Systematic Review and Meta-Analysis

Medicine

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The effect of psychological intervention on the quality of life and rehabilitation outcome of stroke patients with anxiety and depression

A systematic review

Bingquan Zhao, BSc[a], Yanyun Yao, BSc[b], Ting Gao, BSc[b,*]

Abstract

Background: To systematically evaluate the effects of psychological interventions on the quality of life and rehabilitation efficacy of patients with poststroke anxiety and poststroke depression.

Methods: All randomized controlled trials of psychological interventions for the treatment of patients with poststroke anxiety combined with poststroke depression in China National Knowledge Infrastructure, Wan Fang Database, the Chongqing VIP Chinese Science and Technology Periodical Database (VIP), Chinese Biomedical Literature Database, Cochrane Library, Embase, Web of Science, and PubMed were searched. Literature was screened according to inclusion and exclusion criteria, systematic evaluation, and meta-analysis were performed using revman5.0 software.

Results: Seventeen randomized controlled trials were included, which showed that the psychological intervention group was more effective than the control group in reducing anxiety and depression and improving patients' ability to perform daily life and quality of life. Subgroup analyses were performed according to intervention time and assessment scale, and the results showed that the intervention group was more effective in reducing anxiety and depression.

Conclusion: Psychological interventions can improve the ability of patients with stroke combined with anxiety and depression to perform their daily lives, improve their quality of life, reduce their levels of depression and anxiety, and improve functional impairment. The registration number in PROSPERO is CRD42023325594 (http://www.crd.york.ac.uk/PROSPERO/).

Abbreviations: CI = confidence interval, HAMA = Hamilton Anxiety Scale, HAMD = Hamilton Depression Scale, PSA = poststroke anxiety, PSD = poststroke depression, QOL = Quality of Life Scale, RCT = randomized controlled trial, SAS = Zung Self-Assessment Scale for Anxiety, SDS = Zung Self-Assessment Scale for Depression, SMD = standardized mean difference.

Keywords: ability of daily living, quality of life, meta-analysis, poststroke anxiety, poststroke depression, psychological intervention, randomized controlled trial, stroke, systematic evaluation

1. Introduction

Stroke is the second leading cause of death and a major cause of disability worldwide, and is a major public health problem worldwide.[1] The incidence of stroke is characterized by a high mortality rate, high disability rate, high recurrence rate, and high morbidity rate, and the incidence of stroke is becoming younger due to the poor lifestyle habits of young people nowadays, such as staying up late at night, smoking, and drinking. According to data from the China National Stroke Screening Survey, the overall standardized incidence rate of first stroke in people aged 40 to 74 years in China increased from 189/100,000 in 2002 to 379/100,000 in 2013, with an average annual increase of 8.3%.[2] It is estimated that the incidence of cerebrovascular events in China will increase by approximately 50% in 2030 compared with 2010.[2] With the aggravation of population aging, stroke has gradually become an important disease that jeopardizes the quality of life of people in China.[3]

Depression is one of the most common psychological disorders after stroke and is called poststroke depression (PSD), which is a type of secondary depression. Some studies have shown that the

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All data generated or analyzed during this study are included in this published article [and its supplementary information files].

The manuscript does not contain clinical studies or patient data.

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incidence of depression in post stroke patients is 30% to 50%.[4] Poststroke anxiety (PSA) is a poststroke mood disorder characterized by a cluster of anxiety symptoms, and is one of the most common mood disorders after stroke. Rafsten et al[5] conducted a meta-analysis of post stroke anxiety and showed that the prevalence rate was 36.7% at 0 to 2 weeks after stroke, 24.1% at 2 to 3 months, and 24.1% at 3 to 12 months was 23.8%.

The core objective of rehabilitation therapy is to help patients regain the ability to perform their daily lives and improve their quality of life so that they can reintegrate into their families and society. Psychological dysfunctions such as anxiety and depression can lead to behaviors such as low cooperation and poor participation of stroke patients in the rehabilitation process, and even self-abandonment and abandonment of treatment, which seriously affects the rehabilitation effect and quality of life of patients. The decrease of anxiety and depression in stroke patients after psychological intervention can improve the patients' initiative in the treatment process, which improves the rehabilitation efficacy, and then the quality of life of the patients is timely and rapidly improved. Therefore, in the rehabilitation treatment of stroke patients, psychological intervention plays a very important role in the rehabilitation efficacy of stroke patients. Psychological interventions using cognitive behavioral therapy, supportive psychotherapy, group therapy, and motivational interviewing therapy.

2. Information and methodology

2.1. Literature inclusion and exclusion studies

2.1.1. Inclusion criteria.

(1) All randomized controlled trials (RCTs) of psychological interventions for the treatment of patients with PSA combined with PSD;
(2) The patients met the diagnostic indices established by the Fourth National Cerebrovascular Conference in 1995[6] and confirmed by cranial CT/MRI;
(3) The patient had both PSA disorder and PSD disorder, which PSA and PSD diagnoses were in accordance with the Chinese Classification and Diagnostic Criteria for Mental Disorders, Third Edition[7] or were patients with anxiety and depression who had been screened with internationally recognized standard scales.

2.1.2. Exclusion criteria.

(1) Literature not in Chinese or English;
(2) duplicate publications;
(3) literature with incomplete data or inability to analyze data.

2.2. Study objectives

To analyze the effect of psychological intervention on the rehabilitation efficacy and quality of life of patients with stroke combined with anxiety and depression, with the expectation of improving the rehabilitation efficacy and quality of life of stroke patients. By synthesizing and analyzing the existing studies, we can find out the reliable scientific basis, so as to draw doctors' attention to the psychological dysfunction of stroke patients and improve the treatment effect.

2.3. Interventions

The control group was treated with conventional rehabilitation therapy techniques and antianxiety and depression medication. The intervention group underwent systematic psychological interventions on the basis of the control group, including cognitive-behavioral therapy, supportive psychotherapy, group therapy, motivational interviewing therapy, interpersonal psychotherapy, and other techniques.

2.4. Outcome indicators

The primary outcome indicators included changes in anxiety and depression scores, ability to perform daily living scores, and quality of life scores between the intervention and control groups, which were calculated using continuous variables (mean and standard deviation). Anxiety and depression rating scales included Hamilton Anxiety Scale (HAMA), Hamilton Depression Scale (HAMD), Zung Self-Assessment Scale for Anxiety (SAS), Zung Self-Assessment Scale for Depression (SDS), Ability to Perform Daily Life Scale (Barthel Index), and Quality of life assessment using Quality of Life Inventory-74 or the MOS item short from health survey or Symptom Check List-90 or Stroke-Specific Quality of Life Scale, abbreviated as QOL in subsequent texts.

2.5. Retrieval strategy

Computerized searches of PubMed, EMbase, Web of Science, the Cochrane Library, VIP, China National Knowledge Infrastructure, Chinese Biomedical Literature Database, and Wanfang Data databases were conducted to collect information on the effects of psychological interventions on psychological functioning and the ability to perform daily living tasks or the quality of life of patients with stroke (comorbid anxiety and depression). The search was conducted using a combination of subject terms and free words, and the English search terms included Strokes, Cerebrovascular Accident, Angst, Social Anxiety, Depressive Symptoms, Depression, Emotional, Intervention, Psychosocial, Psychological Interventions, Cognitive Behavioral Therapies, etc. Taking Web of science as an example, specific search strategies are shown below.

