

Review of the Effects and Safety of Traditional Chinese Medicine in the Treatment of Cancer Cachexia

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ABSTRACT

Cancer cachexia is characterized by weight loss, anorexia, asthenia, and anemia among cancer patients and can lead to their decreased physical function, poor quality of life, and reduced survival. Progestins have been reported to have beneficial effects on appetite improvement in patients with cancer; however, serious complications have been reported as a result of their use. Traditional Chinese medicine (TCM) is a complementary and alternative system of medicine that may be effective in treating cancer cachexia. This review aims to identify existing evidence on the efficacy and safety of traditional Chinese herbs and common TCM technologies in treating cancer cachexia. We searched six databases – the Cochrane Library, PubMed, EMBASE, CINAHL, China National Knowledge Infrastructure, and Wan Fang Database, using medical subject headings and free text. The search was performed in January 2021, and the reference lists of relevant articles were also

searched. A total of 4685 citations were identified, and 20 studies were included. The results showed that traditional Chinese herbs can improve appetite, weight, biomarkers, the Karnofsky performance status, cachexia-related symptoms, and quality of life in patients with cancer cachexia. Some traditional Chinese herbs may have superiority in curative effects and safety, compared with progestins. Interestingly, acupuncture can improve appetite, nausea, constipation, and quality of life among patients with cancer cachexia but cannot increase body weight. However, high-quality evidence regarding the effect of TCM technologies in treating cancer cachexia is limited. It would be beneficial to explore the use of moxibustion and other TCM technologies in future studies.

Key words: Acupuncture, cancer cachexia, review, traditional Chinese herbs, traditional Chinese medicine

Introduction

Cancer cachexia is a multifactorial wasting syndrome that is characterized by an ongoing loss of skeletal muscle mass (with or without loss of fat mass [FM]), anorexia, asthenia, and anemia, all of which can be partially but not entirely reversed by conventional nutritional support.^[1,2] The prevalence of cachexia varies by cancer type; patients with pancreatic cancer have the highest prevalence of cachexia (88.9%), followed

by those with gastric cancer (76.5%–87%) and esophageal cancer (52.9%).^[3] Cancer cachexia can lead to numerous clinical problems including decreased physical function,^[4] restriction of anticancer treatment chemotherapy,^[5] poor quality of life,^[5-7] and reduced survival rate.^[4] It is estimated that cachexia affects 60%–80% of patients with advanced cancer and leads to death in more than 30%.^[3]

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To date, no universal standardized treatment guideline for cancer cachexia exists.^[5,8,9] Approaches to treating cancer cachexia include pharmacologic treatment, nutritional intervention, and exercise. Pharmacologic treatment usually performs three basic functions:^[8] (1) reduction of tumor-associated inflammation, (2) promotion of the anabolic potential of the body to counter the wasting and hypercatabolic state, and (3) stimulation of appetite. Progestins such as megestrol acetate and medroxyprogesterone acetate are the most common drugs used in the clinical treatment of cachexia.^[8] Megestrol acetate has been reported to have beneficial effects on appetite and results in a slight increase in weight but does not lead to improvements in fat-free mass (FFM) or quality of life.^[10] Moreover, serious complications have been reported as a result of the use of megestrol acetate including increased risks of thromboembolism, adrenal insufficiency, and in male patients, hypogonadism.^[9] Cancer patients with cachexia have increased energy requirements, and increased proteolysis depletes both essential and nonessential amino acids. Nutritional support, including amino acids and other micronutrients such as vitamins, may be beneficial for supplementing the agents used to treat cancer cachexia.^[9] Despite this, studies on the clinical benefits of intense nutritional interventions among cancer patients with cachexia have shown inconclusive results,^[9] and further research is needed.^[11] Cancer cachexia can cause muscle weakness, fatigue, and reduced physical function. Therefore, exercise is another possible treatment that may benefit patients by modulating levels of inflammation and altering muscle metabolism.^[9,12] However, a Cochrane review on randomized controlled trials found no evidence to demonstrate a beneficial effect of exercise on cancer cachexia.^[12]

Traditional Chinese medicine (TCM) has been used widely as a complementary and alternative type of medicine to alleviate the adverse effects of conventional therapies or to improve the patients' quality of life. TCM has been used for thousands of years and includes various forms of herbal medicine, acupuncture, cupping therapy, gua sha, massage, and qigong. Acupuncture in particular has been shown to reduce nausea and vomiting^[13] and prevent loss of appetite by inhibiting the secretion of alpha-melanocyte-stimulating hormone (α -MSH).^[14] Based on this evidence, acupuncture may also reduce the risk of developing cancer-related anorexia and cachexia and improve the overall quality of life. Furthermore, several traditional Chinese herbs have been shown to be effective in the treatment of cancer cachexia.^[15]

A systematic review and meta-analysis^[15] have been conducted to evaluate the efficacy and safety of TCM

decoctions in treating cancer cachexia. Studies on the use of nondecoction formulations, such as Chinese patent medicine injection or Chinese medicine granules, were excluded. This review aims to identify the existing evidence on the effects and safety of traditional Chinese herbs, including both TCM decoction and nondecoction formulations, and common TCM technologies in treating cancer cachexia, which could help to effectively manage this condition.

Methods

Literature search

The following databases were searched from inception to January 2021 for articles published in English or Chinese: The Cochrane Library, PubMed, EMBASE, CINAHL, China National Knowledge Infrastructure, and Wan Fang Database. The reference lists of relevant articles were also searched. The following Medical Subject Headings were used in the search: "Neoplasm," "Carcinoma," "Weight Loss," "Malnutrition," "Cachexia," "Medicine, Chinese Traditional," "Drugs, Chinese Herbal," "Acupuncture," "Acupuncture, Ear," "Moxibustion," "Massage," and numerous free text words such as "cancer," "oncology," "malignant tumor," "leukemia," "Hodgkin," "cachexia," "underweight," "wasting," "TCM," "Chinese herb," "cupping," "ba guan," "massage," and "acupuncture." For detailed search strategies, please see the Appendix 1.

