



# Efficacy of culturally adapted interventions for common mental disorders in people of Chinese descent: a systematic review and meta-analysis



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## Summary

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For the Chinese translation of the abstract see Online for appendix 1

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**Background** Evidence suggests that culturally adapted psychological interventions have some benefits in treating diverse ethnic groups. However, the effect of such cultural adaptations specifically in Chinese ethnic groups has not been thoroughly reviewed. We aimed to systematically assess the evidence for the efficacy of different cultural adaptations in treating common mental disorders in people of Chinese descent (ie, ethnic Chinese populations).

**Methods** In this systematic review and meta-analysis, we searched MEDLINE, Embase, PsycINFO, CNKI, and WANFANG to identify randomised controlled trials published in English and Chinese from database inception to March 10, 2023. We included trials of culturally adapted psychological interventions in people of Chinese descent (with at least 80% of Han Chinese descent) aged 15 years or older with a diagnosis or subthreshold symptoms of common mental disorders, including depression, anxiety disorders, and post-traumatic stress disorder. We excluded studies that included participants with severe mental disorders (eg, schizophrenia, bipolar disorder), neurodevelopmental disorders, or dementia. Study selection and data extraction were done by two independent reviewers, who extracted data for study characteristics, cultural adaptations, and summary efficacy. The primary outcome was post-intervention change in symptoms (both self-reported and clinician-rated). We used random-effects models to calculate standardised mean differences. Quality was assessed using the Cochrane risk of bias tool. The study is registered with PROSPERO (CRD42021239607).

**Findings** We identified 32 791 records, 67 of which were included in our meta-analysis (60 done in mainland China, four in Hong Kong, and one each in Taiwan, Australia, and the USA). We included 6199 participants (mean age 39·32 years [range 16–84]), of whom 2605 (42%) were male and 3247 (52%) were female. Culturally adapted interventions had medium effect sizes in terms of reducing both self-reported (Hedges'  $g$  0·77 [95% CI 0·61–0·94];  $I^2$  84%) and clinician-rated (0·75 [0·54–0·96]; 86%) symptom severity across all disorders at end of treatment, irrespective of adaptation types. We noted no difference in efficacy between culturally modified interventions and culturally specific interventions. Subgroup analyses showed considerable heterogeneity. Inadequate reporting in included studies largely restricted risk-of-bias appraisals across all domains.

**Interpretation** Psychological interventions can be transported across cultures with appropriate modifications. Adaptations to interventions can be made by modifying evidence-based interventions, or in culturally specific ways that are rooted in the sociocultural context. However, findings are limited by the insufficient reporting of interventions and cultural adaptations.

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## Introduction

Evidence-based psychological interventions are a mainstay of the treatment approach to mental disorders in most developed health-care systems (as recommended, for example, by the American Psychological Association<sup>1</sup> and UK National Institute for Health and Care Excellence<sup>2</sup>). However, the effects of psychological interventions could be culturally specific.<sup>3</sup> Both the conceptualisation and the treatment of mental disorders are arguably best understood in a culturally specific frame of reference.<sup>4,5</sup>

Confucianism, Taoism, and Buddhism have fundamentally shaped Chinese culture,<sup>6</sup> which is

characterised by strong collectivism and emphasises social hierarchy, including respect for authority and filial piety.<sup>7</sup> These cultural values have shaped Chinese conceptualisations and manifestations of mental health problems (eg, the notion of integrating body and mind proposed in Taoism might mean that Chinese people are more likely to somatise mental health symptoms).<sup>8</sup> As a result, help-seeking from mental health services might be lower among Chinese populations than other ethnic groups, leading to more severe clinical profiles at treatment initiation and an increased likelihood of poor treatment outcomes or treatment dropout.<sup>9</sup> Therefore, psychological interventions developed in North America

## Research in context

### Evidence before this study

Most psychological interventions in common use were developed in North America and western Europe, and these interventions might be culturally incongruent for people from different cultures. Previous reviews of cultural adaptations of psychological interventions for diverse ethnic groups have shown that they have some positive benefits, but different ethnic groups were often aggregated in these analyses, which could mean that important distinctions between cultures have been overlooked. Whether the benefits of different cultural adaptations hold up in populations of Chinese descent is unclear. In addition, psychological interventions provided to people of Chinese descent include both culturally adapted interventions developed in North America and western Europe, and novel interventions developed in the Chinese cultural context. We searched MEDLINE, Embase, PsychINFO, CNKI, and WANFANG with the search terms (China OR Chinese) AND ((systematic review) OR meta-analys\*) AND (mental OR psycho\* OR \*therap\*) from database inception to March 10, 2023, for studies published in English or Chinese. We found no reviews that directly attempted to assess the efficacy of cultural adaptations for this population and to compare the types of cultural adaptation. We did not identify any reviews that directly assessed the comparable effectiveness of cultural adaptations in treating common mental disorders of people of Chinese descent.

### Added value of this study

To our knowledge, this systematic review and meta-analysis is the first to assess the efficacy of cultural adaptations of psychological interventions for people of Chinese descent. Our findings suggest that cultural adaptations increase the efficacy of psychological interventions in this population. Therapist-related, content-related, and organisational adaptations all improved intervention efficacy, but we could not directly compare their efficacy. Culturally modified evidence-based psychological interventions and culturally specific interventions developed within Chinese culture had similar efficacy.

### Implications of all the available evidence

We identified some benefits for cultural adaptations to psychological interventions for people of Chinese descent (predominantly of Han Chinese descent), but improved reporting of methods of development and implementation is needed to enable more extensive assessments of efficacy. Our findings highlight the importance of cultural considerations in delivering effective treatments to wider populations. An international consensus on the definition, development, and dissemination of methods to support cultural adaptations could substantially improve future research and its clinical application.

and western Europe that are grounded in Western epistemological and philosophical traditions might be culturally incongruent for people of Chinese descent (ie, ethnic Chinese populations) living in China or around the world, who might have a different cultural and social context.<sup>10,11</sup> For example, assertiveness is a component of some evidence-based interventions developed in North America and western Europe, but there is no equivalent term in Chinese.<sup>12</sup>

Cultural adaptation has been defined as the systematic modification of evidence-based interventions to consider language, culture, and context so that the interventions are congruent with the cultural background of service users.<sup>13</sup> Substantial efforts have been made to understand and assess culturally adapted psychological interventions to improve outcomes in diverse ethnic groups.<sup>14,15</sup> Evidence from systematic reviews and meta-analyses<sup>16–19</sup> suggests that these adaptations have been successful, but a lack of consensus on describing or categorising the different types of cultural adaptations that have been implemented has hindered understanding of which types of adaptation might be the most beneficial. Furthermore, these analyses have combined adaptations for different cultures, meaning that differences between cultures might be missed. Several cultural adaptation frameworks have been developed to address the lack of consensus, notably the ecological validity model from Bernal and colleagues.<sup>20</sup> A meta-analysis<sup>21</sup> used the

eight dimensions (ie, language, persons, metaphors, content, concepts, goals, methods, and context) of the ecological validity model to assess the level of cultural adaptation of minimally guided interventions for common mental disorders, and noted increasing intervention effect sizes with increasing numbers of dimensions adapted.

