BMJ Open

# Efficacy of reminiscence therapy with different media on cognitive function and mental health for elderly patients with stroke: protocol of a network meta-analysis



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| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2023-078526 |
| Article Type: | Protocol |
| Date Submitted by the Author: | 06-Aug-2023 |
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| Keywords: | Stroke < NEUROLOGY, MENTAL HEALTH, Delirium & cognitive disorders < PSYCHIATRY |
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# Title page

**Title**

Efficacy of reminiscence therapy with different media on cognitive function and mental health for elderly patients with stroke: protocol of a network meta-analysis

**List of all authors**

Qian Liu[1], Li Liu[1], Fang Wang[1], Lixia Tan[1], Hong Cheng[2], Xiuying Hu[1,*]

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**Authors' contributions**

Qian Liu designed this study with oversight by Xiuying Hu and Hong Cheng. Qian Liu drafted the protocol, and the draft was modified by Li Liu, Fang Wang and Xiuying Hu. Qian Liu and Lixia Tan will search, select, and identify studies and extract data independently, while Li Liu will be the third reviewer for study selection and data extraction. Qian Liu will be responsible for the methodology. All authors have approved the publication of this protocol.

**Funding Statement**

This study is funded by a project from the West China Hospital of Sichuan University (Grant No. HXDZ21003).

**Conflict of Interest**

The authors have no conflicts of interest to disclose.

# Efficacy of reminiscence therapy with different media on cognitive function and mental health for elderly patients with stroke: protocol of a network meta-analysis


## Abstract

Introduction: Cognitive impairment and mental problems are both risk factors for long-term death among elderly stroke survivors. Managing them in elderly patients with stroke is crucial for improving their well-being. Some studies have focused on the effects of reminiscence therapy with different media on stroke survivors. However, there is a lack of research to determine which is the best medium. Therefore, this protocol aims to identify the best medium for reminiscence therapy by using a network meta-analysis.

Methods and analysis: Published randomized controlled trials will be included if reminiscence therapy plus usual care was applied in elderly stroke patients in the experimental group and usual care was applied in the control group. Six electronic databases will be searched from their inception to August 2023, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The media of reminiscence therapy may include (but not restricted to) old photos, music or movies. Outcomes will be cognitive function and mental health (such as anxiety and depression). Study selection, data extraction and quality assessment will be performed independently by two reviewers. The risk of bias of the included studies will be evaluated in accordance with the Cochrane Collaboration's risk of bias tool. The

evidence quality will be measured based on the Grading of Recommendations Assessment, Development and Evaluation. To compare the efficacy of reminiscence therapy with different media, standard pairwise meta-analysis and Bayesian network meta-analysis will be conducted. The probabilities of intervention for all outcomes will be ranked based on the surface under the cumulative ranking curve.

Ethics and dissemination: Ethical approval is not required for reviewing published studies. The findings will be submitted to a peer-reviewed journal for review and publication to provide important evidence for clinicians and guideline developers to determine interventions for elderly stroke patients

PROSPERO registration number: CRD42023447828.

Key words: reminiscence therapy; stroke; network meta-analysis; cognitive function; mental health

## Strengths and limitations of this study

1. This network meta-analysis will integrate the evidence and allow the comparison of different media of reminiscence therapy in one model.

2. For the first time the cognitive function and mental health outcomes of reminiscence therapy with different media for elderly patients with stroke will be comprehensively assessed in a network meta-analysis.

3. Network meta-analysis will promote precision of medium of reminiscence therapy, and provide evidence for the decisions of intervention and the development of guidelines.

4. Due to the retrospective nature of this study, the findings may be influenced by the quantity and quality of the included studies.

## Introduction

With the rapid development of global population aging, the number of elderly patients with chronic diseases is also increasing. Stroke is still a common cause of death and disability in the elderly,[1 2] with a high incidence, high disability rate, high mortality, high recurrence rate, and high economic burden.[3] With the progress of medicine, the emergency medical systems and innovative treatment methods have improved, and the mortality rate of stroke patients has been reduced to a certain extent. However, more and more stroke survivors are struggling with post-stroke complications. [4-6] In particular, stroke increases the risk and severity of cognitive impairment.[7] More than 70% of stroke survivors have cognitive deficits related to disability, dependency and morbidity, posing a significant burden on patients, caregivers, and the health care system.[8] Moreover, the decline in stress and cognitive abilities can easily cause psychological problems (such as anxiety and depression) among stroke survivors when facing physical discomfort and the financial burden of treatment, leading to decreased quality of life in patients. Importantly, post-stroke cognitive impairment and psychological disorders are important risk factors for poor prognosis and low survival rate.[9-11] Therefore, efforts to relieve cognitive impairment and psychological problems in stroke survivors have never been stopped.

Reminiscence therapy was proposed by Butler in 1963 based on Eric Erickson's

theory of psychosocial development, which first emphasized the importance of nostalgia and life review for the elderly to successfully adapt to aging.[12] Nursing Interventions Classification defines reminiscence therapy as helping people improve their sense of well-being, quality of life, and adaptability to existing surroundings by recalling the past events, thoughts, and emotions.[13] Reminiscence therapy uses familiar objects, such as old photos, music, and food, to trigger people's memories of the past in a safe and comfortable environment and to encourage them to share and discuss their life experiences. A randomized controlled trial suggests that reminiscence therapy has a positive effect on cognitive impairment, anxiety and depression in patients with acute ischemic stroke, and can be used as a supplementary rehabilitation plan for post-stroke treatment.[14] Similarly, another study also indicates that reminiscence therapy has the same effect, demonstrating its potential for post-stroke management.[15] However, in the current studies on reminiscence therapy, scholars induced patients to have a sense of nostalgia through various media such as photos, music, and movies, thereby achieving therapeutic effects. It can be seen that there is no unified medium of reminiscence therapy at present. For this reason, we would like to conduct a network meta-analysis, which can summarize the direct and indirect evidence and provide the ranking of intervention options. To date, no network meta-analysis has been conducted to systematically compare which medium for reminiscence therapy have the best effect on cognitive function and mental health in elderly stroke patients. Therefore, the objective of the current protocol is to synthesize all evidence and provide clinicians with reliable medium references of reminiscence

therapy.

## Methods and analysis

This protocol will be developed following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols[16] and was registered on the PROSPERO platform (CRD42023447828).

### Eligibility criteria

Type of participants

Elderly stroke patients will be included. Patients with other major diseases, such as malignant tumors and organ failure, will be excluded.

Type of intervention

Reminiscence therapy that is combined with usual care and implemented in elderly patients with stroke will be included. However, multi-component interventions will be excluded. Reminiscence therapy may be aimed at improving cognitive function and mental health (such as depression and anxiety).

Comparison

Comparator will be considered the usual care of elderly patients with stroke, including medication management, diet, rehabilitation care and complication prevention, or reminiscence therapy with another medium plus usual care.

Type of outcomes

The outcomes will focus on cognitive function and mental health. Cognitive function may be measured by the Mini-Mental State Examination (MMSE) or Montreal Cognitive Assessment (MoCA). Mental health will include depression and

anxiety. Depression may be measured by the Geriatric Depression Scale (GDS) or the Cornell Scale for Depression (CSDD). Anxiety may be calculated by the Rating of Anxiety in Dementia (RAID) or the State Trait Anxiety Inventory (STAI). If the studies have more than one time of outcome evaluation, we will choose the longest time point.

