subject to modification as new knowledge emerges in the review process. The explorative and iterative approach of the discovery might reveal relevant components of indoor programs and what drives the successes and failures for various stakeholders.

# **Study Limitations**

• This protocol lacks a step-by-step review procedure because the realist synthesis is inherently an iterative and interactive process and making it impractical to outline the review process precisely and in advance, yet it establishes the transparency of its process.

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The proposed study will exclude non-English literature and programs designed • solely for rehabilitation or treatment of specific health conditions or diseases. Language, rehabilitation, treatment-based exclusions might omit components of community indoor walking programs from the review that may be relevant for the members of general public.

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# Identifying the Facilitators, Constraints, and Barriers of Community Indoor Walking Programs: Protocol for a Realist Synthesis

# Background

Physical inactivity is a foremost risk factor of chronic illnesses (such as vascular diseases and cancer)[1] and mortality[2], which costs an estimated 2013 Int'l \$53.8 billion globally [3]. Engaging in regular moderate physical activity (such as a 20-minute daily brisk walking) can reduce the risk of premature mortality by 16-30% at the population level [4]. However, a sedentary lifestyle is trending globally[5] despite its established links with health risks[1, 6], public awareness[7], and accessibility of low-cost physical activity such as walking.

Physical activity may be determined by any combinations of personal (e.g., awareness, perception, health status), social (e.g., context, accessibility, services), or environmental (safety, connectivity, destination proximity) [7–13]. A majority of respondents in a Canadian survey (67%; n = 2519) attributed physical inactivity to both personal and public health responsibility[7]. Community walking programs may enhance physical activity at the population level[14]. Walking requires no specific skills or equipment and can be an accessible way of engaging in physical activity for its health benefits[15]. In a literature review, Hanson and Jones[16] located 42 studies reporting outdoor walking programs from 14 countries with most conducted in the USA (n=15) and attended by 19 and older individuals (n=1843) that yielded improved health outcomes with no adverse effects of attending. Walking has shown population-level physical and mental health benefits including reduction of depressive symptoms, cardiovascular risk factors, and all-cause mortality [17–20].

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Farren et al.[21] found that people engage in indoor physical activities such as mall walking programs for their indoor climate-controlled, safe, and comfortable environments. In places like Canada, where harsh winter weather conditions can limit outdoor activities, low or no-cost indoor walking programs at publicly accessible spaces can be a feasible option to increase physical activity among people at the populationlevel. Local stakeholders' engagement in program development and implementation, such as involving mall-managers and members of catchment communities, may enhance the adoption of indoor walking initiatives.

We aim to develop a model that may help local communities to plan and implement sustainable indoor walking programs open for the members of the general public. However, we are unaware of what enables, initiates, or maintains (facilitators) indoor community walking programs, what discourages or blocks (barriers) and what limits the scope or sustainability (constraints) of such initiations. For example, a shared interest between an indoor facility manager and the catchment community may facilitate the initiation of an indoor walking program, but potential burden of insurance liability may discourage the launch of the program posing as a barrier. The scope of an ongoing program may face constraints such as limited public transportation. A systematic search and screening[22] of the existing literature of indoor community walking programs and its realist synthesis [23] may offer an opportunity to expose the links between contexts and processes of the program development, implementation, and evaluation. We plan to utilize the knowledge created from this proposed study to engage various community stakeholders for designing indoor community walking programs by enhancing facilitators, negotiating constraints, and addressing potential barriers.

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	The initial review questions are:
	1. How well realist evaluation components are used, if any, to report indoor
comm	unity walking programs?
	2. What are the facilitators, constraints, and barriers of indoor community walking
progra	ims for participants as well as organizers and service providers?
	3. What characteristics of an indoor community walking program make it both
succe	ssful and unsuccessful in enhancing physical activity?
	4. For whom do indoor community walking programs work or not work, to what
extent	, and in what ways?
	5. What are the processes of program development, promotion, and participation
as wel	I as mechanisms of successful implementation and participation of indoor
comm	unity walking, and in what way are they meaningful for future initiatives?
	In order to select search terms, the review questions were divided into two
catego	pries[22]: (i) community programs (ii) indoor walking. Figure 1 contains a detailed
ist of t	the two categories of search terms. A community walking program is defined as
an org	anized walking group available for all people at minimal or no cost to the
partici	pants. We will include indoor community walking group programs open for all
people	e to attend, which are designed to increase the physical activity of members of the
genera	al public, and that may offer insights into the facilitators, constraints, or barriers of
joining	, sustaining, conducting, or maintaining the programs. A group program must
contai	n two or more regular members walking at a relatively consistent frequency, time,
and lo	cation. We will exclude non-English articles and walking programs that were (i)
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explicitly designed for people with specific illnesses or health conditions such as aimed at rehabilitation, (ii) conducted as a one-time or an occasional walking event, (iii) combined with other structured physical activities such as breathing patterns, Yoga, or Tai Chi. However, non-physical activities, such as information sessions or interventions related to diet and nutrition, will not be excluded.

The search sources will include academic databases and grey literature with no restriction to a timeframe. Table 1 consists of a list of both sources. Specialized databases will be searched to identify relevant articles based on predetermined search terms presented in Figure 1. Grey literature is especially important for the review because the government and non-government organizations who develop, modify, and utilize community walking programs may not necessarily publish their reports in specific databases. Snowballing (citation tracking) and purposive sampling (to find answers to specific questions) strategies will be used to search relevant program theories (set of assumptions that highlight features of intervention) in the grey literature. A backward and forward reference list of identified articles will be searched.

# Identification and Screening Process of the Studies

The identified articles through the comprehensive search will be collected in a bibliography database, and the duplicates will be removed by comparing identical articles based on embedded metadata of the items as well as manual selection. The inclusion and exclusion criteria are described in Table 2.