A conceptual typology drawing on common factors shared across psychological interventions and competence frameworks has been developed on the basis of cultural adaptations reported in previous studies.<sup>4,16,22</sup> This typology incorporates important service-level adaptations (ie, service design and delivery considerations) beyond the psychological intervention itself, and it has been associated with improved clinical outcomes.<sup>16</sup> In this Article, we are adopting this typology to distinguish therapist-related (eg, changes to support the development of the therapeutic relationship, such as ethnic matching of therapists to service users, whereby service users are matched with therapists of the same ethnicity), content-related (eg, cultural modifications of the use of terms in materials and resources), and organisational (eg, changes to service design and provision) adaptations.<sup>16</sup>

Another approach to providing culturally adapted treatment is the development of culturally specific interventions informed by alternative cultural, philosophical, or religious beliefs that address culturally specific issues.<sup>12,23</sup> The core principles and therapeutic

methods of culturally specific interventions are rooted in the values and traditions of a particular culture. However, to our knowledge, despite considerable efforts to adapt and develop psychological interventions to mesh more closely with Chinese culture, no one has systematically summarised the efficacy of culturally modified or culturally specific interventions that have been derived from Chinese culture.

Establishing the efficacy of cultural adaptations of psychological interventions for almost a fifth of the world's population could contribute substantially to the improvement of global mental health care. In this systematic review and meta-analysis, we aimed to establish which types of cultural adaptations for people of Chinese descent have been developed and assessed in randomised controlled trials, whether the identified culturally adapted interventions were efficacious, and the comparative efficacy of culturally modified and culturally specific interventions.

## Methods

### Search strategy and selection criteria

In this systematic review and meta-analysis, we systematically searched MEDLINE (inception Jan 1, 1946), Embase (inception Jan 1, 1947), PsycINFO (inception Jan 1, 1806), CNKI (inception June 1, 1999), and WANFANG (inception Aug 1, 1997) for articles published from database inception to March 10, 2023. We used a search strategy that included a combination of keyword and subject heading searches, including terms related to randomised controlled trials, China or Chinese, common mental disorders, and psychological interventions, to identify studies published in English or Chinese. Our full search strategy is in appendix 2 (pp 2–10). SL and ZX independently screened all identified studies for eligibility. Conflicts were resolved by consensus and through discussion with a senior reviewer (SP).

We included randomised controlled trials of psychological interventions that were developed or modified in a way that was compatible with the Chinese cultural context or addressed culturally specific issues, compared with non-adapted interventions or no intervention. Eligible studies were in people aged 15 years or older with an established diagnosis or sub-threshold symptoms of common mental disorders, including depression, anxiety disorders, and post-traumatic stress disorder. We excluded studies that included participants with severe mental disorders (eg, schizophrenia, bipolar disorder), eating disorders, substance use disorders, neurodevelopmental disorders, or dementia. Our inclusion criteria were in line with the definition of common mental disorder in guidelines from the UK National Institute for Health and Care Excellence<sup>24</sup> and WHO.<sup>25</sup> We included only studies in which at least 80% of participants were ethnically Han Chinese, irrespective of nationality, and we included people from age 15 years to capture the increasing interest in the mental health

challenges of young people.<sup>26</sup> Trials of both indicated prevention and treatments were included. In line with the Institute of Medicine Framework, indicated prevention refers to intervention in people who have detectable signs or symptoms of a disorder but do not meet diagnostic criteria, whereas treatment refers to intervention in people with a diagnosed disorder.<sup>27</sup> Trials of combination psychological and pharmacological interventions were excluded unless the pharmacological treatment was already underway before trial initiation or constituted treatment as usual.

Our study protocol was registered with PROSPERO (CRD42021239607) and adhered to the PRISMA reporting guidelines.<sup>28</sup>

### Data extraction

Our primary outcome was symptom severity after the intervention of interest as measured on a validated scale. Preplanned secondary outcomes were attrition by end of treatment, wellbeing, and social functioning, but we do not report the social-functioning analyses because data in included studies were scarce. Data extraction was done by SL and ZX independently. Completed data extraction sheets were cross-checked for accuracy and consistency, with discrepancies resolved by consensus. We extracted and analysed summary estimates for self-reported and clinician-rated outcome measures separately at four different timepoints (end of treatment, and 1–3 months, 4–6 months, and 7–12 months after end of treatment). Whenever a study included more than one comparison (eg, if it had more than one primary outcome, or more than one intervention group) the sample size was halved to avoid double counting. For studies with more than two intervention groups, we included each pair-wise comparison separately, but divided the sample size of the shared control group approximately evenly among the comparisons to avoid double counting that could spuriously increase precision, in line with guidance from the *Cochrane Handbook for Systematic Reviews of Interventions*.<sup>29</sup>

We developed a data-extraction form in Microsoft Excel to extract data for the number of participants, age, sex, mental health conditions, intervention type (indicated prevention or treatment), intervention data (ie, content, number of sessions, intervention settings, intervention format, practitioner information, and delivery format), adaptations, approach (culturally modified or culturally specific), comparator (active intervention, attentional control, treatment as usual, waitlist, or no treatment), outcome data, and methodical characteristics to inform the quality assessment. Culturally modified adaptations were defined as modifications to the content, structure, or delivery of evidence-based interventions to address the cultural context or culturally specific issues without changing the core methods. Culturally specific interventions were defined as novel intervention types informed by particular cultural, philosophical, or

See Online for appendix 2

religious beliefs that addressed culturally specific issues. Cultural adaptations were further coded according to the conceptual framework,<sup>16</sup> as therapist-related adaptations to support the development of therapeutic relationship (eg, ethnic matching of therapists to service users, use of pre-intervention discussions to establish rapport, communication informed by cultural values held to be important for a particular community), content-related adaptations to ensure the acceptability and suitability of treatment content (eg, cultural modifications to materials, use of culturally relevant terms of reference, incorporation of faith or religious beliefs into treatment), or organisational adaptations to service design and delivery informed by cultural knowledge and interfacing with existing service structures (eg, changes to the time or length of the intervention or where the intervention is provided, provision of interventions remotely or in group settings, making treatment easier to access). Further details on the classification of cultural adaptation in interventions are in appendix 2 (pp 11–12).

SL and ZX independently used the Cochrane Risk of Bias tool<sup>29</sup> to assess the methodological quality of included studies, with discrepancies discussed and resolved by consensus, with input from SP if a consensus

could not be reached. Studies were judged to be at low risk, unclear risk, or high risk of bias on the basis of appraisals of selection, performance, detection, attrition, and reporting biases.<sup>29</sup>

### Data analysis

We used random-effects models to calculate effect sizes (as standard mean differences) and measures of attrition (as odds ratios), with associated 95% CIs. We used the metafor package in R, which corrects for the positive biases of standard mean differences and provided a Hedges' *g*,<sup>30</sup> which enabled comparisons across disparate outcome measures by pooling variances and standardising outcomes across studies that used different outcome measures.<sup>31</sup> We considered *p* values of less than 0.05 to be significant and interpreted effect size conventionally. A Hedges' *g* of less than 0.2 was considered a negligible effect, a value of 0.2 to less than 0.5 a small effect, a value of 0.5 to 0.8 a medium effect, and a value of more than 0.8 a large effect.<sup>32</sup> Heterogeneity was calculated with the *I*<sup>2</sup> statistic and classified as not important (*I*<sup>2</sup> 0–40%) moderate (30–60%), substantial (50–90%), or considerable (75–100%).<sup>29</sup>

We did subgroup analyses to assess the efficacy of interventions grouped by adaptation type (ie, therapist-related, content-related, or organisational), approach (ie, culturally modified or culturally specific), intervention type, region, age group, diagnosis, and comparator group. Analyses were done in any subgroup with more than one comparison. For studies that did not report data for outcome measures at the end of treatment but reported follow-up within a month of the end of treatment, these follow-up data were taken as the end-of-treatment data. For studies in which data for interventions targeting any comorbid disorders were reported, we extracted all target symptoms and analysed them separately. We used Cochran's *Q* to test heterogeneity between subgroups. Univariate and multivariate meta-regression were used to explore the effect of intervention types, control types, targeting disorders, adaptation type, and adaptation approaches on intervention efficacy for both self-rated and clinician-rated measures. The effect sizes for the primary outcome were assessed for publication bias by visual examination of funnel plots. We did all analyses in R (version 4.0.0).