Study selection

We developed the study inclusion criteria based on the study design, participants, interventions, comparisons, and outcomes. The inclusion criteria were as follows: (1) randomized controlled trials or quasiexperimental studies; (2) cancer patients with cachexia aged ≥ 18 years old, with no limit on cancer type; (3) all types of traditional Chinese herbs and common TCM technologies (commonly, ba guan, massage, acupuncture, auricular acupuncture, and moxibustion), with no limit on the number of herbs, administration methods, dosage or duration of treatment; (4) no limit on comparison as quasi-experimental studies were included; and (5) one or more outcomes to evaluate the effects or safety of the interventions including, appetite, body weight, body composition, biomarkers, Karnofsky performance status, cancer cachexia-related symptoms, quality of life, and side effects. Studies on traditional herbs from regions outside China were excluded. Two reviewers (BBX and QQC) independently screened the title and abstract of each article to establish relevance before checking the full texts of potential studies.

Data extraction

Data were extracted into Microsoft Word by BBX and QQC – first author, year of publication, study design, study site, participants and setting, intervention, comparison, time of data collection, outcome variables, and key findings. The extracted data were cross-checked for accuracy.

Results

Study selection

Figure 1 shows the outcomes of the literature search and study selection. A total of 4684 articles were identified from the electronic databases, and one study was identified from the reference lists of the included studies. After removing duplicates, 3472 remained for relevancy screening and 36 remained for full-text checking. Finally, 18 studies^[16-33] published in Chinese and two studies^[34,35] published in English were included in the review.

Study characteristics

Table 1 describes the characteristics of the included studies. Among the 20 included studies, including 14 randomized controlled studies^[16,17,19-22,24,25,29-34] and six quasi-experimental studies,^[18,23,26-28,35] 18 were conducted in China,^[16-33] and the remaining two were conducted in the United States^[34] and Indonesia.^[35] The most common intervention was traditional Chinese herbs^[16-19,21,23-25,27,30,33] (11/20, 55%), followed by TCM combined with Western medicine

intervention^[22,26,29,32] (4/20, 20%) and acupuncture intervention^[20,34,35] (3/20, 15%). The least common intervention was traditional Chinese herbs combined with nutritional support intervention^[31] (1/20, 5%) and traditional Chinese herbs combined with moxibustion intervention^[28] (1/20, 5%). The intervention duration ranged from 7 to 60 days. Eighteen studies^[16-27,29-34] were used to set up the control. The most common control was megestrol acetate^[17,21,22,24,27,29,30,32,33] in 10 of 18 studies (55.6%), 9 of which had the same dose and frequency.^[17,21,22,24,27,29,30,32]

Effects of traditional Chinese medicine in treating cancer cachexia

The identified studies assessed seven main effects of TCM in treating cancer cachexia including appetite improvement, body weight improvement, body composition changes, biomarker changes, Karnofsky performance status improvement, cancer cachexia-related symptom improvement, and quality of life improvement. The effects of TCM in improving cancer cachexia are summarized in Table 2.

Appetite improvement was observed in 12 studies^[20-26,29-33] (12/20, 60%), including six involving interventions comprising traditional Chinese herbs,^[21,23-25,30,33] four involving combinations of traditional Chinese herbs and western medicine,^[22,26,29,32] one involving a combination of traditional Chinese herbs with nutritional support,^[31] and one involving acupuncture.^[20] The use of traditional

