

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

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**To cite:** Liu Q, Liu L, Wang F, *et al*. Efficacy of reminiscence therapy with different media on cognitive function and negative moods for older adult patients who had a stroke: protocol of a network meta-analysis. *BMJ Open* 2024;**14**:e078526. doi:10.1136/bmjopen-2023-078526

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2023-078526>).

Received 06 August 2023  
Accepted 29 August 2024



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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 randomised controlled trials will be included if reminiscence therapy plus usual care was applied in older adult patients who had a 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 (RoB) of the included studies will be evaluated in accordance with the Cochrane Collaboration's RoB 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 who had a stroke.

**PROSPERO registration number** CRD42023447828.

## INTRODUCTION

With the rapid development of global population ageing, the number of older adult patients with chronic diseases is also increasing. Stroke is still a common cause of death and disability

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Network meta-analysis allows for the simultaneous comparison of multiple interventions in a single model.
- ⇒ Network meta-analysis can improve precision of intervention effect estimates and rank interventions based on their effectiveness.
- ⇒ Due to the retrospective nature of this study, the findings may be influenced by the quantity and quality of the included studies.

in older adult,<sup>1 2</sup> with a high incidence, high disability rate, high mortality, high recurrence rate and high economic burden.<sup>3</sup> With the progress of medicine, the emergency medical systems and innovative treatment methods have improved, and the mortality rate of patients who had a stroke has been reduced to a certain extent. However, more and more stroke survivors are struggling with poststroke complications.<sup>4-6</sup> In particular, stroke increases the risk and severity of cognitive impairment,<sup>7</sup> 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 healthcare system.<sup>8</sup> 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 include depression, anxiety, stress and fatigue, which are very common in old adult patients who had a stroke.<sup>9-12</sup> Importantly, poststroke cognitive impairment and negative moods are important risk factors for poor prognosis and low survival rate.<sup>13-15</sup> 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 emphasised the importance of nostalgia and life review for the older adult to successfully adapt to ageing.<sup>16</sup> 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.<sup>17</sup> 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 increase positive ones, and alleviate negative moods.<sup>18</sup> A randomised controlled trial suggests that reminiscence therapy has a positive effect on cognitive impairment and negative moods (anxiety and depression) in patients with acute ischaemic stroke and can be used as a supplementary rehabilitation plan for poststroke treatment.<sup>19</sup> Similarly, another study also indicates that reminiscence therapy has the same effect, demonstrating its potential for poststroke management.<sup>20</sup>

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 summarise 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 who had a stroke. Therefore, this study will evaluate the effects of reminiscence therapies with different media on cognitive function and negative moods in older adult patients who had a 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 (PRISMA) Protocols<sup>21</sup> 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 patients who had a stroke should be in a stable or recovery phase. Patients with other major diseases, such as malignant tumours and organ failure, will be excluded.

### Type of intervention

Reminiscence therapy that is combined with usual care and implemented in older adult patients who had a stroke will be included. However, multicomponent 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 who had a stroke, including medication management, diet, rehabilitation care and complication prevention, or reminiscence therapy with another medium.