### Role of the funding source

There was no funding source for this study.

### Results

We did three searches of published work between Dec 1, 2020, and March 10, 2023. The searches returned 32791 studies, 71 of which met our inclusion criteria and were included in the systematic review (figure 1). Most included studies were done in mainland China (*n*=64 studies), with four studies done in Hong Kong and

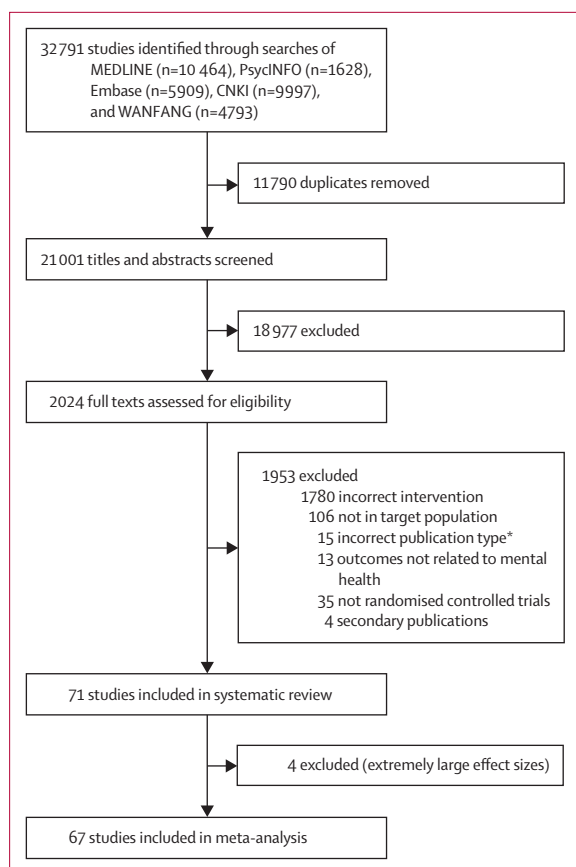


Figure 1: PRISMA diagram

\*Includes studies not published in peer-reviewed journals, dissertations, and letters to the editor.

Mean age, years (range; SD)	Sex	Location	Control	Intervention	Intervention type	Cultural approach	Adaptation area	
							Therapist-related	Organisational
<b>Anxiety disorder (generalised anxiety disorder)</b>								
Deng* (2021; n=80) <sup>33</sup>	29 (36%) female; 51 (64%) male	Liaoning, China	TAU	CBT with exercise	Treatment	Modified	Yes	Yes
Gu et al (2022; n=70) <sup>34</sup>	38 (54%) female; 25 (36%) male; 7 (10%) NR	Henan, China	TAU	Cognitive coping therapy	Treatment	Specific	Yes	Yes
Hu et al (2022; n=64) <sup>35</sup>	45 (70%) female; 19 (30%) male	Beijing, China	Active (literal CBT)	Metaphorical CBT	Indicated prevention	Modified	No	Yes
Li et al (2021; n=45) <sup>36</sup>	29 (64%) female; 11 (24%) male; 5 (11%) NR	Beijing, China	Attentional control	Intolerance of uncertainty cognitive bias modification of interpretation	Indicated prevention	Modified	No	Yes
Li (2022; n=80) <sup>37</sup>	35 (56%) female; 45 (44%) male	Guangxi, China	TAU	Morita therapy and relaxation	Treatment	Specific	No	Yes
Meng and Li (2008; n=60) <sup>38</sup>	33 (55%) female; 27 (45%) male	Henan, China	TAU	Chinese Taoist cognitive psychotherapy	Treatment	Specific	No	Yes
Wang et al (2022; n=72) <sup>39</sup>	42 (58%) female; 30 (42%) male	Beijing, China	Attentional control	Chinese medicine, emotional management, and baduanjin exercise	Treatment	Specific	No	Yes
Yang et al (2017; n=103) <sup>40</sup>	50 (49%) female; 53 (51%) male	Gansu, China	TAU	Naikan cognitive therapy	Treatment	Specific	No	Yes
Yu et al (2008; n=84) <sup>41</sup>	49 (58%) female; 35 (42%) male	Liaoning, China	TAU	Chinese Taoist cognitive psychotherapy	Treatment	Specific	Yes	Yes
Yu (2021; n=78) <sup>42</sup>	35 (45%) female; 43 (55%) male	Shandong, China	TAU	Integrated psychotherapy	Treatment	Specific	Yes	Yes
Zhang et al (2002; n=70) <sup>43</sup>	63 (44%) female; 80 (56%) male†	Hunan, Shanghai, Zhejiang, and Heilongjiang, China	TAU	Chinese Taoist cognitive psychotherapy	Treatment	Specific	No	Yes
Zhang et al (2002; n=73) <sup>44</sup>	63 (44%) female; 80 (56%) male†	Hunan, Shanghai, Zhejiang, and Heilongjiang, China	TAU	Chinese Taoist cognitive psychotherapy (with medication as TAU)	Treatment	Specific	No	Yes
Zhang et al (2014; n=70) <sup>45</sup>	32 (46%) female; 35 (50%) male; 3 (4%) NR	Shandong, China	Active (Morita therapy)	Naikan and Morita therapy	Treatment	Specific	No	Yes
<b>Anxiety disorder (multiple diagnostic groups)‡</b>								
Che et al (2021; n=60) <sup>46</sup>	27 (25-40; 10)	Shandong, China	TAU	Morita therapy	Treatment	Specific	Yes	Yes
Feng et al (2017; n=110) <sup>46</sup>	39 (35%) female; 51 (46%) male; 20 (18%) NR	Liaoning, China	Active (relaxation training)	Chinese medicine, cognitive therapy	Treatment	Specific	No	Yes
Hou et al (2019; n=78) <sup>47</sup>	35 (45%) female; 43 (55%) male	Sichuan, China	Attentional control	Structural family therapy	Treatment	Modified	Yes	Yes
Liu et al (2020; n=54) <sup>48</sup>	46 (85%) female; 8 (15%) male	China	Waitlist	iCBT	Indicated prevention	Modified	Yes	Yes
Sun et al (2014; n=70) <sup>49</sup>	70 (100%) NR	Shanxi, China	No intervention	Self-confidence training	Treatment	Specific	No	Yes
Wang et al (2014; n=67) <sup>50</sup>	38 (57%) female; 29 (43%) male	Guangdong, China	TAU	Chinese medicine, cognitive therapy with relaxation	Treatment	Specific	No	Yes
Wang et al (2021; n=200) <sup>51</sup>	117 (59%) female; 83 (41%) male	Shandong, China	TAU	Chinese medicine, integrated psychotherapy	Treatment	Specific	Yes	Yes

(Table 1 continues on next page)