The collected articles will be further selected for review based on the inclusion and exclusion criteria. The selection procedure will consist of two related steps: (i) identification by title and abstract screening and (ii) full text for screening. The titles and

abstracts reveal key information about a research article to identify its relevance for the review. Articles will be selected based on titles and abstracts, and a selection consensus will be made between at least two reviewers. In the case of a disagreement between the reviewers, similar to Brown et al. [24], a third reviewer will resolve any discrepancies. Articles will be excluded upon the agreement of at least two of the reviewers. Both the article identification and screening process are based on the PRISMA flow diagram[25], which is illustrated in Figure 2.

Reviewers will read and tabulate data from the finally selected articles in Table 3. Data will be extracted related to the study characteristics (year of publication, country) as well as the facilitators, constraints, and barriers of the indoor walking programs. A multitude of qualitative methods can be used to explore the program development processes and experiences of an intervention, such as mall walking. The reviewers will extract the information related to methods used in the articles, the number of participants and their gender, recruitment strategies used (frequency and duration), and the type of walking group (e.g., mall or school) and its duration, and other qualitative aspects such as location and transportation provided or arranged by the participants, incentives offered, and use of technology such as mobile app or accelerometers. Each reviewer will identify and list all the facilitators, constraints, and barriers of attending, sustaining, conducting, or maintaining the walking programs. A consensus will be made among at least two of the reviewers in order to keep the inferences for the realist synthesis. The data will be recorded and saved in a Microsoft Excel<sup>©</sup> sheet.

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# **Quality Assessment**

All the included studies will be scrutinized for quality assessment. The quality of quantitative studies will be assessed utilizing strategies similar to Brown et al.[24]. The first two authors will evaluate the quality of the intervention programs using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies - a recommended tool to assess the content and construct validity of the studies. The quality assessment tool will be used to rate quantitative studies by a rating of weak, moderate, or strong on six aspects: design, blinding, bias, cofounders, methods of data collection, and dropouts (researchers loose contact with participations) and withdrawals (participants state a reason of the discontinuation of their partaking). The aggregate assessment will be taken into account while reporting the quality of the selected studies. The results will be reported using Table 4.

The reviewers will assess the qualitative studies by the rigour and relevance of the included articles, which will be appraised based on RAMESES standards[23, 26] The Cochrane Qualitative and Implementation Methods Group (CQIMG)[27] recommended the reviewers' transparency in reporting the shared decision-making process of the quality assessment. We will assess and report the quality of the synthesized qualitative studies using Table 5, which is based on CASP<sup>©</sup>( Critical Appraisal Skills Programme)[28]. CASP<sup>©</sup> is the most frequently used tool to synthesize qualitative evidence in the World Health Organization and Cochrane guidelines [27]. We will use the CASP<sup>©</sup> as a guiding tool to assess and not as a scoring checklist because the score-based consensus is impractical while synthesizing qualitative research. In doing so, the included articles may consist of a variety of methods with incomparable

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theoretical and philosophical frameworks[27]. Instead of the cut-off points, the CQIMG [27] recommended two or more reviewers to develop an understanding of the strengths and limitations of the included studies using guidelines such as the CASP<sup>©</sup>.

### **Realist Synthesis**

Health promotion community interventions uniquely interplay with a context, which may not invoke similar dynamics when replicated in a different community and at another place and time. Therefore, synthesis of such knowledge requires a perspective to appreciate the contextuality of an intervention that can respond to the question of "What works for whom under what circumstances, how and why?"[23]. We plan to utilize realist synthesis suggested by Pawson et al.[23] for the review. Previously, other researchers applied realist synthesis to explore physical activity promotion strategies [29, 30]

Pawson et al.[23] proposed that rather than being a method, the realist synthesis offers a "logic of inquiry" to explore a phenomenon of interest. The review process includes hypothesizing and testing the mechanics (M), context (C), and the outcomes (O) of the social interventions[23]. Realist synthesis examines the successes and failures of the interventions as well as inquiring about the processes and their respective contexts, including the salient features of the programs and the social reality surrounding it. Realist synthesis utilizes all methods of inquiry, such as qualitative, quantitative, or mixed methods.

The search process, identification, screening, and analysis are parallel and iterative processes in the logic of realist synthesis[23]. The review process begins with a background literature search and identification of existing program theories, which

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exposes its features such as administrative ideologies, places, environments, and social interactions. Low or no-cost publicly available health promotion (including non-rehabilitative) indoor walking programs may exist widely, but they are rarely theorized from the perspective of program development, implementation, participation, and sustainability. We conducted an environmental scan in Calgary (Alberta, Canada) and found several (un)supervised walking groups available for the members of the general public that run for years without being theorized. Currently, we are conducting a preliminary literature search to develop an initial program theory for publicly accessible mall walking programs that are unrestricted based on people's age, gender, ethnicity, diseases, or disability.

The initial program theory will inform further literature search in a focused manner based on the features of the identified indoor walking programs. Further, the primary research questions may be modified as the new knowledge uncovers about the phenomenon in the literature. Snowballing and purposive sampling will aid in finding answers to the analytic questions that may emerge from the ongoing search of the identified program theories, which may further mobilize the review and synthesize process in order to resolve unanswered questions. Components of the program theories will be searched, identified, and tested through the literature search, which may modify the research question, data analysis, and synthesis, making it an interactive and iterative process.

Pawson et al.[23] argued that realist synthesis is a "refining theory," which is achieved through parallel processes of data collection and analysis. Data will be extracted by tracking the components of the program theories and analysis will be

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carried out by constant comparing between what works in what circumstances and what are the conditions it did not work[23]. Reviewers will strive to locate the program ideologies and frameworks as well as implementation processes, including evolution in the intervention strategies. With a new understanding of program intervention, the reviewers will raise questions and find their answers in the empirical literature to develop a better understanding of what works (or not), and in what circumstances.