Web of science search strategies

#	Retrieval formula
1	TS = (Strokes or Cerebrovascular Accident or Cerebrovascular Accidents or CVA (Cerebrovascular Accident) or CVAs (Cerebrovascular Accident) or Cerebrovascular Apoplexy or Apoplexy, Cerebrovascular or Vascular Accident, Brain or Brain Vascular Accident or Brain Vascular Accidents or Vascular Accidents, Brain or Cerebrovascular Stroke or Cerebrovascular Strokes or Stroke, Cerebrovascular or Strokes, Cerebrovascular or Apoplexy or Cerebral Stroke or Cerebral Strokes or Stroke, Cerebral or Strokes, Cerebral or Stroke, Acute or Acute Stroke or Acute Strokes or Strokes, Acute or Cerebrovascular Accident, Acute or Acute Cerebrovascular Accident or Acute Cerebrovascular Accidents or Cerebrovascular Accidents, Acute)
2	TS = (Angst or Social Anxiety or Anxieties, Social or Anxiety, Social or Social Anxieties or Hypervigilance or Nervousness or Anxiousness or Anxiety)
3	TS = (Depression or Depressive Symptoms or Depressive Symptom or Symptom, Depressive or Emotional Depression or Depression, Emotional)
4	TS = (Psychosocial Intervention or Intervention, Psychosocial or Interventions, Psychosocial or Psychosocial Interventions or Psychological Intervention or Intervention, Psychological or Interventions, Psychological or Psychological Interventions)
5	TS = (Cognitive Behavioral Therapy or Cognitive Behavioral Therapies or Cognitive Therapies or Cognitive Therapy or Cognitive Behaviour Therapy or Cognitive Behaviour Therapies or Cognitive Psychotherapy or Cognitive Psychotherapies or Cognition Therapy or Cognition Therapies or Cognitive Behavior Therapies or Cognitive Behavior Therapy)
6	TS = (randomized or controlled randomized or placebo)
7	#1 AND #2 AND #3 AND #4 AND #5 AND #6

2.6. Literature quality assessment

2.6.1. Literature screening and data extraction. Literature was screened, and information was extracted and cross-checked independently by 2 researchers. Any disagreements were resolved

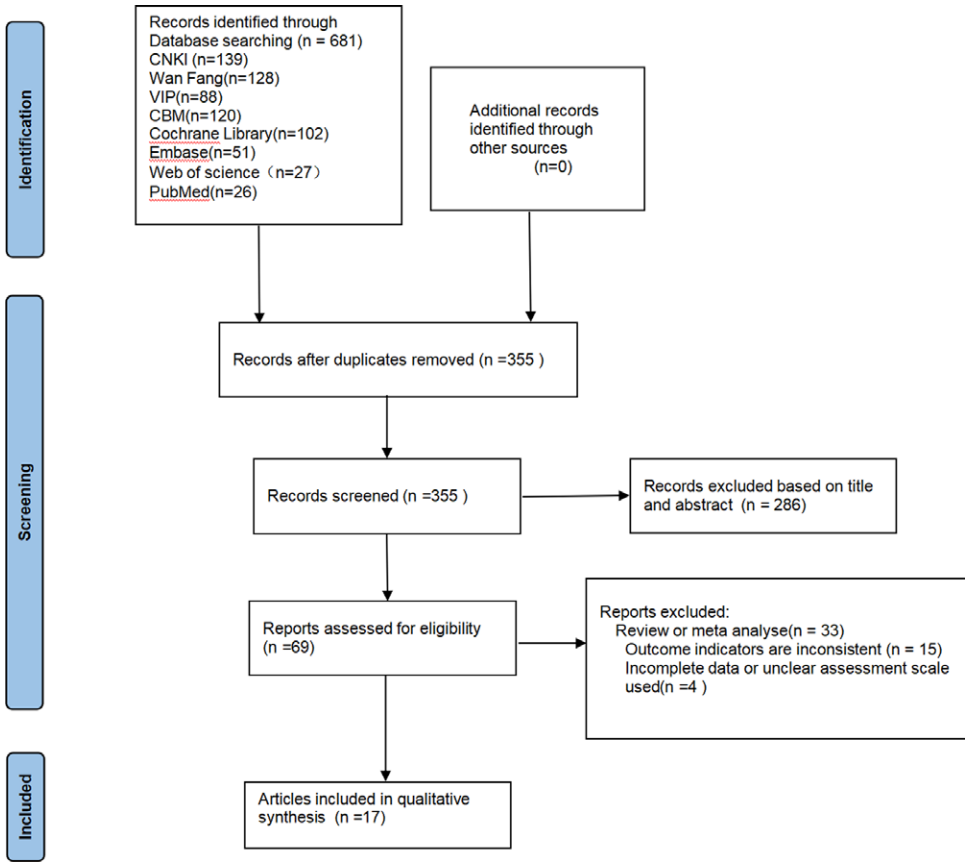

Figure 1. PRISMA flow diagram of search results.

by discussion or consultation with a third party. The literature was screened by first reading the title. After eliminating obviously irrelevant literature, the abstract and full text were further read to determine inclusion. If necessary, the authors of the original studies were contacted by e-mail or telephone to obtain information that was not identified, but was important for this study. The extracted information included (1) basic information of the included studies: study title, first author, year of publication, etc; (2) baseline characteristics and interventions of the study subjects; (3) duration of the intervention, time of the assessment, and the scale used for the assessment; (4) key elements of the evaluation of risk of bias; and (5) outcome indicators of interest.

2.6.2. Risk of bias assessment. The risk of bias of the included studies was independently evaluated by 2 investigators, and the results were cross-checked. The risk of bias was evaluated using the RCT risk of bias assessment tool recommended by the Cochrane Handbook 5.1.0.[8] It includes the following: (1) random allocation method; (2) hidden grouping; (3) whether blinding was used;(4) completeness of the outcome data, including pre-intervention baseline level measurements, loss of visits and dropouts, data from exclusion analyses, and reasons for loss of visits;(5) selective reporting of the study results; and (6) other sources of bias affecting the veracity of the trial. We assessed the risk of bias for each RCT according to the following criteria: "Yes" indicates a low risk of bias; "No" indicates a high risk of bias; and "Unclear" indicates that the literature does not provide sufficient or uncertain information to assess bias. Two researchers discussed the RCTs according to the above criteria and methodology and reached a consensus based on the third-party opinion, if necessary.

2.7. Statistical analysis

RevMan 5.3 software was used for statistical analysis. The mean difference or standardized mean difference (SMD) was used as the effect analysis statistic and each effect was provided with a 95% confidence interval (CI). Heterogeneity was judged by the P value and I^2: $P > .1$ and $I^2 < 50\%$ could be considered homogeneous for multiple studies of the same kind, and a fixed-effects model was chosen; a random-effects model was chosen if $P < .1$ and $I^2 \geq 50\%$, but a merger was required for clinical judgment of consistency between groups. If the heterogeneity is large, we will conduct further subgroup analysis to find the cause.