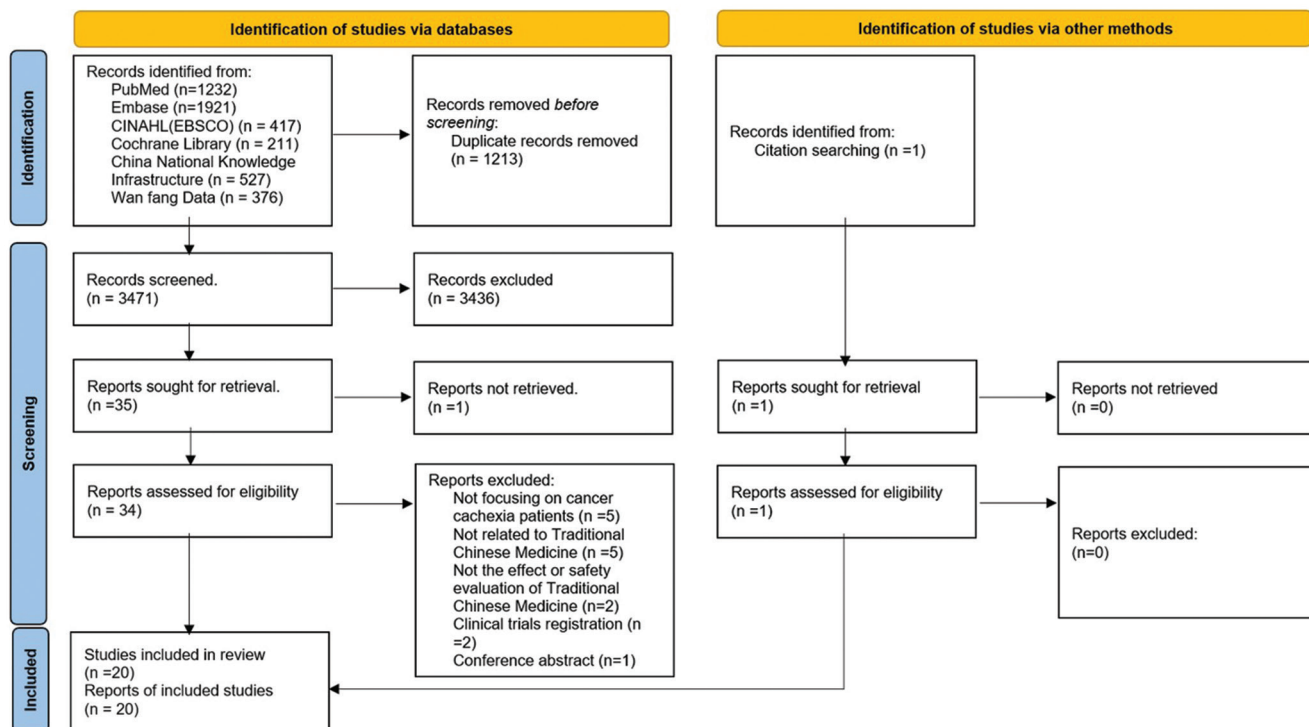


Figure 1: Flow diagram of study selection process

Table 1: Characteristics of the identified studies (n=20)

Study and design	Study site and publication language	Sample	Intervention				Control			
			Content	Dose	Frequency	Duration	Content	Dose	Frequency	Duration
Zhao N, 2018; Quasi-experimental study	Hubei province, China; Chinese	n=60 (30:30) Sex: Male (31) Age: 28-69 Site: Lung (27), digestive (26), nasopharyngeal (7)	Traditional Chinese herbs: <i>Gui Pi Tang</i>	One dose/time*	Once/day	3 weeks	Western medicine: Megestrol acetate	160 mg/time	Once/day	3 weeks
He H, 2019; RCT	Liaoning province, China; Chinese	n=72 (36:36) Sex: Male (47) Age: 27-69 Site: Lung (15), digestive (39), breast (8), prostate (3), gynecological (7)	Traditional Chinese herbs: 1. <i>Yi Qi Yang Xue Tang</i> 2. Compound <i>Ku Shen</i> injection	1. One dose/time* 2. 20 ml/time	1. Once/day 2. Once/day	3 weeks				3 weeks
He L, 2017; RCT	Hunan province, China; Chinese	n=57 (29:28) Sex: Not specified Age: Not specified Site: Not specified	1. Traditional Chinese herbs: <i>Fu Zheng</i> oral liquid 2. Western medicine: Megestrol acetate	1. 20 ml/time 2. 160 mg/time	1. Three times/day 2. Once/day	28 days				28 days
Hu W, 2007; RCT	Zhejiang province, China; Chinese	n=60 (30:30) Sex: Male (31) Age: 28-69 Site: Lung (27), digestive (26), nasopharyngeal (7)	Traditional Chinese herbs: <i>Shen Qi Jiao Cao Tang</i>	One dose/time*	Twice/day	1 month				1 month
Huang H, 2012; RCT	Guangdong province, China; Chinese	n=90 (30:30:30) Sex: Not specified Age: Not specified Site: Not specified	Intervention 1: Traditional Chinese herbs: <i>Bu Shen Jian Pi Tang</i> Intervention 2: Traditional Chinese herbs (<i>Bu Shen Jian Pi Tang</i>) + Western medicine (megestrol acetate)	Intervention 1: One dose/time* Intervention 2: <i>Bu Shen Jian Pi Tang</i> one dose/time*, megestrol acetate 160 mg/time	Intervention 1: Once/day Intervention 2: Once/day	Intervention 1: 1 month Intervention 2: 1 month				1 month
Kuang T, 2009; RCT	Zhejiang province, China; Chinese	n=120 (60:60) Sex: Male (68) Age: 45-82 Site: Lung (120)	Traditional Chinese herbs: <i>Yi Qi Yang Yin Tang</i>	One dose/time*	Twice/day	1 month				1 month
Jin J, 2011; RCT	Guangdong province, China; Chinese	n=90 (30:30:30) Sex: Male (46) Age: 29-73 Site: Lung (40), digestive (29), breast (18), nasopharyngeal (3)	Intervention 1: Traditional Chinese herbs: <i>Shen Ling Bai Zhu Tang</i> Intervention 2: Traditional Chinese herbs (<i>Shen Ling Bai Zhu Tang</i>) + Western medicine (megestrol acetate)	Intervention 1: One dose/time* Intervention 2: <i>Shen Ling Bai Zhu Tang</i> One dose/time*, megestrol acetate 160 mg/time	Intervention 1: Once/day Intervention 2: Once/day	Intervention 1: 1 month Intervention 2: 1 month				1 month

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Table 1: Condr...