#### Discussion

This article is an account of our reflection on the process of a realist synthesis that we plan to undertake in order to understand what works (or not) for an indoor walking program and discovering the challenges, for whom, and in what circumstances. We hope the resulting realist synthesis of literature will provide a comprehensive understanding of the potential facilitators, constraints, and barriers existing in the literature. This knowledge will be shared with local community liaisons and stakeholder consultations, which will be instrumental in planning and implementing a walking program for health promotion and disease risk reduction. BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool

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The expected outcome of this review is to yield a better understanding of what elements of indoor walking programs were successfully adopted by whom and in which circumstances. The resulting knowledge will help the reviewers to design an indoor community walking program by selecting a potentially appropriate setting and utilizing intervention components that will be deemed to have an optimum positive influence on population-wide participation and behaviour change.

The traditional models of analysis and synthesis of intervention programs primarily rely on clinical trials, which are aimed to understand the causal relationship of
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an event or an outcome. However, such traditional reviews tend to omit contextual knowledge about the intervention because clinical trials focus merely on outcomes and strive to control extraneous variables that can not be removed in real-life interventions. Realist synthesis, in addition to outcomes, facilitates to explore the underlying mechanisms of complex intervention programs by taking its context into account [23, 31]. The proposed realist synthesis will likely reveal what influences health promotion efforts related to indoor walking programs in both urban and rural settings.

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The planned realist synthesis will be a critical step in the process of reducing the prevalence of physical inactivity at the population level. The review is expected to reveal components of an indoor walking program that may be suitable for various groups of individuals, such as mall managers and the members of the catchment community. The resulting knowledge might help indoor space-managers to develop accessible and sustainable indoor walking programs combining its components. The proposed review is aimed at synthesizing knowledge for its application into the real world by developing and implementing a community indoor walking program, which is essentially a knowledge translation endeavour as we will use research evidence into practice. The walking program will be appraised by a realist evaluation in order to refine the program further, and it might be a stepping-stone for an ongoing community engagement aiming to reduce population physical inactivity.

# Limitations

The iterative realist synthesis may not provide definitive answers to the research questions[23]. The realist synthesis is not designed to report the success of the intervention programs based on the outcomes only. Instead, it will review the contexts

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and mechanisms leading to the outcomes, which will be instrumental in developing an informed framework of intervention.

The initial program theory development is underway, which will further determine the search and review directions. The initial program theory will be developed based on the systematic search explained in this review, which may introduce a selection bias as we will likely select the features of the model based on the research team's experiences and expertise. However, our transdisciplinary research team brings wide variety of expertise, which might aid in developing an inclusive initial program theory.

Another limitation of this protocol is the absence of a step-by-step review procedure. The realist synthesis is inherently open-ended and iterative, and subject to take turns and twists as the synthesis matures, so it is not feasible to delineate the review process precisely and in advance. Instead, this protocol is a guiding tool to initiate the process, keep the aim of the synthesis into focus as the review progresses, and to establish transparency of the review and synthesis processes. BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool .

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### **Ethics and Dissemination**

Recruitment or direct interactions of patients or members of the general public will not take place in the proposed study. Ethical approval was not required for the study. The process of the realist synthesis will be reported transparently for critics, researchers, and implementation specialists.

The facilitators, constraints, and barriers uncovered from the study will inform the development of a community indoor walking health promotion program. The findings of the study will be shared with the academic community through peer-reviewed publications, conferences, and formal and informal meetings. We will disseminate the

findings to the community through the program website, social media, and conventional media such as radio and use it to communicate with stakeholders while developing the indoor walking program.

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### **Funding Statement**

This work was supported by Astra Zeneca Cardiovascular Health Promotion and Disease Prevention Chair awarded to Dr. Hude Quan.

# **Registration Details and Dates**

The study protocol was submitted to Prospero on September 13. 2019 and the registration is pending. Currently, we are conducting a preliminary literature search that will help us develop an initial program theory. We anticipate completing the study by June 2020.

### Contributors

SS, TCT, LY, SB, and HQ conceptualized the work and critiqued the study protocol. SS and TCT designed the protocol and drafted the initial version of the manuscript, as well as developed data extraction and appraisal strategy and the tables. The study problem, objectives, and the search terms were defined in team meetings where SS, TCT, LY, SB, and HQ directly contributed. Similarly, the whole team defined and refined the inclusion and exclusion criteria and contributed to the manuscript with critical revisions of the initial draft.

### Patient consent for publication

Not required.

# Competing Interest Statement

No competing interest to declare.

# Patient and Public Involvement

No patient involved in this study.

### **PROSPERO Registration**

Submitted for publication and edited on March 17, 2020. Currently being assessed

by the editorial team.

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# Table 1. List of Searched Databases

Academic databases:	Grey literature:
MEDLINE (Ovid)	Google
EMBASE (Ovid)	Google Scholar
PsycINFO	ProQuest (theses & dissertations)
Scopus Web of Science	Canadian Institute for Realth Information Public Health Agency of Canada (PHAC)
CINAHI	Health Canada
SocINDEX	National Institutes of Health (NIH)
Urban Studies Abstracts	Canadian Electronic Library
SPORTDiscus	·····,

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2	
3	Table 2. Inclusion and Exclusion Criteria for Searched Articles
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5	Inclusion critoria (must most all):
6	1 A welking program ergenized in an indeer public
7	T. A walking program organized in an indoor public
8	space
9	2. Indicated at least one barrier, facilitator, constraint to
10	attend, sustain, conduct, or maintain the walking
11	program
12	3. Open for the members of the general public
13	4. Any study design
14	
15	Exclusion criteria (at least meet one):
10	1 A one time or a sessanal walking event
18	2. Designed for a period with energies illustrate
19	2. Designed for a population with specific linesses,
20	disabilities, or health conditions
21	4. Combined with other structured physical activities
22	such as Yoga, Tai Chi, or breathing patterns
23	5. Non-English Articles
24	6. Non-primary research articles
25	
26	
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Table 3. [	Data Extra	cted from the	Studies Inclu	ided in the	Review		ppen-2019 rright, incl		
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author, years, country		mean (range) age)	frequency)	Frequen cy, duration ,	Location	e.g., transportatio n, delivery characteristi	on 30 July 20 Eras or uses related		
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Table 5. CASP <sup>©</sup> Qualitative Research Checklist         Questions[28]	Yes	rt, including for Cogn't Tell	No
		uses re	
1. was there a clear statement of the aims of the research?		y 202 Erasn	
2. Is a qualitative methodology appropriate?		0. Dow nushog	
3. Was the research design appropriate to address the aims of the research?		nloade eschoo	
4. Was the recruitment strategy appropriate to the aims of the research?		d from t	
5. Was the data collected in a way that addressed the research issue?		http://br	
6. Has the relationship between researcher and participants been adequately		njopen aining	
considered?		.bmj.c	
7. Have ethical issues been taken into consideration?	1	om/ on milar te	
8. Was the data analysis sufficiently rigorous?	5	June 7,	
9. Is there a clear statement of findings?		2025 a	
10. How valuable is the research?		It Depa	
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 • Legend