Type of studies

Only randomized controlled trials written in English will be included. Cluster randomized controlled trials and cross-over randomized controlled trials will be excluded. Trials without a control group or in which the control group did not receive usual care will be excluded.

**Data sources and search strategy**

The professional search will use the Medical Subject Headings (MsSH) and free words. The search items will include stroke, apoplexy, cerebrovascular accident, CVA, brain vascular accident, subarachnoid hemorrhage, reminiscence therapy, life review, nostalgia therapy, and randomized controlled trial. We will search electronic databases to identify published studies, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The retrieval time will be from inception to August 2023. In addition to the database search, the references of the included studies and relevant reviews of reminiscence therapy implemented in stroke patients will be scanned to identify additional eligible studies.

**Study selection**

NoteExpress software will be used to download references of all retrieved studies.

Duplicate studies will be removed. Two reviewers will independently screen the titles and abstracts of the remaining studies to exclude studies that obviously do not meet the inclusion criteria. The preliminary results will be cross-checked. Then, the same two reviewers will independently examine the full-text studies to determine their eligibility. If there are disagreements, the third reviewer will be asked to evaluate the full text. The discrepancies will be resolved through discussion. Figure 1 shows the processes of study selection.

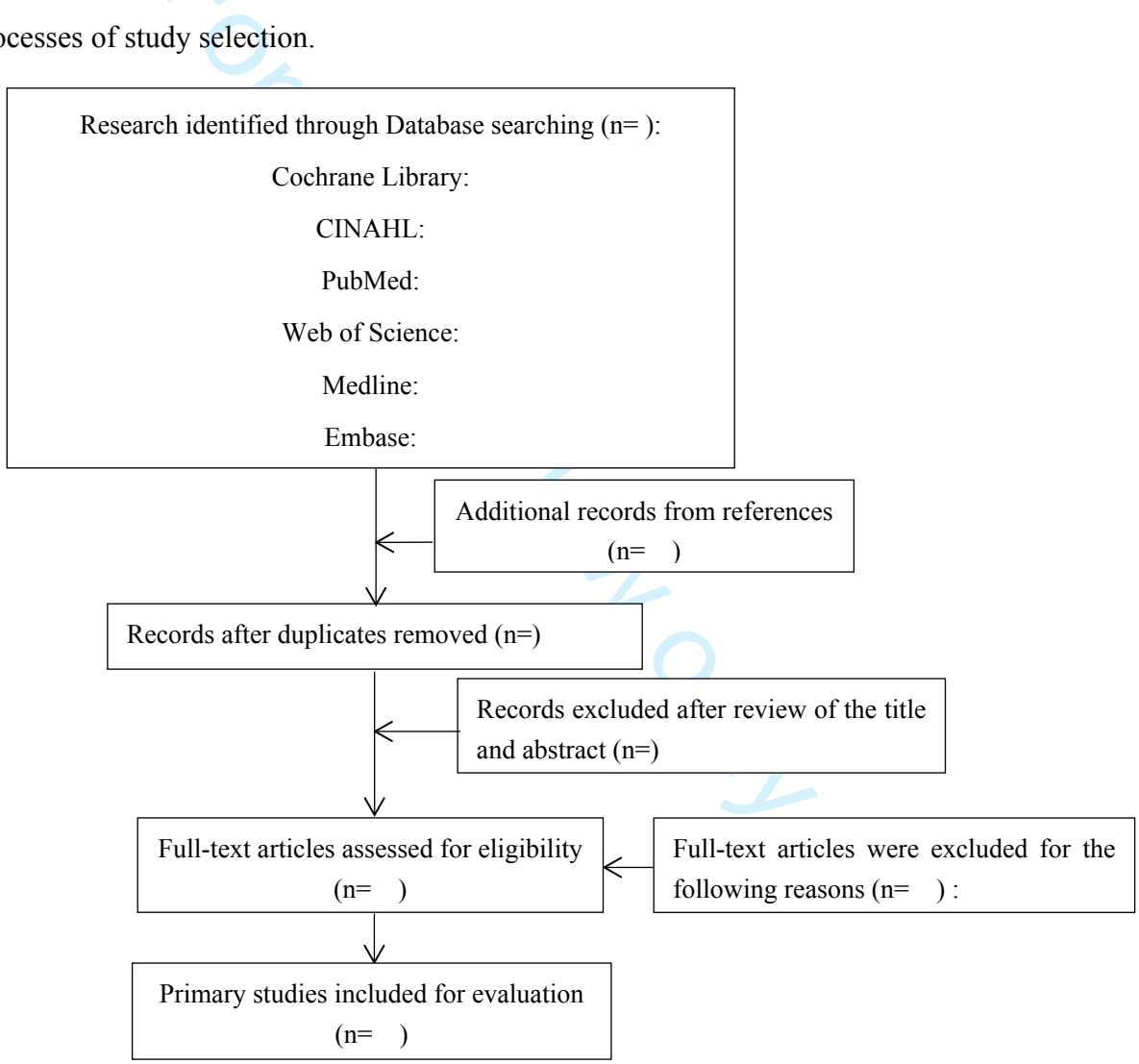


Fig. 1 The processes of study selection

**Data extraction**

First, a standard form for data extraction will be designed through a group discussion among all researchers. Then, two reviewers will independently extract data according to the standard form, which may include author (s), year of publication, sample size, characteristics of patients (such as age and sex), type of stroke, medium of reminiscence therapy, frequency and duration of intervention, outcome (s) and measurement (s). The results of data extraction will be crosschecked. The discrepancies will be resolved through discussions.

**Risk of bias assessment**

We will use the revised version of the Cochrane tool (RoB 2) to evaluate the risk of bias for all included studies.[17] RoB 2 includes five domains, including bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in the measurement of the outcome and bias in the selection of the reported result. The assessment of each domain will be rated as 'low risk of bias', 'some concerns' or 'high risk of bias'. The response options for an overall risk-of-bias judgment are the same as those for individual domains. The risk of bias for each study will be independently examined by two reviewers, and then the results will be cross-checked. Differences will be resolved through team discussion with the third reviewer.

**Statistical analysis**

Pairwise and network meta-analysis

We will use the Review Manager 5.3 software to conduct a pairwise meta-analysis. Standardized mean differences with 95% confidence intervals will be used for continuous outcomes. The $\chi^2$ test will be used to assess heterogeneity. A fixed-effects

model will be used to synthesize the standardized mean difference if the *p* value is ≥0.1. Conversely, if the *p* value is <0.1, a random-effects model will be used. Due to the expected heterogeneity between studies, the effects of different art therapies will be compared by conducting a random-effects network meta-analysis within a Bayesian framework using Markov Chains Monte Carlo in R software (version 4.1.3). Brooks-Gelman-Rubin diagnosis and potential scale reduction factor will be used to ensure the convergence of the model.[18] The surface under the cumulative ranking curve with its 95% confidence interval and rank-heat plot will be used to evaluate the hierarchy of each art therapy.[19 20]

Dealing with missing data

The missing data will be obtained by contacting the corresponding authors whenever possible. We will try to calculate the missing data based on availability factors if there is no reply. Sensitivity analysis will be used to examine the potential impact of missing data on the results of this study.