2.8. Sensitivity analysis

Sensitivity analyses were performed to assess the robustness of the meta-analysis results.

3. Results

3.1. Literature screening process and results

A total of 676 relevant literatures were obtained from the initial review, and after a layer-by-layer screening process, 17 RCTs,[9–25] were finally included. The literature screening process and the results are shown in Figure 1.

3.2. Basic characteristics of included studies

The basic characteristics of the included studies are shown in Table 1. The studies in our meta-analysis were published between 2009 and 2022, with a total sample size of 784, all participants were diagnosed with stroke with anxiety-depression. Anxiety was assessed using the SAS[26] or HAMA[27] scales, depression using the SDS[28] or HAMD[29] scales, ability to perform activities of daily living using the Barthel Index,[30] and quality of life using the QOLI-74[31]/SF-36[32]/SCL-90[33]/

Table 1

Characteristics of included studies.

Study	Country	Year	All number	Age		Intervening measure		Evaluate time	Outcome indicator
			Experimental group/ control group	$\bar{x} \pm s$ (experimental group)	$X \pm S$ (control group)	Experimental group	Control group		
Yanli Chen[9]	China	2016	49/49	61 ± 3	61 ± 3	Mental intervention	Conventional rehabilitation	1 month	HAMA, HAMD, SCL-90
Jing Zhu[10]	China	2021	46/46	71.02 ± 2.39	71.1 ± 2.41	Mental intervention	Conventional rehabilitation	-	SAS, SDS, GQOLI
Lunjiao Fu[11]	China	2012	38/38	-	-	Mental intervention	Conventional rehabilitation	1 month	SAS, SDS, QOL
Shijie Ning[12]	China	2019	36/36	62.12 ± 2.92	62.05 ± 2.98	Mental intervention	Conventional rehabilitation	The day of discharge and 1 months after discharge	HAMA, HAMD, SF-36
Guoming Li[13]	China	2018	50/50	64.58 ± 2.7	64.74 ± 2.69	Mental intervention	Conventional rehabilitation	-	SAS, SDS, Barthel
Xiaolin Liu[14]	China	2021	56/56	63.52 ± 4.23	63.32 ± 4.31	Mental intervention	Conventional rehabilitation	-	SAS, SDS, Barthel
Huijuan Shi[15]	China	2013	44/40	72.4 ± 6.1	70.6 ± 5.2	Mental intervention	Conventional rehabilitation	1 month	SAS, SDS, SCL-90
Linxia Sang[16]	China	2015	40/40	60.72 ± 4.78	61.56 ± 5.02	Mental intervention	Conventional rehabilitation	1 month	SAS, SDS, SCL-90
Min Shen[17]	China	2021	60/60	54.48 ± 3.69	55.48 ± 3.25	Mental intervention	Conventional rehabilitation	1 month	SAS, SDS, GQOLI-74
Yanxiao Suo[18]	China	2020	32/32	69.91 ± 3.15	69.84 ± 3.26	Mental intervention	Conventional rehabilitation	-	SAS, SDS, GQOLI-74
Chunxia Xu[19]	China	2015	40/40	60.72 ± 4.78	61.56 ± 5.02	Mental intervention	Conventional rehabilitation	1 month	SAS, SDS, SCL-90
Shiwu Ye[20]	China	2014	57/57	61.71 ± 6.25	62.19 ± 6.23	Mental intervention	Conventional rehabilitation	1d, 7d, 14d, 21d	SAS, HAMD, Barthel
Zhijuan Chen[21]	China	2022	37/37	55.74 ± 6.41	54.65 ± 6.22	Mental intervention	Conventional rehabilitation	-	SAS, SDS, SCL-90, QLQ-C30
Wen Zhang[22]	China	2016	75/75	54.15 ± 4.71	54.15 ± 4.71	Mental intervention	Conventional rehabilitation	-	SAS, SDS, Barthel
Xinzhi Zhang[23]	China	2015	50/50	-	-	Mental intervention	Conventional rehabilitation	-	SAS, SDS, Barthel
Min Lu[24]	China	2016	42/42	58.7 ± 2.5	58.3 ± 2.2	Mental intervention	Conventional rehabilitation	The day of discharge and 3 months after discharge	SAS, SDS, Barthel
Shujun Zhang[25]	China	2009	32/32	57.4 ± 7.2	56.9 ± 6.1	Mental intervention	Conventional rehabilitation	-	SAS, SDS, QOL

HAMA = Hamilton Anxiety Scale, HAMD = Hamilton Depression Scale, QLQ-C30 = European Organization for Research and Treatment of Cancer Quality of Life Questionnaire, QOL = Quality of Life Scale, QOLI-74 = Quality of life assessment using Quality of Life Inventory-74, RCT = randomized controlled trial, SAS = Zung Self-Assessment Scale for Anxiety, SCL-90 = Symptom Check List-90, SDS = Zung Self-Assessment Scale for Depression, SF-36 = the MOS item short from health survey.

QOL.[34] Linxia Sang et al[16] and Chunxia Xu et al[19] used cognitive therapy, behavioral modification therapy and social support therapy to implement the intervention; Sunjun Zhang et al[25] and Lunjiao Fu et al[11] intervened with cognitive therapy, behavior modification therapy, social support therapy, and rational emotive therapy; Ming Shen et al[17] implements interventions with solution-focused brief therapy; Ming Lu et al[24] implemented the intervention with psychological counseling and supportive therapy; Zhijuan Chen et al[21] used a phased psychological intervention approach to implement the treatment, which was divided into 3 phases, namely, the retardation phase, the spasticity phase, and the relative recovery phase. Supportive psychotherapy was used in the first phase, cognitive-behavioral therapy was used in the second phase, and supportive psychotherapy, behavioral modification, and interpersonal psychotherapy were used in the third phase; Huijuan Shi et al[15] implemented the intervention with music-electricity integrated therapy, social support and health promotion; Guoming Li et al[13] implemented the intervention using psychological counseling, family interventions, and interpersonal psychotherapy; Shiwu Ye et al[20] implemented treatment with psychological counseling, cognitive interventions, and family interventions; Jing Zhu et al[23] used psychological counseling and health promotion to implement intervention therapy; Xinzhi Zhang et al[10] implemented the intervention with cognitive therapy, social support and relaxation therapy; implementation of treatment with comprehensive psychological interventions by Wen Zhang et al[22], Xiaolin Liu et al,[14] Shijie Ning et al[12], and Yanli Chen et al[9]; Yanxiao Suo et al[18] implemented the intervention used emotional therapy and cognitive behavioral therapy.

3.3. Risk of bias evaluation results

The results of the risk of bias evaluation are shown in Figures 2 and 3. In 17 studies, none of the articles mentioned whether the participants or assessors were blinded or whether they were assigned concealment, so it was unclear and there was a moderate risk, and the rest were low risk.

3.4. Results of the evaluation of the effectiveness of psychological interventions

3.4.1. Effects of psychological interventions on anxiety cores. Seventeen studies evaluated the effects of psychological interventions on anxiety, and there was heterogeneity among the studies; meta-analysis was conducted using a random effects model. Seventeen studies provided pre-intervention and post-intervention means and standard deviations, which were calculated before and after baseline for the experimental and control groups in each study, respectively. Figure 4 shows the forest plot of the 17 included articles, and the results showed that the psychological intervention group was more effective in reducing anxiety than the control group (SMD =-2.82, 95%CI[–3.54,–2.10], $P < .00001$).