 Figure 1. Systematic Search Strategy. The figure illustrates a systematic strategy to search record and in literature sontaining organized indoor community walking group programs.

 gure 2. Identification and Screening Process of the Studies based on the PRISMA flow diagrees

 tematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria.

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Figure 1.

# Keywords for programs:

(interven\* or program\* or promo\* or initiat\* or implement\* or group\* or communit\* or indoor or campaign\* or impact\* or project\* or servic\* or pattern\*).tw,kf.

# Keywords for Indoor Walking:

(walk\* and (indoor or inside or built\* or interior\* or mall\* or hall\* or stair\* or atrium\* or atria\* or theatre\* or theater\* or seminary or building\* or facilities or facility or center\* or centre\* or institute\* or school\* or university\* or college\* or campus\* or church\* or synagogue\* or temple\* or mosque\* or gurudwara\* or gurdwara\* or place\* or area\* or office\* or workplace\* or "work place\*" or "at work" or site\* or space\* or spot\*)).tw.kf.

Figure 1. Systematic Search Strategy 



flow diagram[23]

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# Identifying the facilitators, constraints, and barriers of community indoor walking programs: protocol for a realist synthesis

Journal:	BMJ Open
Manuscript ID	bmjopen-2019-034342.R3
Article Type:	Protocol
Date Submitted by the Author:	21-May-2020
Complete List of Authors:	Singh, Shaminder ; University of Calgary, Community Health Sciences, Cumming School of Medicine Yang, Lin; Alberta Health Services, Cancer Epidemiology and Prevention Research; University of Calgary, Department of Oncology, Cumming School of Medicine Butalia, Sonia; University of Calgary, Community Health Sciences and Department of Medicine, Cumming School of Medicine Quan, Hude; University of Calgary, Community Health Sciences, Cumming School of Medicine Turin, Tanvir; University of Calgary, Department of Family Medicine and Community Health Sciences, Cumming School of Medicine
<b>Primary Subject Heading</b> :	Public health
Secondary Subject Heading:	Health services research, Nursing, Research methods
Keywords:	Realist Review, Realist synthesis, PUBLIC HEALTH, Health Promotion, Walking, Risk management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT
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# Title:

Identifying the facilitators, constraints, and barriers of community indoor walking programs: protocol for a realist synthesis

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# Keywords:

Realist Review; Realist Synthesis; Health Promotion; Risk Reduction; Walking Program; Community Engagement; Community Walking; Indoor Walking; Mall Walking; Group Walking; Physical Activity; Sedentary Lifestyle

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## Abstract

### Introduction

Physical inactivity is a costly and leading health risk factor. Engaging in moderate or more intense regular physical activity reduces premature mortality at the population level. Walking is a viable option for achieving the recommended level of physical activity. Yet, the sedentary lifestyle is trending. Determinants of physical activity may be personal, social, or environmental. Health promotion endeavours aiming to enhance population-level physical activity are reported in the literature. However, a full range of factors influencing the development and implementation of sustainable indoor walking programs is unclear. The current review protocol is aimed at describing a process of realist synthesis to uncover contexts, mechanisms, and outcomes of indoor walking intervention programs, which might reveal facilitators, constraints, and barriers of planning, implementing, and participating in indoor walking initiatives open for the members of the general public.

### **Methods and Analysis**

We will employ a realist synthesis to determine successes or failures in certain circumstances for specific stakeholders, which will aid in developing a sustainable mall walking health promotion and community engagement program. Qualitative, quantitative, and mixed-method articles and reports will be screened for intervention theories and models in order to identify elements of programs that may be linked to the success or failure of the interventions. Data related to the context, mechanism, and the outcome of the interventions will be collected, analyzed, and synthesized iteratively until a theoretical understanding develops, which might explain the intricacies of the success

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and failure of identified indoor walking programs. The review process will be conducted and evaluated by utilizing the recommended tools.

# Ethics and Dissemination

Ethical approval, such as Conjoint Health Research Ethics Board, was not required for this study because no direct interaction with patients will occur for data collection and analysis. We will disseminate directly to the scholarly community through publication and presentation, and may post on social media or websites.

# **Study Strengths**

- In addition to reporting the outcomes, the realist synthesis will explore contexts and mechanisms to review the success and failures of the programs.
- A wide range of expertise of our transdisciplinary team might be helpful in developing an inclusive initial program theory, thereby reducing selection bias.
- The explorative and iterative approach of the discovery might reveal relevant components of indoor programs and what drives the successes and failures for various stakeholders.

# Study Limitations

- This protocol lacks a step-by-step review procedure because the realist synthesis is inherently an iterative and interactive process.
- English language, rehabilitation, and treatment-based exclusions might omit components of community indoor walking programs from the review that may be relevant for the members of the general public.