### Type of outcomes

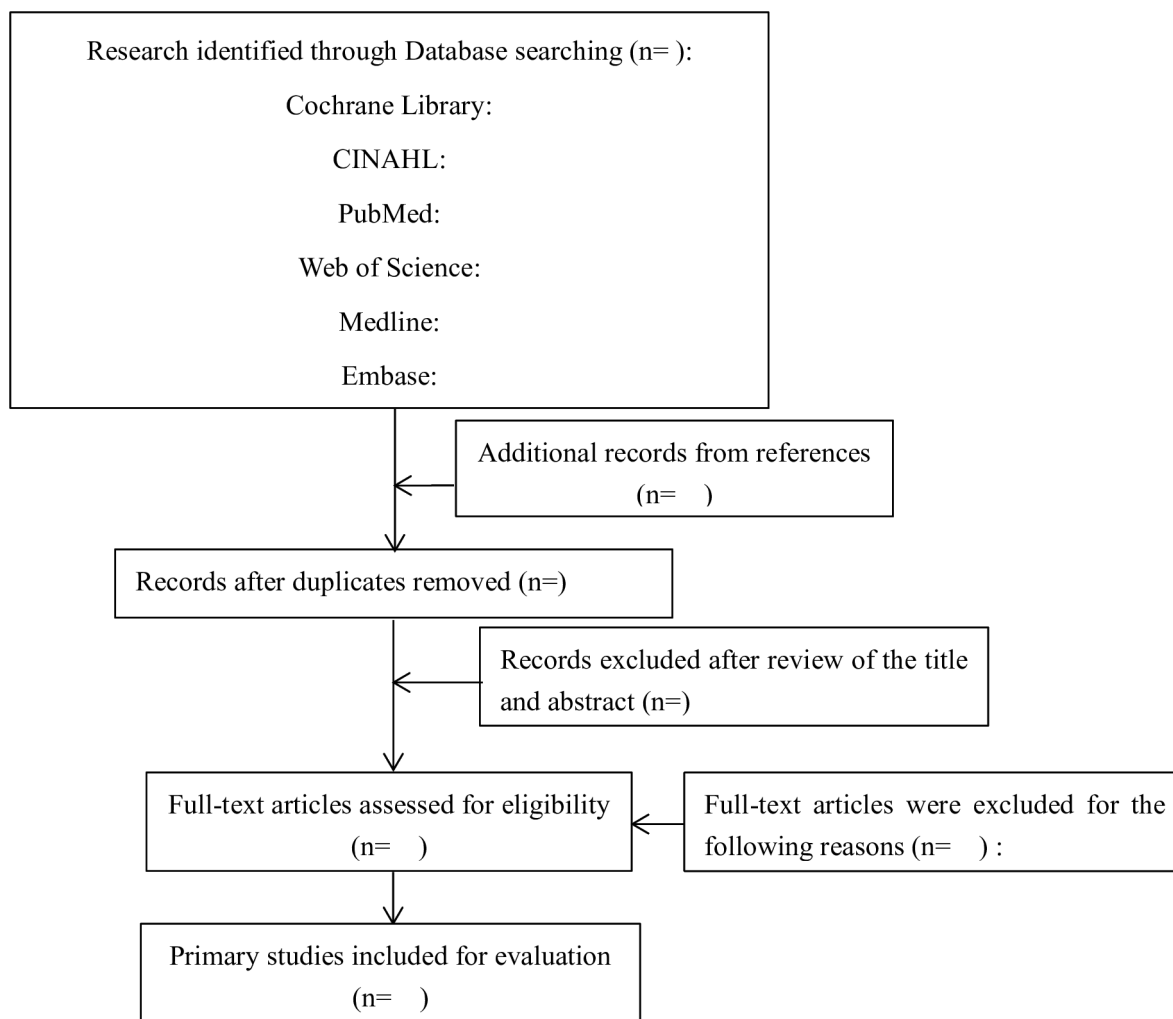
The outcomes will focus on cognitive function and negative moods. Cognitive function outcomes mainly includes sensory perception, memory, thinking, imagination and language. Cognitive function may be measured by the Mini-Mental State Examination or Montreal Cognitive Assessment, which covers nine cognitive domains including attention, concentration, executive functions, memory, language, visuospatial ability, conceptual thinking, calculations and orientation. The Trail Making Test parts A and B may be used to assess executive function, which has been shown to correlate with processing speed and cognitive fluidity.<sup>22</sup> Negative moods mainly include depression, anxiety, stress and fatigue. Depression may be measured by the Geriatric Depression Scale, the Cornell Scale for Depression or the Depression-Anxiety-Stress Scale-21. Anxiety may be calculated by the Rating of Anxiety in Dementia, the State Trait Anxiety Inventory 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 randomised controlled trials written in English will be included. Cluster randomised controlled trials and cross-over randomised 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 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



**Figure 1** The processes of study selection.

relevant reviews of reminiscence therapy implemented in patients who had a stroke 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 cross-checked and discrepancies will be resolved through discussions. After extracting the outcomes, dichotomous outcomes will be labelled, 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 (RoB) assessment

We will use the revised version of the Cochrane tool (RoB V.2) to evaluate the RoB for all included studies.<sup>23</sup> RoB V.2 includes five domains, including bias arising from the randomisation 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 RoB', 'some concerns' or 'high RoB'. The response options for an overall RoB judgement are the same as those for individual domains.