Assessment of publication bias

If this network meta-analysis includes more than nine studies, funnel plots and Egger's regression tests will be used to evaluate the presence of publication bias in Stata software (version 15.0).[21 22]

Assessment of inconsistency and subgroup analysis

Based on a loop-special method within each loop of the network,[23] the local inconsistency and global inconsistency will be measured in Stata software (version 15.0)**Error! Reference source not found.**.[24] If heterogeneity or inconsistency exists, the sources

of heterogeneity will be explored by network meta regression. Subgroup analysis will be performed in accordance with age, sex, type of disease or duration of intervention.

Sensitivity analysis

We will perform a sensitivity analysis for all outcomes to verify the robustness of the findings. After excluding the selected studies that are judged to be at high risk of bias and with missing data, whether the results are changed and whether the transitivity (consistency and model fit) is affected will be examined.

Quality of evidence

We will also evaluate the quality of evidence conducing to all outcomes based on the Grading of Recommendations Assessment, Development and Evaluation framework, according to the limitations of study, imprecision, heterogeneity, inconsistency, indirectness and publication bias.[25]

## Discussion

Aging has become one of the major contributors to the increased mortality from stroke.[26] The world faces more and more challenges in reducing the disease burden from stroke. The symptoms, such as cognitive impairment, depression and anxiety will seriously increase the risk of adverse outcomes in stroke survivors, which will bring enormous burdens to caregivers and society. Reminiscence therapy can guide people to review past events and thoughts, thereby enhancing their sense of happiness, improving their cognitive function and the ability to adapt to existing life, and reducing their psychological burden. In recent years, various media have been applied in reminiscence therapy applied to stroke patients. For instance, a previous study

suggests that reminiscence therapy using photos can help to improve cognitive function and relieve negative mood states.[27]

However, to date, no network meta-analysis has been conducted to assess the comparative efficacy of reminiscence therapy with different media. This means that, in order to identify the effects of various media of reminiscence therapy, it is necessary to perform a network meta-analysis. To the best of our knowledge, this is the first network meta-analysis to analyze the effects of reminiscence therapy with different media in elderly stroke patients. In accordance with the comparative effectiveness evidence, the findings are expected to provide a ranking of these media used for reminiscence therapy to improve cognitive function and mental health in elderly stroke patients. The results could help clinicians and guideline setters choose the appropriate intervention and develop guidelines for elderly stroke patients.

**Ethics and dissemination**

This study is based on published data, so ethical approval is not a requirement. We plan to publish the findings of this study in a peer-reviewed journal. This work will start on 1st September 2023. The expected end time is 29 February 2024. The results will be reported based on the PRISMA-compliant guidelines.

**Authors' contributions**

Qian Liu designed this study with oversight by Xiuying Hu and Hong Cheng. Qian Liu drafted the protocol, and the draft was modified by Li Liu, Fang Wang and Xiuying Hu. Qian Liu and Lixia Tan will search, select, and identify studies and extract data independently, while Li Liu will be the third reviewer for study selection

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**Funding statement**

This study is funded by a project from the West China Hospital of Sichuan University (Grant No. HXDZ21003).

**Competing interests statement**

The authors have no conflicts of interest to disclose.

**Patient and Public Involvement**

This study is based on published data, so patients or the public were not involved in the design, conduct, reporting, and dissemination plans of our research.

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**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Page |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | 1 |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | NA |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | 2 |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | 1 |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | 11 |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | NA |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | 11 |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | 11 |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | 11 |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | 2-4 |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | 2-4 |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | 4-5 |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | 4-5 |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated | 6 |
| Study records: | | | |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | 7 |

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|---|---|---|---|
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | 6 |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | 7 |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | 7 |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | 5 |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | 8 |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | 8-9 |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | 8-9 |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | 8-9 |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | NA |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | 8-9 |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | 10 |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*

BMJ Open

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| Complete List of Authors: | Liu, Qian; West China Hospital of Sichuan University<br>Liu, Li; Sichuan University,<br>Wang, Fang; Sichuan University West China Hospital, West China School of Nursing/Innovation Center of Nursing Research, Nursing Key Laboratory of Sichuan Province, National Clinical Research Center for Geriatrics<br>Tan, Lixia; Sichuan University<br>Cheng, Hong; University of Electronic Science and Technology of China<br>Hu, Xiuying; Sichuan University West China Hospital, Innovation Center of Nursing Research |
| Primary Subject Heading: | Nursing |
| Secondary Subject Heading: | Nursing |
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# Title page

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## List of all authors

Qian Liu[1], Li Liu[1], Fang Wang[1], Lixia Tan[1], Hong Cheng[2], Xiuying Hu[1,*]

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## Authors' contributions

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**Conflict of Interest**

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## Abstract

Introduction: Stroke is a common cause of death and disability in the older adult and increases the risk and severity of cognitive impairment, which is a factor for long-term death among stroke survivors. Some studies have focused on the effects of reminiscence therapy with different media on stroke survivors. It is currently unclear which is the best medium. This protocol aims to deal with this problem by using a network meta-analysis.

Methods and analysis: Published randomized controlled trials will be included if reminiscence therapy plus usual care was applied in older adult patients with stroke in the experimental group and usual care was applied in the control group. Six electronic databases will be searched from their inception to August 2023, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The media of reminiscence therapy may include (but not restricted to) old photos, music or movies. Outcomes will be cognitive function and negative moods. Study selection, data extraction and quality assessment will be performed independently by two reviewers. The risk of bias of the included studies will be evaluated in accordance with the Cochrane Collaboration's risk of bias tool. The evidence quality will be measured based on the Grading of Recommendations Assessment, Development and

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PROSPERO registration number: CRD42023447828.

Key words: reminiscence therapy; stroke; network meta-analysis; cognitive function; negative mood

## Strengths and limitations of this study

1. Network meta-analysis allows for the simultaneous comparison of multiple interventions in a single model.

2. Network meta-analysis can improve precision of intervention effect estimates and rank interventions based on their effectiveness and assess the

3. Due to the retrospective nature of this study, the findings may be influenced by the quantity and quality of the included studies.

## Introduction

With the rapid development of global population aging, the number of older adult

patients with chronic diseases is also increasing. Stroke is still a common cause of death and disability in older adult,[1 2] with a high incidence, high disability rate, high mortality, high recurrence rate, and high economic burden.[3] With the progress of medicine, the emergency medical systems and innovative treatment methods have improved, and the mortality rate of stroke patients has been reduced to a certain extent. However, more and more stroke survivors are struggling with post-stroke complications. [4-6] In particular, stroke increases the risk and severity of cognitive impairment,[7] such as sensory perception, memory, thinking, imagination, and language. More than 70% of stroke survivors have cognitive deficits related to disability, dependency and morbidity, posing a significant burden on patients, caregivers, and the health care system.[8] Moreover, the decline in stress and cognitive abilities can easily cause negative moods among stroke survivors when facing physical discomfort and the financial burden of treatment, leading to decreased quality of life in patients. Negative moods includes depression, anxiety, stress, and fatigue, which are very common in old adult patients with stroke.[9-12] Importantly, post-stroke cognitive impairment and negative moods are important risk factors for poor prognosis and low survival rate.[13-15] Therefore, efforts to relieve cognitive impairment and negative moods in stroke survivors have never been stopped.

