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Review

Effects of meaning therapy on spirituality, psychological health, and quality of life in patients with cancer: A systematic review and meta-analysis of randomized controlled trials

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A B S T R A C T

Objective: This study aimed to systematically review studies of meaning therapy on patients with cancer and to evaluate its effectiveness on spiritual outcomes, psychological outcomes, and quality of life (QOL).
Methods: A comprehensive literature search were performed in five international databases (PubMed, Embase, Web of Science, The Cochrane Library, and CINAHL) and four Chinese databases (CNKI, Wanfang Data, VIP, and CBM) from the inception to August 2023. The methodological quality of each included studies was evaluated by using the revised Cochrane risk-of-bias tool for randomized trials. The random-effects model or fixed-effects model was utilized for effect size analysis, and the standardized mean difference (SMD) or mean difference (MD) along with its corresponding 95% confidence interval (CI) was computed. Meta-analysis was conducted by using the RevMan software 5.4.1.
Results: Eight randomized controlled trials with 1251 participants were included in this review. Meta-analyses revealed that meaning therapy can significantly improve the spiritual outcomes including meaning in life (SMD = −0.48; 95% CI = −0.89 to −0.07; P = 0.02), hopelessness (SMD = −0.30; 95% CI = −0.51 to −0.09; P = 0.005), self-esteem (MD = −2.74; 95% CI = −4.17 to −1.32; P = 0.0002) and spiritual well-being (MD = −3.32; 95% CI = −5.63 to −1.01; P = 0.005), psychological outcomes including anxiety (MD = −0.66; 95% CI = −1.30 to −0.01; P = 0.05), depression (SMD = −0.37; 95% CI = −0.55 to −0.20; P < 0.0001), psychological distress (SMD = −0.35; 95% CI = −0.70 to −0.01; P = 0.04) and desire for hastened death (MD = −0.76; 95% CI = −1.47 to −0.05; P = 0.04), and QOL (SMD = −0.29; 95% CI = −0.50 to −0.09; P = 0.006) in patients with cancer.
Conclusions: Meaning therapy has positive effects on improving spirituality, psychological health, and QOL of patients with cancer. More high-quality randomized controlled trials with larger sample sizes are warranted to confirm the results of our review and to clarify the long-term effects of meaning therapy in the future.
Systematic review registration: PROSPERO (No. CRD42021278286).

Introduction

According to the report of the International Agency for Research on Cancer, an estimated 19.3 million new cancer cases and nearly 10.0 million cancer deaths occurred all over the world in 2020.[1] Clearly, cancer has become one of the major threats to human health. Except for a series of physical, psychological, and social problems, patients with cancer often experience spiritual distress, such as loss of meaning in life, impaired self-esteem, and declined spiritual well-being, which together generated poor quality of life (QOL).[2–4] As an important part of health, spirituality has been paid more and more attention in recent years. When facing difficulties or under the threat of death, patients with cancer often have spiritual needs to find meaning, purpose, and value in their life.[5,6] The 2018 American Society of Clinical Oncology guideline on palliative care pointed out that spiritual care is a basic requirement for patients with cancer.[7] The purpose of spiritual care is to alleviate the spiritual distress of patients with cancer and to help them find the meaning in life, self-realization, hope, creativity, belief, trust, peace, comfort, prayer, and

the ability to love and forgive in spite of suffering and disease.[8] This makes spiritual interventions such as meaning therapy critical to enhance the spiritual well-being of patients with cancer.

Developed from Frankl's work of "Man's Search for Meaning," meaning therapy is an integrative and positive existential psychotherapy that focuses on personal meaning to empower clients with resources to overcome inevitable negative events and build a life worth living.[9] Meaning therapy includes various types of interventions: meaning-centered psychotherapy (MCP), meaning-making intervention (MMi),[10] and others.[11,12] MCP can be further divided into two types based on the intervention format: meaning-centered group psychotherapy (MCGP)[13] and individual meaning-centered psychotherapy (IMCP).[14] After a series of research studies, Breitbart's research group found that non-pharmacologic, psychotherapeutic interventions need to be developed to help patients with cancer enhance their sense of meaning and purpose in life despite their illness.[13] Some interventions that had been systematically evaluated had not examined the impact on spiritual well-being or a sense of meaning and purpose. In response to the need for interventions focused on enhancing spiritual well-being, the research group developed MCP. The theoretical underpinning of MCP is the theory of logotherapy,[15] which allows patients to reflect on the attitudinal, creative, and experiential values of meaning of life, thus helping patients to maintain and enhance their sense of meaning in the face of an existential crisis.[16] The MMi for patients with cancer was adapted from an original intervention that was initially developed to assist trauma patients cope with the post-traumatic distress symptoms experienced in the wake of a life-threatening critical injury. Although the cancer experience shares many of the features of a traumatic injury, other distinguishing aspects specific to the cancer experience required that the original intervention be adapted to be relevant for the cancer population. As the intervention progressed, the areas of concern that repeatedly surfaced for patients with cancer were retained and purposefully explored, and an intervention program was formed for patients with cancer.[17] Based on the process of meaning-making coping,[18] MMi is delivered individually around 3 goals: evaluating the patient's change in thoughts and mindset from the time of cancer diagnosis to the present; exploring the patient's previous life experiences and how they have coped with current cancer events; and looking to the future.[19] MCP requires more intervention time and frequency than MMi. Although MCP and MMi have different theoretical foundations, working mechanisms, and implementation sessions, their ultimate goal is to help patients find meaning in life.

Preliminary studies have shown that meaning therapy was a promising approach for providing spiritual care to patients with cancer, which can help patients to improve the meaning in life,[10,13] self-esteem,[19] spiritual well-being,[13,14] and QOL[11,14] and to decrease the anxiety,[13,20] depression,[12,20] emotional distress,[20] desire for hastened death,[13] and demoralization.[12] Therefore, some definitive randomized controlled trials (RCTs) were conducted later to examine the effectiveness of meaning therapy on patients with cancer. However, the results for outcomes such as hopelessness, optimism, anxiety, depression, and QOL were inconclusive,[21–24] which caused uncertainty about the effects of meaning therapy, thus meta-analyses are warranted.

At present, only one relevant meta-analysis study conducted in 2017 by Korean researchers was identified.[25] The study found that meaning therapy was effective in improving outcomes of meaning in life, spiritual well-being, anxiety, physical symptoms, and QOL. However, non-RCTs and pilot studies were included for analysis, which reduced the scientific rigor of the study, and in recent years, new studies have also been conducted and published. Therefore, we conduct the current systematic review and meta-analysis with the following objectives: (1) to systematically identify and summarize studies of meaning therapy on patients with cancer based on methodology, participants, interventions, instruments, and outcome measures and (2) to evaluate the effects of meaning therapy on spiritual outcomes, psychological outcomes, and QOL in patients with cancer through meta-analysis of RCTs.

Methods

This review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement, and its protocol was registered with the International Prospective Register of Systematic Reviews (No. CRD42021278286).[26]

Selection criteria

Inclusion criteria

The inclusion criteria are as follows: (1) Participants: patients aged 18 years or above who were diagnosed with cancer; (2) Interventions: any types of meaning therapy; (3) Controls: usual care or other interventions; (4) Outcomes: spiritual outcomes, psychological outcomes, and QOL; (5) Studies: RCTs published in English or Chinese.

Exclusion criteria

The exclusion criteria are as follows: (1) studies recruiting patients with cognitive or communication problems; (2) meaning therapy combined with other interventions; (3) studies with insufficient data or unavailable full texts; and (4) Pilot studies.

Search strategy

A comprehensive search literature was performed in five international databases (PubMed, Embase, Web of Science, The Cochrane Library, and CINAHL) and four Chinese databases (CNKI, Wanfang Data, VIP, and CBM) from the inception to August 2023. The search strategy was (Neoplasm* OR Tumor* OR Neoplasia* OR Cancer* OR Malignant Neoplasm* OR Malignanc* OR Neoplasm*, Malignant OR carcinoma*) AND (logotherapy OR meaning OR life meaning OR meaning in life OR meaning of life OR meaning making OR meaning-centered) AND (randomized controlled trial OR clinical trial OR RCT OR intervention). In addition, references in relevant articles, reviews and books were manually searched. The selection of eligible studies was conducted independently by two reviewers. Any disagreements were resolved through discussion or consulting a third reviewer if necessary.