Study and design	Study site and publication language	Sample	Intervention			Control				
			Content	Dose	Frequency	Duration	Content	Dose	Frequency	Duration
Li Y, 2011; RCT	Hubei province, China, Chinese	n=80 (40:40) Sex: Male (53) Age: 38-74 Site: Lung (26), digestive (42), breast (7), others (5)	Traditional Chinese herbs: <i>Jian Pi Hua Tan Tang</i>	One dose/time*	Twice/day	1 month				1 month
Shi J, 2020; RCT	Shanxi province, China; Chinese	n=102 (51:51) Sex: Male (63) Age: 28-83 Site: Lung (25), digestive (62), breast (6), others (9)	Traditional Chinese herbs: <i>Sheng He San</i> (in the form of powders)	6 g/time	Three times/day	60 days				60 days
Yang W, 2007; RCT	Guangdong province, China; Chinese	n=85 (29:29:27) Sex: Male (50) Age: 40-80 Site: Lung (42), digestive (43)	1. Traditional Chinese herbs: <i>Bu Shen Tian Jing San</i> (in the form of powders) 2. Other dialectical Chinese herbs (any ingredient of <i>Bu Shen Tian Jing San</i> was excluded), were given according to patients' other symptoms 3. Nutrition support (amino acid, fat milk, etc.)	1. 3 g/time 2. Not reported 3. Not reported	1. Three times/day 2. Not reported 3. Not reported	30 days	Control 1: 1. Western medicine: Megestrol acetate 2. Component 2 and 3 in IC Control 2: Component 2 and 3 in IC	Control 1: 1. 160 mg/time 2. Not reported Control 2: Not reported	Control 1: Once/day Control 2: Not reported	30 days
Wang Y, 2018; RCT	Tianjin, China; Chinese	n=60 (30:30) Sex: Male (29) Age: 39-79 Site: Lung (22), digestive (38)	Traditional Chinese herbs: <i>Ban Xia Xie Xin Tang</i>	150 ml/time	Twice/day	4 weeks	Western medicine: Megestrol acetate	40 mg/time	Twice/day	4 weeks
Wang L, 2017; Quasi-experimental study	Jiangsu province, China; Chinese	n=60 (20:20:20) Sex: Male (27) Mean Age: 58.7 Site: Lung (14), digestive (20), gynecological (17), others (9)	Intervention 1: Traditional Chinese herbs: <i>Flavored Xiang Sha Gui Shao Liu Jun Tang</i> Intervention 2: Traditional Chinese herbs (same with intervention 1) + Western medicine (same with control)	Intervention 1: One dose/time* Intervention 2: Traditional Chinese herbs: One dose/time* Western medicine: 250 mg/time	Intervention 1: Once/day Intervention 2: Traditional Chinese herbs: Once/day Western medicine: Twice/day	4 weeks	Western medicine: Medroxyprogesterone acetate	250 mg/time	Twice/day	4 weeks
Huang Y, 2009; RCT	Shanghai, China; Chinese	n=68 (34:34) Sex: Male (37) Age: 31-73 Site: Lung (18), digestive (30), breast (20)	Traditional Chinese herbs: <i>Jian Pi Bu Shen Tang</i>	One dose/time*	Twice/day	30 days				30 days

Contd...

Table 1: Condr...

Study and design	Study site and publication language	Sample	Intervention			Control				
			Content	Dose	Frequency	Duration	Content	Dose	Frequency	Duration
Du X, 2002; Quasi experimental study	Beijing, China; Chinese	n=46 (23:23) Sex: Male (35) Age: 37-69 Site: Lung (46)	Traditional Chinese herbs: <i>Ping Fei</i> oral liquid	One bottle/ time†	Three times/ day	30 days				30 days
Su Y, 2015; RCT	Anhui province, China; Chinese	n=60 (30:30) Sex: Male (33) Age: 28-69 Site: Lung (25), digestive (32), breast (3)	Traditional Chinese herbs: <i>Ba Zhen Tang</i>	One dose/time*	Once/day	1 month	Nutrition support	Not reported	Not reported	1 month
Diao Y, 2019; Quasi-experimental study	Jilin province, China; Chinese	n=76 (38:38) Sex: Not specified Age: Not specified Site: Not specified	Traditional Chinese herbs: 1. <i>Yi Qi Yang Xue Tang</i> 2. Compound <i>Ku Shen</i> injection	1. One dose/ time* 2. 12 ml/time	1. Once/day 2. Once/day	Not reported	Traditional Chinese herbs: Compound <i>Ku Shen</i> injection	12 ml/time	Once/day	Not reported
Sun S, 2014; Quasi-experimental study	Heilongjiang province, China; Chinese	n=30 Sex: Male (14) Age: 41-82 Site: Lung (5), digestive (18), others (7)	1. Traditional Chinese herbs: <i>Gui Pi Tang</i> 2. Moxibustion (8 acupoints): Shen que, Guan yuan, Tian Shu (right and left), Zu San Li (right and left), Yin Ling Quan (right and left)	1. 250 ml/time 2. 30 min/time	1. Twice/day 2. Once/day	14 days	No control group	Not applicable	Not applicable	Not applicable
Yuliatun L, 2019; pretest-posttest design	Indonesia; English	n=7 Sex: Not specified Age: 54±3 Site: Not specified	Acupuncture 1. Acupuncture points: Hegu (LI-4), Zusanli (ST36), Sanyinjiao (Sp6), Xuehai (Sp10), Neiguan (P6), Dazhui (GV14), and Dicang (ST4). 2. Acupuncture points were located using standard anatomical location and needle at proper needling depth (0.5-1.5 cm) bilaterally and needle was retained for 30 min. Acupuncture was provided to all patients by an acupuncturist who is trained and certified	One session (about 30 min/time)	Every 2 days	8 sessions (16 days)	No control group	Not applicable	Not applicable	Not applicable

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Table 1: Contrl...

Study and design	Study site and publication language	Sample	Intervention			Control				
			Content	Dose	Frequency	Duration	Content	Dose	Frequency	Duration
Zhao Z, 2016; RCT	Chongqing, China; Chinese	n= 129 (43:43:43) Sex: Not specified Age: Not specified Site: Not specified	Acupuncture+placebo drug Acupuncture points: Zu San Li (right and left), Nei Guan, San Yin Jiao, Zhong Wan, Guan Yuan	Acupuncture: 30 min/time placebo drug: 160 mg/time	Once/day	7 days	Control 1 Western medicine: Megestrol acetate+placebo acupuncture Control 2: Acupuncture points: Kong Zui, Yang Ling Quan, Xuan Zhong, Yin Tang Control 2 placebo drug+placebo acupuncture	Control 1: Megestrol acetate 160 mg/time placebo acupuncture Control 2: Placebo drug 160 mg/time; placebo acupuncture 30 min/time	Control 1: Once/day Control 2: Once/day	Control 1: 7 days Control 2: 7 days
Grundmann O, 2019; RCT	USA; English	n=30 (15:15) Sex: Not specified Age: Not specified Site: Digestive (30)	Targeted acupuncture: 23 auricular and body acupuncture points that were linked to specific biological factors that affect the processes involved in the initiation, progression, or maintenance of cachexia 1. Anti-inflammatory: ST36, SP6, LI11, EX-HN-3, GV20, interferon (left ear), thymus (left ear), PGE1 (right ear) 2. Stress/autonomic nervous system: PC6, SP4, LI4, LV3, renin/angiotensin (right ear), adrenal/cortisol (left ear) 3. Anorexia: HT7, KD6, hypothalamus (right ear) 4. Gastrointestinal function: CV12, CV13, ST25, celiac plexus (both ears) 5. Muscle functioning: SP7	45-50 min per treatment	Once per week	8 weeks	Nontargeted acupuncture: 5 points that were not specific to the mechanisms of cachexia 1. UB7 for nasal congestion and headaches 2. UB61 for pain and weakness of the lower extremities 3. SJ9 for migraine, sore throat, and pain of the upper extremities 4. Wrist (both ears)	45-50 min per treatment	Once per week	8 weeks

