

Effects of positive thinking intervention on negative emotions and quality of life in stroke patients: a scoping review

Xin Fan¹, Mei Wang¹, Xiang-Shu Cui^{1*}

¹School of Nursing, Yanbian University, Yanji 133000, China.

*Corresponding to: Xiang-Shu Cui, School of Nursing, Yanbian University, No. 977, Park Road, Yanji 133000, China. E-mail: CUIYBDX@outlook.com.

Author contributions

Xin Fan and Mei Wang were responsible for research design and document analysis. Xin Fan, Mei Wang and Xiang-Shu Cui have contributed to the revision of the manuscript. All authors have read and agreed to the final draft.

Competing interests

The authors declare no conflicts of interest.

Acknowledgments

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Peer review information

Nursing Communications thanks Ibrahim Topuz and other anonymous reviewers for their contribution to the peer review of this paper.

Citation

Fan X, Wang M, Cui XS. Effects of positive thinking intervention on negative emotions and quality of life in stroke patients: a scoping review. *Nurs Commun.* 2023;7:e2023009. doi: 10.53388/IN2023009.

Executive editor: Guang-Ze Ma.

Received: 06 February 2023; **Accepted:** 23 March 2023;

Available online: 26 March 2023.

© 2023 By Author(s). Published by TMR Publishing Group Limited. This is an open access article under the CC-BY license. (<https://creativecommons.org/licenses/by/4.0/>)

Abstract

Objective: To analyze domestic and international studies on the effects of positive thought intervention therapy on negative emotions and the quality of life of stroke patients to provide a reference for future related studies. **Methods:** Using the scoping review method as a guide, computer searches of PubMed, Web of Science, Embase, Cochrane Library, China National Knowledge Infrastructure, Wanfang Database, China Vipers Full Text Database and China Biomedical Literature Database were conducted to collect relevant studies on the application of positive thinking interventions in stroke patients from the establishment to January 2023, and the literature was screened according to the inclusion and exclusion criteria, and the data were extracted and analyzed by two investigators independently. **Results:** The search yielded 964 publications, and a total of 19 were included. The time of publication, study site, study population, study design, study length, and type of results of the included studies was summarized and analyzed. **Conclusions:** Positive thinking-based interventions have shown significant changes in negative emotions such as anxiety and depression in stroke patients and can reduce somatic pain, enhance their social integration, and improve their quality of life. However, interventions in the areas of self-compassion, artificial intelligence and the adoption of tailoring need to be further explored.

Keywords: positive thinking intervention; stroke; negative emotions; quality of life; scoping review

Background

Stroke is an acute cerebrovascular disease caused by the rupture of blood vessels in the brain or due to vascular obstruction, and the lifetime risk of stroke in China has been as high as 39.9%, which is the second leading cause of death worldwide and a major cause of disability in patients [1, 2]. Therapeutic interventions and post-stroke management of stroke patients are necessary because they can suffer from a variety of physical and psychological problems secondary to treatment, such as post-stroke depression, fatigue, anxiety disorders, post-stroke dementia, epilepsy, sleep disorders, and chronic pain, which can have a serious impact on the quality of life of patients [3, 4]. In 1979, Kabat-Zinn applied positive stress reduction therapy to clinically improve patients' quality of life [5]. Positive thinking intervention was developed in the medical field. Positive thinking intervention (mindfulness based intervention) is an intervention that helps patients explore and identify adaptive reflections. This intervention can improve stroke patients' level of self-control over their bodies, reduce their psychological stress and burden, and promote their psychological well-being, which can have a beneficial effect on their illness [6]. Therefore, this study used the framework approach of the Arksey and O'Malley scoping review to summarize and analyze the relevant domestic and international literature in this field and to review the effectiveness of the application of positive thinking interventions for stroke patients in order to provide a reference for the treatment of stroke patients [7].

