Review Protocol:

Effects of participatory creation of urban green spaces on health – A systematic review

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Registration

- Registered on PROSPERO
- Registration number: CRD42023454363

Introduction

An increasing proportion of the world's population lives in cities. This leads to a densification of built structures, e.g., for housing, schools and mobility. At the same time, cities are facing growing challenges such as adapting to climate change and social inequity that pose various health-related risks to its population. Green spaces can provide resources to mitigate these. Evidence suggests that the exposure to urban green areas has beneficial effects on mental and physical health. However, experiencing green spaces rather than just being exposed to them has not been the focus of much research. Yet, there are several practical approaches using participatory processes that address experiencing green space. With this systematic review, we will assess the potentials of participation in urban green space creation for different health-related outcomes as a solution for tackling adverse health-effects of living in cities - especially in the context of climate change-related health risks.

Objective

The review wants to identify all published empirical studies (within the last 20 years, 2003 - 2023) on the relation between participatory urban green space creation and outcomes related to health-related quality of life and assess the effects.

Outcomes and Interventions

As outcome and intervention variables the following are considered:

- 1. Interventions:
 - All kinds of participatory urban green space interventions
 - Participation: citizen/public/community/resident/stakeholder engagement/involvement/collaboration, citizen science, participation, cocreation, co-production, co-design, volunteering, community gardening, conservation groups
 - Green space: green area/space/infrastructure, urban regeneration/park/forest/landscape/biodiversity, natural environment, streetscape greenery
- 2. Health outcomes:
 - Quality of life, subjective health, well-being
 - Mental health, stress
 - Sickness/ disease, morbidity, mortality

Eligibility

The title or abstract of a study contains at least one term out of the *participation search string,* (*and/or*) one term out of the *green space search string* as well as a health outcome measure. Only articles in English language are considered which are published in the 20 years between 2003 and 2023 (09.10.2023). All empirical study designs are considered.

- Participants: any
- Interventions: participation in planning/designing/building/experiencing urban green spaces
- Comparators: any
- Outcomes: health-related outcomes
- Study design: empirical studies

Databases

The review should cover studies from Psychology, Environmental Studies and Public Health. The following databases will be used for the search process:

- 1. EbscoHost Databases (PsycINFO, PSYNDEX, PsycArticles, Psychology and Behavioral Sciences Collection, CINAHL Complete)
- 2. Web of Science
- 3. PUBMED

Search Strategy

The field in which the review is conducted is quite broad and lacks well-defined concepts and terminology due to its multidisciplinary nature and recency. Therefore, a rather broad search term combination is used to minimize the risk of overlooking articles which use slightly different wording in their research. We search abstracts and titles for the following keywords:

<u>Keywords</u>

((engage* OR involve* OR collabora* OR participat* OR co?creat* OR co?produc* OR co?design* OR "citizen science" OR volunt*) AND ("green area*" OR "green space*"-OR "urban regeneration" OR "natural environment*" OR "streetscape greenery" OR "green infrastructure" OR "urban park" OR "urban forest" OR "urban landscape" OR "urban biodiversity") AND ("quality of life" OR well?being OR satisfaction OR "morbidity" OR "mortality" OR illness* OR disease* OR disorder* OR "health" OR stress))

Protocol addition 20.09.2023:

We proceeded with search strategy and study selection as planned. In the last step of the study selection – the screening of the references of selected full texts – 30 additional studies relevant were identified. Due to the high number of additional relevant studies in accordance with our selection criteria, we decided to repeat the search and extend our search string with the following keywords (based on the additional studies found):

- community garden, community greening, horticulture, garden therapy, eco therapy

This resulted in the following updated search query:

((engage* OR involve* OR collabora* OR participat* OR co?creat* OR co?produc* OR co?design* OR "citizen science" OR volunt*)

AND

("green area*" OR "green space*"-OR "urban regeneration" OR "natural environment*" OR "streetscape greenery" OR "green infrastructure" OR "urban park" OR "urban forest" OR "urban landscape" OR "urban biodiversity" OR "community garden*" OR community greening OR horticultur* OR "garden therapy" OR "eco therapy")

AND

("quality of life" OR well?being OR satisfaction OR "morbidity" OR "mortality" OR illness* OR disease* OR disorder* OR "health" OR stress))

We searched the databases stated above again on the 20.09.2023. We used the same eligibility criteria and study selection process as previously.

Protocol addition 09.11.2023

The last adaption made to the search strategy proved to lead to insufficient results, because a large number of irrelevant studies were added to the search and only a small number of relevant studies

were added. Therefore, the search query had to be modified again. We separated the search terms "community garden", "environmental volunteering", and added the term "conservation groups" to a separate part of the search string.

((("community garden*" OR "environmental volunt*" OR "conservation group*") AND ("quality of life" OR "well-being" OR wellbeing OR satisfaction OR "morbidity" OR "mortality" OR illness* OR disease* OR disorder* OR "health" OR stress)) OR ((engage* OR involve* OR collabora* OR participat* OR "co-creat*" OR "co-produc*" OR "codesign*" OR "citizen science" OR volunt*) AND ("green area*" OR "green space*" OR "urban regeneration" OR "natural environment" OR "streetscape green*" OR "green infrastructure" OR "urban park*" OR "urban forest*" OR "urban landscap*" OR "urban biodiversity") AND ("quality of life" OR "well-being" OR wellbeing OR satisfaction OR "morbidity" OR "mortality" OR

("quality of life" OR "well-being" OR wellbeing OR satisfaction OR "morbidity" OR "mortality" OR illness* OR disease* OR disorder* OR "health" OR stress)))

The search was carried out using the following search query was conducted on the 09.10.2023. We used the same eligibility criteria and study selection process as previously.

Study Selection and Data Extraction

One researcher will pool the search results and remove duplicates in a reference manager. Then, two researchers will separately scan the titles and abstracts of the resulting database for articles which fit the criteria stated in the eligibility section (based on the PICOS scheme). If they are in doubt, they will mark articles as potentially relevant instead of disregarding it. Results will be compared and discussed with a third researcher. In a next step one researcher will go through the full text of articles to see if they fit the eligibility criteria. Finally, the references of selected articles will be screened for additional relevant sources that have been missed by the search. The final article selection will be discussed among all reviewers.

From the resulting articles general information about the study design and intervention, study population and context, measures, health-related outcome variables, secondary outcome variables and conclusions about effects of participatory urban green space creation will be extracted into a spread sheet which will be the basis for overview tables.

Appraisal

Quality markers of the study relating to possible bias are considered using the following criteria:

- Quantitative studies:
 - o Control variables
 - Study design
 - o Measures
 - Peer-review
 - o Effect measure
- Qualitative studies:
 - o Interrater reliability
 - o Peer-review

Studies will be ranked in different evidence grades from I (high) to III (low). If studies with high quality yield systematically different results, this will be highlighted.

Data synthesis

A qualitative summary categorized along outcome measures, secondary outcomes, different populations and methodological approaches will be used. If possible, different types of interventions will also be assessed.