Mean age, years (range; SD)	Sex	Location	Control	Intervention	Intervention type	Adaptation area		
						Cultural approach	Therapist-related	Organisational
(Continued from previous page)								
Zheng (2016; n=84) <sup>52</sup>	39 (46%) female; 45 (54%) male	Sichuan, China	TAU	Chinese medicine, cognitive therapy with relaxation	Treatment	Specific	No	Yes
<b>Anxiety disorder (obsessive compulsive disorder)</b>								
Chi et al (2014; n=64) <sup>53</sup>	35 (55%) female; 29 (45%) male	Jiangsu, China	TAU	Integrated psychotherapy (thinking disrupted-concentrated reappear method)	Treatment	Specific	No	Yes
Mei et al (2000; n=64) <sup>54</sup>	36 (56%) female; 28 (44%) male	Jiangsu, China	TAU	Morita therapy	Treatment	Specific	Yes	Yes
Meng et al (2019; n=167) <sup>55</sup>	66 (40%) female; 101 (60%) male	Beijing, China	TAU	CBT	Treatment	Modified	Yes	Yes
Shi et al (2005; n=56) <sup>56</sup>	27 (48%) female; 29 (52%) male	Guangxi, China	TAU	Morita therapy	Treatment	Specific	Yes	Yes
Wu (2018; n=90) <sup>57</sup>	42 (47%) female; 48 (53%) male	Zhejiang, China	TAU	Chinese medicine, cognitive therapy with relaxation	Treatment	Specific	Yes	Yes
<b>Anxiety disorder (panic disorder)</b>								
Guo et al (2013; n=60) <sup>58</sup>	34 (57%) female; 26 (43%) male	Henan, China	TAU	Integrated psychotherapy	Treatment	Specific	No	Yes
Wang et al (2021; n=25) <sup>59</sup>	11 (44%) female; 14 (56%) male	Shanxi, China	Attentional control	Simplified CBT	Treatment	Modified	Yes	Yes
<b>Anxiety disorder (social anxiety disorder)</b>								
Ni et al* (2010; n=41) <sup>60</sup>	15 (37%) female; 26 (63%) male	Shandong, China	No intervention	Morita therapy-based group counselling	Treatment	Specific	Yes	Yes
Sun et al (2019; n=38) <sup>61</sup>	31 (82%) female; 7 (18%) male	Beijing, China	Attentional control	Cognitive bias modification	Indicated prevention	Modified	No	Yes
Wen et al (2020; n=64) <sup>62</sup>	57 (89%) female; 7 (11%) male	China	Active (CBT)	iCBT	Treatment	Modified	No	Yes
Yang* (2015; n=68) <sup>63</sup>	41 (60%) female; 27 (40%) male	Jilin, China	TAU	Cognitive insight therapy	Treatment	Specific	Yes	Yes
<b>Mixed anxiety-depressive disorder</b>								
Chen et al (2022; n=118) <sup>64</sup>	59 (50%) female; 41 (35%) male; 18 (15%) NR	Guangdong, China	TAU	Online mindfulness-based stress reduction	Treatment	Modified	Yes	Yes
Liang et al (2021; n=52) <sup>65</sup>	32 (62%) female; 20 (38%) male	Anhui, China	Attentional control	Dialectical behavioural therapy	Indicated prevention	Modified	No	Yes
Sun et al (2021; n=114) <sup>66</sup>	84 (74%) female; 30 (26%) male	China (27 provinces)	Attentional control	Mindfulness-based mobile intervention	Indicated prevention	Modified	Yes	Yes
Yan et al (2022; n=60) <sup>67</sup>	90 (75%) female; 27 (22.5%) male; 3 (2.5%) NRT	Beijing, China	TAU	Transdiagnostic group cognitive behavioural intervention	Treatment	Modified	Yes	Yes
Yan et al (2022; n=60) <sup>68</sup>	90 (75%) female; 27 (22.5%) male; 3 (2.5%) NRT	Beijing, China	TAU	Transdiagnostic individual cognitive behavioural intervention	Treatment	Modified	Yes	Yes
Zhang et al (2006; n=136) <sup>68</sup>	29 (20-56; NR)	Zhejiang, China	TAU	Morita therapy	Treatment	Specific	No	Yes

(Table 1 continues on next page)

Mean age, years (range; SD)	Sex	Location	Control	Intervention	Intervention type	Cultural approach	Adaptation area			
							Therapist-related	Content-related	Organisational	
(Continued from previous page)										
Zhang et al (2017; n=60) <sup>69</sup>	38 (NR; 11)	70 (52%) female; 64 (48%) male†	Shanghai, China	TAU	Simplified CBT	Treatment	Modified	Yes	Yes	Yes
Zhang et al (2017; n=74) <sup>69</sup>	38 (NR; 11)	70 (52%) female; 64 (48%) male†	Shanghai, China	TAU	Simplified CBT (with medication as TAU)	Treatment	Modified	Yes	Yes	Yes
Zhang et al (2023; n=160) <sup>70</sup>	30 (NR; 4)	160 (100%) female	Shandong, China	TAU	Digital guided self-help mindfulness training	Indicated prevention	Modified	No	Yes	Yes
<b>Depression</b>										
Chan et al (2011; n=40) <sup>71</sup>	49 (25-64; 11)	30 (75%) female; 10 (25%) male	Hong Kong	Active (CBT)	Chan-based Dejian mind-body intervention	Indicated prevention	Specific	No	Yes	Yes
Chan et al (2012; n=34) <sup>72</sup>	47 (28-62; 12)	28 (80%) female; 6 (20%) male	Hong Kong	Active (CBT)	Chan-based Dejian mind-body intervention	Treatment	Specific	No	Yes	Yes
Cheng and Cui (2022; n=60) <sup>73</sup>	31 (NR; 8)	27 (45%) female; 33 (55%) male	Beijing, China	Attentional control	iCBT	Treatment	Modified	No	Yes	Yes
Choi et al (2012; n=58) <sup>74</sup>	39 (21-68; 12)	44 (76%) female; 11 (19%) male; 3 (5%) NR	Australia	Waitlist	Brighten your mood iCBT	Treatment	Modified	Yes	Yes	Yes
Choy and Lou (2016; n=114) <sup>75</sup>	79 (NR; 10)	74 (65%) female; 40 (35%) male	Hong Kong	Waitlist	Instrumental Reminiscence Intervention—Hong Kong	Indicated prevention	Modified	Yes	Yes	Yes
Ding et al (2018; n=64) <sup>76</sup>	37 (NR; 8)	27 (42%) female; 37 (58%) male	Fujian, China	Active (CBT)	Culturally adapted CBT	Treatment	Modified	Yes	Yes	Yes
Fu (2018; n=80) <sup>77</sup>	50 (20-71; 6)	38 (48%) female; 42 (53%) male	Shaanxi, China	TAU	Traditional Chinese medicine psychotherapy	Treatment	Specific	Yes	Yes	Yes
Guo et al (2020; n=300) <sup>78</sup>	28 (NR; 8)	23 (8%) female; 277 (92%) male	Guangdong, China	Waitlist	Run4Love WeChat-based intervention	Indicated prevention	Modified	No	Yes	Yes
Hang et al (2015; n=24) <sup>79</sup>	46 (NR; 16)	26 (55%) female; 21 (45%) male†	Anhui, China	Waitlist	Online counselling	Indicated prevention	Modified	Yes	Yes	Yes
Hang et al (2015; n=23) <sup>79</sup>	46 (NR; 16)	26 (55%) female; 21 (45%) male†	Anhui, China	Waitlist	Face-to-face counselling	Indicated prevention	Modified	Yes	Yes	Yes
He et al (2022; n=99) <sup>80</sup>	19 (17-21; 1)	37 (37%) female; 62 (63%) male	Tianjin, China	Attentional control	XiaoE CBT-based chatbot	Indicated prevention	Modified	No	Yes	Yes
Hsiao et al (2011; n=63) <sup>81</sup>	37 (NR; 14)	48 (76%) female; 15 (24%) male	Taiwan	TAU	Body-mind-spirit therapy	Treatment	Specific	Yes	Yes	Yes
Hwang et al (2015; n=50) <sup>82</sup>	45 (18-65; 12)	36 (72%) female; 14 (28%) male	USA	Active (unadapted CBT)	Culturally adapted CBT	Treatment	Modified	Yes	Yes	No
Li et al (2013; n=186) <sup>83</sup>	23 (21-26; 1)	49 (26%) female; 32 (17%) male; 105 (56%) NR	China	No intervention	iCBT	Indicated prevention	Modified	No	Yes	Yes
Li (2015; n=90) <sup>84</sup>	68 (NR; 10)	45 (50%) female; 45 (50%) male	Chongqing, China	TAU	Group reminiscence therapy	Treatment	Modified	Yes	Yes	Yes
Li et al (2019; n=100) <sup>85</sup>	64 (46-84; 10)	48 (48%) female; 38 (38%) male; 14 (14%) NR	Jilin, China	TAU	Group reminiscence therapy	Treatment	Modified	Yes	Yes	Yes
Liu et al (2018; n=100) <sup>86</sup>	67 (60-77; 6)	43 (43%) female; 34 (34%) male; 23 (23%) NR	Sichuan, China	Active (group CBT)	Group integrated psychotherapy	Treatment	Specific	No	Yes	Yes