3.4.1.1. Subgroup analysis by intervention time. Subgroup analyses were performed for studies with an intervention duration of less than or equal to 1 month and studies that did not specify the duration of the intervention (Fig. 5), with 7 studies with an intervention duration of less than or equal to 1 month and the remaining 10 studies that did not specify the duration of the intervention. The results of psychosocial interventions with a duration of less than or equal to 1 month showed that the psychosocial intervention group was more effective at lowering anxiety scores than the control group [SMD =–0.90, 95%CI(–1.18,–0.63), $P < .00001$]. The results of the unspecified duration of the intervention showed that

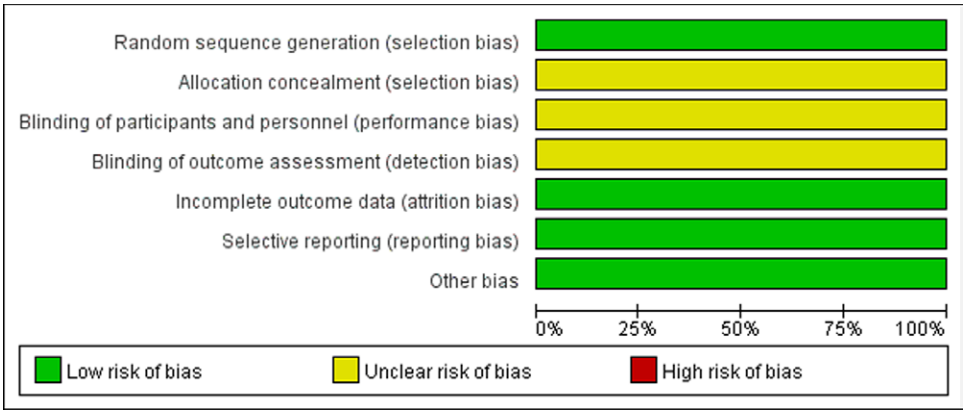

Figure 2. Risk of bias graph.

the psychological intervention group was more effective in reducing anxiety scores than the control group [SMD =–4.46, 95%CI(–5.71,–3.22), $P < .00001$].

3.4.1.2. Subgroup analysis by assessment scale. A subgroup analysis of the SAS and HAMA scales for assessing anxiety was performed (Fig. 6), which included 15 studies that assessed anxiety using the SAS scale and 2 studies that assessed it using the HAMA scale. An analysis of the studies using the SAS scale showed that the psychological intervention group was more effective than the control group in reducing anxiety scores (WMD =–8.95, 95%CI[–11.05,–6.85], $P < .00001$). Analysis of studies using the HAMA scale showed that the psychological intervention group was more effective than the control group in reducing anxiety scores (WMD = –2.91, 95%CI(–4.40,–1.43), $P = .0001$], and $P > .1$, $I^2 < 50\%$, indicating that the 2 included studies were not heterogeneous.

3.4.2. Effects of psychological interventions on depression. Seventeen studies evaluated the effects of psychological interventions on depression, and there was heterogeneity among the studies, so meta-analysis was conducted using a random effects model. Seventeen studies provided pre-intervention and post-intervention means and standard deviations, which were calculated before and after baseline for the experimental and control groups in each study, respectively. Figure 7 shows a forest plot of the 17 included, and the results showed that the psychological intervention group was more effective in reducing depression than the control group score [SMD = –2.40, 95%CI(–3.05,–1.75), $P < .00001$].

3.4.2.1. Subgroup analysis by intervention time. Subgroup analyses were performed for those with an intervention duration of less than or equal to 1 month and those without a clearly stated intervention duration (Fig. 8), with 7 studies with an intervention duration of less than or equal to 1 month and the remaining 10 without a clearly stated intervention duration. The results of psychological interventions with a duration of less than or equal to 1 month showed that the psychological intervention group was more effective in reducing anxiety scores than the control group [SMD = –0.78, 95%CI(–1.06,–0.5), $P < .00001$]. The results of the unspecified duration of the intervention showed that the psychological intervention group was more effective in reducing depression scores than the control group [SMD = –3.72, 95%CI(–4.79,–2.65), $P < .00001$].

3.4.2.2. Subgroup analysis by assessment scale. A subgroup analysis of the SDS and HAMD scales for assessing anxiety was performed (Fig. 9), with 15 studies assessing anxiety using the SDS scale and 2 studies assessing it using the HAMD scale. Analysis of studies using the SDS scale showed that the psychological intervention group was more effective than the control group in reducing depression scores (WMD =–9.07, 95%CI(–12.30,–5.84), $P < .00001$]. An analysis of studies using the HAMD scale showed that the psychological intervention group was more effective than the control group in reducing depression scores (WMD =–4.97, 95%CI[–6.89,–3.05], $P < .00001$).

3.4.3. The effect of psychological intervention on the ability to perform daily life in patients with stroke combined with anxiety and depression. The mean and standard deviation of the experimental and control groups before and after baseline were calculated respectively in each study. Figure 10 shows the forest plot of the 6 included studies. The results showed that the psychological intervention group was more effective than the control group in improving the ability to perform daily life scores [WMD = 8.36, 95%CI(5.34,11.37), $P < .00001$].

3.4.4. The effect of psychological intervention on the quality of life of patients with stroke combined with anxiety and depression. Clinical assessment of quality of life was mostly assessed by QOL, GQOLI-74 index, and 3 studies used GQOLI assessment, but the total score was not given and was not included in the study. Two studies used QOL for quality of life scores, and both studies provided pre-intervention and post-intervention means and standard deviations. The means and standard deviations of the experimental and control groups before and after baseline were calculated for each study, and the results are shown in Figure 11, which showed that the psychological intervention group was more effective than the control group in improving patients' quality of life scores (WMD = 11.63, 95%CI[9.78, 13.48], $P < .00001$).

3.5. Sensitivity analysis

The sensitivity analysis of the 17 studies included in this study using the method of excluding individual studies one by one showed that none of the studies significantly interfered with the results of this meta-analysis, suggesting that the results of the study were stable.