Quality appraisal

The methodological quality of each included study was evaluated by using the revised Cochrane risk-of-bias tool for randomized trials, including the following seven aspects: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias. Each aspect was rated as low risk, unclear risk, and high risk of bias. Review Manager (RevMan) software 5.4.1 was used to generate the risk-of-bias summary and graph. Quality appraisal was conducted by the two reviewers independently and verified by the third reviewer.

Data extraction

Data were extracted by the two reviewers independently, and different opinions were resolved by consensus. Extracted data included authors, year, country, design, theoretical framework, sample size, cancer type and stage, intervention details, control groups, outcome variables and assessment, and results. For studies with multiple follow-ups, the first assessment after intervention was selected for data extraction. If there were any missing data, the authors of the study were contacted.

Data synthesis

Meta-analysis was conducted by using the RevMan software 5.4.1. Continuous outcomes were reported as mean difference (MD) and 95%

confidence interval (95% CI) if they were assessed using the same instruments; otherwise, standardized mean difference (SMD) and 95% CI were adopted. The MD or SMD with their accompanying 95% intervals were used to estimate the effect size and the values of 0.2, 0.5, or 0.8 representing small, medium, and large effect sizes, respectively.[27] The I^2 statistic was used to evaluate the heterogeneity among studies. If the I^2 value was $\leq$ 50%, a fixed-effects model was adopted to pool the data; however, if the I^2 value was > 50%, a random-effects model was used. A P value of $\leq$ 0.05 was considered statistically significant. In addition, we used funnel plot to assess the publication bias.

Results

Study selection

The search identified 2774 articles (2036 in English and 738 in Chinese). After duplicate removal and title and abstract screening, 33 potential relevant articles were identified for full-text examination. Of these, 24 articles were excluded for not meeting the selection criteria, and the remaining 9 articles (5 in English and 4 in Chinese) were finally included,[21–24,28–32] among which two articles reported the same study,[24,31] with one article[31] assessing the longer-term effects of the

intervention than the other.[24] The retrieval and selection process of these studies is illustrated in Fig. 1.

Risk of bias

Of the eight included RCTs, three studies used simple randomization,[29,30,32] two studies used block randomization,[24,28,31] two studies used stratified randomization,[22,23] and one study used clustered randomization.[21] Due to the nature of the intervention, only one study clearly indicated the implementation of single blinding,[28] four studies did not mention whether to set blind,[23,29,30,32] and three studies did not set blind.[21,22,24,31] The main risk of bias in this review came from the blinding and allocation concealment. Details are shown in Fig. 2.

Study characteristics

Characteristics of the eight eligible RCTs were summarized in Table 1. Four studies were conducted in China,[23,29,30,32] two in the USA,[21,22] one in Canada,[28] and one in the Netherlands.[24,31] The study included 1251 patients with various cancer diagnosis, and most of them were in the advanced stage of the disease. For most studies, the intervention was delivered in the hospital with one exception,[28] in which the intervention
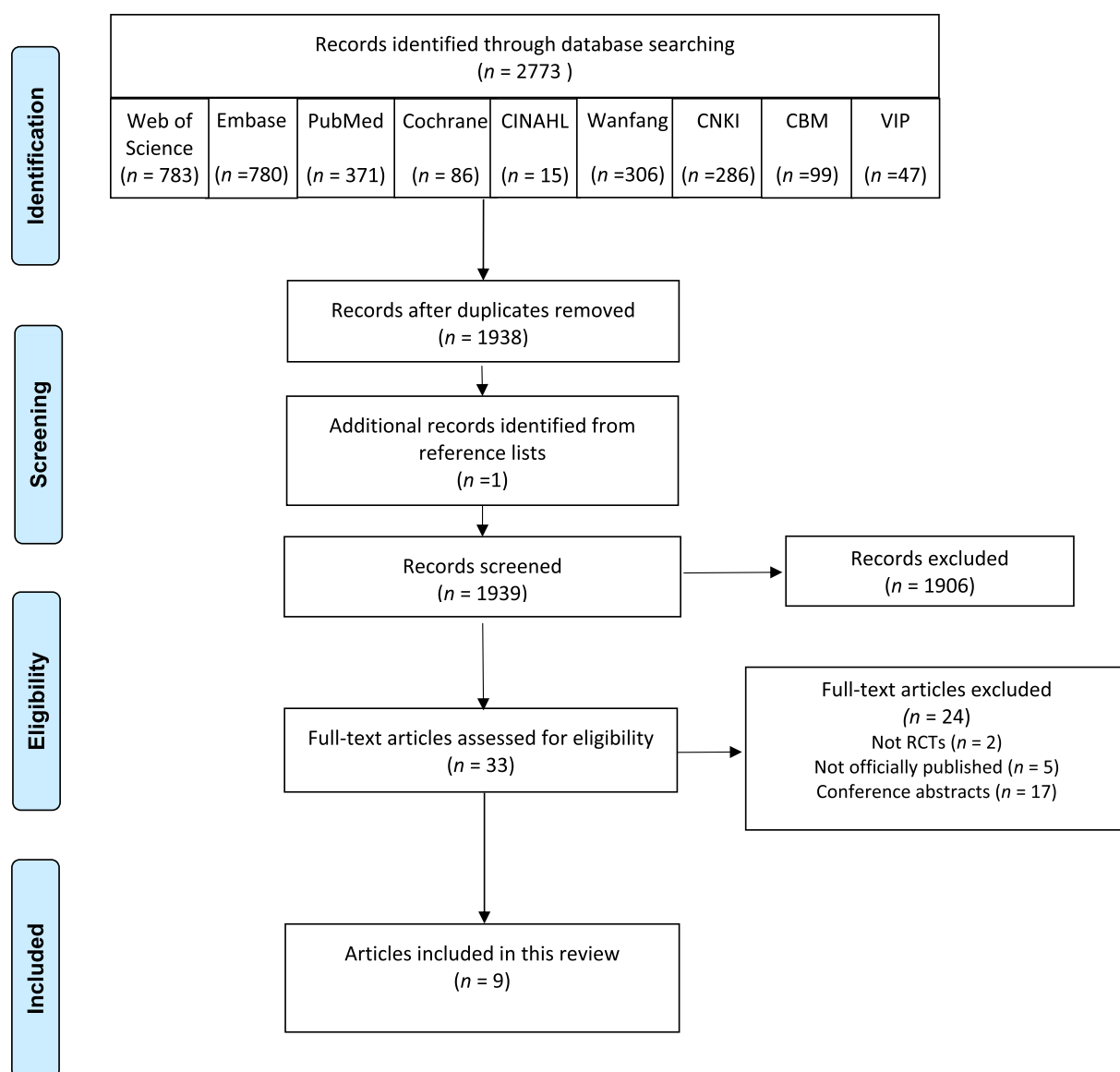