**PROSPERO registration number**: CRD42020150415

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# Identifying the Facilitators, Constraints, and Barriers of Community Indoor Walking Programs: Protocol for a Realist Synthesis

### Background

Physical inactivity is a foremost risk factor of chronic illnesses (such as vascular diseases and cancer)[1] and mortality[2], which costs an estimated 2013 Int'I \$53.8 billion globally [3]. Engaging in regular moderate physical activity (such as a 20-minute daily brisk walking) can reduce the risk of premature mortality by 16-30% at the population level [4]. However, a sedentary lifestyle is trending globally[5] despite its established links with health risks[1, 6], public awareness[7], and accessibility of low-cost physical activity such as walking.

Physical activity may be determined by any combinations of personal (e.g., awareness, perception, health status), social (e.g., context, accessibility, services), or environmental (e.g., safety, transportation connectivity – walking, bicycling or public transit to program destinations, destination proximity) characteristics or features [7–13]. A majority of respondents in a Canadian survey (67%; n = 2519) attributed physical inactivity to both personal and public health responsibility[7]. Community walking programs may enhance physical activity at the population level[14, 15]. Walking requires no specific skills or equipment and can be an accessible way of engaging in physical activity for its health benefits[16]. In a literature review, Hanson and Jones[17] located 42 studies reporting outdoor walking programs from 14 countries (mostly in the USA; n=15) and attended by 19 and older individuals (n=1843) that yielded improved health outcomes with no adverse effects of attending. Walking has shown the

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population-level physical and mental health benefits including a reduction of depressive symptoms, cardiovascular risk factors, and all-cause mortality [18–21].

Farren et al.[22] found that people engage in indoor physical activities such as mall walking programs for their indoor climate-controlled, safe, and comfortable environments. In places like Canada, where harsh winter weather conditions can limit outdoor activities, low or no-cost indoor walking programs at publicly accessible spaces can be a feasible option to increase physical activity among people at the populationlevel. Local stakeholders' engagement in program development and implementation, such as involving mall-managers and members of catchment communities, may enhance the adoption of indoor walking initiatives.

We aim to develop a model that may help local communities to plan and implement sustainable indoor walking programs open for the members of the general public. However, we are unaware of what enables, initiates, or maintains (facilitators) indoor community walking programs, what discourages or blocks (barriers) and what limits the scope or sustainability (constraints) of such initiations. For example, a shared interest between an indoor facility manager and the catchment community may facilitate the initiation of an indoor walking program, but a potential burden of insurance liability may discourage the launch of the program posing as a barrier. The scope of an ongoing program may face constraints such as limited public transportation. A systematic search and screening[23] of the existing literature of indoor community walking programs and its realist synthesis[24] may offer an opportunity to expose the links between contexts and processes of program development, implementation, and evaluation. We plan to utilize the knowledge created from this proposed study to engage various community BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool

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stakeholders for designing indoor community walking programs by enhancing facilitators, negotiating constraints, and addressing potential barriers.

### Objectives

The initial review questions are:

1. How well realist evaluation components are used, if any, to report indoor community walking programs?

2. What are the facilitators, constraints, and barriers of indoor community walking programs for participants as well as organizers and service providers?

3. What characteristics of an indoor community walking program make it both successful and unsuccessful in enhancing physical activity?

4. For whom do indoor community walking programs work or not work, to what extent, and in what ways?

5. What are the processes of program development, promotion, and participation as well as mechanisms of successful implementation and participation of indoor community walking, and in what way are they meaningful for future initiatives?

### Method

In order to select search terms, the review questions were divided into two categories[23]: (i) community programs (ii) indoor walking. Figure 1 contains a detailed list of the two categories of search terms. A community walking program is defined as an organized walking group available for all people at minimal or no cost to the participants. We will include indoor community walking group programs open for all people to attend, which are designed to increase the physical activity of members of the general public, and that may offer insights into the facilitators, constraints, or barriers of

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joining, sustaining, conducting, or maintaining the programs. A group program must contain two or more regular members walking at a relatively consistent frequency, time, and location. We will exclude non-English articles and walking programs that were (i) explicitly designed for people with specific illnesses or health conditions such as aimed at rehabilitation, (ii) conducted as a one-time or an occasional walking event, (iii) combined with other structured physical activities such as breathing patterns, Yoga, or Tai Chi. However, non-physical activities, such as information sessions or interventions related to diet and nutrition, will not be excluded.

The search sources will include academic databases and grey literature with no restriction to a timeframe. Table 1 consists of a list of both sources. Specialized databases will be searched to identify relevant articles based on predetermined search terms presented in Figure 1. Grey literature is especially important for the review because the government and non-government organizations who develop, modify, and utilize community walking programs may not necessarily publish their reports in specific databases. Snowballing (citation tracking) and purposive sampling (to find answers to specific questions) strategies will be used to search relevant program theories (set of assumptions that highlight features of intervention) in the grey literature. A backward and forward reference list of identified articles will be searched. The protocol is registered with PROSPERO (registration number: CRD42020150415). Any significant amendment in the proposed protocol will be documented in the registered PROSPERO record.

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# Identification and Screening Process of the Studies

The identified articles through the comprehensive search will be collected in a bibliography database, and the duplicates will be removed by using Covidence systematic review software, which compares and removes identical articles based on embedded metadata of the items. The inclusion and exclusion criteria are described in Table 2.

The collected articles will be further selected for review based on the inclusion and exclusion criteria. The selection procedure will consist of two related steps: (i) identification by title and abstract screening and (ii) full text for screening. The titles and abstracts reveal key information about a research article to identify its relevance for the review. Articles will be selected based on titles and abstracts, and a selection consensus will be made between two independent reviewers. In the case of a disagreement between the reviewers, similar to Brown et al. [25], a third reviewer will resolve any discrepancies. Articles will be excluded upon the agreement of at least two of the independent reviewers. Both the article identification and screening process are based on the PRISMA flow diagram[26], which is illustrated in Figure 2.