The RoB 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 V.5.3 software to conduct a pairwise meta-analysis. Standardised mean differences with 95% CIs will be used for continuous outcomes. The  $\chi^2$  test will be used to assess heterogeneity. A fixed effects model will be used to synthesise the standardised mean difference if the p value is  $\geq 0.1$ . 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 (V.4.1.3). Brooks-Gelman-Rubin diagnosis and potential scale reduction factor will be used to ensure the convergence of the model.<sup>24</sup> The surface under the cumulative ranking curve with its 95% CI and rank-heat plot will be used to evaluate the hierarchy of each art therapy.<sup>25 26</sup>

### 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 (V.15.0).<sup>27 28</sup>

### Assessment of inconsistency and subgroup analysis

Based on a loop-special method within each loop of the network,<sup>29</sup> the local inconsistency and global inconsistency will be measured in Stata software (V.15.0).<sup>30</sup> 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:  $\geq 80$  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 RoB 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 conducting 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.<sup>31</sup>

## 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

Ageing has become one of the major contributors to the increased mortality from stroke.<sup>32</sup> 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 patients who had a stroke. For instance, a previous study suggests that reminiscence therapy using photos can help to improve cognitive function and relieve negative moods.<sup>33</sup>

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 analyse the effects of reminiscence therapy with different media in older adult patients who had a 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 who had a stroke. The results could help clinicians and guideline setters choose the appropriate intervention and develop guidelines for older adult patients who had a 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 began on 1 September 2023 and will be ended on 10 November 2024. The results will be reported based on the PRISMA-compliant guidelines.

**Contributors** QL designed the study with oversight by XH and HC. XH is the guarantor. QL drafted the protocol, and the draft was modified by LL, FW and XH. QL and LT searched, selected and identified studies and extracted data independently.

while LL served as the third reviewer for study selection and data extraction. QL was responsible for the methodology. All authors have approved the publication of this protocol.

**Funding** This study was funded by a project from the West China Hospital of Sichuan University (grant no. HXDZ21003).

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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# REFERENCES