Fig. 1. PRISMA search flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.
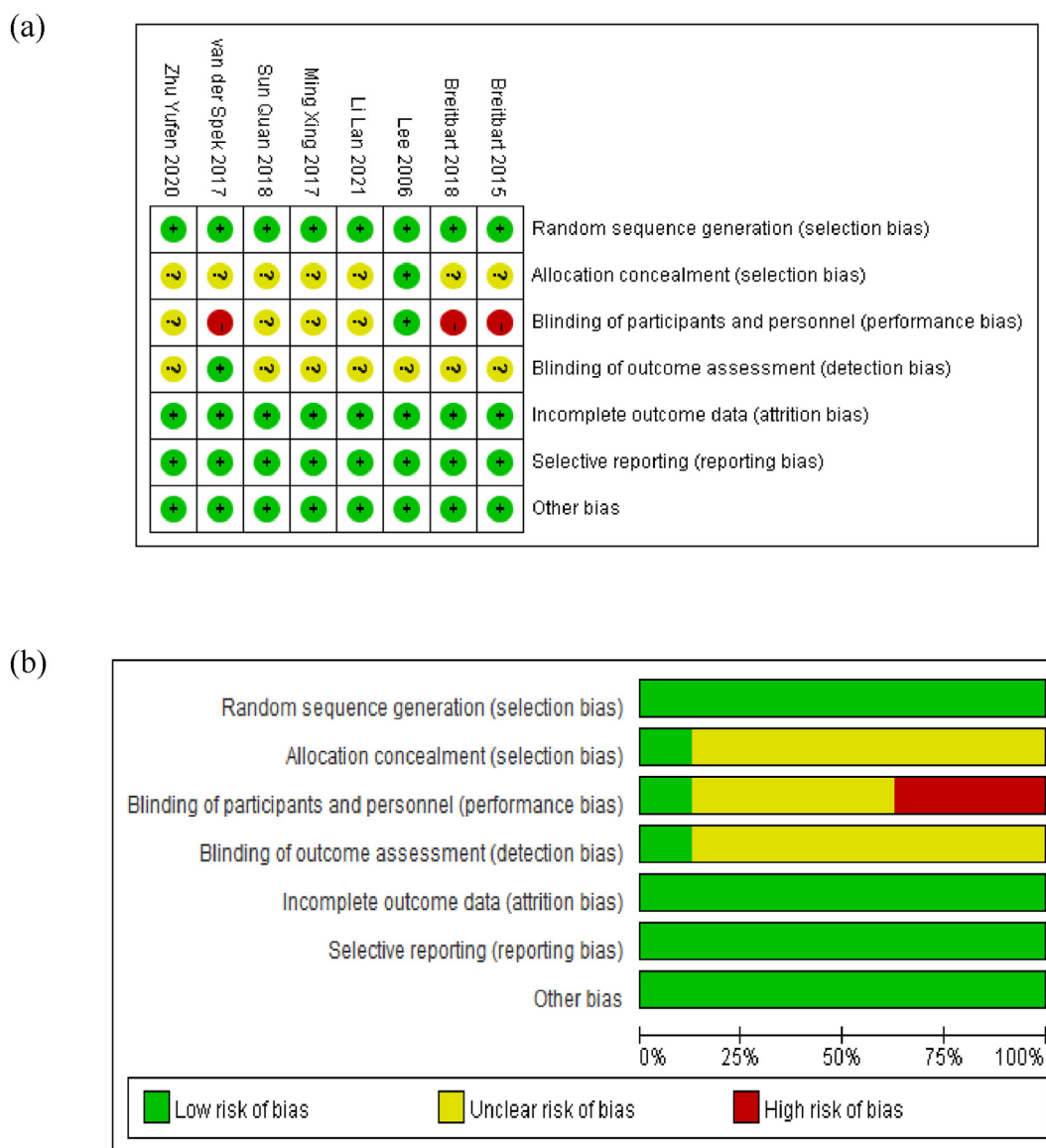
(a)

(b)

Fig. 2. (a) Risk-of-bias summary; (b) Risk-of-bias graph.

was conducted in either hospital-based or home-based on patient preference. The interveners included nurse, psychiatrist, psychologist, social worker, and psychotherapist. For the intervention group, three studies adopted MMi,[23,28,30] three used MCGP,[21,24,31,32] one used IMCP,[22] and the remaining one adopted other types of meaning therapy.[29] In group meaning therapy, there was typically one therapist who facilitated the session and helped guide the participants through their shared experiences and goals,[21,24,31,32] and individual meaning therapy used one-to-one communication between the therapist and patient.[22,23,28–30] The treatment duration ranged from 6 days to 8 weeks with 3–8 sessions, and the length of each session ranged from 20 to 120 min. For the control group, one study used supportive group psychotherapy (SGP),[21] and the rest adopted usual care. For spiritual outcomes, five outcomes were examined by two studies or more, including meaning in life,[22–24,30,32] hopelessness,[21,22,24] self-esteem,[28,30] optimism,[24,28] and spiritual well-being,[21,22] whereas the outcomes of post-traumatic growth,[24] self-efficacy,[28] and hope[29] were assessed by only one study. For psychological outcomes, five outcomes were examined by two studies or more, including anxiety,[21–24,32] depression,[21–24,32] psychological distress,[23,24] and desire for hastened death,[21,22] whereas the outcomes of self-perceived burden,[29] adjustment to cancer,[24] and psychological

well-being[24] were assessed by only one study.[24] The outcome of QOL was examined by four studies.[21,22,24,32]

Results of meta-analysis

Spiritual outcomes

Meaning in life. Five studies evaluated the effect of meaning therapy on meaning in life of patients with cancer.[22–24,30,32] The heterogeneity among studies was high ($I^2 = 80\%$, $P = 0.0006$). Using the random-effects model, it was found that the intervention group was more effective in improving meaning in life than the control (SMD $= -0.48$; 95% CI $= -0.89$ to -0.07; $P = 0.02$). Sensitivity analyses reflected that when excluding the study of Li,[32] the combined effect became stable and the heterogeneity decreased from high to low (SMD $= -0.69$; 95% CI: -0.89 to -0.48; $P < 0.00001$; $I^2 = 29\%$; $P = 0.24$), thus may be the source of heterogeneity (Fig. 3.1).

Hopelessness. Three studies evaluated the effect of meaning therapy on hopelessness of patients with cancer.[21,22,24] The fixed-effects model showed that meaning therapy was effective in improving hopelessness

Table 1
Summary of included studies.

Study; country	Design; theoretical framework	Participants (sample size, cancer type, and cancer stage)	Intervention (type, format, session, facilitator, and setting)	Control	Outcomes (variable, measurement, and data collection time)	Major findings
Breitbart et al., 2015; USA	RCT; Theory of logotherapy	**N**: 253 (I: 132; C: 121) **Cancer type:** Unlimited **Cancer stage:** Advanced	**Type:** MCGP **Format:** Group (8–10 participants) **Session:** 8 sessions over 8 wk **Facilitator:** Psychiatrist, clinical psychologist, or social worker **Setting:** Outpatient clinic	SGP	**Variable**: Spiritual well-being, quality of life, depression, anxiety, hopelessness, desire for hastened death, physical symptom distress **Measurement:** SWB, MQOL, BDI, HADS-A, HAI, SAHD, MSAS-GDI **Data collection time:** Baseline, posttreatment (I: 69; C: 58), 2 months after treatment (I: 57; C: 45)	Patients receiving MCGP showed significantly greater improvement in spiritual well-being and quality of life and significantly greater reductions in depression, hopelessness, desire for hastened death, and physical symptom distress compared with those receiving SGP. No group differences were observed for changes in anxiety.
Breitbart et al., 2018; USA	RCT; Theory of logotherapy	**N**: 321 (I: 109; C1: 108; C2: 104) **Cancer type:** Unlimited **Cancer stage:** Advanced	**Type:** IMCP **Format:** Individual **Session:** 7 sessions over 7 wk **Facilitator:** Psychiatrist, clinical psychologist, or social worker **Setting:** Outpatient clinic	C1: Supportive psychotherapy (SP); C2: EUC	**Variable**: Spiritual well-being, sense of meaning, quality of life, hopelessness, desire for hastened death, anxiety, depression **Measurement:** SWB, LAP-R, MQOL, HAI, SAHD, HADS-A, HADS-D **Data collection time:** Baseline, midtreatment (4 wk) (I: 82; C1: 74; C2: 63), post-treatment (I: 78; C1: 70; C2: 59), 2 months after treatment (I: 70; C1: 54; C2: 53)	Significant treatment effects (small to medium in magnitude) were observed for IMCP, in comparison with EUC, for 5 of 7 outcome variables (quality of life, sense of meaning, spiritual well-being, anxiety, and desire for hastened death), with Cohen's d ranging from 0.1 to 0.34. The effect of IMCP was significantly greater than the effect of SP for quality of life and sense of meaning (d = 0.19) but not for the remaining study variables.
Holtmaat et al., 2020; Netherlands	RCT; Theory of logotherapy	**N**: 170 (I: 57; C1: 56; C2: 57) **Cancer type:** Unlimited **Cancer stage:** Cancer survivors	**Type:** MCGP-CS **Format:** Group **Session:** 8 sessions over 8 wk, 2 h each **Facilitator:** Psychotherapist **Setting:** Hospital	C1: SGP; C2: CAU	**Variable**: Personal meaning, psychological well-being, post-traumatic growth **Measurement:** PMP, SPWB, PTGI **Data collection time:** Baseline, 1 year (I: 39; C1: 42; C2: 35), and 2 years post-intervention (I: 39; C1: 41; C2: 35)	MCGP-CS participants reported more improvement on positive relations (subscale of SPWB) than CAU participants two years post-intervention (ITT analysis, Cohen's d = 0.82). Completers also reported more personal growth (subscale of SPWB) after MCGP-CS than after SGP one year post-intervention (Cohen's d = 0.94). No long-term effects were found on the other outcome measures.
Lee et al., 2006; Canada	RCT; Process of meaning-making coping	**N**: 74 (I: 41; C: 41) **Cancer type:** Breast and colorectal cancer **Cancer stage:** Unlimited	**Type:** MMi **Format:** Individual **Session:** Up to 4 sessions, up to 120 min each **Facilitator:** Nurse **Setting:** Home or	Usual care	**Variable**: Self-esteem, optimism, self-efficacy **Measurement:** RSES, LOT-R, GSES **Data collection time:** Baseline,	The experimental group participants demonstrated significantly higher levels of self-esteem, optimism, and self-