Reviewers will read and tabulate data from the finally selected articles in Table 3. Data will be extracted related to the study characteristics (year of publication, country) as well as the facilitators, constraints, and barriers of indoor walking programs. A multitude of qualitative methods can be used to explore the program development processes and experiences of an intervention, such as mall walking. The reviewers will extract the information related to methods used in the articles, the number of participants and their gender, recruitment strategies used (frequency and duration), and

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the type of walking group (e.g., mall or school) and its duration, and other qualitative aspects such as location and transportation provided or arranged by the participants, incentives offered, and use of technology such as mobile app or accelerometers. Each reviewer will identify and list all the facilitators, constraints, and barriers of attending, sustaining, conducting, or maintaining the walking programs. A consensus will be made among at least two of the reviewers in order to keep the inferences for the realist synthesis. The data will be recorded and saved in a Microsoft Excel<sup>©</sup> sheet.

### **Quality Assessment**

All the included studies will be scrutinized for quality assessment. The quality of quantitative studies will be assessed utilizing strategies similar to Brown et al.[25]. The first two authors will evaluate the quality of the intervention programs using the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies - a recommended tool to assess the content and construct validity of the studies. The quality assessment tool will be used to rate quantitative studies by a rating of weak, moderate, or strong on six aspects: design, blinding, bias, confounders, methods of data collection, and dropouts (researchers loose contact with participants) and withdrawals (participants state a reason for the discontinuation of their partaking). The aggregate assessment will be taken into account while reporting the quality of the selected studies. The results will be reported using Table 4.

The reviewers will assess the qualitative studies by the rigour and relevance of the included articles, which will be appraised based on RAMESES standards[24, 27] The Cochrane Qualitative and Implementation Methods Group (CQIMG)[28] recommended the reviewers' transparency in reporting the shared decision-making

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process of the quality assessment. We will assess and report the quality of the synthesized qualitative studies using Table 5, which is based on CASP<sup>®</sup>( Critical Appraisal Skills Programme)[29]. CASP<sup>®</sup> is the most frequently used tool to synthesize qualitative evidence in the World Health Organization and Cochrane guidelines [28]. We will use the CASP<sup>®</sup> as a guiding tool to assess and not as a scoring checklist because the score-based consensus is impractical while synthesizing qualitative research. In doing so, the included articles may consist of a variety of methods with incomparable theoretical and philosophical frameworks[28]. Instead of the cut-off points, the CQIMG [28] recommended two or more reviewers to develop an understanding of the strengths and limitations of the included studies using guidelines such as the CASP<sup>®</sup>.

### **Realist Synthesis**

Health promotion community interventions uniquely interplay with a context, which may not invoke similar dynamics when replicated in a different community and at another place and time. Therefore, a synthesis of such knowledge requires a perspective to appreciate the contextuality of an intervention that can respond to the question of "What works for whom under what circumstances, how and why?"[24]. We plan to utilize realist synthesis suggested by Pawson et al.[24] for the review. Previously, other researchers applied realist synthesis to explore physical activity promotion strategies [30, 31]

Pawson et al.[24] proposed that rather than being a method, the realist synthesis offers a "logic of inquiry" to explore a phenomenon of interest. The review process includes hypothesizing and testing the mechanics (M), context (C), and the outcomes (O) of social interventions[24]. Realist synthesis examines the successes and failures of

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the interventions as well as inquiring about the processes and their respective contexts, including the salient features of the programs and the social reality surrounding it. Realist synthesis utilizes all methods of inquiry, such as qualitative, quantitative, or mixed methods.

The search process, identification, screening, and analysis are parallel and iterative processes in the logic of realist synthesis[24]. The review process begins with a background literature search and identification of existing program theories, which exposes its features such as administrative ideologies, places, environments, and social interactions. Low or no-cost publicly available health promotion (including non-rehabilitative) indoor walking programs may exist widely, but they are rarely theorized from the perspective of program development, implementation, participation, and sustainability. We conducted an environmental scan in Calgary (Alberta, Canada) and found several (un)supervised walking groups available for the members of the general public that run for years without being theorized. Currently, we are conducting a preliminary literature search to develop an initial program theory for publicly accessible mall walking programs that are unrestricted based on people's age, gender, ethnicity, diseases, or disability.

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The initial program theory will inform further literature search in a focused manner based on the features of the identified indoor walking programs. Further, the primary research questions may be modified as the new knowledge uncovers about the phenomenon in the literature. Snowballing and purposive sampling will aid in finding answers to the analytic questions that may emerge from the ongoing search of the identified program theories, which may further mobilize the review and synthesize

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process in order to resolve unanswered questions. Components of the program theories will be searched, identified, and tested through the literature search, which may modify the research question, data analysis, and synthesis, making it an interactive and iterative process.

Pawson et al.[24] argued that realist synthesis is a "refining theory," which is achieved through parallel processes of data collection and analysis. Data will be extracted by tracking the components of the program theories and analysis will be carried out by constant comparing between what works in what circumstances and what are the conditions it did not work[24]. Reviewers will strive to locate the program ideologies and frameworks as well as implementation processes, including evolution in the intervention strategies. With a new understanding of program intervention, the reviewers will raise questions and find their answers in the empirical literature to develop a better understanding of what works (or not), and in what circumstances.

# **Patient and Public Involvement**

No patient involved in this study. Patient consent was not required for data collection, analysis, or publication of this study.

### Discussion

This article is an account of our reflection on the process of a realist synthesis that we plan to undertake in order to understand what works (or not) for an indoor walking program and discovering the challenges, for whom, and in what circumstances. We hope the resulting realist synthesis of literature will provide a comprehensive understanding of the potential facilitators, constraints, and barriers existing in the literature. This knowledge will be shared with local community liaisons and stakeholder

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consultations, which will be instrumental in planning and implementing a walking program for health promotion and disease risk reduction.

The expected outcome of this review is to yield a better understanding of what elements of indoor walking programs were successfully adopted by whom and in which circumstances. The resulting knowledge will help the reviewers to design an indoor community walking program by selecting a potentially appropriate setting and utilizing intervention components that will be deemed to have an optimum positive influence on population-wide participation and behaviour change.