*For traditional Chinese medicine decoction, a dose is usually a bowl, approximately equal to 200-250 ml. †For traditional Chinese medicine oral fluid, a bottle equals to about 10 ml. RCT: Randomized controlled trial, IG: Intervention group

Table 2: The effects of traditional Chinese medicine in improving cancer cachexia

Study	Intervention		Control		Effects					
	Intervention	Control	Appetite improvement	Bodyweight improvement	Body composition changes	Biomarkers changes	Kamofsky performance status improvement	Symptoms improvement	Quality of life improvement	
Zhao N., 2018	<i>Gui Pi Tang</i>	Megestrol acetate		Yes*		Yes*	Yes*	Asthenia* Fatigue* Insomnia* Palpitation* Anorexia emaciation Sallow face Yes*		
Hu W., 2007	<i>Shen Qi Jiao Cao Tang</i>	megestrol acetate	Yes	Yes		ALB ↑** PAB ↑**	Yes*			
Kuang T., 2009	<i>Yi Qi Yang Yin Tang</i>	Megestrol acetate	Yes	Yes		ALB ↑† PAB ↑**	Yes*	Yes*		
Li Y., 2011	<i>Jian Pi Hua Tan Tang</i>	Megestrol acetate	Yes*			ALB ↑** PAB ↑†	Yes*	Yes*		
Shi J., 2020	<i>Sheng He San</i>	Megestrol acetate				TNF-α ↑† IL-1 ↑† IL-6 ↑† ALB ↑† HGB ↑†	Yes†	Yes†		
Wang Y., 2018	<i>Ban Xia Xie Xin Tang</i>	Megestrol acetate	Yes*			ALB ↑† PAB ↑**		Yes*	Yes* (FAACT) Yes* (QOL-C30)	
Huang Y., 2009	<i>Jian Pi Bu Shen Tang</i>	Medroxyprogesterone acetate	Yes	Yes		ALB ↑† PAB ↑**			Yes* (EORTC QLQ-C30 and QLQ-LC13)	
Du X., 2002	<i>Ping Fei oral liquid</i>	Medroxyprogesterone acetate	Yes	Yes*		IL-6 ↑† TNF-α ↑†				
Su Y., 2015	<i>Ba Zhen Tang</i>	Nutrition support		Yes*		ALB ↑** PAB ↑**			Yes* (EORTC QLQ-C30)	
He H., 2019	<i>Yi Qi Yang Xue Tang</i> + compound <i>Ku Shen injection</i>	Megestrol acetate						Ructus* Nausea* Vomiting* Fatigue* Anorexia* Insomnia*		
Diao Y., 2019	<i>Yi Qi Yang Xue Tang</i> + compound <i>Ku Shen injection</i>	Compound <i>Ku Shen injection</i>					Yes*	Yes*		
He L., 2017	<i>Fu Zheng oral liquid</i> +megestrol acetate	Megestrol acetate	Yes*	Yes*		ALB ↑** HGB ↑**	Yes*			
Jin J., 2011	Intervention 1: <i>Shen Ling Bai Zhu Tang</i> Intervention 2: <i>Shen Ling Bai Zhu Tang</i> +megestrol acetate	Megestrol acetate	Yes	Yes			Yes IG1 versus CG*	Yes IG1 versus CG*		
			Yes	Yes			Yes IG2 versus CG*	Yes IG2 versus CG*		

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Table 2: Contd...

Study	Intervention	Control	Effects					
			Appetite improvement	Bodyweight improvement	Body composition changes	Biomarkers changes	Karnofsky performance status improvement	Symptoms improvement
Huang H, 2012	Intervention 1: <i>Bu Shen Jian Pi Tang</i> Intervention 2: <i>Bu Shen Jian Pi Tang</i> + megestrol acetate	Megestrol acetate	Yes	Yes		HGB [†]	asthenia fatigue Asthenia Fatigue Anhelation	Yes (QOL-C30) Yes (QOL-C30) IG2 versus CG* IG2 versus IG1*
Wang L, 2017	Intervention 1: <i>Flavored Xiang Sha Gui Shao Liu Jun Tang</i> Intervention 2: <i>Flavored Xiang Sha Gui Shao Liu Jun Tang</i> + medroxyprogesterone acetate	Medroxyprogesterone acetate	Yes	Yes	Yes	ALB [†]	Yes	Yes (QOL-C30) IG2 versus CG* IG2 versus IG1*
Yang W, 2007	1) <i>Bu Shen Tian Jing San</i> + 2) Other dialectical Chinese herbs (any ingredient of <i>Bu Shen Tian Jing San</i> was excluded) + 3) Nutrition support (amino acid, fat milk, etc.)	Control 1: Megestrol acetate + component 2 and 3 in IG Control 2: Component 2 and 3 in IG	Yes	Yes	IG versus CG2 [†]	HGB [†] IG versus CG1 [†] IG versus CG2 [†] ALB [†] IG versus CG1 [†] IG versus CG2 [†]	Yes IG versus CG1* IG versus CG2*	Yes IG versus CG2 [†]
Sun S, 2014 Yuliatun L, 2019	<i>Gui Pi Tang</i> + moxibustion Acupuncture	No control group No control group	Decreased by 0.57% ($P > 0.05$)	Decreased by 1. BMI: Decreased from (20.4 ± 2.9) to (20.25 ± 3.1) ($P > 0.05$) 2. FFM: Decreased by 0.4% ($P > 0.05$) 3. FM: Decreased by 0.4% ($P > 0.05$)			Yes	Yes
Zhao Z, 2016	Acupuncture + placebo drug	Control 1: Megestrol acetate + placebo acupuncture Control 2: Placebo drug + placebo acupuncture	Yes	IG versus CG2*			Nausea Constipation	Yes (FAACT) IG versus CG2*
Grundmann O, 2019	Targeted acupuncture	Nontargeted acupuncture	Decreased by an average of 12-15 lbs. ($P > 0.05$) Demonstrated a trend in weight gain in week 7 and 8	FFM: remained stable				