(Table 1 continues on next page)

Mean age, years (range; SD)	Sex	Location	Control	Intervention	Intervention type	Adaptation area				
						Cultural approach	Content-related	Organisational		
(Continued from previous page)										
Liu et al (2022; n=83) <sup>87</sup>	23 (19–28; 2)	46 (55%) female; 37 (45%) male	Hellongjiang, Hubei, and Guangdong, China	Active (bibliotherapy)	XiaoNan CBT-based chatbot	Indicated prevention	Modified	No	Yes	Yes
Ly et al (2022; n=80) <sup>88</sup>	67 (NR; 7)	29 (36%) female; 45 (56%) male; 6 (8%) NR	Hebei, China	TAU	Reminiscence-themed reality therapy	Indicated prevention	Specific	Yes	Yes	Yes
Qiao (2013; n=64) <sup>89</sup>	34 (NR; 10)	43 (67%) female; 21 (33%) male	Liaoning, China	TAU	Naikan therapy and group CBT	Treatment	Specific	No	Yes	Yes
Ren et al* (2016; n=62) <sup>90</sup>	21 (NR; 2)	28 (45%) female; 17 (27%) male; 17 (27%) NR	China	Waitlist	Moodgym iCBT	Treatment	Modified	No	Yes	Yes
Wang (2018; n=60) <sup>91</sup>	63 (NR; 11)	35 (58%) female; 25 (42%) male	Beijing, China	TAU	Low-resistance state thought induction psychotherapy with exercise	Treatment	Specific	No	Yes	Yes
Wang et al (2019; n=64) <sup>92</sup>	32 (NR; 18)	39 (61%) female; 21 (33%) male; 4 (6%) NR	Guangdong, China	TAU	Narrative psychotherapy	Treatment	Modified	No	Yes	Yes
Wei et al (2021; n=70) <sup>93</sup>	68 (61–78; 8)	28 (40%) female; 42 (60%) male	Henan, China	TAU	Group reminiscence therapy	Indicated prevention	Modified	No	Yes	Yes
Wen et al (2008; n=63) <sup>94</sup>	62 (NR; 11)	27 (43%) female; 36 (57%) male	Guangxi, China	TAU	Chinese Taoist cognitive psychotherapy	Treatment	Specific	Yes	Yes	Yes
Wu and Wang (2018; n=184) <sup>95</sup>	26 (21–36; 4)	63 (34%) female; 121 (66%) male	Guangxi, China	TAU	Morita therapy	Treatment	Specific	No	Yes	Yes
Xiang (2007; n=22) <sup>96</sup>	NR (NR; NR)	22 (100%) NR	Sichuan, China	No intervention	Group counselling	Indicated prevention	Modified	No	Yes	Yes
Xie et al (2019; n=80) <sup>97</sup>	72 (NR; 4)	47 (59%) female; 33 (41%) male	Hunan, China	TAU	Modified behavioural activation treatment	Indicated prevention	Modified	Yes	Yes	Yes
Ying et al (2022; n=220) <sup>98</sup>	42 (NR; 20)	117 (53%) female; 59 (27%) male; 44 (20%) NR	Zhejiang, China	Active (face-to-face CBT)	WeChat-delivered CBT	Indicated prevention	Modified	No	Yes	Yes
Yu et al (2021; n=65) <sup>99</sup>	27 (18–38; 10)	44 (68%) female; 21 (32%) male	Shanghai, China	Attentional control	Simplified CBT	Treatment	Modified	Yes	Yes	Yes
Zhou and Zhang (2018; n=217) <sup>100</sup>	41 (19–60; 20)	125 (58%) female; 92 (42%) male	Shandong, China	TAU	Naikan cognitive therapy	Treatment	Specific	No	Yes	Yes
Zhou et al (2019; n=152) <sup>101</sup>	NR (NR; NR)	152 (100%) female	Guangdong, China	TAU	Group CBT and mother–infant relationship therapy	Treatment	Modified	Yes	Yes	Yes
<b>Post-traumatic stress disorder</b>										
Wang et al (2013; n=183) <sup>102</sup>	NR (NR; NR)	143 (78%) female; 40 (22%) male	Sichuan, China	Waitlist	Chinese My Trauma Recovery online self-help intervention	Indicated prevention	Modified	No	Yes	Yes
Wu et al (2014; n=53) <sup>103</sup>	40 (NR)	17 (32%) female; 36 (68%) male	Hong Kong	Active (self-help programme)	Brief CBT	Indicated prevention	Modified	Yes	Yes	Yes

For intervention type, indicated prevention describes interventions in people who have detectable signs or symptoms of a disorder but do not meet diagnostic criteria, whereas treatment refers to interventions in people with a diagnosed disorder. NR=not reported. NA=not applicable. TAU=treatment as usual. CBT=cognitive behavioural therapy. iCBT=internet-based cognitive behavioural therapy. \*Included in systematic review but not in meta-analysis. †The study has more than one experimental group. Sex data are reported for all participants in the study and are not available by intervention. ‡Included a mix of participants with various types of anxiety disorders (including generalised anxiety disorder, social anxiety disorder, panic disorder, and obsessive compulsive disorder) or did not specify the specific subtype of anxiety disorder.