Reminiscence therapy was proposed by Butler in 1963 based on Eric Erickson's theory of psychosocial development, which first emphasized the importance of nostalgia and life review for the older adult to successfully adapt to aging.[16] Nursing Interventions Classification defines reminiscence therapy as helping people improve

their sense of well-being, quality of life, and adaptability to existing surroundings by recalling the past events, thoughts, and emotions.[17] Reminiscence therapy uses familiar objects, such as old photos, music, and food, to trigger people's memories of the past in a safe and comfortable environment and to encourage them to share and discuss their life experiences, which can help reduce negative memories and increases positive ones, and alleviate negative moods.[18] A randomized controlled trial suggests that reminiscence therapy has a positive effect on cognitive impairment and negative moods (anxiety and depression) in patients with acute ischemic stroke, and can be used as a supplementary rehabilitation plan for post-stroke treatment.[19] Similarly, another study also indicates that reminiscence therapy has the same effect, demonstrating its potential for post-stroke management.[20]

However, in the current studies on reminiscence therapy, scholars induced patients to have a sense of nostalgia through various media such as photos, music, and movies, thereby achieving therapeutic effects. It can be seen that there is no unified medium of reminiscence therapy at present. For this reason, we would like to conduct a network meta-analysis, which can summarize the direct and indirect evidence and provide the ranking of intervention options. To date, no network meta-analysis has been conducted to systematically compare which medium for reminiscence therapy have the best effect on cognitive function and negative moods in older adult patients with stroke. Therefore, this study will evaluate the effects of reminiscence therapies with different media on cognitive function and negative moods in older adult patients with stroke through a network meta-analysis.

## Methods and analysis

This protocol will be developed following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols[21] and was registered on the PROSPERO platform (CRD42023447828).

### Eligibility criteria

Type of participants

Older adult patients (60 years old and above) with stroke will be included. The disease duration should be less than 6 months and it should be the initial stroke. The condition of stroke patients should be in a stable or recovery phase. Patients with other major diseases, such as malignant tumors and organ failure, will be excluded.

Type of intervention

Reminiscence therapy that is combined with usual care and implemented in older adult patients with stroke will be included. However, multi-component interventions will be excluded. Reminiscence therapy may be aimed at improving cognitive function and negative moods.

Comparison

Comparator will be considered the usual care of older adult patients with stroke, including medication management, diet, rehabilitation care and complication prevention, or reminiscence therapy with another medium.

Type of outcomes

The outcomes will focus on cognitive function and negative moods. Cognitive function outcomes mainly includes sensory perception, memory, thinking,

imagination, and language. Cognitive functionmay be measured by the Mini-Mental State Examination (MMSE) or Montreal Cognitive Assessment (MoCA), which covers 9 cognitive domains including attention, concentration, executive functions, memory, language, visuospatial ability, conceptual thinking, calculations, and orientation. The Trail Making Test (TMT) Parts A and B may be used to assess executive function, which has been shown to correlate with processing speed and cognitive fluidity.[22] Negative moods mainly include depression, anxiety, stress, and fatigue. Depression may be measured by the Geriatric Depression Scale (GDS), the Cornell Scale for Depression (CSDD), or the Depression-Anxiety-Stress Scale-21. Anxiety may be calculated by the Rating of Anxiety in Dementia (RAID), the State Trait Anxiety Inventory (STAI), or the Depression-Anxiety-Stress Scale-21. Stress may be measured by Depression-Anxiety-Stress Scale-21 or Chinese Perceived Stress Scale. Fatigue may be measured by Fatigue Assessment Scale, Brief Fatigue Inventory, or Fatigue Severity Scale. If the studies have more than one time of outcome evaluation, we will choose the longest time point.

Type of studies

Only randomized controlled trials written in English will be included. Cluster randomized controlled trials and cross-over randomized controlled trials will be excluded. Trials without a control group or in which the control group did not receive usual care will be excluded.

**Data sources and search strategy**

The professional search will use the Medical Subject Headings (MsSH) and free

words. The search items will include stroke, apoplexy, cerebrovascular accident, CVA, brain vascular accident, subarachnoid hemorrhage, reminiscence therapy, life review, nostalgia therapy, and randomized controlled trial. We will search electronic databases to identify published studies, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The retrieval time will be from inception to August 2023. In addition to the database search, the references of the included studies and relevant reviews of reminiscence therapy implemented in stroke patients will be scanned to identify additional eligible studies.

**Study selection**

NoteExpress software will be used to download references of all retrieved studies. Duplicate studies will be removed. Two reviewers will independently screen the titles and abstracts of the remaining studies to exclude studies that obviously do not meet the inclusion criteria. The preliminary results will be cross-checked. Then, the same two reviewers will independently examine the full-text studies to determine their eligibility. If there are disagreements, the third reviewer will be asked to evaluate the full text. The discrepancies will be resolved through discussion. Figure 1 shows the processes of study selection.

**Data extraction**

First, a standard form for data extraction will be designed through a group discussion among all researchers. Then, two reviewers will independently and carefully read the eligible full text and extract data according to the standard form, which may include author (s), year of publication, sample size, characteristics of

patients (such as age and sex), type of stroke, medium of reminiscence therapy, frequency and duration of intervention, outcome (s) and measurement (s). The dichotomous and continuous outcomes will be directly extracted. The results of data extraction will be crosschecked. The discrepancies will be resolved through discussions.

**Risk of bias assessment**

We will use the revised version of the Cochrane tool (RoB 2) to evaluate the risk of bias for all included studies.[23] RoB 2 includes five domains, including bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in the measurement of the outcome and bias in the selection of the reported result. The assessment of each domain will be rated as 'low risk of bias', 'some concerns' or 'high risk of bias'. The response options for an overall risk-of-bias judgment are the same as those for individual domains. The risk of bias for each study will be independently examined by two reviewers, and then the results will be cross-checked. Differences will be resolved through team discussion with the third reviewer. In addition, Cohen's kappa values will be calculated to measure agreement between reviewers.

**Statistical analysis**

Pairwise and network meta-analysis

We will use the Review Manager 5.3 software to conduct a pairwise meta-analysis. Standardized mean differences with 95% confidence intervals will be used for continuous outcomes. The $\chi^2$ test will be used to assess heterogeneity. A fixed-effects model will be used to synthesize the standardized mean difference if the *p* value is

≥0.1. Conversely, if the *p* value is <0.1, a random-effects model will be used. Due to the expected heterogeneity between studies, the effects of different art therapies will be compared by conducting a random-effects network meta-analysis within a Bayesian framework using Markov Chains Monte Carlo in R software (version 4.1.3). Brooks-Gelman-Rubin diagnosis and potential scale reduction factor will be used to ensure the convergence of the model.[24] The surface under the cumulative ranking curve with its 95% confidence interval and rank-heat plot will be used to evaluate the hierarchy of each art therapy.[25 26]

Dealing with missing data

The missing data, such as outcome scores and type of medium, will be obtained by contacting the corresponding authors whenever possible. We will try to calculate the missing data based on availability factors if there is no reply. Sensitivity analysis will be used to examine the potential impact of missing data on the results of this study.

Assessment of publication bias

If this network meta-analysis includes more than nine studies, funnel plots and Egger's regression tests will be used to evaluate the presence of publication bias in Stata software (version 15.0).[27 28]

Assessment of inconsistency and subgroup analysis

Based on a loop-special method within each loop of the network,[29] the local inconsistency and global inconsistency will be measured in Stata software (version 15.0)[30] If heterogeneity or inconsistency exists, the sources of heterogeneity will be explored by network meta regression. Subgroup analysis will be performed using the

same methods described above. The priori hypothesis is as follows: ≥80 years old and with a poorly cognitive function at baseline.