4. Discussion

The results of this study show that psychological intervention can improve the ability of daily life of patients with stroke combined with anxiety and depression, and improve the quality of

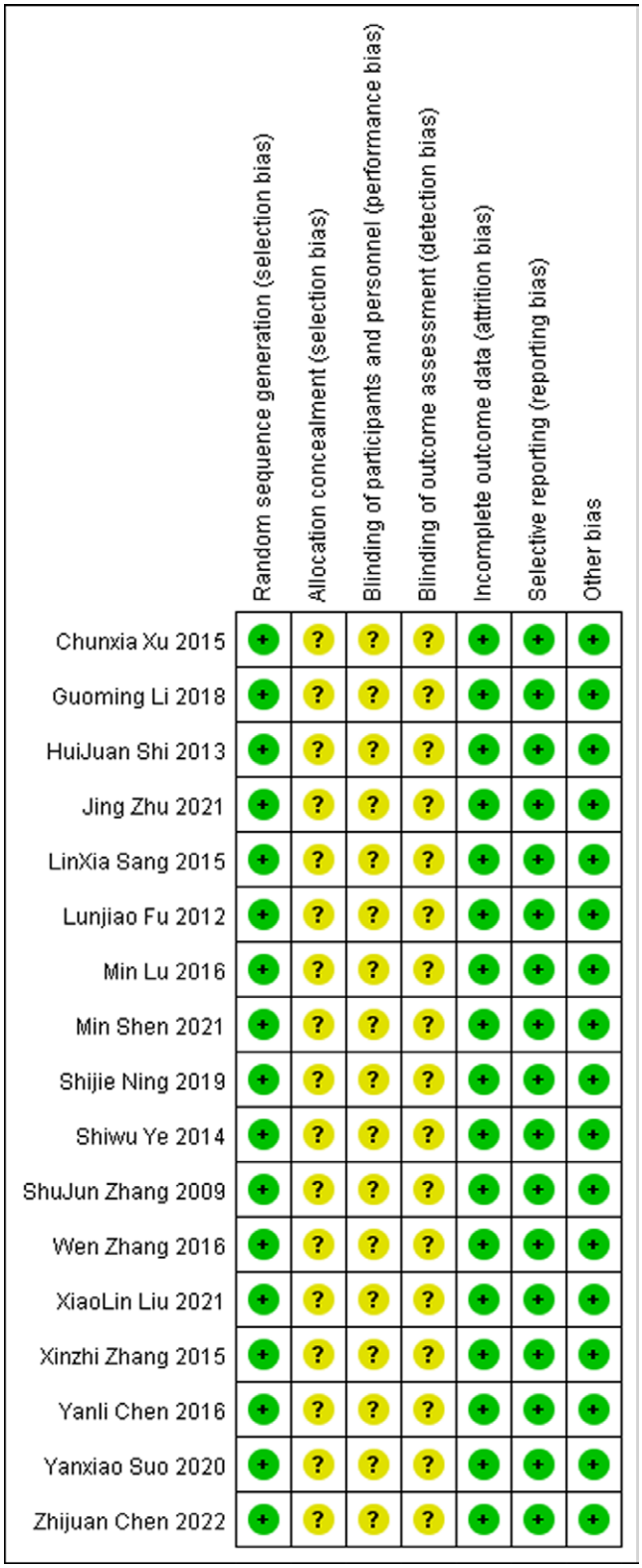

Figure 3. Risk of bias summary.

life and rehabilitation of patients. Patients suffering from anxiety and depression after stroke have severe psychological dysfunction, which can seriously affect the degree of cooperation, initiative and participation of the patients, thus substantially reducing their rehabilitation effects. During the rehabilitation process, the difference between patients' active and passive participation significantly affects the rehabilitation outcome. Patient initiative is closely related to rehabilitation efficacy, and improving patients' psychological dysfunction is conducive to improving rehabilitation outcomes. However, at present, many general hospitals do not provide systematic rehabilitation psychotherapy for stroke patients, especially in remote areas of ethnic minorities, which are limited by local economic conditions, social environment, and medical level, and pay less attention to psychological disorders such as poststroke anxiety and depression, and medical staff and family members mainly focus on the physical function of stroke patients, often neglecting their psychological function, which affects the final rehabilitation effect.

The advantage of Shiwu Ye et al[20] Yeh Shih-Wu study was that it assessed every 7 days, which can know the patient's recovery in time, which is helpful for adjusting the treatment methods and interventions to improve the rehabilitation effect; the study by Yanli Chen et al[9] and Shijie Ning et al[12] used HAMA and HAMD for anxiety and depression assessment, which excludes the influence of subjectivity, reduces heterogeneity, and makes the assessment results more reliable; the strength of Lv Min study was that it focuses more on longevity, reassessed patients 3 months after discharge, providing a better understanding of the patient's needs and wishes through continuous care and communication, and providing a more attentive healthcare service for the patient, with the aim of ensuring that the patient receives effective rehabilitation and care after discharge, and improving the patient's quality of life; the study by Guoming Li et al,[13] XiaoLin Liu et al,[14] Shiwu Ye et al,[20] Wen Zhang et al,[22] Xinzhi Zhang et al,[23] and Min Lu et al[24] used the Barthel Index for the assessment of daily living ability, which has higher reliability and sensitivity, is easy to use and has reliable results. The study by Lunjiao Fu et al[11] and Shujun Zhang et al[25] used QOL for quality of life assessment, which is a specialized quality of life assessment scale for stroke patients, and is more targeted and specialized compared to other universal quality of life assessment scales.

In the currently included study, a comparative analysis of psychological interventions for anxiety and depression yielded optimal recovery using a staged psychotherapy intervention. The reason that staged psychotherapy is the best intervention is because in this intervention, the psychological characteristics of the patient at each stage of the process are taken into account, and the implementation of targeted psychotherapy at each stage results in the best recovery outcome. Although there have been some studies on systematic psychological interventions for patients with stroke with anxiety and depression, there are fewer studies on which psychological interventions achieve the best therapeutic outcome, and more high-quality literature is needed to further confirm this in the future.

Limitations of this study are as follows: (1) the literature was collected only in English and Chinese, which may have led to incomplete inclusion; (2) because of the specificity of the intervention, whether blinding and allocation concealment were used was not stated in the study, and the time of the intervention was inconsistent, which may have resulted in implementation, measurement, and other biases; (3) some of the outcome indicators were included in an insufficient number of studies, which affected the accuracy of the results; and (4) the SAS and SDS assessment scales belong to the patients' self-assessment scale, which can lead to differences in the results of the assessment due to subjective reasons. All of these factors may have contributed to the large heterogeneity.

5. Conclusion

Adding psychological interventions to conventional rehabilitation therapy can significantly improve rehabilitation outcomes

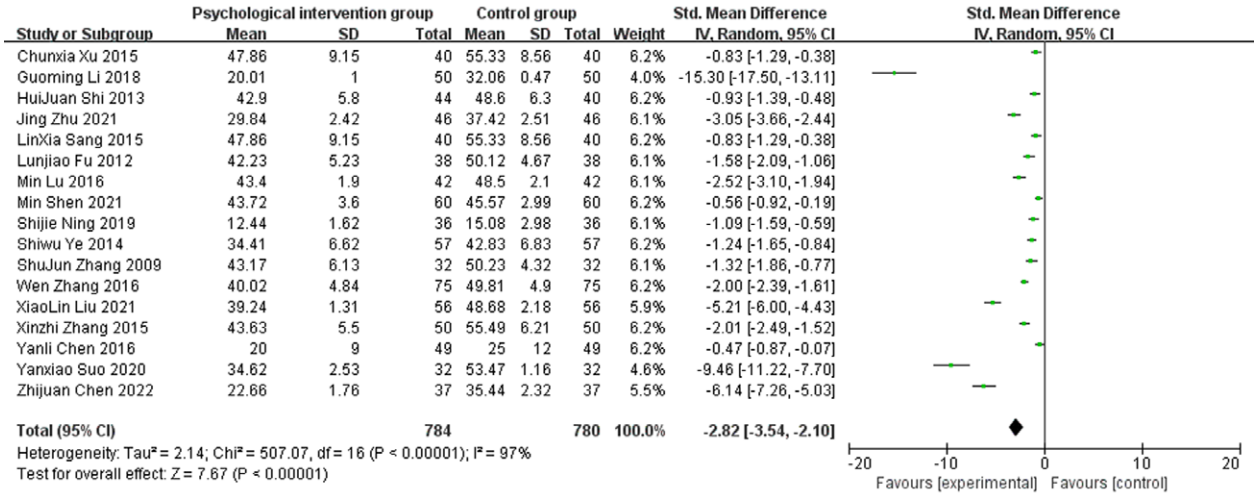

Figure 4. Effect of psychological interventions on anxiety.