(continued on next page)

Table 1 (*continued*)

Study; country	Design; theoretical framework	Participants (sample size, cancer type, and cancer stage)	Intervention (type, format, session, facilitator, and setting)	Control	Outcomes (variable, measurement, and data collection time)	Major findings
			clinic (determined by patient preference)		within 24 h post-intervention (I: 35; C: 39)	efficacy compared to the control group.
Li, 2021; China	RCT; Theory of logotherapy coping	**N**: 112 (I: 56; C: 56) **Cancer type:** Liver cancer **Cancer stage:** Advanced	**Type:** MCGP for advanced liver cancer **Format:** Group **Session:** 8 sessions over 8 wk **Facilitator:** Psychotherapist **Setting:** Hospital	Usual care	**Variable:** Meaning in life, anxiety, depression, quality of life **Measurement:** MLQ, HADS-A, HADS-D, FACT-G **Data collection time:** Baseline, post-intervention (I: 56; C: 56)	MCGP can enhance the meaning in life of patients with advanced liver cancer, and improve their mental health and quality of life.
Ming et al., 2017; China	RCT; Process of meaning-making coping	**N**: 38 (I: 18; C: 20) **Cancer type:** Unlimited **Cancer stage:** Advanced	**Type:** MMi **Format:** Individual **Session:** 3 sessions within 6 days, within 40 min each **Facilitator:** Nurse **Setting:** Hospital	Usual care	**Variable:** Meaning in life, psychological distress, anxiety, depression **Measurement:** MiLS, NRSS, HADS-A, HADS-D **Data collection time:** Baseline, within 24 h post-intervention (I: 18; C: 20)	After the intervention, the level of psychological distress and depression in the intervention group was lower than that in the control group. For the intervention group, the overall level of meaning in life was improved, and the degree of psychological distress and depression was decreased.
Sun et al., 2018; China	RCT; Unclear	**N**: 164 (I: 81; C: 83) **Cancer type:** Cervical cancer **Cancer stage:** Early (after surgery)	**Type:** Other **Format:** Individual **Session:** 4 sessions within 12–14 days, 20 min each **Facilitator:** Nurse **Setting:** Hospital	Usual care	**Variable:** Self-perceived burden, hope **Measurement:** SPBS, HHI **Data collection time:** Before discharge (I: 81; C: 83)	The self-perceived burden score of the observation group was lower and the total and each dimension scores of hope were higher than that of the control group.
van der Spek et al., 2017; Netherlands	RCT; Theory of logotherapy	**N**: 170 (I: 57; C1: 56; C2: 57) **Cancer type:** Unlimited **Cancer stage:** Cancer survivors	**Type:** MCGP-CS **Format:** Group **Session:** 8 sessions over 8 wk, 2 h each **Facilitator:** Psychotherapist **Setting:** Hospital	C1: SGP; C2: CAU	**Variable:** Personal meaning, psychological well-being, post-traumatic growth, adjustment to cancer, optimism, hopelessness, psychological distress, anxiety, depression, quality of life **Measurement:** PMP, SPWB, PTGI, MAC, LOT-R, BHS, HADS, EORTC QLQ-C30 **Data collection time:** Baseline, 1 wk (I: 50; C1: 49; C2: 47), 3 months (I: 48; C1: 48; C2: 40), and 6 months post-intervention (I: 45; C1: 46; C2: 35)	Post-hoc analyses showed significantly stronger treatment effects of MCGP-CS compared with CAU on personal meaning (d = 0.81), goal-orientedness (d = 1.07), positive relations (d = 0.59), purpose in life (d = 0.69); fighting spirit (d = 0.61) (post-intervention) and helpless/hopeless (d = −0.87) (3 months FU); and distress (d = −0.6) and depression (d = −0.38) (6 months FU). Significantly stronger effects of MCGP-CS compared with SGP were found on personal growth (d = 0.57) (3 months FU) and environmental mastery (d = 0.66) (6 months FU).
Zhu et al., 2020; China	RCT; Process of meaning-making coping	**N**: 119 (I: 57; C: 62) **Cancer type:** Lung cancer	**Type:** MMi **Format:** Individual **Session:** 4 sessions	Usual care	**Variable:** meaning in life, self-esteem	After the intervention, the total and each

Table 1 (*continued*)

Study; country	Design; theoretical framework	Participants (sample size, cancer type, and cancer stage)	Intervention (type, format, session, facilitator, and setting)	Control	Outcomes (variable, measurement, and data collection time)	Major findings
		Cancer stage: Advanced	over 4 wk, 40–50 min each **Facilitator:** Nurse **Setting:** Hospital		**Measurement:** MiLS, RSES **Data collection time:** Baseline, post-intervention (I: 57; C: 62)	dimension scores of meaning in life and the self-esteem score of the intervention group were higher than that of the control group.

BDI, Beck Depression Inventory; BHS, Beck's Hopelessness Scale; CAU, Care As Usual; EORTC QLQ-C30, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; EUC, Enhanced Usual Care; FACT-G, Functional Assessment of Cancer Therapy Scale-General; GSES, Generalized Self-Efficacy Scale; HADS, Hospital Anxiety and Depression Scale; HADS-A, Hospital Anxiety and Depression Scale-Anxiety; HADS-D, Hospital Anxiety and Depression Scale-Depression; HAI, Hopelessness Assessment in Illness Questionnaire; HHI, Herth Hope Index Scale; IMCP, Individual Meaning-Centered Psychotherapy; LAP-R, Life Attitude Profile-Revised; LOT-R, Life Orientation Test-Revised; MAC, Mental Adjustment to Cancer Scale; MCGP-CS, Meaning-Centered Group Psychotherapy for Cancer Survivors; MCGP, Meaning-Centered Group Psychotherapy; MiLS, Meaning in Life Scale for Advanced Cancer Patients; MMi, Meaning-Making Intervention; MLQ, Meaning in Life Questionnaire; MQOL, McGill Quality of Life Questionnaire; MSAS-GDI, Memorial Symptom Assessment Scale Global Distress Index; NRSS, Numeric Rating Scale of Suffering; PMP, Personal Meaning Profile; PTGI, Posttraumatic Growth Inventory; RCT, Randomized Controlled Trial; RSES, Rosenberg Self-Esteem Scale; SAHD, Schedule of Attitudes Toward Hastened Death; SGP, Supportive Group Psychotherapy; SPBS, Self-perceived Burden Scale; SPWB, Ryff's Scales of Psychological Well-being; SWB, Functional Assessment of Chronic Illness Therapy Spiritual Well-Being Scale.