Sensitivity analysis

We will perform a sensitivity analysis for all outcomes to verify the robustness of the findings. After excluding the selected studies that are judged to be at high risk of bias and with missing data, whether the results are changed and whether the transitivity (consistency and model fit) is affected will be examined.

Quality of evidence

We will also evaluate the quality of evidence conducing to all outcomes based on the Grading of Recommendations Assessment, Development and Evaluation framework, according to the limitations of study, imprecision, heterogeneity, inconsistency, indirectness and publication bias.[31]

Patient and Public Involvement

This study is based on published data, so patients or the public were not involved in the design, conduct, reporting, and dissemination plans of our research.

# Discussion

Aging has become one of the major contributors to the increased mortality from stroke.[32] The world faces more and more challenges in reducing the disease burden from stroke. The symptoms, such as cognitive impairment, depression and anxiety will seriously increase the risk of adverse outcomes in stroke survivors, which will bring enormous burdens to caregivers and society. Reminiscence therapy can guide people to review past events and thoughts, thereby enhancing their sense of happiness,

improving their cognitive function and the ability to adapt to existing life, and reducing their psychological burden. In recent years, various media have been applied in reminiscence therapy applied to stroke patients. For instance, a previous study suggests that reminiscence therapy using photos can help to improve cognitive function and relieve negative moods.[33]

However, to date, no network meta-analysis has been conducted to assess the comparative efficacy of reminiscence therapy with different media. This means that, in order to identify the effects of various media of reminiscence therapy, it is necessary to perform a network meta-analysis. To the best of our knowledge, this is the first network meta-analysis to analyze the effects of reminiscence therapy with different media in older adult patients with stroke. In accordance with the comparative effectiveness evidence, the findings are expected to provide a ranking of these media used for reminiscence therapy to improve cognitive function and negative moods in older adult patients with stroke. The results could help clinicians and guideline setters choose the appropriate intervention and develop guidelines for older adult patients with stroke.

## Ethics and dissemination

This study is based on published data, so ethical approval is not a requirement. We plan to publish the findings of this study in a peer-reviewed journal. This work will start on 1st September 2023. The expected end time is 29 February 2024. The results will be reported based on the PRISMA-compliant guidelines.

## Authors' contributions

Qian Liu designed this study with oversight by Xiuying Hu and Hong Cheng. Qian Liu drafted the protocol, and the draft was modified by Li Liu, Fang Wang and Xiuying Hu. Qian Liu and Lixia Tan will search, select, and identify studies and extract data independently, while Li Liu will be the third reviewer for study selection and data extraction. Qian Liu will be responsible for the methodology. All authors have approved the publication of this protocol.

**Funding statement**

This study is funded by a project from the West China Hospital of Sichuan University (Grant No. HXDZ21003).

**Competing interests statement**

The authors have no conflicts of interest to disclose.

Fig. 1 The processes of study selection

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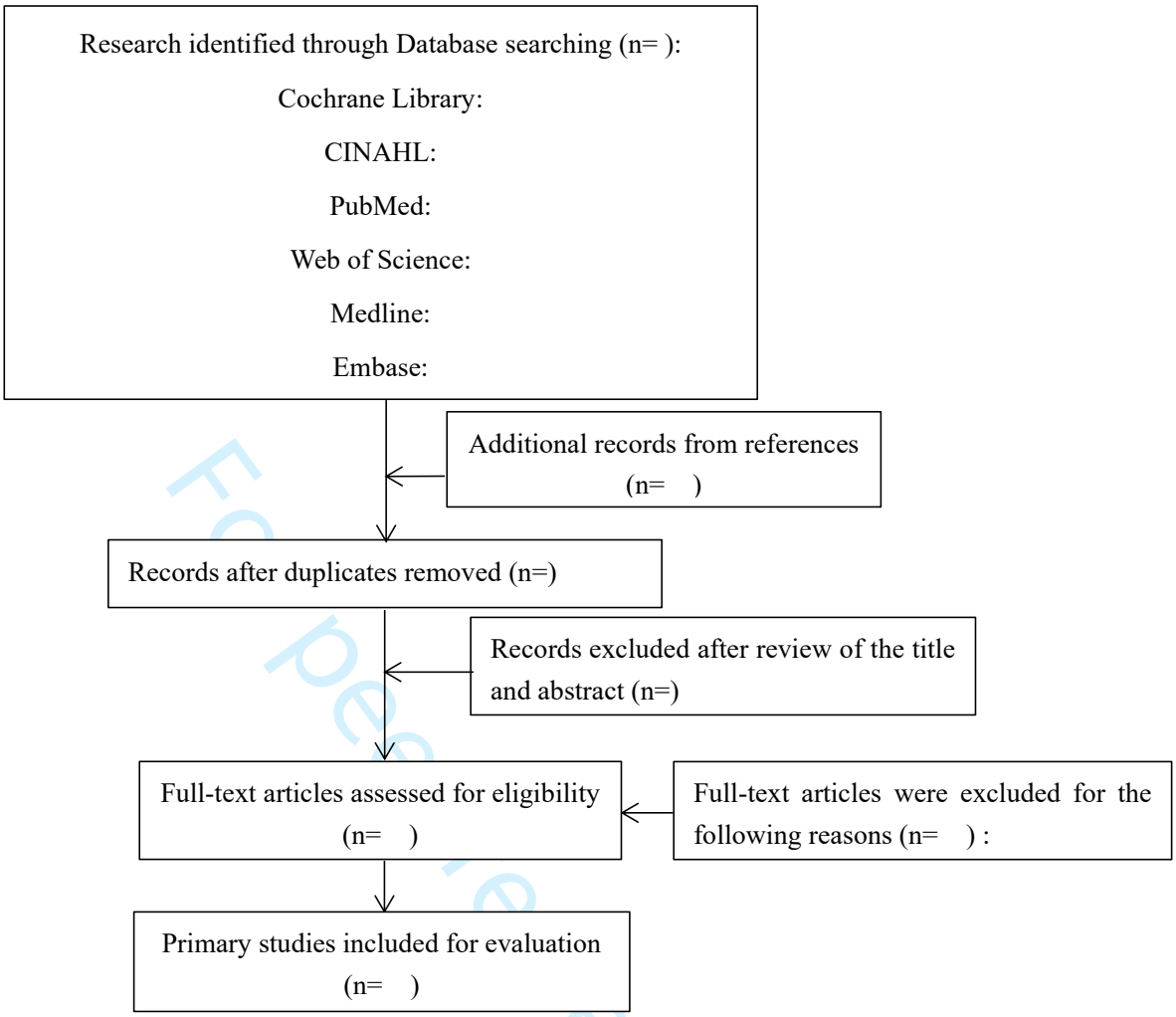


Fig. 1 The processes of study selection

**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Page |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | 1 |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | NA |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | 2 |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | 1 |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | 11 |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | NA |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | 11 |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | 11 |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | 11 |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | 2-4 |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | 2-4 |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | 4-5 |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | 4-5 |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated | 6 |
| Study records: | | | |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | 7 |

| | | | |
|---|---|---|---|
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | 6 |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | 7 |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | 7 |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | 5 |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | 8 |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | 8-9 |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | 8-9 |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | 8-9 |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | NA |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | 8-9 |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | 10 |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*