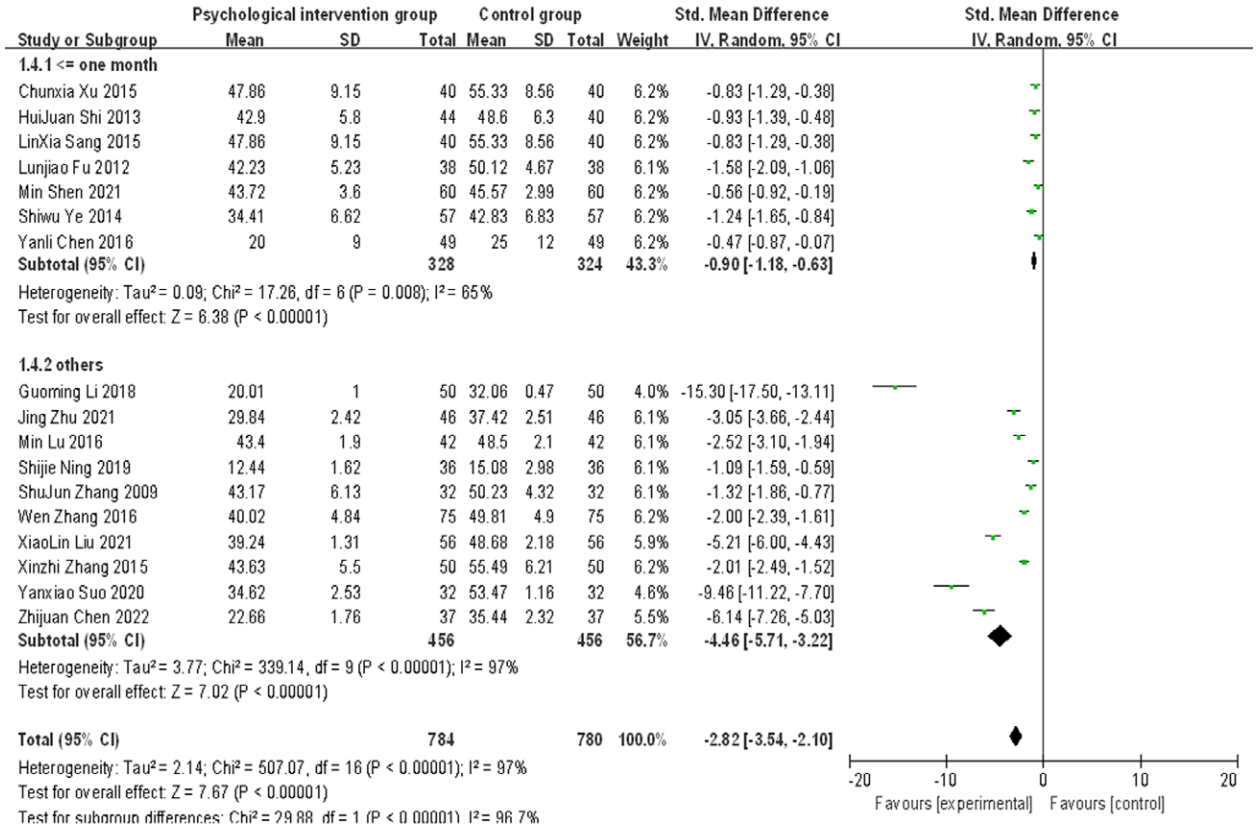

Figure 5. Effect of psychological intervention on anxious patients (subgroup analysis according to intervention time).

and quality of life in patients with stroke combined with anxiety and depression. Rehabilitation practitioners and families should emphasize the patient's psychotherapy. Future studies should take into account both physical and psychological treatments, focusing on psychological treatments within the comprehensive treatment and identifying the best interventions in psychological treatments, in order to arrive at the best rehabilitation measures and the best interventions in psychological treatments for patients with stroke combined with anxiety and depression.

Author contributions

Conceptualization: Ting Gao, Bingquan Zhao.
Data curation: Ting Gao, Bingquan Zhao.
Formal analysis: Bingquan Zhao.
Methodology: Ting Gao, Yanyun Yao.
Software: Ting Gao, Yanyun Yao.
Writing – original draft: Ting Gao, Bingquan Zhao.
Writing – review & editing: Ting Gao.