(SMD = −0.30; 95% CI = −0.51 to −0.09; P = 0.005) with no heterogeneity among studies (I^2 = 0%, P = 0.67) (Fig. 3.2).

Self-esteem. Two studies evaluated the effect of meaning therapy on self-esteem of patients with cancer.[28,30] The fixed-effects model showed that meaning therapy was effective in improving self-esteem (MD = −2.74; 95% CI = −4.17 to −1.32; P = 0.0002) with no heterogeneity among studies (I^2 = 0%, P = 0.96) (Fig. 3.3).

Optimism. Two studies evaluated the effect of meaning therapy on optimism of patients with cancer.[24,28] The heterogeneity among studies was low (I^2 = 34%, P = 0.22). The fixed-effects model showed that there was no statistically significant difference between the intervention and control groups (MD = −1.01; 95% CI = −2.16 to 0.14; P = 0.09) (Fig. 3.4).

Spiritual well-being. Two studies evaluated the effect of meaning therapy on spiritual well-being of patients with cancer.[21,22] The fixed-effects model showed that meaning therapy was effective in improving spiritual well-being (MD = −3.32; 95% CI = −5.63 to −1.01; P = 0.005), with no heterogeneity among studies (I^2 = 0%, P = 0.66) (Fig. 3.5).

Psychological outcomes

Anxiety. Five studies evaluated the effect of meaning therapy on anxiety of patients with cancer.[21–24,32] The fixed effects model showed that meaning therapy was effective in improving anxiety (MD = −0.66; 95% CI = −1.30 to −0.01; P = 0.05) with no heterogeneity among studies (I^2 = 0%, P = 0.70) (Fig. 3.6).

Depression. Five studies evaluated the effect of meaning therapy on depression of patients with cancer.[21–24,32] The fixed-effects model showed that meaning therapy was effective in improving depression (SMD = −0.37; 95% CI = −0.55 to −0.20; P < 0.0001) with no heterogeneity among studies (I^2 = 0%, P = 0.94) (Fig. 3.7).

Psychological distress. Two studies evaluated the effect of meaning therapy on psychological distress of patients with cancer.[23,24] The fixed effects model showed that meaning therapy was effective in improving psychological distress (SMD = −0.35; 95% CI = −0.70 to −0.01; P = 0.04) with no heterogeneity among studies (I^2 = 0%, P = 0.52) (Fig. 3.8).

Desire for hastened death. Two studies evaluated the effect of meaning therapy on desire for hastened death of patients with cancer.[21,22] The fixed effects model showed that meaning therapy was effective in improving desire for hastened death (MD = −0.76; 95% CI = −1.47 to −0.05; P = 0.04) with no heterogeneity among studies (I^2 = 0%, P = 0.96) (Fig. 3.9).

Quality of life

Four studies evaluated the effect of meaning therapy on QOL of patients with cancer.[21,22,24,32] However, only three studies were included in the meta-analysis,[21,22,24] for one study did not report the total score of QOL.[32] The heterogeneity among studies was low (I^2 = 46%, P = 0.16). Using the fixed-effects model, it was found that the intervention group was more effective in improving QOL than the control (SMD = −0.29; 95% CI = −0.50 to −0.09; P = 0.006) (Fig. 3.10).

Publication bias

In this review, we assessed the publication bias of studies by funnel plot. As shown in Fig. 4, the two sides of all funnel plots were basically symmetrical, indicating a low risk of publication bias.

Discussion

Main findings

To our knowledge, this systematic review and meta-analysis is the first study to examine the effects of meaning therapy on patients with cancer by including and analyzing relevant RCTs. The results of eight studies showed that meaning therapy was effective in improving the spiritual outcomes (meaning in life, hopelessness, self-esteem, and spiritual well-being), psychological outcomes (anxiety, depression, psychological distress, and desire for hastened death), and QOL of patients with cancer compared to the control group of usual care or other psychological interventions.

Spirituality is a dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence, and experience relationship to self, family, others, community, society, nature, and the significant or sacred.[33] Patients with cancer suffer from the disease and are physically and emotionally damaged during the course of their illness. Spirituality can be an effectively utilized resource for patients with cancer in a number of ways, transforming them from a state of emotional pain to a state of health. A total of five indicators of spirituality (meaning in life, hopelessness, self-esteem, optimism, and spiritual well-being) were included in this study, and the results showed that meaning therapy had a significant impact on four indicators of patients with cancer, except for optimism.
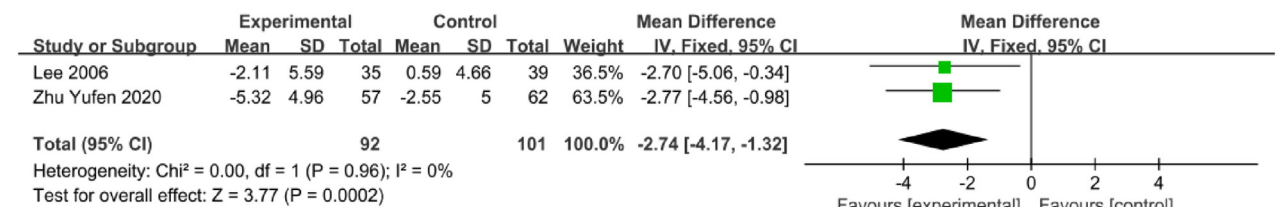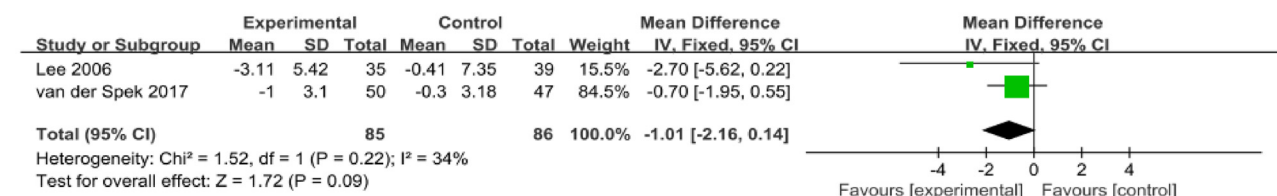
(3.1) Meaning in life
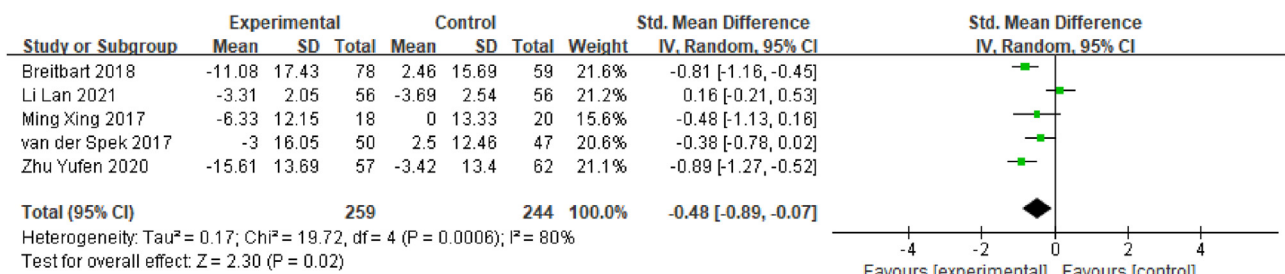
(3.2) Hopelessness
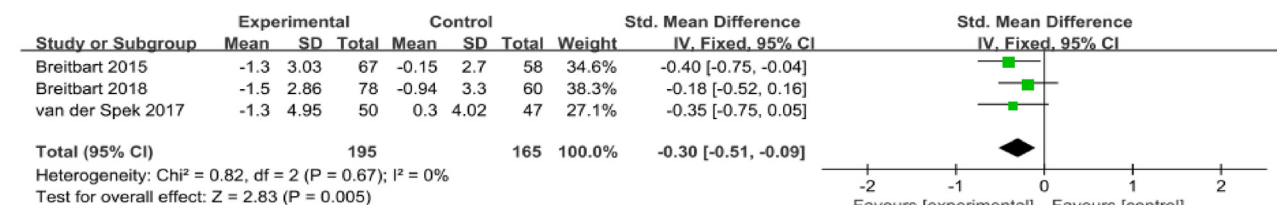
(3.3) Self-esteem
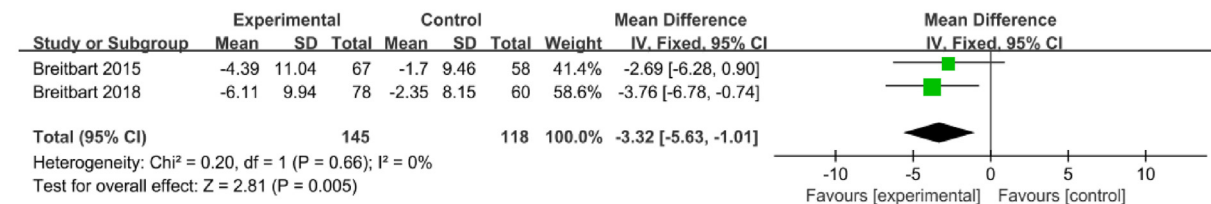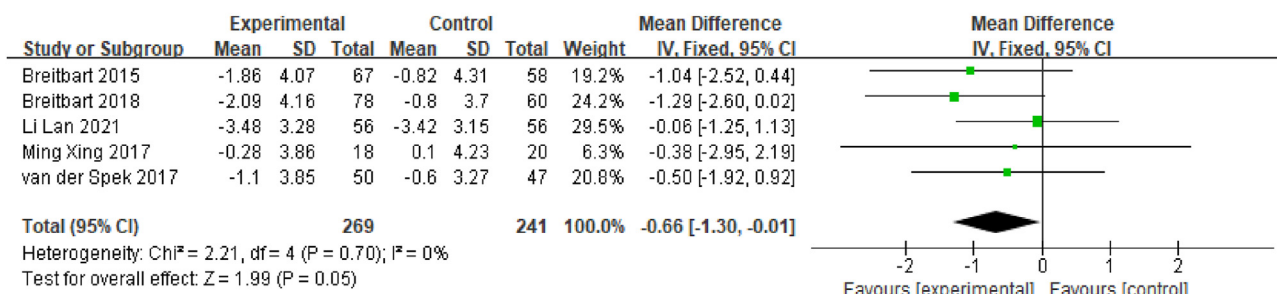