BMJ Open

# Efficacy of reminiscence therapy with different media on cognitive function and negative moods for older adult patients with stroke: protocol of a network meta-analysis



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| Journal: | *BMJ Open* |
| Manuscript ID | bmjopen-2023-078526.R2 |
| Article Type: | Protocol |
| Date Submitted by the Author: | 10-Aug-2024 |
| Complete List of Authors: | Liu, Qian; West China Hospital of Sichuan University<br>Liu, Li; Sichuan University,<br>Wang, Fang; Sichuan University West China Hospital, West China School of Nursing/Innovation Center of Nursing Research, Nursing Key Laboratory of Sichuan Province, National Clinical Research Center for Geriatrics<br>Tan, Lixia; Sichuan University<br>Cheng, Hong; University of Electronic Science and Technology of China<br>Hu, Xiuying; Sichuan University West China Hospital, Innovation Center of Nursing Research |
| Primary Subject Heading: | Nursing |
| Secondary Subject Heading: | Nursing |
| Keywords: | Stroke < NEUROLOGY, Delirium & cognitive disorders < PSYCHIATRY, MENTAL HEALTH |
| | |

# Title page

## Title

Efficacy of reminiscence therapy with different media on cognitive function and negative moods for older adult patients with stroke: protocol of a network meta-analysis

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## Authors' contributions

Qian Liu designed this study with oversight by Xiuying Hu and Hong Cheng. Qian Liu drafted the protocol, and the draft was modified by Li Liu, Fang Wang and Xiuying Hu. Qian Liu and Lixia Tan will search, select, and identify studies and extract data independently, while Li Liu will be the third reviewer for study selection

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**Funding Statement**

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**Conflict of Interest**

The authors have no conflicts of interest to disclose.

# Efficacy of reminiscence therapy with different media on cognitive function and negative moods for older adult patients with stroke: protocol of a network meta-analysis


## Abstract

Introduction: Stroke is a common cause of death and disability in the older adult and increases the risk and severity of cognitive impairment, which is a factor for long-term death among stroke survivors. Some studies have focused on the effects of reminiscence therapy with different media on stroke survivors. It is currently unclear which is the best medium. This protocol aims to deal with this problem by using a network meta-analysis.

Methods and analysis: Published randomized controlled trials will be included if reminiscence therapy plus usual care was applied in older adult patients with stroke in the experimental group and usual care was applied in the control group. Six electronic databases will be searched from their inception to August 2023, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The media of reminiscence therapy may include (but not restricted to) old photos, music or movies. Outcomes will be cognitive function and negative moods. Study selection, data extraction and quality assessment will be performed independently by two reviewers. The risk of bias of the included studies will be evaluated in accordance with the Cochrane Collaboration's risk of bias tool. The evidence quality will be measured based on the Grading of Recommendations Assessment, Development and

Evaluation. To compare the efficacy of reminiscence therapy with different media, standard pairwise meta-analysis and Bayesian network meta-analysis will be conducted. The probabilities of intervention for all outcomes will be ranked based on the surface under the cumulative ranking curve.

Ethics and dissemination: Ethical approval is not required for reviewing published studies. The findings will be submitted to a peer-reviewed journal for review and publication to provide important evidence for clinicians and guideline developers to determine interventions for older adult patients with stroke.

PROSPERO registration number: CRD42023447828.

Key words: reminiscence therapy; stroke; network meta-analysis; cognitive function; negative mood

## Strengths and limitations of this study

1. Network meta-analysis allows for the simultaneous comparison of multiple interventions in a single model.

2. Network meta-analysis can improve precision of intervention effect estimates and rank interventions based on their effectiveness and assess the

3. Due to the retrospective nature of this study, the findings may be influenced by the quantity and quality of the included studies.

## Introduction

With the rapid development of global population aging, the number of older adult

patients with chronic diseases is also increasing. Stroke is still a common cause of death and disability in older adult,[1 2] with a high incidence, high disability rate, high mortality, high recurrence rate, and high economic burden.[3] With the progress of medicine, the emergency medical systems and innovative treatment methods have improved, and the mortality rate of stroke patients has been reduced to a certain extent. However, more and more stroke survivors are struggling with post-stroke complications. [4-6] In particular, stroke increases the risk and severity of cognitive impairment,[7] such as sensory perception, memory, thinking, imagination, and language. More than 70% of stroke survivors have cognitive deficits related to disability, dependency and morbidity, posing a significant burden on patients, caregivers, and the health care system.[8] Moreover, the decline in stress and cognitive abilities can easily cause negative moods among stroke survivors when facing physical discomfort and the financial burden of treatment, leading to decreased quality of life in patients. Negative moods includes depression, anxiety, stress, and fatigue, which are very common in old adult patients with stroke.[9-12] Importantly, post-stroke cognitive impairment and negative moods are important risk factors for poor prognosis and low survival rate.[13-15] Therefore, efforts to relieve cognitive impairment and negative moods in stroke survivors have never been stopped.

Reminiscence therapy was proposed by Butler in 1963 based on Eric Erickson's theory of psychosocial development, which first emphasized the importance of nostalgia and life review for the older adult to successfully adapt to aging.[16] Nursing Interventions Classification defines reminiscence therapy as helping people improve

their sense of well-being, quality of life, and adaptability to existing surroundings by recalling the past events, thoughts, and emotions.[17] Reminiscence therapy uses familiar objects, such as old photos, music, and food, to trigger people's memories of the past in a safe and comfortable environment and to encourage them to share and discuss their life experiences, which can help reduce negative memories and increases positive ones, and alleviate negative moods.[18] A randomized controlled trial suggests that reminiscence therapy has a positive effect on cognitive impairment and negative moods (anxiety and depression) in patients with acute ischemic stroke, and can be used as a supplementary rehabilitation plan for post-stroke treatment.[19] Similarly, another study also indicates that reminiscence therapy has the same effect, demonstrating its potential for post-stroke management.[20]

However, in the current studies on reminiscence therapy, scholars induced patients to have a sense of nostalgia through various media such as photos, music, and movies, thereby achieving therapeutic effects. It can be seen that there is no unified medium of reminiscence therapy at present. For this reason, we would like to conduct a network meta-analysis, which can summarize the direct and indirect evidence and provide the ranking of intervention options. To date, no network meta-analysis has been conducted to systematically compare which medium for reminiscence therapy have the best effect on cognitive function and negative moods in older adult patients with stroke. Therefore, this study will evaluate the effects of reminiscence therapies with different media on cognitive function and negative moods in older adult patients with stroke through a network meta-analysis.

## Methods and analysis

This protocol will be developed following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols[21] and was registered on the PROSPERO platform (CRD42023447828).

### Eligibility criteria

Type of participants

Older adult patients (60 years old and above) with stroke will be included. The disease duration should be less than 6 months and it should be the initial stroke. The condition of stroke patients should be in a stable or recovery phase. Patients with other major diseases, such as malignant tumors and organ failure, will be excluded.

Type of intervention

Reminiscence therapy that is combined with usual care and implemented in older adult patients with stroke will be included. However, multi-component interventions will be excluded. Reminiscence therapy may be aimed at improving cognitive function and negative moods.

Comparison

Comparator will be considered the usual care of older adult patients with stroke, including medication management, diet, rehabilitation care and complication prevention, or reminiscence therapy with another medium.

