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Corresponding author:

Yan Han

hanyan0536@foxmail.com

Author Affiliation:

Independent Researcher, China.

Han, Y; Li, B; Zhang, Y; Hou, Y.

ADMINISTRATIVE INFORMATION

Support - No financial support was received for this systematic review.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202650126

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 May 2026 and was last updated on 22 May 2026.

INTRODUCTION

Review question / Objective This systematic review will examine the role of therapeutic landscapes in promoting the mental health of older adults and will address the following research questions:

RQ1: What are the general characteristics of studies on therapeutic landscapes and the mental health of older adults from 2015 to 2025, including publication sources, publication distribution, and participant characteristics?

RQ2: What measurement methods and intervention approaches have been used to examine the effects of therapeutic landscapes on the mental health of older adults?

RQ3: What effects do therapeutic landscapes have on the mental health of older adults, including depression, anxiety, stress, loneliness, and psychological well-being?

Rationale As global population aging continues to intensify, the mental health of older adults has become an important public health concern.

Depression, anxiety, stress, loneliness, and reduced psychological well-being are common issues among older adults, but they are often insufficiently recognized and addressed. Therapeutic landscapes, as health-promoting environmental interventions, may provide a feasible non-pharmacological pathway for improving mental health among older adults. However, existing studies are scattered across different disciplines, landscape types, intervention approaches, and outcome measures. Therefore, a systematic review is needed to synthesize current evidence, clarify the effects of therapeutic landscapes on older adults' mental health, and identify gaps for future research and practical landscape design.

Condition being studied This review focuses on the mental health of older adults in relation to therapeutic landscape exposure or intervention. Older adults are generally defined as individuals aged 60 years and above, or as older populations as defined in the included studies. The mental health conditions of interest include depression,

anxiety, perceived stress, loneliness, psychological well-being, and emotional restoration. Therapeutic landscapes refer to health-promoting environments or landscape-based interventions, such as therapeutic gardens, healing gardens, community green spaces, natural environments, and green spaces attached to elderly care facilities. This review will examine how exposure to or participation in these therapeutic landscape settings may influence mental health outcomes among older adults.

METHODS

Search strategy A systematic search will be conducted in Web of Science, Scopus, JSTOR, and ScienceDirect for peer-reviewed English-language studies published from 2015 to 2025. The search strategy will combine three groups of terms related to therapeutic landscapes, older adults, and mental health. The search terms will include: (“therapeutic landscape” OR “healing garden” OR “therapeutic garden”) AND (“older adult” OR “elderly” OR “senior” OR “aged people”) AND (“mental health” OR “psychological health” OR “psychological well-being” OR “mental well-being” OR “emotional well-being” OR “mental fatigue” OR “psychological distress” OR “mental disorder” OR “depression” OR “anxiety” OR “stress” OR “loneliness”). All retrieved records will be imported into EndNote for duplicate removal and screening.

Participant or population The population of this review will be older adults, generally defined as individuals aged 60 years and above, or populations identified as older adults in the original studies. Participants may include community-dwelling older adults, older adults living in elderly care facilities, and older adults exposed to or participating in therapeutic landscapes, natural environments, horticultural activities, community green spaces, or related landscape-based interventions.

Intervention The intervention or exposure of interest is therapeutic landscape-based environmental exposure or intervention for older adults. This includes therapeutic gardens, healing gardens, restorative gardens, community green spaces, natural landscapes, horticultural activities, forest-based programs, garden-based activities, and green spaces attached to elderly care facilities. These interventions may involve passive exposure, such as viewing or staying in green environments, or active participation, such as gardening, walking, outdoor activities, social interaction, or structured therapeutic programs in

landscape settings. The review will examine how these therapeutic landscape interventions or exposures influence mental health outcomes among older adults.

Comparator The comparators will include usual living environments, indoor or non-green environments, no exposure to therapeutic landscapes, or baseline conditions before the intervention. In studies without a separate control group, pre-intervention mental health status will be used as the comparator. This review will also include studies comparing different types, frequencies, durations, or levels of therapeutic landscape exposure.

Study designs to be included Empirical studies using quantitative, qualitative, or mixed-methods designs will be included. Eligible designs may include randomized or non-randomized intervention studies, quasi-experimental studies, pre-post studies, cross-sectional studies, cohort studies, case studies, interview studies, and observational studies. Reviews, editorials, commentaries, protocols, and conference abstracts will be excluded.