*Better improved than control group, intervention group 1, or control group 2 ($P < 0.05$); [†]Better improved than control group, intervention group 1, control group 1, or control group 2 ($P < 0.01$); †Decrease, ‡Increase, †IG: Intervention group, CG: Control group, ALB: Serum albumin, PAB: Prealbumin, TNF-α: Tumor necrosis factor-α, IL-1: Interleukin-1, IL-6: Interleukin-6 HGB: Hemoglobin, BMI: Body mass index, FFM: Free fat mass, FM: Fat mass, LDH: Lactate dehydrogenase, CRP: C-reactive protein, FFACT: Functional assessment of anorexia/cachexia therapy, QOL-C30: Quality of life questionnaire-core 30, EORTC QLQ-C30: The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire- Core 30, QLQ- LC13: Quality of Life Questionnaire-Lung Cancer Scale 13

Chinese herbs, including *Shen Qi Jiao Cao Tang*,^[30] *Yi Qi Yang Yin Tang*,^[21] *Jian Pi Hua Tan Tang*,^[24] *Ban Xia Xie Xin Tang*,^[33] *Jian Pi Bu Shen Tang*,^[25] and *Ping Fei* oral liquid,^[23] were reported to improve the appetite of cancer patients with cachexia. However, the improvement was only better than the Western medicine group when *Jian Pi Hua Tan Tang* (improvement rate: 95.0% vs. 85.0%, $P < 0.05$)^[24] and *Ban Xia Xie Xin Tang* (improvement rate: 70% vs. 50%, $P < 0.05$) were used.^[33] Four traditional Chinese herbs were combined with western medicine interventions including *Fu Zheng* oral liquid,^[29] *Shen Ling Bai Zhu Tang*,^[22] *Bu Shen Jian Pi Tang*,^[32] and flavored *Xiang Sha Gui Shao Liu Jun Tang*,^[26] the western medicine was megestrol acetate^[22,29,32] in 3 of 4 (75%) and medroxyprogesterone acetate^[26] in 1 of 4 studies (25%). The results showed that *Fu Zheng* oral liquid combined with megestrol acetate could improve the appetite of cancer patients with cachexia better than megestrol acetate (improvement rate: 82.2% vs. 57.1%, $P < 0.05$).^[29] Moreover, the improvement was greater when flavored *Xiang Sha Gui Shao Liu Jun Tang* was combined with medroxyprogesterone acetate than when flavored *Xiang Sha Gui Shao Liu Jun Tang* (improvement rate: 85.0% vs. 55.0%, $P < 0.05$) or medroxyprogesterone acetate (improvement rate: 85.0% vs. 45.0%, $P < 0.05$) was used alone.^[26] The improvement in appetite was also better when *Bu Shen Tian Jing San* was combined with other dialectical Chinese herbs (herbs with components of *Bu Shen Tian Jing San* were excluded) and nutritional support than when other dialectical Chinese herbs were combined with nutritional support (improvement rate: 72.4% vs. 40.7%, $P < 0.05$).^[31] One study evaluated the effect of acupuncture on appetite among cancer patients with cachexia and showed that its effect was better than that of placebo acupuncture (appetite score after treatment: 62.29 ± 16.43 vs. 33.82 ± 9.56 , $P < 0.05$).^[20]

Eleven interventions^[16,21-23,25-27,29-32] (11/20, 55%) were reported to affect body weight among cancer patients with cachexia including six involving traditional Chinese herbs,^[16,21,23,25,27,30] four involving traditional Chinese herbs combined with western medicine interventions,^[22,26,29,32] and one involving traditional Chinese herbs combined with nutritional support intervention.^[31] Compared with western medicine, greater improvements in body weight were observed with *Gui Pi Tang* (compared with megestrol acetate, improvement rate: 76.7% vs. 63.3%, $P < 0.05$),^[27] *Ping Fei* oral liquid (compared with megestrol acetate, improvement rate: 69.57% vs. 30.43%, $P < 0.05$),^[23] and *Ba Zhen Tang* (compared with nutritional support, improvement rate: 76.7% vs. 63.3%, $P < 0.05$).^[16] However, there was no significant difference in the body weight improvement between groups treated with the three other TCM decoctions (*Shen Qi Jiao*