Type of outcomes

The outcomes will focus on cognitive function and negative moods. Cognitive function outcomes mainly includes sensory perception, memory, thinking,

imagination, and language. Cognitive functionmay be measured by the Mini-Mental State Examination (MMSE) or Montreal Cognitive Assessment (MoCA), which covers 9 cognitive domains including attention, concentration, executive functions, memory, language, visuospatial ability, conceptual thinking, calculations, and orientation. The Trail Making Test (TMT) Parts A and B may be used to assess executive function, which has been shown to correlate with processing speed and cognitive fluidity.[22] Negative moods mainly include depression, anxiety, stress, and fatigue. Depression may be measured by the Geriatric Depression Scale (GDS), the Cornell Scale for Depression (CSDD), or the Depression-Anxiety-Stress Scale-21. Anxiety may be calculated by the Rating of Anxiety in Dementia (RAID), the State Trait Anxiety Inventory (STAI), or the Depression-Anxiety-Stress Scale-21. Stress may be measured by Depression-Anxiety-Stress Scale-21 or Chinese Perceived Stress Scale. Fatigue may be measured by Fatigue Assessment Scale, Brief Fatigue Inventory, or Fatigue Severity Scale. If the studies have more than one time of outcome evaluation, we will choose the longest time point.

Type of studies

Only randomized controlled trials written in English will be included. Cluster randomized controlled trials and cross-over randomized controlled trials will be excluded. Trials without a control group or in which the control group did not receive usual care will be excluded.

**Data sources and search strategy**

The professional search will use the Medical Subject Headings (MsSH) and free

words. The search items will include stroke, apoplexy, cerebrovascular accident, CVA, brain vascular accident, subarachnoid hemorrhage, reminiscence therapy, life review, nostalgia therapy, and randomized controlled trial. We will search electronic databases to identify published studies, including the Cochrane Library, CINAHL, PubMed, Web of Science, Medline, and Embase. The retrieval time will be from inception to August 2023. In addition to the database search, the references of the included studies and relevant reviews of reminiscence therapy implemented in stroke patients will be scanned to identify additional eligible studies.

**Study selection**

NoteExpress software will be used to download references of all retrieved studies. Duplicate studies will be removed. Two reviewers will independently screen the titles and abstracts of the remaining studies to exclude studies that obviously do not meet the inclusion criteria. The preliminary results will be cross-checked. Then, the same two reviewers will independently examine the full-text studies to determine their eligibility. If there are disagreements, the third reviewer will be asked to evaluate the full text. The discrepancies will be resolved through discussion. Figure 1 shows the processes of study selection.

**Data extraction**

First, a standard form for data extraction will be designed through a group discussion among all researchers. Then, two reviewers will independently and carefully read the eligible full text and extract data according to the standard form, which may include author (s), year of publication, sample size, characteristics of

patients (such as age and sex), type of stroke, medium of reminiscence therapy, frequency and duration of intervention, outcome (s) and measurement (s). The dichotomous and continuous outcomes will be directly extracted and submitted to the admission Excel sheet. The results of data extraction will be crosschecked and discrepancies will be resolved through discussions. After extracting the outcomes, dichotomous outcomes will be labeled, such as 0 for males and 1 for females. Continuous outcomes will not be processed and will be directly input into statistical software for analysis.

**Risk of bias assessment**

We will use the revised version of the Cochrane tool (RoB 2) to evaluate the risk of bias for all included studies.[23] RoB 2 includes five domains, including bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in the measurement of the outcome and bias in the selection of the reported result. The assessment of each domain will be rated as 'low risk of bias', 'some concerns' or 'high risk of bias'. The response options for an overall risk-of-bias judgment are the same as those for individual domains. The risk of bias for each study will be independently examined by two reviewers, and then the results will be cross-checked. Differences will be resolved through team discussion with the third reviewer. In addition, Cohen's kappa values will be calculated to measure agreement between reviewers.

**Statistical analysis**

Pairwise and network meta-analysis

We will use the Review Manager 5.3 software to conduct a pairwise meta-analysis.

Standardized mean differences with 95% confidence intervals will be used for continuous outcomes. The $\chi^2$ test will be used to assess heterogeneity. A fixed-effects model will be used to synthesize the standardized mean difference if the *p* value is ≥0.1. Conversely, if the *p* value is <0.1, a random-effects model will be used. Due to the expected heterogeneity between studies, the effects of different art therapies will be compared by conducting a random-effects network meta-analysis within a Bayesian framework using Markov Chains Monte Carlo in R software (version 4.1.3). Brooks-Gelman-Rubin diagnosis and potential scale reduction factor will be used to ensure the convergence of the model.[24] The surface under the cumulative ranking curve with its 95% confidence interval and rank-heat plot will be used to evaluate the hierarchy of each art therapy.[25 26]

Dealing with missing data

The missing data, such as outcome scores and type of medium, will be obtained by contacting the corresponding authors whenever possible. We will try to calculate the missing data based on availability factors if there is no reply. Sensitivity analysis will be used to examine the potential impact of missing data on the results of this study.

Assessment of publication bias

If this network meta-analysis includes more than nine studies, funnel plots and Egger's regression tests will be used to evaluate the presence of publication bias in Stata software (version 15.0).[27 28]

Assessment of inconsistency and subgroup analysis

Based on a loop-special method within each loop of the network,[29] the local

inconsistency and global inconsistency will be measured in Stata software (version 15.0)[30] If heterogeneity or inconsistency exists, the sources of heterogeneity will be explored by network meta regression. Subgroup analysis will be performed using the same methods described above. The priori hypothesis is as follows: ≥80 years old and with a poorly cognitive function at baseline.

Sensitivity analysis

We will perform a sensitivity analysis for all outcomes to verify the robustness of the findings. After excluding the selected studies that are judged to be at high risk of bias and with missing data, whether the results are changed and whether the transitivity (consistency and model fit) is affected will be examined.

Quality of evidence

We will also evaluate the quality of evidence conducing to all outcomes based on the Grading of Recommendations Assessment, Development and Evaluation framework, according to the limitations of study, imprecision, heterogeneity, inconsistency, indirectness and publication bias.[31]

Patient and Public Involvement

This study is based on published data, so patients or the public were not involved in the design, conduct, reporting, and dissemination plans of our research.

# Discussion

Aging has become one of the major contributors to the increased mortality from stroke.[32] The world faces more and more challenges in reducing the disease burden from stroke. The symptoms, such as cognitive impairment, depression and anxiety

will seriously increase the risk of adverse outcomes in stroke survivors, which will bring enormous burdens to caregivers and society. Reminiscence therapy can guide people to review past events and thoughts, thereby enhancing their sense of happiness, improving their cognitive function and the ability to adapt to existing life, and reducing their psychological burden. In recent years, various media have been applied in reminiscence therapy applied to stroke patients. For instance, a previous study suggests that reminiscence therapy using photos can help to improve cognitive function and relieve negative moods.[33]

However, to date, no network meta-analysis has been conducted to assess the comparative efficacy of reminiscence therapy with different media. This means that, in order to identify the effects of various media of reminiscence therapy, it is necessary to perform a network meta-analysis. To the best of our knowledge, this is the first network meta-analysis to analyze the effects of reminiscence therapy with different media in older adult patients with stroke. In accordance with the comparative effectiveness evidence, the findings are expected to provide a ranking of these media used for reminiscence therapy to improve cognitive function and negative moods in older adult patients with stroke. The results could help clinicians and guideline setters choose the appropriate intervention and develop guidelines for older adult patients with stroke.