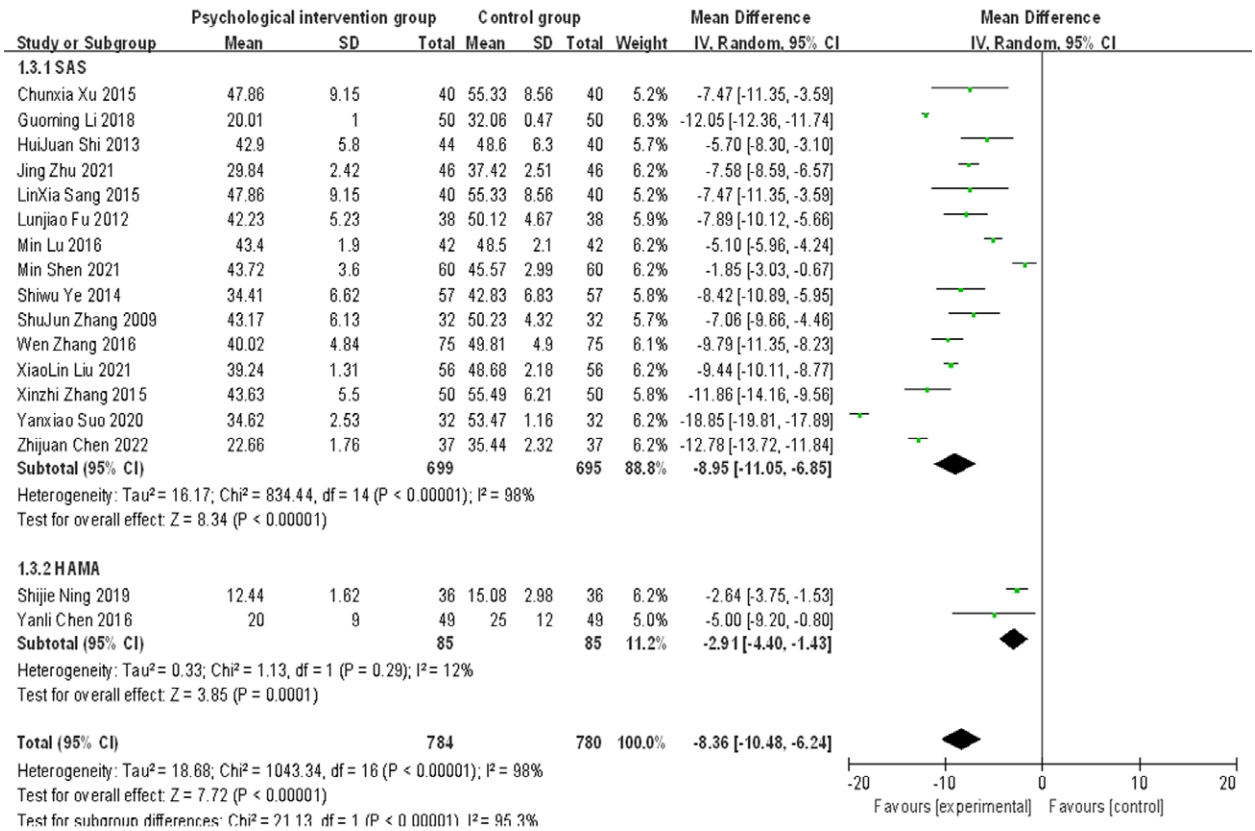

Figure 6. Effect of psychological interventions on anxiety (subgroup analysis based on assessment scales).

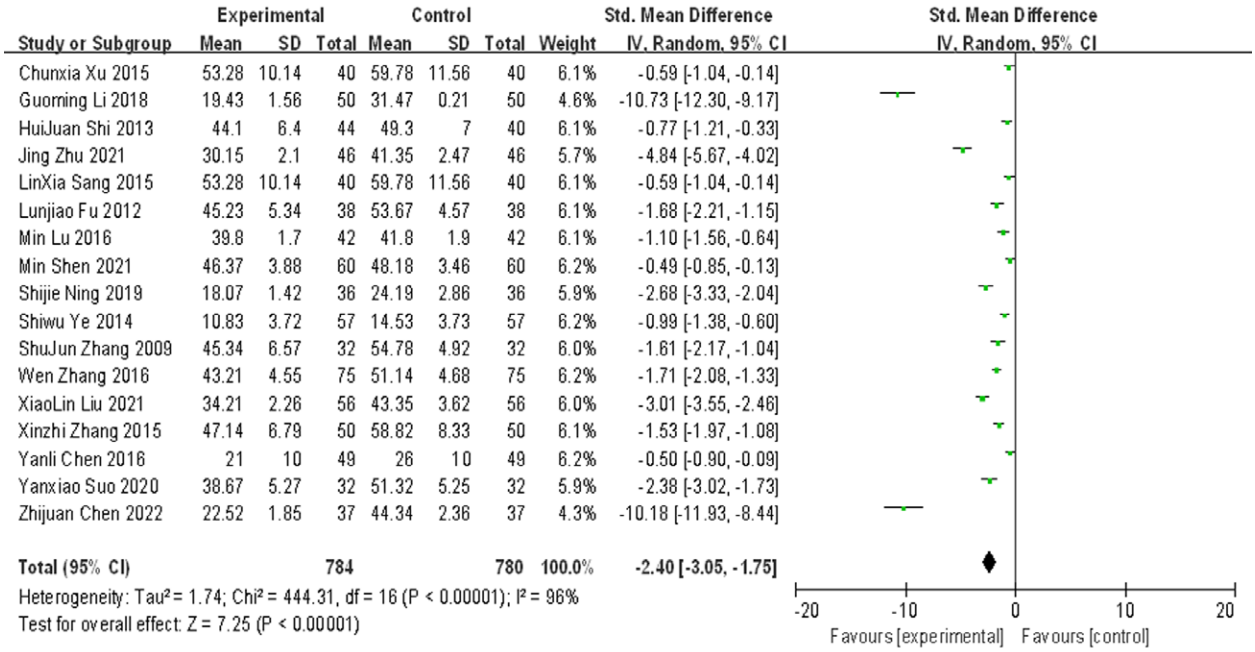

Figure 7. Effect of psychological interventions on depression.

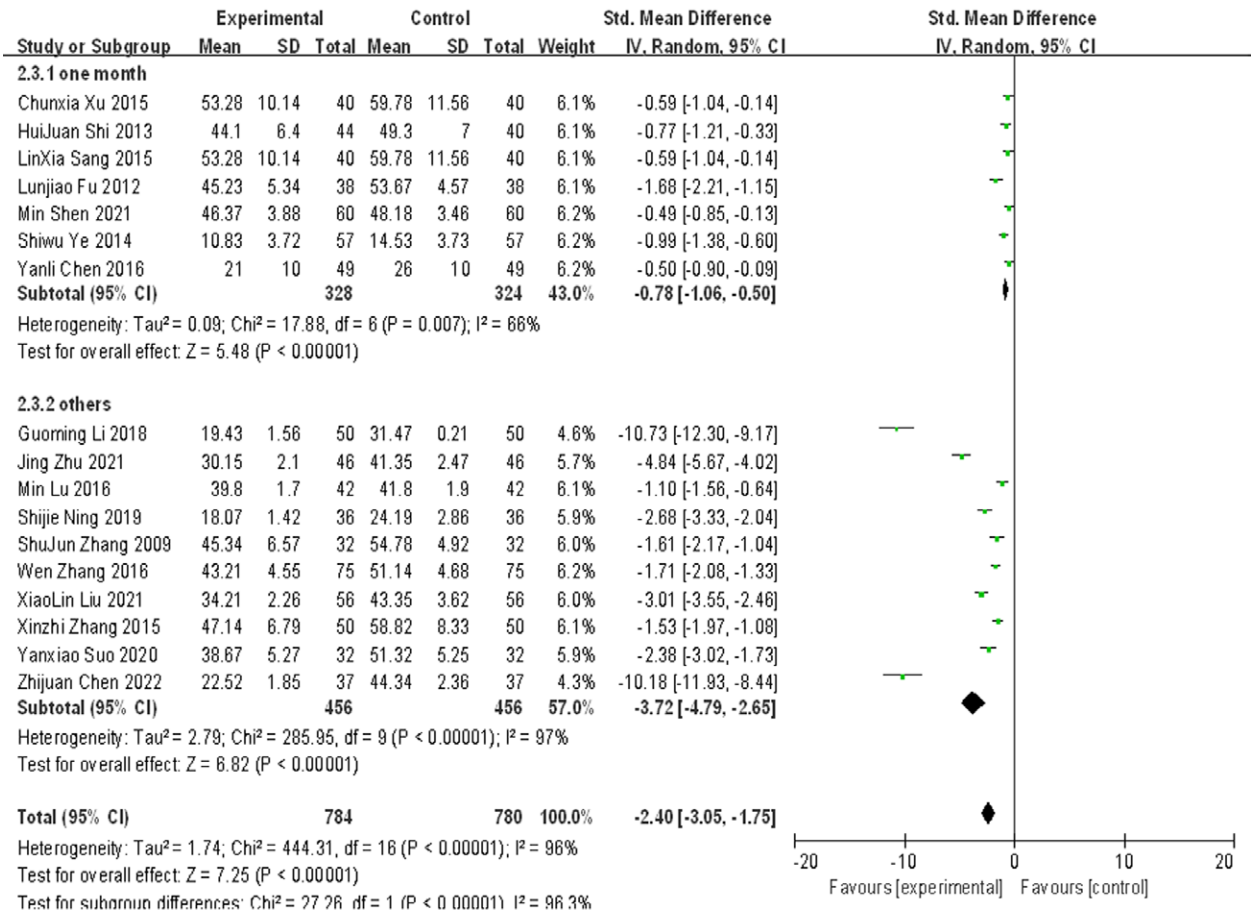

Figure 8. Effect of psychological interventions on depression (subgroup analysis according to intervention time).