Cao Tang, *Yi Qi Yang Yin Tang*, and *Jian Pi Bu Shen Tang*) and western medicine (all $P > 0.05$).^[21,25,30] The combined use of *Fu Zheng* oral liquid with megestrol acetate has been reported to improve the body weight of cancer patients with cachexia to a greater extent than megestrol acetate alone (improvement rate: 82.8% vs. 50.0%, $P < 0.05$).^[29] A greater improvement in body weight was also observed with a combination of *Bu Shen Jian Pi Tang* with megestrol acetate, compared with the use of *Bu Shen Jian Pi Tang* or megestrol acetate alone (improvement rate: 80.0% vs. 56.7%, 80.0% vs. 53.3%; both $P < 0.05$).^[32] Moreover, when the effect of *Bu Shen Tian Jing San* combined with other dialectical Chinese herbs and nutritional support on the body weight of cancer patients with cachexia was evaluated, a greater improvement was observed with that combination, compared with other dialectical Chinese herbs combined with nutritional support (average weight gain: 4.6 kg vs. -3.77 kg, $P < 0.01$).^[31] However, the patients' body weight decreased after two acupuncture interventions, although these changes were not significant (both $P > 0.05$).^[34,35]

The body composition changes in cancer patients with cachexia were also measured after two acupuncture interventions.^[34,35] In one study, after eight sessions of acupuncture, the body mass index (BMI) decreased from 20.4 ± 2.9 to 20.25 ± 3.1 and the FFM and FM both decreased by 0.4% (all $P > 0.05$).^[35] In the other study, the FFM remained stable after the intervention.^[34]

The most common biomarkers measured in the identified studies were the serum concentrations of albumin (ALB),^[16,19,21,23-26,29-32] pre-ALB (PAB),^[16,21,23-25,30] tumor necrosis factor- α (TNF- α),^[19,23] interleukin-1(IL-1),^[19] IL-6,^[19,23] and hemoglobin (HGB).^[19,29,31,32] The use of *Shen Qi Jiao Cao Tang*,^[30] *Yi Qi Yang Yin Tang*,^[21] *Jian Pi Hua Tan Tang*,^[24] *Jian Pi Bu Shen Tang*,^[25] and *Ba Zhen Tang*^[16] were reported to increase the concentrations of ALB and PAB in cancer patients with cachexia, and these increases were more obvious than those achieved with either western medicine or nutritional support ($P < 0.05$ and $P < 0.01$, respectively). The use of *Fu Zheng* oral liquid combined with megestrol acetate,^[29] *Bu Shen Tian Jing San* combined with other dialectical Chinese herbs and nutritional support,^[31] and *Bu Shen Jian Pi Tang* combined with megestrol acetate^[32] were found to increase the concentrations of ALB and HGB in cancer patients with cachexia. Compared with patients who received megestrol acetate, more obvious increases in ALB and HGB were observed in patients who received *Fu Zheng* oral liquid combined with megestrol acetate (both $P < 0.05$).^[29] Furthermore, the increases in the ALB and HGB concentrations were greater in patients who received *Bu Shen Tian Jing San* combined with other dialectical Chinese herbs and nutritional support, compared

with those who received other dialectical Chinese herbs and nutritional support with or without megestrol acetate (all $P < 0.01$).^[31] The *Sheng He San* intervention led to increases in the ALB and HGB and decreases in the TNF- α , IL-1, and IL-6 concentrations, and the changes in these biomarkers were significantly greater than those in the control group (megestrol acetate) (all $P < 0.01$).^[19] Moreover, the *Ping Fei* oral liquid intervention led to increases in the ALB and PAB and decreases in the TNF- α and IL-6 concentrations, and the changes in these biomarkers were significantly greater than those in the control group (megestrol acetate) (PAB: $P < 0.05$; ALB, TNF- α and IL-6: $P < 0.01$).^[23] Furthermore, the concentration of ALB increased in patients receiving the flavoured *Xiang Sha Gui Shao Liu Jun Tang* combined with medroxyprogesterone acetate intervention, but this change was not significant when compared with flavoured *Xiang Sha Gui Shao Liu Jun Tang* or medroxyprogesterone acetate alone ($P > 0.05$).^[26]

Eleven studies on cancer patients with cachexia revealed improvements in the Karnofsky performance status^[18,19,21,22,24,26-31] (11/20, 55%). A greater improvement in this measure was observed among patients who received *Gui Pi Tang* (improvement rate: 76.7% vs. 63.3%),^[27] *Shen Qi Jiao Cao Tang* (improvement rate: 76.67% vs. 50.00%),^[30] *Yi Qi Yang Yin Tang* (improvement rate: 80.0% vs. 56.7%),^[21] *Jian Pi Hua Tan Tang* (Karnofsky performance score after treatment: 69.47 ± 12.05 vs. 63.65 ± 11.34),^[24] and *Sheng He San* (improvement rate: 88.24% vs. 45.10%)^[19] than among those who received megestrol acetate (all $P < 0.05$). One study^[18] compared the combination of *Yi Qi Yang Xue Tang* and compound *Ku Shen* injection with compound *Ku Shen* injection alone and found that the combination treatment led to a greater improvement in the Karnofsky performance status (improvement rate: 84.21% vs. 63.16%, $P < 0.05$). Similarly, another study^[29] compared the combined treatment of *Fu Zheng* oral liquid and megestrol acetate with megestrol acetate alone. Patients who received the combined therapy had a greater improvement in the Karnofsky performance status than those who received megestrol acetate alone (improvement rate: 79.3% vs. 42.9%, $P < 0.05$). Another study^[22] compared the results of *Shen Ling Bai Zhu Tang*, megestrol acetate, and a combination of these treatments. The results showed that *Shen Ling Bai Zhu Tang* alone or in combination with megestrol acetate could improve the Karnofsky performance status better than megestrol acetate alone (improvement rate: 70.0% vs. 46.7%, 73.3% vs. 46.7%; both $P < 0.05$). Moreover, the combination of flavoured *Xiang Sha Gui Shao Liu Jun Tang* and medroxyprogesterone acetate led to a greater improvement in the Karnofsky performance status, compared with either treatment alone (improvement rate: 85% vs. 45%, 85%

vs. 40%; both $P < 0.05$).^[26] The combination of *Bu Shen Tian Jing San* with other dialectical Chinese herbs and nutritional support improved the Karnofsky performance status to a greater extent than other dialectical Chinese herbs and nutritional support either in combination with megestrol acetate (improvement rate: 68.9% vs. 34.4%) or alone (improvement rate: 68.9% vs. 33.3%; both $P < 0.05$).^[26] Furthermore, 76.7% of participants in one study experienced an improvement in the Karnofsky performance status after receiving *Gui Pi Tang* combined with moxibustion intervention.^[28]