Materials and methods

Information methodology

Identification of research questions. Positive thinking interventions are divided into various types according to different populations [6]. This scoping review identifies the population as stroke-related patients, thus exploring them in terms of positive thinking stress reduction, positive thinking cognition, positive thinking therapy, and positive thinking interventions. After an initial search of the literature, the researchers identified the research questions for this scoping review: 1. what is the current status of research on positive thinking-based interventions to provide support for stroke patients? 2. What are the specific effects of implementing a positive thinking intervention? 3. What are the components of positive thinking interventions?

Identify relevant studies. Computer searches were performed on PubMed, Web of Science, Embase, Cochrane Library, China National Knowledge Infrastructure, Wanfang Data Knowledge Service Platform, China Vipers Full Text Database, and China Biomedical Literature Database. English databases were searched using a combination of MeSH subject terms and free terms using PubMed as an example. ("Mindfulness" (MeSH terms) or "Meditation" (MeSH terms) or "Mindfulness" (Title/Abstract) or "Meditation" (Title/Abstract) or "mindfulness based intervention" (Title/Abstract) or "MBSR" (Title/Abstract) or "mindfulness based stress reduction" (Title/Abstract) or "mindfulness based cognitive therapy" (Title/Abstract) or "Vipassana" (Title/Abstract) and ("Stroke" (MeSH terms) or "stroke*" (Title/Abstract) or "cerebrovascular accident*" (Title/Abstract) or "brain vascular accident*" (Title/Abstract) or "Apoplexy" (Title/Abstract)), Chinese databases were searched on the China National Knowledge Infrastructure, for example, with the search formula (topic = positive intervention + positive cognition + positive therapy + positive stress reduction) and (topic = stroke + cerebral hemorrhage + cerebral infarction + stroke). The search time frame was from the creation of the database to January 2023.

Literature inclusion and exclusion criteria. Inclusion criteria: 1. study subjects: stroke patients who were diagnosed by computed tomography and magnetic resonance imaging and met the diagnostic criteria of "Diagnostic Essentials of Various Types of Cerebrovascular Diseases in China", with no restrictions on age, gender, disease duration, and staging, and clear consciousness [8]. 2. Interventions:

positive mind-based interventions, such as positive mind decompression therapy, positive mind cognitive therapy, positive mind training, and positive mind meditation were performed on stroke patients. 3. Type of literature: randomized controlled trials, experimental-like studies, qualitative studies, etc. 4. Outcome indicators: anxiety, depression, and quality of life.

Exclusion criteria: 1. type of literature: case reports, reviews, conference abstracts, etc. 2. Literature for which full text was not available. 3. Duplicate publications. 4. Non-English and Chinese literature.

Literature screening and data extraction. Two researchers read the titles and abstracts of the included literature. After the screening, those that met the criteria were downloaded and read in full for screening again, and in case of disagreement, a third researcher joined for joint discussion and confirmation.

Results

Literature screening process

A total of 964 papers were searched, of which 99 were from PubMed, 221 from Web of Science, 199 from Cochrane Library, 253 from Embase, 36 from China Biomedical Literature Database, 61 from China National Knowledge Infrastructure, 64 from Wanfang, and 31 from Vipers; 352 duplicates were excluded. The titles and abstracts were browsed, and the full text of the literature was read to exclude papers that did not match the study object, type of literature and topic, and those that could not be obtained in full text. 19 papers were finally included. The literature screening process is shown in Figure 1.

Basic characteristics of the included literature

Nineteen papers were published between 2015 and 2022, including 9 in English and 10 in Chinese, conducted in the United States (n = 1), United Kingdom (n = 5), China (n = 11), Australia (n = 1), and Singapore (n = 1). The types of studies included randomized controlled trials (n = 12), qualitative studies (n = 2), experimental-like studies (n = 3), and mixed studies (n = 2) with sample sizes ranging from 9 to 134 cases and study durations ranging from 2 weeks to 6 months, as shown in Table 1.