The traditional models of analysis and synthesis of intervention programs primarily rely on clinical trials, which are aimed to understand the causal relationship of an event or an outcome. However, such traditional reviews tend to omit contextual knowledge important to community-based or public health interventions because clinical trials focus merely on outcomes and strive to control extraneous variables that can not be removed in real-life interventions. Realist synthesis, in addition to outcomes, facilitates to explore the underlying mechanisms of complex intervention programs by taking its context into account [24, 32]. The proposed realist synthesis may reveal what influences health promotion efforts related to indoor walking programs in both urban and rural settings. BMJ Open: first published as 10.1136/bmjopen-2019-034342 on 30 July 2020. Downloaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA Erasmushogeschool .

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The planned realist synthesis will be a critical step in the process of reducing the prevalence of physical inactivity at the population level. The review is expected to reveal components of an indoor walking program that may be suitable for various groups of individuals, such as mall managers and the members of the catchment community. The resulting knowledge might help indoor space-managers to develop accessible and

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sustainable indoor walking programs combining its components. The proposed review is aimed at synthesizing knowledge for its application into the real world by developing and implementing a community indoor walking program, which is essentially a knowledge translation endeavour as we will use research evidence into practice. This review may ultimately inform broader public health dissemination and implementation research related to indoor walking programs.

The walking program will be appraised by a realist evaluation in order to refine the program further, and it might be a stepping-stone for an ongoing community engagement aiming to reduce population physical inactivity.

## Limitations

The iterative realist synthesis may not provide definitive answers to the research questions[24]. The realist synthesis is not designed to report the success of the intervention programs based on the outcomes only. Instead, it will review the contexts and mechanisms leading to the outcomes, which will be instrumental in developing an informed framework of intervention.

The initial program theory development is underway, which will further determine the search and review directions. The systematic search explained in this review will guide the development of the initial program theory, which may introduce a selection bias as we will likely select the features of the model based on the research team's experiences and expertise. However, our transdisciplinary research team brings a wide variety of expertise, which might aid in developing an inclusive initial program theory.

Another limitation of this protocol is the absence of a step-by-step review procedure. The realist synthesis is inherently open-ended and iterative, and subject to

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take turns and twists as the synthesis matures, so it is not feasible to delineate the review process precisely and in advance. Instead, this protocol is a guiding tool to initiate the process, keep the aim of the synthesis into focus as the review progresses, and to establish the transparency of the review and synthesis processes.

### **Ethics and Dissemination**

Recruitment or direct interactions of patients or members of the general public will not take place in the proposed study. Ethical approval, such as Conjoint Health Research Ethics Board, was not required for the study. The process of the realist synthesis will be reported transparently for critics, researchers, and implementation specialists.

The facilitators, constraints, and barriers uncovered from the study will inform the development of a community indoor walking health promotion program. The findings of the study will be shared with the academic community through peer-reviewed publications, conferences presentations or posters, webinars, and formal and informal meetings. We will disseminate the findings to the community through the program website, social media, and conventional media such as radio and use it to communicate with stakeholders while developing the indoor walking program.

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### **Funding Statement**

This work was supported by Astra Zeneca Cardiovascular Health Promotion and Disease Prevention Chair awarded to Dr. Hude Quan.

### Registration

The study protocol is registered with PROSPERO (registration number CRD42020150415). Currently, we are conducting a preliminary literature search that will

help us develop an initial program theory. We anticipate completing the study by October 2020.

### Contributors

SS, TCT, LY, SB, and HQ conceptualized the work and critiqued the study protocol. SS and TCT designed the protocol and drafted the initial version of the manuscript, as well as developed data extraction and appraisal strategy and the tables. The study problem, objectives, and the search terms were defined in team meetings where SS, TCT, LY, SB, and HQ directly contributed. Similarly, the whole team defined and refined the inclusion and exclusion criteria and contributed to the manuscript with critical revisions of the initial draft.

# Patient consent for publication

Not required.

# Competing Interest Statement

No competing interest to declare.

# Patient and Public Involvement

No patient involved in this study.

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## Table 1. List of Searched Databases

Academic databases:	Grey literature:
MEDLINE (Ovid)	Google
EMBASE (Ovid)	Google Scholar
PsycINFO	ProQuest (theses & dissertations)
Scopus Web of Science	Canadian Institute for Realth Information Public Health Agency of Canada (PHAC)
CINAHI	Health Canada
SocINDEX	National Institutes of Health (NIH)
Urban Studies Abstracts	Canadian Electronic Library
SPORTDiscus	·····

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3	Table 2 Inclusion and Exclusion Criteria for Searched Articles
4	
5	Inclusion aritaria (must maat all);
6	inclusion chiena (inust meet all).
7	1. A waiking program organized in an indoor public
8	space
9	2. Indicated at least one barrier, facilitator, constraint to
10	attend, sustain, conduct, or maintain the walking
11	program
12	3. Open for the members of the general public
13	4. Any study design
14	
15	Exclusion criteria (at least meet one):
10	1 A ope time or a concorrel welking event
12	1. A one-time of a seasonal walking event
19	2. Designed for a population with specific linesses,
20	disabilities, or health conditions
21	<ol><li>Combined with other structured physical activities</li></ol>
22	such as Yoga, Tai Chi, or breathing patterns
23	5. Non-English Articles
24	6. Non-primary research articles
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Data Ext	acted from the	Studi	es Inclu	ided in the	Review		pyright, inc	100en-2019	
Method	Participants (n, women,	Recru (strat	uitment eav.	Walking g	roup	Qualitative features:	Facilitato	Constraints	Barriers
	mean (range) age)	frequ	ency)	Frequen cy, duration	Location	e.g., transportatio n, delivery characteristi	or uses relatec	2 on 30 July 20:	
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7 of 33					BMJ Open		10.1136/bn cted by co		
	Table 4. F	Results of the	Quality Asses	sment Tool			njopen-2019-03434 pyright, including		
	Article (First author, years, country	Intervention	Study design	Bias	Confounders	Blinding	Data for uses related to text	Drop- out/ Withdra wal	Ratin
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	111	BBB	Weak Moderate Strong	Weak Moderate Strong	Weak Moderate Strong	Weak Moderate Strong	Weak A Moderate Strong ning	Weak Moderat e Strong	
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Cable 5. CASP <sup>©</sup> Qualitative Research Checklist      Questions[29]	Yee	1-2019-034342 pr 1, including for	No
	163		
1. Was there a clear statement of the aims of the research?		July 202 Erasr	
2. Is a qualitative methodology appropriate?		20. Dow hushog to text	
3. Was the research design appropriate to address the aims of the research?		nloade and da	
4. Was the recruitment strategy appropriate to the aims of the research?		d from	
5. Was the data collected in a way that addressed the research issue?		http://b	
6. Has the relationship between researcher and participants been adequately		mjoper	
considered?		, and s	
7. Have ethical issues been taken into consideration?	51	om/ on milar t	
8. Was the data analysis sufficiently rigorous?	5	June 7 echnold	
9. Is there a clear statement of findings?		, 2025 <i>a</i> )gles.	
10. How valuable is the research?		it Depar	
27		rtment GEZ	
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 • Legend