- 1 Lindley RI. Stroke prevention in the very elderly. *Stroke* 2018;49:796–802.
- 2 Wang W, Jiang B, Sun H, *et al*. Prevalence, incidence, and mortality of stroke in China: results from a nationwide population-based survey of 480 687 adults. *Circulation* 2017;135:759–71.
- 3 Wang LD, Peng B, Zhang HQ, *et al*. Brief report on stroke prevention and treatment in China, 2020. *Chin J Cerebrovasc Dis* 2022;19:136–44.
- 4 Chowdhury SZ, Baskar PS, Bhaskar S. Effect of prehospital workflow optimization on treatment delays and clinical outcomes in acute ischemic stroke: a systematic review and meta-analysis. *Acad Emerg Med* 2021;28:781–801.
- 5 Muresanu DF, Strliciu S, Stan A. Current drug treatment of acute ischemic stroke: challenges and opportunities. *CNS Drugs* 2019;33:841–7.
- 6 Zhang S, Xu M, Liu Z-J, *et al*. Neuropsychiatric issues after stroke: clinical significance and therapeutic implications. *World J Psychiatry* 2020;10:125–38.
- 7 Huang YY, Chen SD, Leng XY, *et al*. Post-stroke cognitive impairment: epidemiology risk factors, and management. *J Alzheimers Dis* 2022;86:983–99.
- 8 Rost NS, Brodtmann A, Pase MP, *et al*. Post-stroke cognitive impairment and dementia. *Circ Res* 2022;130:1252–71.
- 9 Yurasek AM, Miller MB, Pritschmann RK, *et al*. Negative mood as a mediator of the association between insomnia severity and marijuana problems in college students. *J Sleep Res* 2020;29:e12985.
- 10 Facucho-Oliveira J, Esteves-Sousa D, Espada-Santos P, *et al*. Depression after stroke. *Pract Neurol* 2021;21:384–91.
- 11 Gu P, Ding Y, Ruchi M, *et al*. Post-stroke dizziness, depression and anxiety. *Neurol Res* 2024;46:466–78.
- 12 Alghamdi I, Ariti C, Williams A, *et al*. Prevalence of fatigue after stroke: a systematic review and meta-analysis. *Eur Stroke J* 2021;6:319–32.
- 13 Kowalska K, Krzywoszański Ł, Droś J, *et al*. Early depression independently of other neuropsychiatric conditions, influences disability and mortality after stroke (research study-part of PROPOLIS study). *Biomedicines* 2020;8:509.
- 14 Baccaro A, Wang Y-P, Candido M, *et al*. Post-stroke depression and cognitive impairment: study design and preliminary findings in a Brazilian prospective stroke cohort (EMMA study). *J Affect Disord* 2019;245:72–81.
- 15 Zhang L, Zhang T, Sun Y. A newly designed intensive caregiver education program reduces cognitive impairment, anxiety, and depression in patients with acute ischemic stroke. *Braz J Med Biol Res* 2019;52:e8533.
- 16 Li L, Ge ZX, Deng XL. The effect of reminiscence therapy on patients with Alzheimer's disease. *J Nurs Sci* 2015;30:1–4.
- 17 Bulechek GM, Butcher HK, Dochterman JM, *et al*. Nursing Interventions Classification (NIC). 6th Edn. Louis: Elsevier Health Sciences, 2013:323–4.
- 18 Sun J, Jiang J, Wang Y, *et al*. The efficacy of reminiscence therapy in cancer-related symptom management: a systematic review and meta-analysis. *Integr Cancer Ther* 2023;22:153473542211474.
- 19 Cheng C, Fan W, Liu C, *et al*. Reminiscence therapy-based care program relieves post-stroke cognitive impairment, anxiety, and depression in acute ischemic stroke patients: a randomized, controlled study. *Ir J Med Sci* 2021;190:345–55.
- 20 Li A, Liu Y. Reminiscence therapy serves as an optional nursing care strategy in attenuating cognitive impairment, anxiety, and depression in acute ischemic stroke patients. *Ir J Med Sci* 2022;191:877–84.
- 21 Shamseer L, Moher D, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 2015;350:g7647.
- 22 Gjellesvik TI, Becker F, Tjønnå AE, *et al*. Effects of high-intensity interval training after stroke (The HIIT Stroke Study) on Physical and Cognitive Function: A Multicenter Randomized Controlled Trial. *Arch Phys Med Rehabil* 2021;102:1683–91.
- 23 Sterne JAC, Savović J, Page MJ, *et al*. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019;366:l4898.
- 24 Brooks SP, Gelman A. General methods for monitoring convergence of iterative simulations. *J Comput Graph Stat* 1998;7:434–55.
- 25 Salanti G, Ades AE, Ioannidis JPA. Graphical methods and numerical summaries for presenting results from multiple-treatment meta-analysis: an overview and tutorial. *J Clin Epidemiol* 2011;64:163–71.
- 26 Veroniki AA, Straus SE, Fyridis A, *et al*. The rank-heat plot is a novel way to present the results from a network meta-analysis including multiple outcomes. *J Clin Epidemiol* 2016;76:193–9.
- 27 Collaboration TC. Cochrane Handbook for systematic reviews of interventions version 5.1.0. 2011.
- 28 Egger M, Davey Smith G, Schneider M, *et al*. Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997;315:629–34.
- 29 Du Y, Wu F, Lu S, *et al*. Efficacy of pressure ulcer prevention interventions in adult intensive care units: a protocol for a systematic review and network meta-analysis. *BMJ Open* 2019;9:e026727.
- 30 Higgins JPT, Jackson D, Barrett JK, *et al*. Consistency and inconsistency in network meta-analysis: concepts and models for multi-arm studies. *Res Synth Methods* 2012;3:98–110.
- 31 Puhan MA, Schünemann HJ, Murad MH, *et al*. A GRADE Working Group approach for rating the quality of treatment effect estimates from network meta-analysis. *BMJ* 2014;349:g5630.
- 32 Wang Y-J, Li Z-X, Gu H-Q, *et al*. China stroke statistics: an update on the 2019 report from the National Center for Healthcare Quality Management in Neurological Diseases, China National Clinical Research Center for Neurological Diseases, the Chinese Stroke Association, National Center for Chronic and Non-communicable Disease Control and Prevention, Chinese Center for Disease Control and Prevention and Institute for Global Neuroscience and Stroke Collaborations. *Stroke Vasc Neurol* 2022;7:415–50.
- 33 Zheng Y, Wang Z, Zhang XX. Effects of photo reminiscence therapy on mood state and evoked potential P300 in patients with cognitive impairment after stroke. *Cardio-cerebrovasc Dis Prev Treat* 2023;23:47–9.