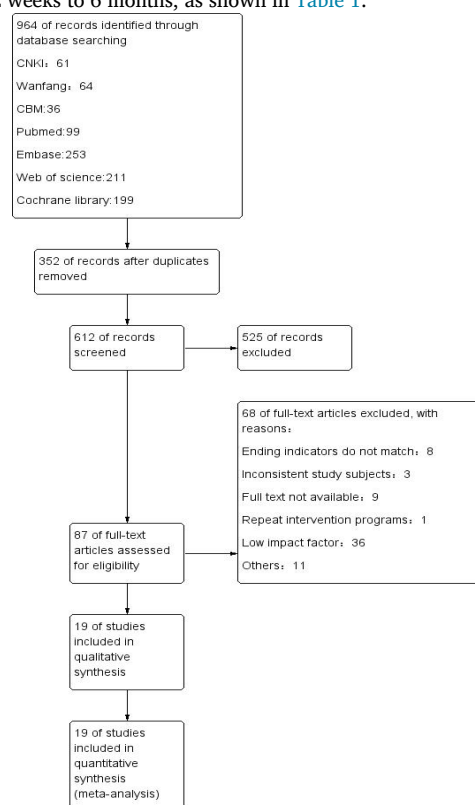


Figure 1 Flow diagram of study

Table1 Basic features of the included literature

Author (year)	Country	Research Subjects	Research type	Sample size (cases) E/C	Intervention method E/C	Intervention duration	Closing indicators
Demers 2022 [9]	US	Stroke survivor	Hybrid study	14	Online positive thinking intervention	3W	①②
Wrapson 2021 [10]	UK	Stroke survivor	Qualitative research	17	Positive thinking training	6W	①②
Thayabaranathan 2021 [11]	Australia	Stroke survivor	Qualitative research	9	Virtual positive thinking skills	8W	①
Baylan 2020 [12]	UK	Stroke patients	RCT	72 (23/24/25)	Positive Music Listening Group, Music Listening Group, Audiobooks	6M	①②
Wang XY 2020 [13]	China	Cerebral hemorrhage patients	RCT	134 (67/67)	Receiving positive cognitive therapy	8W	②③
Yan XY 2020 [14]	China	Stroke patients	RCT	68 (34/34)	Positive thinking training based on routine stroke care and standard rehabilitation training	4W	①②③
Zeng J 2020 [15]	China	Cerebral hemorrhage patients	RCT	90 (45/45)	Positive cognitive therapy was given on the basis of the control group	6W	③
Wang X 2019 [16]	UK	Stroke survivor	Hybrid study	51	Positive thinking and relaxation techniques	4W	①
Dong LH 2019 [17]	China	Cerebral hemorrhage patients	RCT	70 (35/35)	Positive and soothing music training on the basis of regular care	2W	①
Lawrence 2018 [18]	UK	Stroke patients	Class experimental research	30	Positive stress reduction therapy	8W	①②
Zang LJ 2018 [19]	China	Stroke patients	RCT	60 (30/30)	Received positive cognitive therapy on top of the control group	8W	①②
Wang Q 2018 [20]	China	Cerebral hemorrhage patients	RCT	66 (33/33)	Positive music training on the basis of the control group	15d	③
Pan S 2018 [21]	China	Stroke patients	RCT	62 (31/31)	Positive thinking intervention was given on top of the control group	8W	②
Doshi 2017 [22]	Singapore	Stroke survivor	Class experimental research	11	Practice of positive thinking	4W	②③
Baylan 2017 [23]	UK	Stroke patients	Class experimental research	–	The first group of music listening. The second group: positive music listening. The third group: audiobook listening	8W	①②
Huang XS 2017 [24]	China	Stroke patients	RCT	80 (40/40)	Adding positive stress reduction training to conventional care	8W	①②
Li HY 2016 [25]	China	Stroke patients	RCT	60 (30/30)	Adding positive thinking training to conventional rehabilitation therapy	8W	②
Fan YX 2016 [26]	China	Cerebral infarction patients	RCT	65 (32/33)	Cognitive-behavioral training based on positive thinking was given on the basis of the control group	6W	③
Zhang YX 2015 [27]	China	Stroke patients	RCT	89 (56/33)	Behavioral training based on positive thinking	13W	②③

①, Anxiety; ②, Depression; ③, Quality of life. RCT, randomized controlled trial.