**Table 1: Characteristics of included studies**



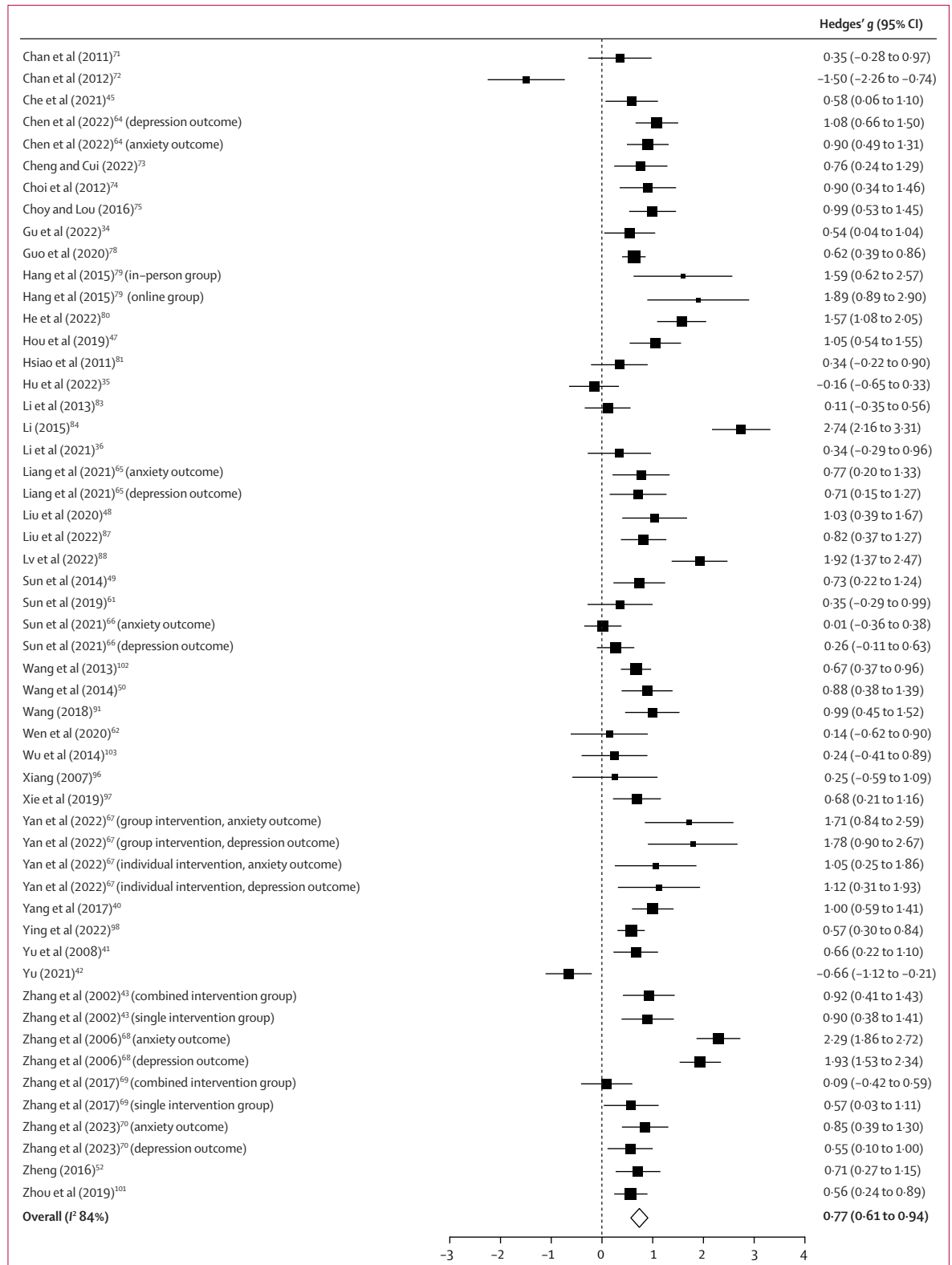
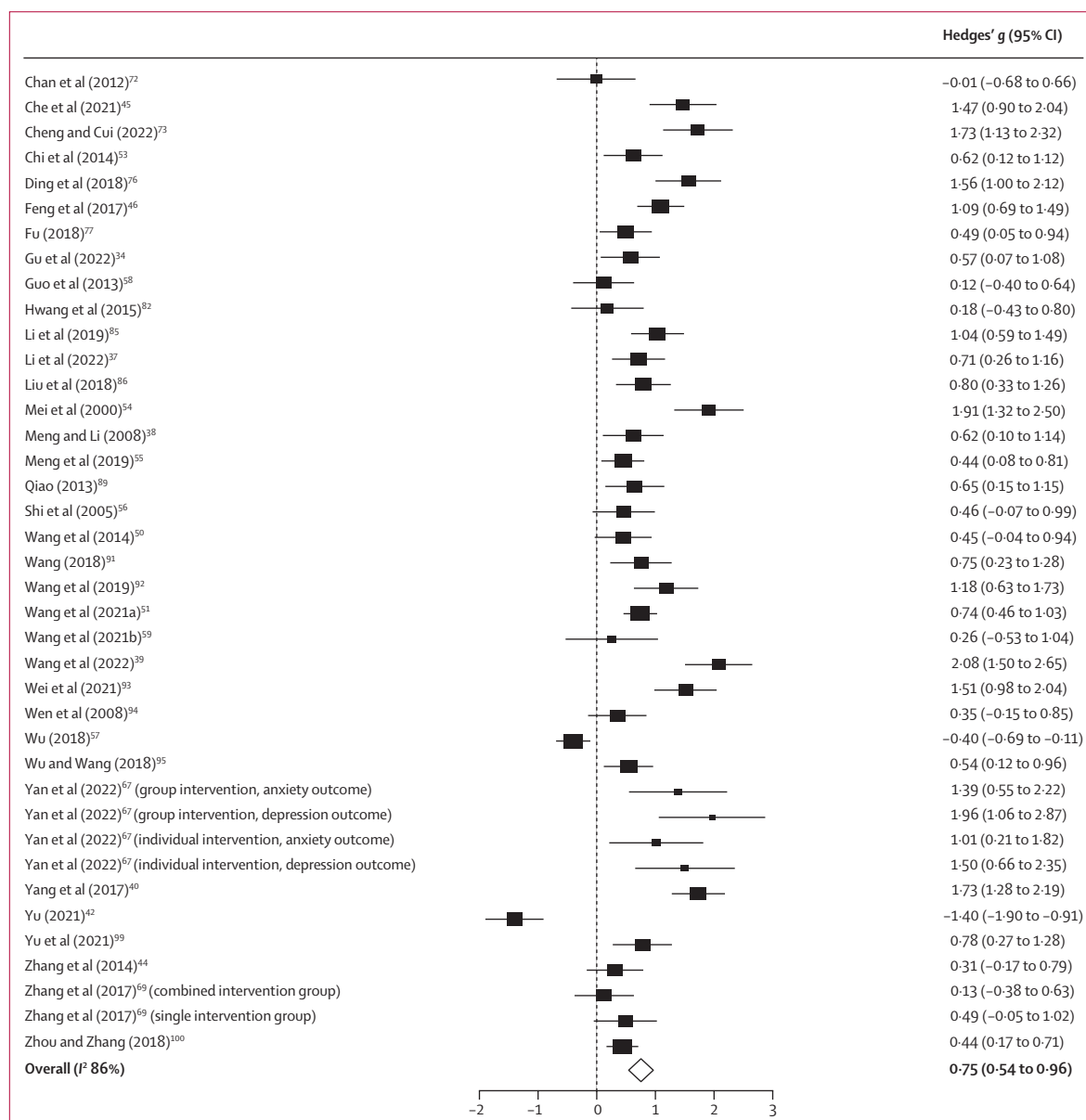


Figure 2: Forest plot of effect of adapted interventions on self-reported symptom measures at the end of treatment. The size of the datapoints are proportional to the study sample size.

one each in Taiwan, Australia, and the USA (table 1). Studies covered a range of common mental disorders, including interventions targeting depression (n=31), anxiety disorders (n=31), mixed anxiety–depressive disorder (n=7), and post-traumatic stress disorder (n=2). All studies described more than one type of adaptation and included content-related adaptations; only one study<sup>82</sup> did not have organisational adaptations. 35 (49%) studies detailed therapist-related adaptations. 37 (52%) of the studies were of culturally modified interventions, and 34 (48%) were of culturally specific interventions (table 1). Further intervention characteristics and descriptions of cultural adaptations for included studies, and explanation

of some of the classifications, are in appendix 2 (pp 13–15, 23).

Four studies<sup>33,60,63,90</sup> had very large effect sizes (Hedges'  $g > 3$ ). The scores on symptom measures in these studies were unusual compared with those typically reported in meta-analyses of common mental disorders (eg, typically reporting zero change or deterioration of symptoms in control groups, whereas most studies reported reductions in symptom severity in both groups) and were excluded from our meta-analysis (as was done in a similar previous review<sup>14</sup>). Thus, our meta-analysis included 67 studies, 6199 patients, and 71 comparisons of adapted interventions with controls (22 indicated



**Figure 3:** Forest plot of effect of adapted interventions on clinician-rated symptom measures at the end of treatment. The size of the datapoints are proportional to the study sample size.

preventions [n=21 studies] and 49 treatments [n=46]). The mean age of the sample was 39.3 years (range 16–84). 2605 (42%) participants were male and 3247 (52%) were female. In our risk-of-bias assessments, inadequate reporting in included studies largely restricted quality appraisals across all domains (appendix 2 p 24). For example, 46 studies did not include a consort diagram and 31 studies did not report attrition at any stage of the intervention. Funnel plots suggested little publication bias in estimates of effects on both self-reported and clinician-rated scales (appendix 2 p 25).