(3.4) Optimism

(3.5) Spiritual well-being

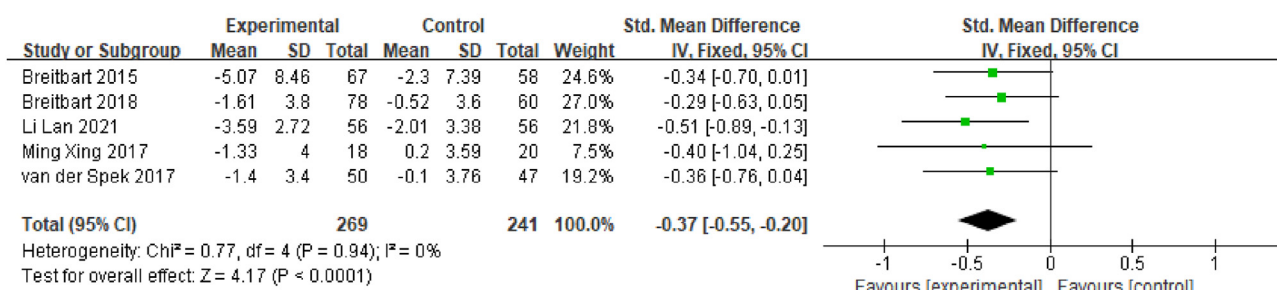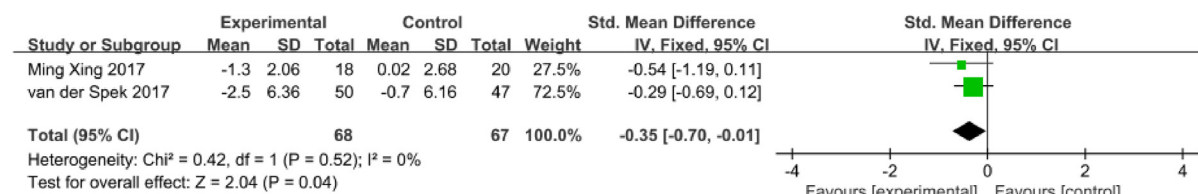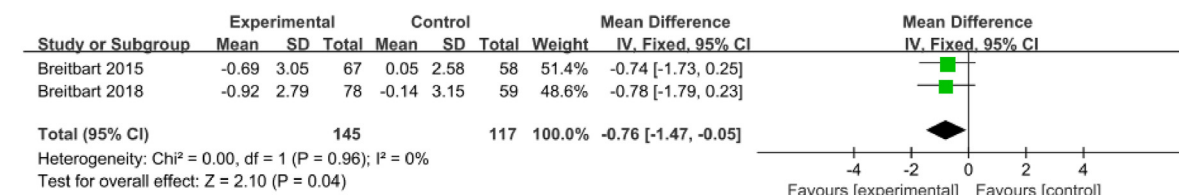**Fig. 3.** Forest plot: effect of meaning therapy.

(3.6) Anxiety

(3.7) Depression

(3.8) Psychological distress

(3.9) Desire for hastened death

(3.10) Quality of life
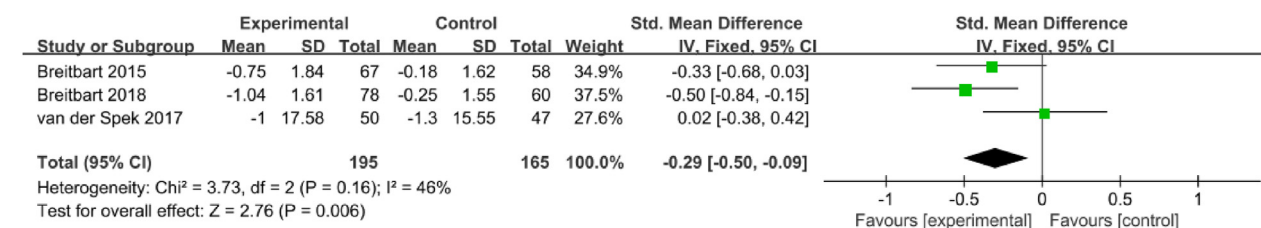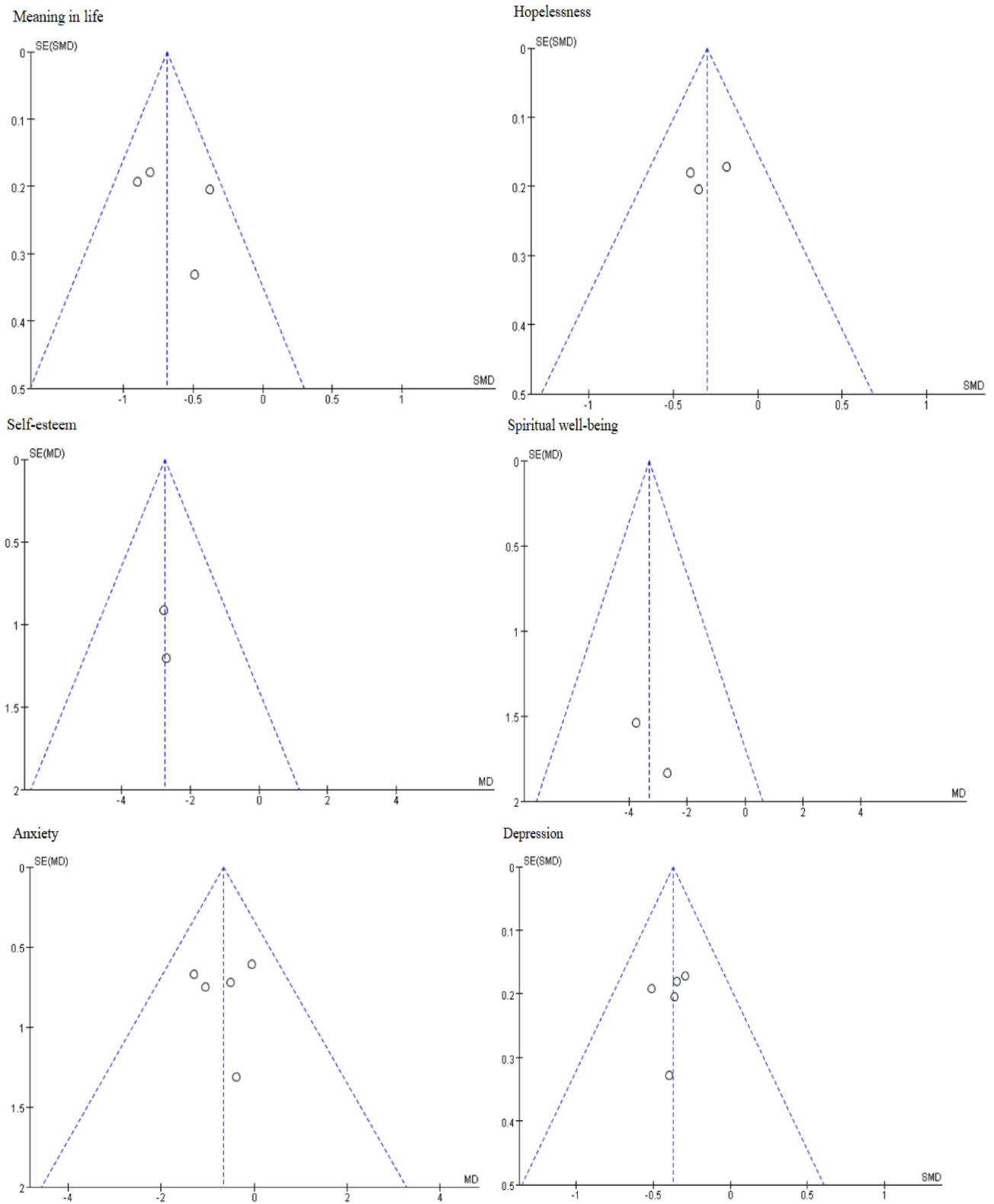