 Figure 1. Systematic Search Strategy. The figure illustrates a systematic strategy to search record and in literature sontaining organized indoor community walking group programs.

 gure 2. Identification and Screening Process of the Studies based on the PRISMA flow diagrees

 tematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria, and finally or itematic process to identify and remove duplicate records searched is son and exclusion criteria.

containing organized indoor community walking group programs. 

at Department GEZ-LTA

Figure 1.

## Keywords for programs:

(interven\* or program\* or promo\* or initiat\* or implement\* or group\* or communit\* or indoor or campaign\* or impact\* or project\* or servic\* or pattern\*).tw,kf.

## Keywords for Indoor Walking:

(walk\* and (indoor or inside or built\* or interior\* or mall\* or hall\* or stair\* or atrium\* or atria\* or theatre\* or theater\* or seminary or building\* or facilities or facility or center\* or centre\* or institute\* or school\* or university\* or college\* or campus\* or church\* or synagogue\* or temple\* or mosque\* or gurudwara\* or gurdwara\* or place\* or area\* or office\* or workplace\* or "work place\*" or "at work" or site\* or space\* or spot\*)).tw.kf.

Figure 1. Systematic Search Strategy 

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Figure 2. Identification and Screening Process of the Studies based on the PRISMA

flow diagram[23]

 

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 PRISMA-P 2015 Checklist
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 This checklist has been adapted for use with protocol submissions to Systematic Reviews from Table of int Moher D et al: Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic Reviews 2015 4:1

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Saction/tonia	#			Information reported		Page
Section/topic	#	checkist item at a start a sta		Yes	No	number(s)
ADMINISTRATIVE INFO	ORMAT					
Title: Identifying the fac	ilitators	s, constraints, and barriers of community indoor walking programs: protocol for a realist said be	sis			
Identification	1a	Identify the report as a protocol of a systematic review		$\boxtimes$		1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such				
Registration	2	If registered, provide the name of the registry (e.g., PROSPERO) and registration number in the Abstract	e	$\square$		5, 9, 17
Authors						
Contact	За	Provide name, institutional affiliation, and e-mail address of all protocol authors; provide by sea mailing address of corresponding author	al	$\square$		1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review		$\square$		18
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol determined as such and list changes; otherwise, state plan for documenting important protocol amendment	tify ts	$\square$		9
Support		r teo				
Sources	5a	Indicate sources of financial or other support for the review		$\boxtimes$		17
Sponsor	5b	Provide name for the review funder and/or sponsor				NA
Role of sponsor/funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol				NA
INTRODUCTION		pa				
Rationale	6	Describe the rationale for the review in the context of what is already known		$\bowtie$		7
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)		$\square$		8
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Section/topic	#	Checklist item	2019-03- includi	Information Yes	n reported No	Page number(s)
METHODS			4342 ng fo			1.
Eligibility criteria	8	Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criter eligibility for the review	on 30 Jul			10, 25
nformation sources	9	Describe all intended information sources (e.g., electronic databases, contact with study trial registers, or other grey literature sources) with planned dates of coverage	V 2020 lated to			9, 24
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including limits, such that it could be repeated				Figure 1
STUDY RECORDS			nloa and			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the				10, 11
Selection process	11b	State the process that will be used for selecting studies (e.g., two independent reviewers each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)	∃ no no no no no no no no no no no no no			10, 11
			, <del>p</del>			Figure 2
Data collection process	11c	Describe planned method of extracting data from reports (e.g., piloting forms, done inde in duplicate), any processes for obtaining and confirming data from investigators		, ×		10, 11
Data items	12	List and define all variables for which data will be sought (e.g., PICO items, funding sour pre-planned data assumptions and simplifications	Ges), Angeles Gester Stand			10, Table 3
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main additional outcomes, with rationale	ingind on			10, Table 3
Risk of bias in Individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including w this will be done at the outcome or study level, or both; state how this information will be data synthesis	the			11, Table 4
DATA			2025 Jies.			
	15a	Describe criteria under which study data will be quantitatively synthesized	at E		$\square$	NA
Synthesis	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, of handling data, and methods of combining data from studies, including any planned ex of consistency (e.g., <i>I</i> <sup>2</sup> , Kendall's tau)	metheods ploration			NA
	15c	Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta regression)	nt GEZ			NA

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			pen-20 <sup>.</sup> right, ir			
Section/topic	#	Checklist item	19-034: 1cludin	Information Yes	on reported No	Page number(s)
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	342 o 19 fo			12, 13, 14
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, reporting within studies)	selective			NA
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (e.g., GRADE)	luly 20 Eras relatec			NA
			loaded from http://bmjopen.bmj.com/ on June 7, 2025 at Department GEZ-LTA school . Ind data mining, Al training, and similar technologies.			Contro



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