At the end of treatment, culturally adapted interventions had medium effect sizes in terms of reducing self-reported symptom severity (n=42; Hedges' g 0.77 [95% CI 0.61–0.94]; I<sup>2</sup> 84%; figure 2) and clinician-rated symptom severity (n=35; 0.75 [0.54–0.96]; 86%; figure 3) across all disorders. The subgroup difference between self-reported and clinician-rated measures was not significant when examined with Cochran's Q (p=0.88; I<sup>2</sup> 0%). Further subgroup analyses by region (ie, China vs Hong Kong), diagnosis, and age group did not reduce heterogeneity to a moderate level (appendix 2 pp 27–28). Cultural adaptation showed benefits in studies of both indicated prevention and treatment (appendix 2 pp 26–27). In subgroup analyses, cultural adaptations were still efficacious in terms of effect on self-reported symptoms when compared with active interventions only (eg, non-adapted alternative psychotherapy, attentional control, treatment as usual), rather than with waitlist or no intervention (active interventions n=33; 0.77 [0.56–0.97]; I<sup>2</sup> 86%; waitlist control n=8; 0.79 [0.55–1.04]; 57%; appendix 2 pp 26–27). The beneficial effects of culturally adapted interventions persisted at all follow-up timepoints (appendix 2 pp 26–27).

Interventions involving any of the three types of adaptations (ie, therapist-related, content-related, or organisational adaptations) efficaciously reduced symptoms compared with any control at the end of treatment and at the 1–3-month follow-up (table 2). The 32 studies of therapist-related adaptations included in the meta-analysis showed large effect sizes at the end of treatment, and these were larger on self-reported scales (n=19; Hedges' g 0.86 [95% CI 0.60–1.12]; I<sup>2</sup> 84%) than on clinician-rated scales (n=16; 0.72 [0.43–1.02]; 85%; table 2). All studies included in the meta-analysis involved content-related adaptations, which produced medium effect sizes on both self-reported (n=42; 0.77 [0.61 to 0.94]; 84%) and clinician-rated scales (n=35; 0.75 [0.54 to 0.96]; 86%; table 2). Organisational adaptations were reported in 66 studies included in the meta-analysis and had similar results at end of treatment on both self-reported (n=42; 0.77 [0.61–0.94]; 4%) and clinician-rated scales (n=34; 0.77 [0.55–0.98]; 86%; table 2).

Subgroup analysis and meta-regression were only possible for comparisons based on reporting of the therapist-related adaptations (because nearly all studies incorporated both content-related and organisational adaptations). Efficacy (as measured by Cochran's Q) did not differ significantly between studies in which therapist-related adaptations were reported and those in which such adaptations were not reported (p=0.37, I<sup>2</sup> 0% for self-reported efficacy; p=0.76, 0% for clinician-rated efficacy).

Both culturally specific and culturally modified interventions had medium-to-large effect sizes for symptom severity at the end of treatment for self-reported symptoms (culturally specific Hedges' g=0.76 [95% CI 0.36–1.15]; culturally modified 0.76 [0.60–0.93]) as well

	Number of studies (comparisons)	Hedges' g (95% CI)	p value	I <sup>2</sup>
<b>Therapist-related adaptations</b>				
Self-reported				
End of treatment	19 (26)	0.86 (0.60 to 1.12)	<0.0001	84%
1–3 months of follow-up	6 (10)	0.65 (0.34 to 0.96)	<0.0001	67%
4–6 months of follow-up	4 (5)	0.43 (0.26 to 0.59)	<0.0001	8%
7–12 months of follow-up	1 (4)	1.73 (0.92 to 2.53)	<0.0001	70%
Clinician-rated				
End of treatment	16 (21)	0.72 (0.43 to 1.02)	<0.0001	85%
1–3 months of follow-up	1 (4)	1.66 (0.98 to 2.33)	<0.0001	57%
4–6 months of follow-up	3 (4)	1.11 (0.02 to 2.21)	0.047	93%
7–12 months of follow-up	2 (5)	1.58 (0.91 to 2.24)	<0.0001	71%
<b>Content-related adaptations</b>				
Self-reported				
End of treatment	42 (53)	0.77 (0.61 to 0.94)	<0.0001	84%
1–3 months of follow-up	14 (19)	0.74 (0.49 to 0.99)	<0.0001	77%
4–6 months of follow-up	5 (6)	0.42 (0.27 to 0.57)	<0.0001	0%
7–12 months of follow-up	1 (4)	1.73 (0.92 to 2.53)	<0.0001	70%
Clinician-rated				
End of treatment	35 (39)	0.75 (0.54 to 0.96)	<0.0001	86%
1–3 months of follow-up	2 (5)	1.40 (0.69 to 2.11)	<0.0001	77%
4–6 months of follow-up	3 (4)	1.11 (0.02 to 2.2)	0.047	93%
7–12 months of follow-up	2 (5)	1.58 (0.91 to 2.24)	<0.0001	71%
<b>Organisational adaptations</b>				
Self-reported				
End of treatment	42 (53)	0.77 (0.61 to 0.94)	<0.0001	84%
1–3 months of follow-up	14 (19)	0.74 (0.49 to 0.99)	<0.0001	77%
4–6 months of follow-up	5 (6)	0.42 (0.27 to 0.57)	<0.0001	0%
7–12 months of follow-up	1 (4)	1.73 (0.92 to 2.53)	<0.0001	70%
Clinician-rated				
End of treatment	34 (38)	0.77 (0.55 to 0.98)	<0.0001	86%
1–3 months of follow-up	2 (5)	1.40 (0.69 to 2.11)	<0.0001	77%
4–6 months of follow-up	3 (4)	1.11 (0.02 to 2.2)	0.047	93%
7–12 months of follow-up	2 (5)	1.58 (0.91 to 2.24)	<0.0001	71%
<b>Culturally specific approaches</b>				
Self-reported				
End of treatment	15 (17)	0.76 (0.36 to 1.15)	0.0002	91%
1–3 months of follow-up	2 (2)	1.38 (–1.22 to 3.99)	0.30	97%
Clinician-rated				
End of treatment	24 (24)	0.62 (0.35 to 0.89)	<0.0001	89%
4–6 months of follow-up	2 (2)	1.96 (0.25 to 3.66)	0.024	93%

(Table 2 continues on next page)

as clinician-rated symptoms (culturally specific 0.62 [0.35–0.89]; culturally modified 0.98 [0.68–1.27]; table 2). Culturally specific and culturally modified adaptations did not differ significantly from each other according to Cochran's  $Q$  ( $p=0.98$ ,  $I^2$  0% for comparison of self-reported efficacy;  $p=0.083$ , 67% for comparison of clinician-rated efficacy).

Univariate meta-regressions showed no significant associations between intervention types, control types, or diagnosis and symptom reduction measured on either self-reported or clinician-rated measures at end of treatment (appendix 2 p 29). Therapist-related adaptations were not significantly associated with symptom reduction (self-reported  $b$  0.16,  $p=0.37$ ; clinician-rated  $b$   $-0.07$ ,  $p=0.76$ ). Compared against each other, neither culturally modified nor culturally specific interventions were associated with significant improvements in treatment outcomes (self-reported  $b$   $-0.005$ ,  $p=0.98$ ; clinician-rated  $b$   $-0.36$ ,  $p=0.10$ ), even after controlling for targeted disorders and control type (appendix 2 p 10).