Fig. 3. (continued).

Fig. 4. Funnel plot for assessing publication bias.

Psychological distress

Desire for hastened death
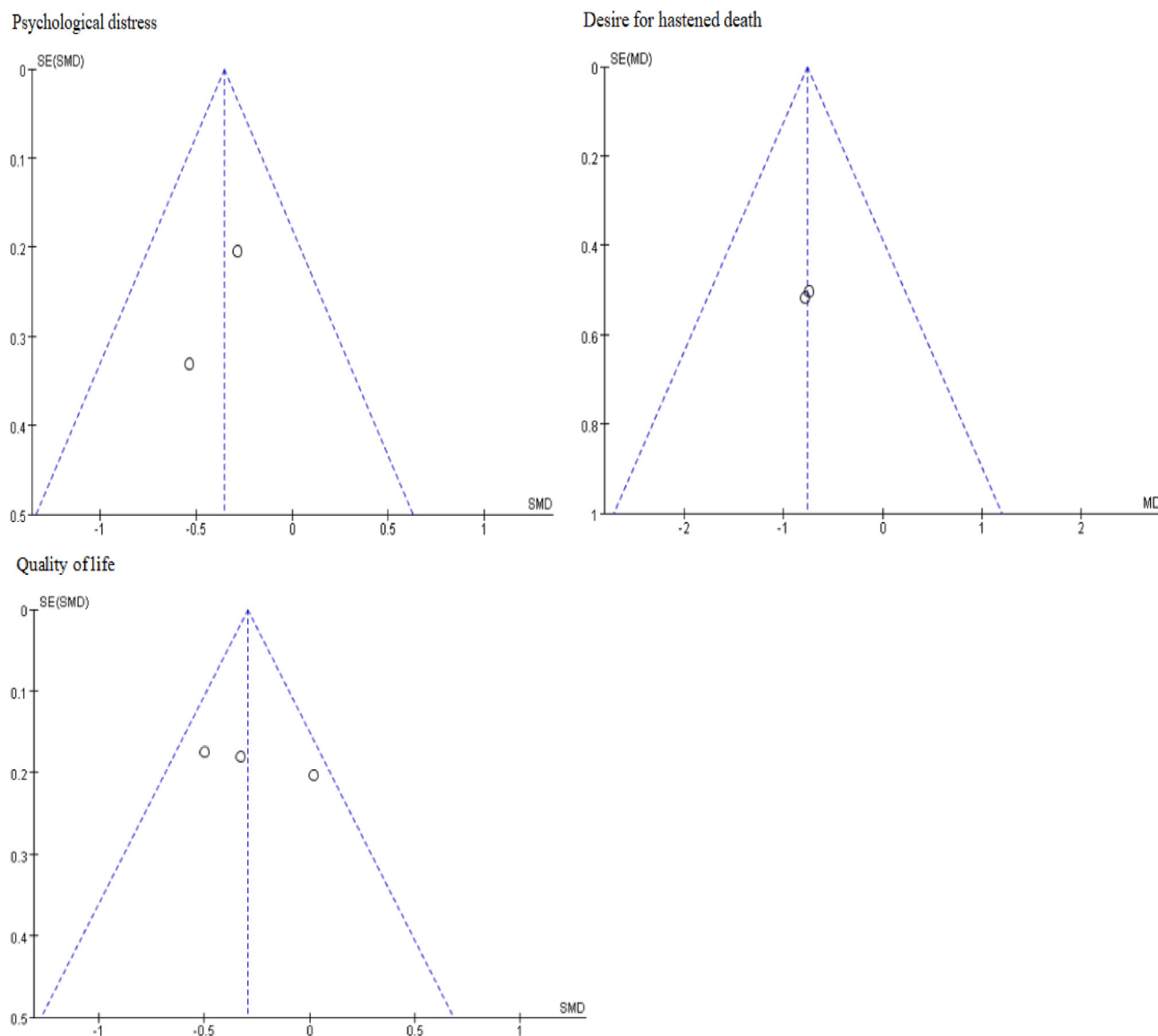

Quality of life

Fig. 4. (*continued*).

Regarding meaning in life, five studies included in our meta-analysis suggested the significant effects of meaning therapy. However, the heterogeneity among the studies was high, and sensitivity analyses showed that the heterogeneity was caused by the trial of MCGP on patients with advanced liver cancer conducted in China.[32] The heterogeneity might be caused by the measurement tool. The study of Li used the Meaning in Life Questionnaire developed in the USA by Steger,[34] whereas other studies used the locally compiled tools for measuring meaning in life, which might reflect the actual situation of patients better. MCP is a therapeutic approach that helps patients reflect on the meaning in life through the attitudinal, creative and experiential values and realize the hidden meaning and find the value of their own existence.[35] MMi allows patients to reflect on thoughts and mindset of cancer and the impact that cancer has had on their lives and identities, with the goal of allowing patients to maintain and enhance their sense of meaning in the face of an existential crisis.[18] In patients with advanced disease, meaning in life can enhance patients' well-being, promote coping and improve tolerance of physical symptoms, and also act as a buffer against hopelessness and depression,

reduce the emergence of desire for hastened death, and thus, it is a key factor in ensuring patients' spiritual well-being and QOL.[36,37]

Meaning therapy was found to have positive effects on hopelessness. Patients with cancer often perceive cancer as a negative and fatal disease, resulting in a deep sense of hopelessness during the course of the disease, which continues to cause stress and negative expectations for the future.[38] Frankl believed that by realizing attitudinal values, people can change their views of things, understand what is most important to them at the moment, and thereby gain new cognition.[15] Thus, meaning therapy can reduce the hopelessness on disease and let patients look forward to the future and set up their life goals through improving attitude of patients with cancer. Furthermore, it was found that hopelessness is one of the most important predictors of depression and suicidal ideation and behavior.[39] Therefore, it is essential to detect and alleviate patients' feelings of hopelessness in clinical treatment and care.