## Ethics and dissemination

This study is based on published data, so ethical approval is not a requirement. We plan to publish the findings of this study in a peer-reviewed journal. This work will

start on 1st September 2023. The expected end time is 29 February 2024. The results will be reported based on the PRISMA-compliant guidelines.

**Authors' contributions**

Qian Liu designed this study with oversight by Xiuying Hu and Hong Cheng. Xiuying Hu is the guarantor. Qian Liu drafted the protocol, and the draft was modified by Li Liu, Fang Wang and Xiuying Hu. Qian Liu and Lixia Tan will search, select, and identify studies and extract data independently, while Li Liu will be the third reviewer for study selection and data extraction. Qian Liu will be responsible for the methodology. All authors have approved the publication of this protocol.

**Funding statement**

This study is funded by a project from the West China Hospital of Sichuan University (Grant No. HXDZ21003).

**Competing interests statement**

The authors have no conflicts of interest to disclose.

Fig. 1 The processes of study selection

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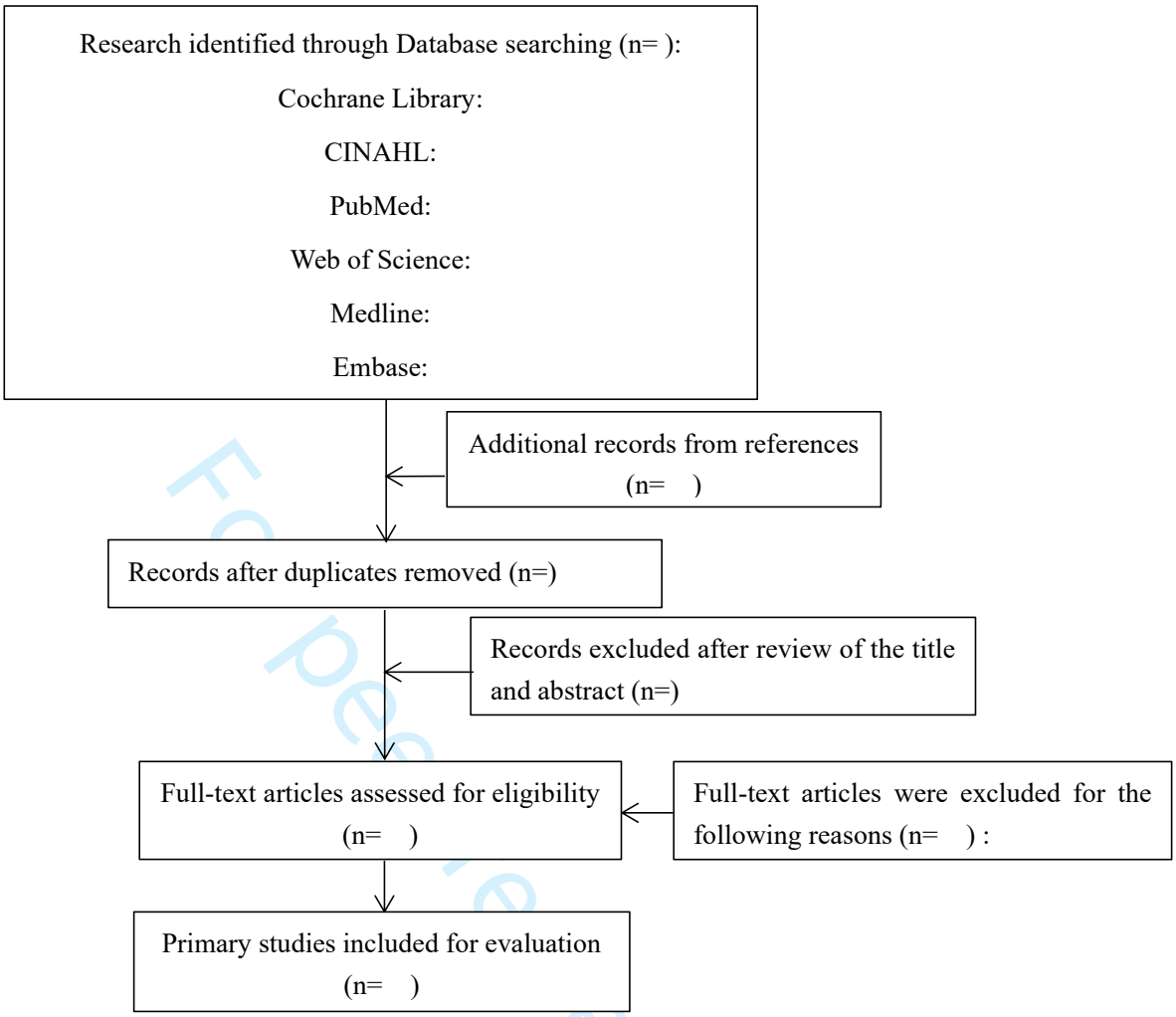


Fig. 1 The processes of study selection

**PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol***

| Section and topic | Item No | Checklist item | Page |
|---|---|---|---|
| **ADMINISTRATIVE INFORMATION** | | | |
| Title: | | | |
| Identification | 1a | Identify the report as a protocol of a systematic review | 1 |
| Update | 1b | If the protocol is for an update of a previous systematic review, identify as such | NA |
| Registration | 2 | If registered, provide the name of the registry (such as PROSPERO) and registration number | 2 |
| Authors: | | | |
| Contact | 3a | Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author | 1 |
| Contributions | 3b | Describe contributions of protocol authors and identify the guarantor of the review | 11 |
| Amendments | 4 | If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments | NA |
| Support: | | | |
| Sources | 5a | Indicate sources of financial or other support for the review | 11 |
| Sponsor | 5b | Provide name for the review funder and/or sponsor | 11 |
| Role of sponsor or funder | 5c | Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol | 11 |
| **INTRODUCTION** | | | |
| Rationale | 6 | Describe the rationale for the review in the context of what is already known | 2-4 |
| Objectives | 7 | Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) | 2-4 |
| **METHODS** | | | |
| Eligibility criteria | 8 | Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review | 4-5 |
| Information sources | 9 | Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage | 4-5 |
| Search strategy | 10 | Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated | 6 |
| Study records: | | | |
| Data management | 11a | Describe the mechanism(s) that will be used to manage records and data throughout the review | 7 |

| | | | |
|---|---|---|---|
| Selection process | 11b | State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis) | 6 |
| Data collection process | 11c | Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators | 7 |
| Data items | 12 | List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications | 7 |
| Outcomes and prioritization | 13 | List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale | 5 |
| Risk of bias in individual studies | 14 | Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis | 8 |
| Data synthesis | 15a | Describe criteria under which study data will be quantitatively synthesised | 8-9 |
| | 15b | If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as $I^2$, Kendall's $\tau$) | 8-9 |
| | 15c | Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression) | 8-9 |
| | 15d | If quantitative synthesis is not appropriate, describe the type of summary planned | NA |
| Meta-bias(es) | 16 | Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies) | 8-9 |
| Confidence in cumulative evidence | 17 | Describe how the strength of the body of evidence will be assessed (such as GRADE) | 10 |

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

*From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.*