Evaluation of the effectiveness of positive thinking-based interventions in stroke patients

Positive thinking intervention can reduce anxiety and depression in stroke patients. In the included studies, positive thinking-based interventions were found to be effective in stroke patients across regions, patients, and study types. Six studies [9–11, 17, 20, 23] showed that the use of online positive thinking and virtual positive thinking skills interventions and offline positive thinking training, positive thinking cognitive therapy, and positive thinking soothing music training had a good effect on the anxiety and depression produced by stroke patients with different disease stages, which is similar to the findings of Li Lijun et al. [28]. In recent years, more and more attention has been paid to the humanistic care needs of patients, and the included studies have shown that positive thinking intervention can have an excellent positive effect on patients' body and mind, provide them with care and psychological counseling, improve the sleep quality of stroke patients, and effectively relieve the patients' heart tension and anxiety caused by the quality of sleep, thus reducing the internal pain and anxiety of stroke patients due to the disease and reducing their depression.

Positive thinking intervention can improve the quality of life of stroke patients. Stroke patients often suffer physically and mentally during the treatment process due to their secondary physical problems, such as chronic pain, treatment burden and treatment costs, which seriously affect their quality of life. The results of this study showed that the intervention of positive thinking could improve the quality of life of stroke patients. Yan et al. [14, 23] used positive thinking training, positive thinking cognition and positive thinking music therapy to intervene in young and middle-aged stroke patients. The results showed that the intervention of positive thinking alleviated the post-traumatic psychological burden of the patients, faced the disease with an objective attitude, made the patients' spiritual and psychological motivation positive, and improved the quality of life and the patient's social functioning ability was enhanced. In addition, in terms of social quality of life, the seven studies included in this paper had a better application on patients' quality of life and reintegration into society [13–15, 20, 22, 26, 27], and the combination of positive thinking interventions with professionals can effectively reduce the cost of medical services and benefit more stroke patients.

Discussion

The effective application of positive thinking intervention in stroke patients

There are more types of interventions based on positive thinking and more options for patient-specific interventions [6]. Of the 19 included papers, medical professionals were more skilled in applying positive thinking to stroke patients. Patients had higher hospital outcomes and compliance, indicating that applying positive thinking-based interventions in stroke patients is practical. Lawrence explored the positive thinking-based stress reduction to improve mood in stroke patients was feasible [18]. 30 stroke survivors were recruited in the United States for an 8-week group-based self-management program. The study results showed that the sessions, adaptations, and their perceptions of related losses effectively regulate patients' moods in stroke patients. A study by Thayabaranathan showed that sessions using virtual positive thinking skills could also address sleep disturbances, improve understanding of oneself and thus enhance the quality of life in stroke patients [11]. At the same time, combining multiple positive thinking-based interventions can effectively help patients restore their limbic motor functions, reduce self-perception burden, and increase social functioning [14, 15]. In addition, the age of the patient should be taken into account in the intervention process, as the age of onset of stroke patients has become increasingly young, and different interventions are received differently by stroke patients.

Limited research on the application of positive thinking intervention in stroke patients

The clinical application of holistic interventions based on positive thinking in stroke patients is at a preliminary stage. In treating stroke patients, interventions based on positive thinking have a good benefit on the treatment of the patient's disease. However, the number of interventions is small and well-designed large, randomized controlled trials are still needed. As a non-pharmacological intervention, healthcare professionals should pay attention to the control of interventions and the length of interventions when intervening in stroke patients. For the application of positive thinking, 50 reviews searched by Cochrane showed [29] that there is a lack of conclusive evidence for the application of positive thinking in different diseases, such as fibromyalgia and aggression in people with intellectual disabilities, and therefore focus on improving the output as well as patient compliance and improving patient self-control of positive thinking training. According to the severity of the onset, less attention has been paid to the population of chronic stroke patients at home and abroad. Only one paper was included on chronic stroke patients [30]. Still, stroke patients are characterized by a high recurrence rate, so further research is needed for the future development of chronic stroke patients. The study results showed that all outcome indicators were beneficial to the recovery of stroke patients, so it is essential to explore the combination of positive thinking interventions and course learning, as well as the application of artificial intelligence to enhance the selection of appropriate positive thinking interventions after stroke.