Meaning therapy had a large effect on improving self-esteem. It has been found that loss of dignity is the main reason for accelerating the death of patients with serious or incurable diseases,[40] so it is very

important for patients with cancer to maintain or improve their sense of dignity. During the intervention process of meaning therapy, patients can fully express their wishes and tell their true feelings and can receive sincere feedback from the intervenor, which demonstrates respect for the patient, thereby increasing the patient's self-esteem.

Meaning therapy was found to have a large effect on improving spiritual well-being, which is an effective coping mechanism that includes different dimensions of faith, meaning, and peace.[41] Meaning and peace can reduce depression in patients, and faith can improve their mental health,[42] so spiritual well-being is closely linked to the mental and physical health of patients with cancer.[43] Healthcare professionals usually pay more attention to relieving patients' physical and mental distress and neglect spiritual care in the clinic, which is one of the reasons for the low level of spiritual well-being of patients with cancer.[44] Therefore, healthcare professionals should realize the importance of spiritual well-being and provide appropriate spiritual care for patients with cancer with spiritual distress. In addition, different groups have different cognitions of spiritual well-being,[45] so healthcare professionals should provide help to patients according to their cultural and social backgrounds.

The process of diagnosis and treatment of cancer can cause severe physical and psychological trauma, and optimistic individuals are able to objectively and correctly view illness, actively accept and cooperate with the treatment, and also proactively adopt positive stress-coping strategies to alleviate the trauma.[46,47] However, meaning therapy was found to have no significant effects on optimism. This may be related to the stage of cancer. Participants in van der Spek's study were cancer survivors,[24] and the level of optimism in this population may not be greatly influenced by the meaning of life, for it was consistently found to be negatively correlated with fear of cancer recurrence, which is one of the most common and aversive psychological phenomena among cancer survivors.[48] Due to the limited included studies, more research are needed in the future.

Patients with cancer suffer from not only physical discomfort but also psychological, economic, and social pressures, which lead to numerous psychological problems, such as anxiety and depression.[49] Meaning therapy helps the individual reconnect with his or her own inner meaning, improves the patient's sense of life satisfaction and well-being, and promotes psychological recovery and growth. A total of four psychological health indicators (anxiety, depression, psychological distress, and desire to hastened death) were included in this study, and the results showed that meaning therapy could improve the psychological health of patients with cancer.

Meaning therapy was found to have significant effects on reducing anxiety and depression. Anxiety and depression can hinder cancer treatment and recovery, which further affects the QOL of patients.[50] A previous study found that anxiety may be a precursor to depression, so it is important to assess and treat patients' anxiety to prevent later episodes of depressive symptoms.[51] In addition, meaning in life plays an essential role in reducing depression as well as the predictive effect of anxiety on it. Meaning therapy may take effect by directly enhancing meaning in life, then indirectly improving anxiety and depression in patients with cancer. Meaning therapy was found to have positive effects on psychological distress. A survey found that 52% of patients with cancer have high psychological pain.[52] As their condition worsens, patients with advanced cancer will have to endure severe disease symptoms, adverse reactions to treatment, and face the threat of death at any time, making them highly susceptible to immense psychological distress.[53] Meaning therapy can help patients with cancer maintain inner peace, regain life goals, and alleviate psychological distress. Meaning therapy was found to have significant effects on relieving desire for hastened death. Desire for hastened death is prevalent in patients with advanced disease, and it fluctuates according to their physical condition, psychological characteristics, social environment, etc. Meaning therapy is beneficial in helping patients recognize the value and meaning of life and decreasing desire for death to a great extent as time goes by.[3] It is extremely important for clinicians to proactively assess desire for hastened death and apply meaning therapy to alter it in time.

The diagnosis and treatment of cancer has a significant impact on a patient's QOL, and the level of QOL can reflect the recovery of patients with cancer and the effectiveness of treatment in turn. Meaning therapy was found to have positive effects on QOL, which were consistent with a previous meta-analysis.[54] Vos found that psychological meaning-centered therapies could significantly improve QOL and reduce psychological stress over an extended period of time; thus, they should be widely applied to individuals in life transitions or suffering from life-threatening illnesses.

Implications for clinical practice and research

Overall, meaning therapy exerts effectiveness in improving the spiritual outcomes, psychological outcomes, and QOL of patients with cancer. However, it can be further explored on the basis of its current application. First, more high-quality RCTs should be conducted to confirm the effects of meaning therapy. Only eight definitive RCTs were identified and included in this systematic review and meta-analysis, and most of the studies have small sample sizes, short follow-up times, and high dropout rates. Regarding the cause of dropout, the majority were due to disease progression or death of patients, scheduling conflict, burden of participation, et al.[21,22] Therefore, it is necessary to adopt a rigorous trial design to ensure sufficient sample sizes, so that the short-term and long-term follow-ups can be carried out smoothly and more scientific and credible results can be obtained. Second, meaning therapy should be modified based on the cultural background of the research population, thus can be better accepted by patients with cancer. Meaning therapy was proposed by the Austrian scholar Frankl[15] and was initially tested mainly in western countries such as Canada, the USA, and the Netherlands. However, each country and region has its unique culture. For example, talking about death in the face of patients with cancer is quite sensitive in China, and the study of Ming developed a localized meaning-in-life intervention on the basis of the MMi, in which talking about death in the original program was changed to expressing needs or concerns about the present or future.[23] Third, the training of intervenors should be strengthened. It was found that as health professionals who have the most contact and communication with patients, nurses have become one of the main forces in the clinical implementation of meaning therapy. Therefore, the clinic should strengthen the training of nurses' relevant knowledge and skills in applying meaning therapy so as to achieve its best intervention effect.

Limitations

There were some limitations in our systematic review and meta-analysis. First, the language was limited to English and Chinese, and the included patients with cancer were adults; therefore, the effects of meaning therapy in studies published in other languages and on adolescent patients with cancer were not known. Second, we did not compare the effectiveness of meaning therapy on different cancer types and stages because of the limited number of included studies. Third, the lack of long-term follow-up research in most of the studies prevented us from evaluating the long-term effects of meaning therapy. Fourth, there was heterogeneity among measures taken by the control groups of the included studies, which may have some impact on the results. Finally, methodological issues with the included studies cannot be ignored, such as a lack of concealed allocation and blinding of participants and outcome assessors.

Conclusions

The present systematic review and meta-analysis included eight RCTs and provided evidence for the effectiveness of meaning therapy on improving the spirituality of patients with cancer (meaning in life, hopelessness, self-esteem, and spiritual well-being), psychological health (anxiety, depression, psychological distress, and desire for hastened

death), and QOL. Meaning therapy can be an effective clinical psychological intervention that should be actively advocated and applied in the clinic so as to improve multidimensional distress and QOL in patients with cancer. However, due to the small number of studies included for each outcome and the lack of follow-up assessments, more high-quality RCTs with larger sample sizes are warranted to confirm the results of our review and to clarify the long-term effects of meaning therapy in the future.

Ethics statement

Not required.

Funding

CRediT authorship contribution statement

Mimi Sun: Conceptualization, Methodology, Literature search, Data curation, Formal analysis, Writing – Original draft preparation. Xia Tian: Conceptualization, Methodology, Literature search, Writing – Revised draft preparation. Yunyi Peng: Conceptualization, Writing – Revised draft preparation. Zheng Wang: Conceptualization, Writing – Revised draft preparation. Yongmei Lu: Conceptualization, Writing – Original draft preparation, Writing – Revised draft preparation. Wenli Xiao: Conceptualization, Writing – original draft preparation, Writing – Revised draft preparation. All authors were involved in the manuscript writing. All authors had full access to all the data in the study, and the corresponding author had final responsibility for the decision to submit for publication. The corresponding authors attest that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Declaration of competing interest

The authors declare no conflict of interest.

Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article.

Declaration of Generative AI and AI-assisted technologies in the writing process

No AI tools/services were used during the preparation of this work.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apjon.2024.100388.

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