Eligibility criteria Studies will be included if they meet the following criteria: 1. the participants are older adults, generally aged 60 years and above, or defined as older adults in the original studies; 2. the study focuses on therapeutic landscapes or related health-promoting natural environments, such as therapeutic gardens, healing gardens, community green spaces, or green spaces in elderly care facilities; 3. the study reports mental health-related outcomes, including depression, anxiety, stress, loneliness, psychological well-being, or emotional restoration; 4. the study is empirical and uses quantitative, qualitative, or mixed-methods approaches; 5. the publication period is from 2015 to 2025; and 6. the article is published in English. Reviews, non-empirical papers, and studies not focused on older adults, mental health, or therapeutic landscapes will be excluded.

Information sources The following electronic databases will be systematically searched: Web of Science, Scopus, JSTOR, and ScienceDirect. The search will cover peer-reviewed English-language studies published from 2015 to 2025.

Main outcome(s) The main outcomes of this review are mental health-related outcomes among older adults, including depression, anxiety, perceived stress, loneliness, psychological well-being, and emotional restoration. The review will

extract and synthesize evidence on the effects of therapeutic landscape exposure or intervention on these outcomes. Differences in outcomes according to landscape type, mode of use, intervention approach, and contextual conditions will also be examined where applicable.

Data management All retrieved records will be imported into EndNote for reference management, duplicate removal, and initial screening. Titles, abstracts, and full texts will be screened according to the eligibility criteria. The screening process, reasons for exclusion, and extracted data will be recorded using Microsoft Excel. Extracted information will include author, year, country, participants, study design, type of therapeutic landscape, intervention or exposure approach, measurement tools, mental health outcomes, and main findings.

Quality assessment / Risk of bias analysis The methodological quality of included studies will be assessed using the Crowe Critical Appraisal Tool (CCAT). The assessment will consider key aspects such as study design, sampling, data collection, ethical considerations, results, and conclusions. Each included study will be appraised according to the CCAT criteria to evaluate its overall methodological quality. The quality assessment results will be used to interpret the reliability of the evidence, but they will not be used as the sole basis for exclusion. Any disagreements in quality assessment will be resolved through discussion.

Strategy of data synthesis A narrative synthesis will be conducted to analyze the included studies. First, the general characteristics of the studies will be summarized, including publication year, country or region, participants, study design, and sample characteristics. Second, the studies will be categorized according to the type of therapeutic landscape, intervention or exposure approach, measurement tools, and mental health outcomes. Finally, the effects of different therapeutic landscapes on depression, anxiety, stress, loneliness, psychological well-being, and emotional restoration will be compared and synthesized. Due to expected heterogeneity in study design, intervention approaches, and outcome measures, a meta-analysis is not planned.

Subgroup analysis If sufficient data are available, subgroup analysis will be conducted according to landscape type, participant characteristics, intervention or exposure approach, region, and study design. Possible subgroups may include natural environmental landscapes, structured

intervention-oriented landscapes, and sociocultural experiential landscapes; community-dwelling older adults and older adults in elderly care facilities; passive exposure, horticultural activities, walking activities, forest-based programs, and structured therapeutic programs. Subgroup analysis will be used to explore possible differences in the effects of therapeutic landscapes on mental health outcomes among older adults.

Sensitivity analysis As this review is expected to use narrative synthesis rather than meta-analysis, a formal statistical sensitivity analysis may not be conducted. If sufficient data are available, sensitivity analysis will be performed by excluding studies with lower methodological quality or by comparing findings from higher-quality studies separately. The potential influence of study design, sample characteristics, and outcome measurement tools on the overall conclusions will also be considered.

Language restriction Only studies published in English will be included.

Country(ies) involved China, Malaysia, South Korea.

Other relevant information No additional relevant information.

Keywords Therapeutic Landscapes; Older Adults; Mental Health; Systematic Review; Health Benefits.

Dissemination plans The findings of this systematic review will be disseminated through publication in a peer-reviewed academic journal and may also be presented at relevant academic conferences or research meetings.

Contributions of each author

Author 1 - Yan Han - Author 1 designed the review, conducted the literature search, screened studies, extracted data, assessed study quality, synthesized the findings, and drafted the manuscript.

Email: hanyan0536@foxmail.com

Author 2 - Bin Li - Author 2 contributed to the review design, supervised the research process, reviewed the methodology, and revised the manuscript critically.

Email: libin.upm0319@gmail.com

Author 3 - Juan Zhang - Author 3 acted as the corresponding author, supervised the review process, contributed to the interpretation of findings, critically revised the manuscript, and approved the final protocol.

Email: zhangjuan@bjut.edu.cn
Author 4 - Yuxin Hou - Author 4 assisted with literature screening, data extraction, quality assessment, and organization of the review results.
Email: houyuxin21@163.com