Prospects for the development of positive thinking intervention in stroke patients

With the progressive development of the times, to reduce the self-perceived burden of patients' diseases, the psychological construction of patients has been paid more and more attention to. Positive thinking interventions will gradually become an integral part of clinical work, precise and refined. The implementation of a one-to-one model for patients is the future development direction of positive thinking intervention means, "Health China 2030 Outline" pointed out that in the future, for the health of individuals Promote the formation of a service model that combines patient movement and medical care to promote the overall physical and mental health of patients [32, 33]. In addition, further improvement of patients' personal health indicators, more comprehensive observation, combined with artificial intelligence, the Internet and other ways to achieve hospital-community-home continuity of care, can improve the motor function of post-stroke patients and improve the quality of life of patients.

Conclusion

This study integrates and analyzes the literature related to the application of positive thinking interventions in stroke patients using the framework of a scoping review. Positive thinking-based interventions can improve negative emotions and quality of life aspects in stroke patients, and patients respond well to acceptance and compliance, but the sample size of related studies is small and there is a lack of targeted intervention studies for patients. In future studies, healthcare providers need to conduct trials with larger sample sizes to provide more comfortable and effective medical rehabilitation for patients.

References

1. China Stroke Prevention and Control Report Writing Group. Summary of the China Stroke Prevention and Control Report 2019. *Chin J Cerebrovasc Dis* 2020;17(5):272–281. (Chinese) Available at: <http://dx.chinadoi.cn/10.3969/j.issn.1672-5921.2020.05.008> <https://d.wanfangdata.com.cn/periodical/zgnxbgzz202005008>
2. Iadecola C, Buckwalter MS, Anrather J. Immune responses to stroke: mechanisms, modulation, and therapeutic potential. *J Clin Invest* 2020;130(6):2777–2788. Available at:

- <http://doi.org/10.1172/JCI135530>
3. Schwarzbach CJ, Grau AJ. Komplikationen nach Schlaganfall. *Nervenarzt* 2020;91(10):920–925. Available at: <http://doi.org/10.1007/s00115-020-00988-9>
4. Kuriakose D, Xiao Z. Pathophysiology and Treatment of Stroke: Present Status and Future Perspectives. *Int J Mol Sci* 2020;21(20):7609. Available at: <http://doi.org/10.3390/ijms21207609>
5. Kabat-Zinn J. An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *Gen Hosp Psychiatry* 1982;4(1):33–47. Available at: [http://doi.org/10.1016/0163-8343\(82\)90026-3](http://doi.org/10.1016/0163-8343(82)90026-3)
6. Chinese Psychological Society, Clinical and Counseling Psychology Committee, Positive Thinking Group, Chinese Mental Health Association, Cognitive Behavioral Therapy Committee, Positive Thinking Group. Expert consensus on positive thinking interventions. *Chin J Behav Med Brain Sci* 2019;28(9):771–777. (Chinese) Available at: <https://doi.org/10.3760/cma.j.issn.1674-6554.2019.09.002> <https://rs.yiigle.com/CN371468201909/1165193.htm>
7. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Method* 2005;8(1): 19–32. Available at: <http://doi.org/10.1080/1364557032000119616>
8. Chinese Medical Association Neurology Branch, Chinese Medical Association Neurology Branch, Cerebrovascular Disease Group. Diagnostic points of various major cerebrovascular diseases in China 2019. *Chin J Neurol* 2019;9(9):710–715. (Chinese) Available at: <https://doi.org/10.3760/cma.j.issn.10067876.2019.09.003> <https://d.wanfangdata.com.cn/periodical/zhsjk201909004>
9. Demers M, Pagnini F, Phillips D, Chang B, Winstein C, Langer E. Feasibility of an Online Langerian Mindfulness Program for Stroke Survivors and Caregivers. *OTJR* 2022;42(3):228–237. Available at: <http://doi.org/10.1177/15394492221091266>
10. Wrapson W, Dorrestein M, Wrapson J, et al. Stroke survivors' expectations and post-intervention perceptions of mindfulness training: A qualitative study. *Neuropsychol Rehabil* 2021;32(10): 2496–2518. Available at: <http://doi.org/10.1080/09602011.2021.1950777>
11. Thayabaranathan T, Immink MA, Hillier S, et al. Co-Designing a New Yoga-Based Mindfulness Intervention for Survivors of Stroke: A Formative Evaluation. *Neurol Int* 2021;14(1):1–10. Available at: <http://doi.org/10.3390/neurolint14010001>
12. Baylan S, Haig C, MacDonald M, et al. Measuring the effects of listening for leisure on outcome after stroke (MELLO): A pilot randomized controlled trial of mindful music listening. *Int J Stroke* 2019;15(2):149–158. Available at: <http://doi.org/10.1177/1747493019841250>
13. Wang X, Li J, Wang C, Lv J. The effects of mindfulness-based intervention on quality of life and poststroke depression in patients with spontaneous intracerebral hemorrhage in China. *Int J Geriatr Psychiatry* 2020;35(5):572–580. Available at: <http://doi.org/10.1002/gps.5273>
14. Yan XY, Guo DM, Chen XY, Gao L, Yang HY. Influence of Mindfulness Training on Stigma and Limb Motor Function in Young and Middle-aged Patients with Post-stroke Hemiplegia. *Qilu J Nurs* 2020;26(23):7–10. (Chinese) Available at: https://www.nstl.gov.cn/paper_detail.html?id=b0ac826c9b22534179f56360b987939c
15. Zeng J, Xia T. Effect of mindfulness-based cognitive therapy on stigma, self-efficacy and quality of life in patients with acute cerebral infarction. *Chinese J Health Psychol* 2020;28(01):33–37. (Chinese) Available at: <https://doi.org/10.13342/j.cnki.cjhp.2020.01.009>
16. Wang X, Smith C, Ashley L, Hyland ME. Tailoring Self-Help Mindfulness and Relaxation Techniques for Stroke Survivors: Examining Preferences, Feasibility and Acceptability. *Front Psychol* 2019;10:391. Available at: <http://doi.org/10.3389/fpsyg.2019.00391>
17. Dong LH, Wang Q, Pei HZ, et al. Effects of positive thought-based music therapy on patients with acute stress disorder with sleep disturbance in cerebral hemorrhage. *J Nurs* 2019;34(8):15–18. (Chinese) Available at: https://wenku.baidu.com/view/b5663c88df88d0d233d4b14e852458fb770b38f8?fr=xueshu&wkts_ = 1679551221968
18. Lawrence M, Davis B, Booth J, et al. Mindfulness based stress reduction to support self-managment of anxiety and depression following stroke: A development study. *Eur Stroke J* 2018;3(1): 215. Available at: <https://doi.org/10.26226/morressier.5ab8f564d462b8029238d2e8>
19. Zhang LJ, Song YL, Dong B, Li W, He YZ, Yu R. Effect of Mindfulness-based Cognitive Therapy on Dysphagia after Stroke. *Chin J Rehabil Theory Prac* 2018;24(11):1361–1364. (Chinese) Available at: <https://doi.org/10.3969/j.issn.1006-9771.2018.00.008> <https://www.cjrtponline.com/CN/10.3969/j.issn.1006-9771.2018.00.008>
20. Wang Q, Dong LH, Cheng J, Liu Y. Effects of positive thought-based music training on sleep-wake behavior in patients with cerebral hemorrhage sleep disorder. *J Nurs* 2018;25(16): 5–8. (Chinese) Available at: <https://doi.org/10.16460/j.issn1008-9969.2018.16.005>
21. Pan S, Chen QZ, Zhu JM, et al. Application Effect of Mindfulness Intervention in Post-stroke OSA Patients Complicated with Depression. *Prac J Card Cereb Pneumal Vasc Dis* 2018;26(05): 60–63. (Chinese) Available at: <https://doi.org/10.3969/j.issn.1008-5971.2018.05.014> https://www.nstl.gov.cn/paper_detail.html?id=d23c12dc0cb128214dd7748991a17bcb
22. Doshi K, Henderson SL, Sugumar L, Low AY, Thilarajah S, De Silva DA. A pilot study investigating the impact of mindfulness based interventions on the psychosocial well-being of stroke survivors. *J Neurol Sci* 2017;381:410–411. Available at: <http://doi.org/10.1016/j.jns.2017.08.3372>
23. Baylan S, Stiles C, MacDonald M, et al. A single-blind randomised controlled trial of mindful music listening to enhance cognitive recovery and mood after stroke (MELLO): Feasibility and acceptability. *Eur Stroke J* 2017;2(1):177(80). Available at: <https://www.researchgate.net/publication/318440972>
24. Huang XS, Zou J, Yang MF. Effect of positive stress reduction therapy on the level of anxiety and depression in post-stroke depressed patients. *J Nurs* 2017;24(7):62–64. (Chinese) Available at: <https://doi.org/10.16460/j.issn1008-9969.2017.07.062>
25. Li HY, Gong ZK, Hu ZY, Wang JF, Wang QH, Li X. Effect of short-term positive behavioral training on limb motor function in stroke patients with hemiplegia. *Chin J Mod Nurs* 2016;22(07): 926–929. (Chinese) Available at: <https://doi.org/10.3760/cma.j.issn.1674-2907.2016.07.010> <https://d.wanfangdata.com.cn/periodical/xdhl201607012>
26. Fan YX, Hao ZW, Wang HY. Effect of positive cognitive behavioral training on self-perceived burden and self-efficacy in patients with cerebral infarction shoulder-hand syndrome. *Chin J Mod Nurs* 2016;22(12):1664–1669. (Chinese) Available at: <https://doi.org/10.3760/cma.j.issn.1674-2907.2016.12.009> <https://d.wanfangdata.com.cn/periodical/xdhl201612011>
27. Zhang YX, Hao ZW, Guo X. Clinical effects of behavioral training based on positive thinking to intervene in post-stroke depression. *Chin J Integr Med Cardiovasc Dis* 2015;14(14):1679–1681. (Chinese) Available at: <http://qikan.cqvip.com/Qikan/Article/Detail?id=666716406>
28. Li LJ, Zhang N, Chen Q, et al. A meta-analysis of positive