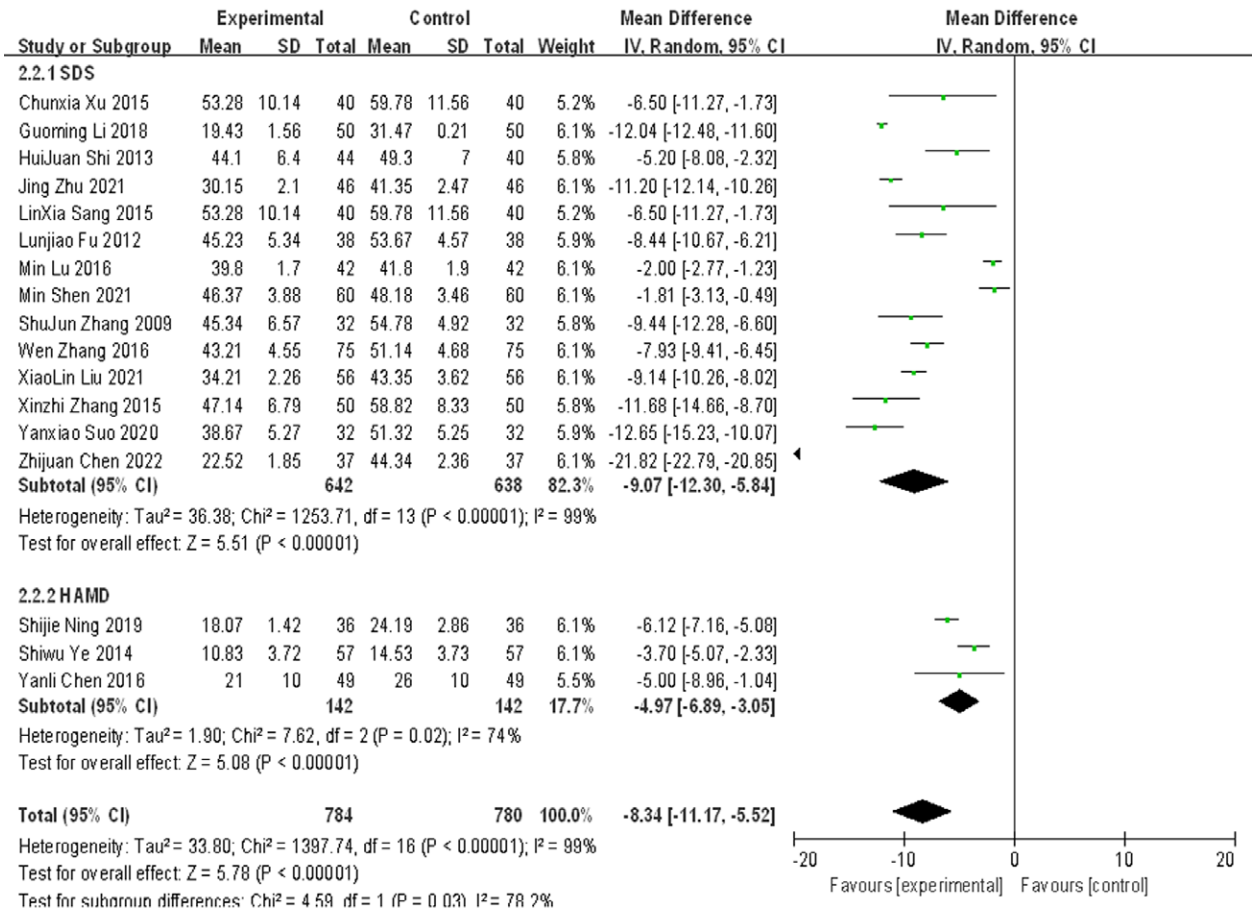

Figure 9. Effect of psychological interventions on depression (subgroup analysis based on assessment measures).

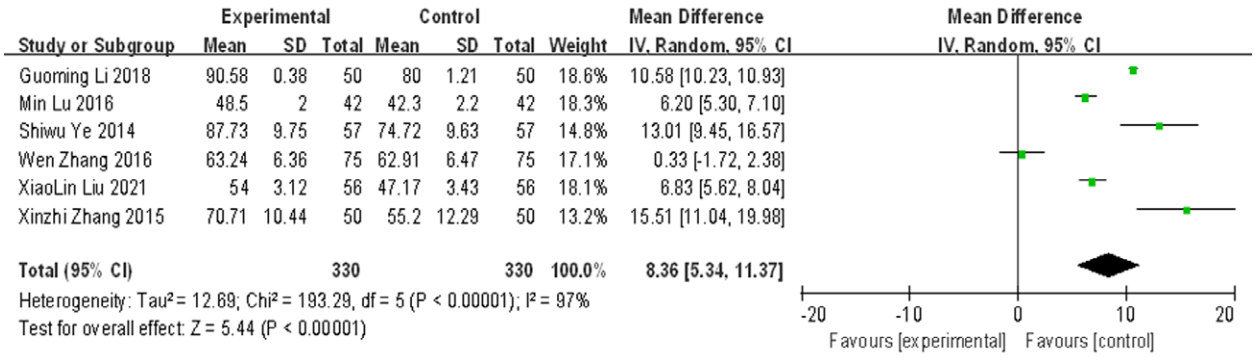

Figure 10. Effect of psychological intervention on daily living ability score (Barthel index) in patients with stroke combined with depression and anxiety.

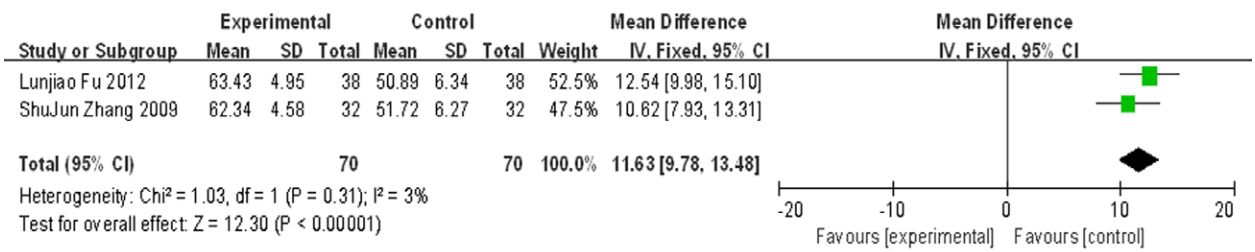

Figure 11. Effect of psychological intervention on quality of life scores (QOL scale) in patients with stroke combined with depression and anxiety.

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