Attrition data were available for 43 interventions ( $n=40$ ). Participants were significantly less likely to drop out of intervention groups than active control groups (10% vs 15%; odds ratio 0.63 [95% CI 0.49–0.81];  $p=0.0003$ ). The proportion of participants who dropped out did not differ significantly between intervention groups and waitlist or no-intervention control groups (21% vs 23%; 1.08 [0.49–2.35];  $p=0.86$ ). Further comparison of participant dropout by diagnosis is in appendix 2 (p 29). Adapted interventions resulted in significant improvement in wellbeing at the end of treatment ( $n=13$ , Hedges'  $g$  1.65 [95% CI 0.87–2.42]; appendix 2 p 29).

## Discussion

Our systematic review showed that substantial efforts have been made to develop culturally appropriate interventions for common mental disorders in people of Chinese descent, but these adaptations varied substantially. Our meta-analysis suggested benefits for these adapted interventions, with moderate-to-large effect sizes (as measured by both self-reported and clinician-rated improvement in symptoms) for both indicated prevention and treatment compared with waitlist, no intervention, or non-adapted active controls. All included studies incorporated more than one type of adaptation, which might explain why no one adaptation type was significantly better than any other in subgroup analyses or meta-regression. Importantly, we identified no differences in efficacy between culturally modified interventions adapted from Western interventions and culturally specific interventions rooted within the Chinese cultural context.

No study focused on one specific adaptation type and adaptations across several areas tended to be made simultaneously, which is typical of most studies of culturally based adaptations.<sup>16</sup> Most of the included studies were based in China, which means that these interventions

	Number of studies (comparisons)	Hedges' $g$ (95% CI)	$p$ value	$I^2$
(Continued from previous page)				
<b>Culturally modified approaches</b>				
Self-reported				
End of treatment	27 (36)	0.76 (0.60 to 0.93)	<0.0001	76%
1–3 months of follow-up	12 (17)	0.63 (0.44 to 0.83)	<0.0001	60%
4–6 months of follow-up	3 (4)	0.42 (0.25 to 0.63)	<0.0001	22%
7–12 months of follow-up	1 (4)	1.73 (0.92 to 2.53)	<0.0001	70%
Clinician-rated				
End of treatment	11 (15)	0.98 (0.68 to 1.27)	<0.0001	74%
1–3 months of follow-up	1 (4)	1.66 (0.98 to 2.33)	<0.0001	57%
4–6 months of follow-up	1 (2)	0.28 ( $-0.35$ to 0.92)	0.38	66%
7–12 months of follow-up	1 (4)	1.56 (0.64 to 2.48)	0.0009	77%
Effect sizes are for studies comparing interventions with any control.				
<b>Table 2: Subgroup analyses of effect sizes for interventions incorporating different adaptation types, by timepoint</b>				

presumably incorporated therapist-related and content-related adaptations, such as ethnic matching of therapists to service users, therapists' cultural awareness, translation of content, and the use of culturally congruent materials. The same probably holds for organisational adaptations because interventions were mostly provided within the common standardised approach to care—typically delivered in inpatient and outpatient departments at local hospitals. Extensive attempts to develop new interventions within the Chinese cultural context were evident: roughly half of the included studies reported culturally specific interventions that were based on Chinese philosophical underpinnings (eg, Chinese Taoist cognitive therapy, Morita therapy) or multi-modal interventions closely tied to the Chinese sociocultural context (eg, cognitive insight therapy, Chinese medicine cognitive therapy).<sup>43,44,50,63</sup> Despite continuous global efforts to develop cultural adaptation frameworks,<sup>16,20</sup> these frameworks do not seem to have been used to guide the cultural adaptation process in many of the randomised controlled trials in our study. This issue could be addressed by the development and implementation of an internationally agreed framework on cultural adaptations.

Importantly, the range of effects in the studies reported in our review are in line with the effects of treatment reported in meta-analyses of psychological interventions delivered in Western health-care systems.<sup>104,105</sup> There has been considerable debate about the adaptability of Western psychological interventions, such as cognitive behavioural therapy, that are based on specific cultural conceptions of mental disorders, and whether such interventions might be efficacious only when delivered in a congruent cultural context.<sup>1–7</sup> We identified no difference in efficacy between culturally specific and culturally modified interventions, suggesting that evidence-based interventions developed in a Western context can be beneficial in Chinese cultural contexts when adapted and

embedded into health-care systems, without any fundamental modification of the nature of the intervention or integration of core Chinese cultural values. Cultural adaptations could provide an additive benefit to evidence-based therapeutic models with established efficacy by aligning the construction, conceptualisation, and delivery of psychological interventions with cultural values.<sup>106</sup>

This study had several limitations. First, the validity and reliability of the conceptual typology<sup>16</sup> we used might be limited when applied to populations of predominantly Han Chinese descent. The original typology<sup>16</sup> was developed from research in ethnic groups who were typically minorities in the settings where they were treated. By contrast, most of the studies included in this review were done in native communities who would not necessarily experience difficulties accessing treatments in the same way. For example, in the context of improving access to mental health treatment for ethnic minorities, organisational-specific adaptations refer to changes to the routinely delivered care to provide culturally informed and accessible care (eg, novel, culturally appropriate pathways to care). However, for the studies included in this review, modifications at the organisational level were likely to be seen as standard delivery of care, and as such were often not reported as adaptations in the studies. Second, although we identified a large body of literature published in Chinese, our conclusions were hindered by scant details of interventions and inconsistent reporting in many trials published in Chinese journals (by contrast, trials published in English tended to follow standard guidelines such as the CONSORT statement).<sup>107</sup> The minimal description of interventions in Chinese-language studies limited our ability to identify and classify adaptations. The absence of appropriate reporting about the competence of therapists or the fidelity of the interventions offered also restricted our ability to fully assess the validity of included studies. Third, this study only included culturally modified and culturally specific adaptations. The comparative effects of these interventions should be compared with those of non-adapted, evidence-based interventions in future to further understanding of the steps needed to improve treatment efficacy. Finally, although our review focused on the treatment efficacy of cultural adaptation, the acceptability of these interventions was assessed only by attrition. Patients' perspectives on culturally adapted interventions are important and should be explored via quantitative and qualitative research methods and in clinical trials in future studies.

To our knowledge, ours is the first review and meta-analysis to examine the efficacy of cultural adaptations to a broad range of psychological interventions specifically in people of Chinese descent (predominantly of Han Chinese descent). Our systematic review and meta-analysis provides evidence for the efficacy of culturally adapted Western interventions and culturally specific psychological interventions in populations of Chinese descent when implemented with appropriate cultural

considerations. Reaching an international consensus on the definition, development, and dissemination of cultural adaptations could provide a firm foundation for future research and implementation of the cultural adaption of psychological interventions.

#### Contributors

SL, SP, and RSh conceived the study, which was supervised by SP. SL wrote the protocol, managed the bibliographic database searches, screening, and study-selection processes, extracted data, and ran the analyses. ZX supported the screening, study-selection, and data-extraction processes. PB, SP, RSa, RSh, and SP contributed to the research methods, and PB, RSa, and RSh contributed to the data analyses. SL wrote the first draft of the article, which was reviewed and edited by SP, PB, RSa, and RSh. All authors accessed and verified all the data in the study, and were responsible for the decision to submit for publication.

#### Declaration of interests

We declare no competing interests.

#### Data sharing

The data extracted and analysed in this study can be made available by the corresponding author upon request.

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