- thinking intervention for depressive symptoms after stroke. *Chin J Stroke* 2021;16(05):502–507. (Chinese) Available at: <https://doi.org/10.3969/j.issn.1673-5765.2021.05.015> <http://www.chinastroke.org.cn/CN/10.3969/j.issn.1673-5765.2021.05.015>
29. Maldonado Fernandez M, Rubio Rodriguez L, López Fernández J. Evidence-based mindfulness. *Eur psychiatr* 2016;33(S1): S635–S635. Available at: <http://doi.org/10.1016/j.eurpsy.2016.01.2389>
 30. Baldo JV, Schendel K, Lwi SJ, et al. Mindfulness-Based Stress Reduction Intervention in Chronic Stroke: a Randomized, Controlled Pilot Study. *Mindfulness* 2021;12(12):2908–2919. Available at: <http://doi.org/10.1007/s12671-021-01751-0>
 31. Mehrholz J. Evidence for robotics post stroke. *Int J Stroke* 2016;11:14. Available at: <https://journals.sagepub.com/doi/epub/10.1177/1747493016670567>
 32. Wrapson W, Dorrestein M, Wrapson J, et al. A Feasibility Study of a One-to-One Mindfulness-Based Intervention for Improving Mood in Stroke Survivors. *Mindfulness* 2021;12(5):1148–1158. Available at: <http://doi.org/10.1007/s12671-020-01583-4>
 33. The outline of the “Health China 2030” plan of the State Council of the Central Committee of the Communist Party of China; 2016. (Chinese) Available at: http://www.xinhuanet.com/politics/2016-10/25/c_1119785867.htm