Cancer cachexia-related symptoms, such as anorexia, asthenia, fatigue, and insomnia, were improved in 12 of 20 studies.^[17-22,24,27,28,30,32,33] Traditional Chinese herbal interventions, including *Gui Pi Tang*,^[27] *Shen Qi Jiao Cao Tang*,^[30] *Yi Qi Yang Yin Tang*,^[21] *Jian Pi Hua Tan Tang*,^[24] *Sheng He San*,^[19] *Ban Xia Xie Xin Tang*,^[33] and *Shen Ling Bai Zhu Tang*,^[22] have been reported to improve cancer cachexia-related symptoms to a greater extent than megestrol acetate (all $P < 0.05$). The use of *Yi Qi Yang Xue Tang* combined with compound *Ku Shen* injection has also been reported to improve these symptoms to a greater degree than megestrol acetate or compound *Ku Shen* injection alone (both $P < 0.05$).^[17,18] Furthermore, symptoms were improved to a greater extent with *Shen Ling Bai Zhu Tang* combined with megestrol acetate than with megestrol acetate alone ($P < 0.05$).^[22] It has been reported that *Bu Shen Jian Pi Tang* could improve asthenia and fatigue^[32] that *Bu Shen Jian Pi Tang* combined with megestrol acetate could improve asthenia, fatigue, and anhelation^[32] and that acupuncture could improve nausea and constipation.^[20] An improvement in symptoms was also observed with an intervention of *Gui Pi Tang* combined with moxibustion.^[28]

Quality of life was measured in seven studies^[16,20,23,25,26,31,33] using the Functional Assessment of Anorexia/Cachexia Therapy scale,^[20,33] Quality of Life Questionnaire-Core 30 (QOL-C30),^[25,26] The European Organization for Research and Treatment of Cancer QOL-C30,^[16,23] and the Quality of Life Questionnaire-Lung Cancer Scale 13.^[23] The results showed that the use of *Ban Xia Xie Xin Tang*,^[33] *Jian Pi Bu Shen Tang*,^[25] *Ping Fei* oral liquid,^[23] *Ba Zhen Tang*,^[16] flavoured *Xiang Sha Gui Shao Liu Jun Tang* combined with medroxyprogesterone acetate;^[26] *Bu Shen Tian Jing San* combined with other dialectical Chinese herbs and nutritional support;^[31] and acupuncture^[20] could improve the quality of life of cancer patients with cachexia (all $P < 0.05$).

Safety of Traditional Chinese medicine in treating cancer cachexia

Only eight studies evaluated the safety of the interventions^[20,22,25,27,28,30,31,33] (8/20, 40%) according to the occurrence of adverse effects. Differences were observed

in both the type and frequency of adverse effects between the intervention and control, but these were not significant. A study^[27] that compared *Gui Pi Tang* and megestrol acetate showed that the incidence of adverse effects was higher in the TCM group (6.7%, one case of constipation and one case of elevated blood pressure) than in the western medicine group (16.7%, two cases of constipation, two cases of elevated blood pressure, and one case of dyspnea). However, no significant difference in adverse effects was observed between the two groups. Another study^[30] that compared *Shen Qi Jiao Cao Tang* and megestrol acetate found no significant difference in side effects ($P > 0.05$), with no adverse effects in the TCM group and one case of Grade I hepatic function damage and two cases of mild water sodium retention in the western medicine group. Moreover, no adverse effects were observed in the study^[33] that compared *Ban Xia Xie Xin Tang* and megestrol acetate or the study that evaluated *Gui Pi Tang* combined with moxibustion.^[28] In the study^[25] that compared *Jian Pi Bu Shen Tang* and medroxyprogesterone acetate, two cases of elevated blood pressure and one case of hepatic function damage were observed in the western medicine group (relieved after symptomatic treatment) and no adverse effects were observed in TCM group. The study^[22] that compared *Shen Ling Bai Zhu Tang*, megestrol acetate, and a combination of both showed no adverse effects in the TCM group; two cases of hypertension, two cases of edema, three cases of abdominal distension, and three cases of constipation in the western medicine group; and one case of hypertension and one case of facial swelling in the combination group. There were no significant differences in the occurrence of side effects between these three groups. Another study^[31] compared the use of *Bu Shen Tian Jing San* combined with other dialectical Chinese herbs and nutritional support (intervention group), megestrol acetate combined with other dialectical Chinese herbs and nutritional support (control group), and other dialectical Chinese herbs combined with nutritional support (blank group). The results demonstrated two cases of nasal bleeding, six cases of thirst, and one case of abdominal distension in the intervention group; one case of hypertension, six cases of nausea and vomiting, and three cases of abdominal distension in the control group; and no obvious side effects in the blank group. The observed side effects of acupuncture were mild including pain (1.2%), bleeding (0.34%), ecchymosis (0.5%), palpitation (0.8%), and fatigue (0.5%), and the incidence of these effects was low.^[20]

Discussion

The findings of this review suggest that traditional Chinese herbs can effectively improve appetite, weight, biomarkers, Karnofsky performance status, cachexia-related

symptoms, and quality of life in cancer patients with cachexia and show excellent safety. We also highlight the effects of acupuncture in improving appetite, nausea, constipation, and quality of life. However, the role of acupuncture in improving body weight, body composition, biomarkers, and other related symptoms remains uncertain.

Compared with megestrol acetate and medroxyprogesterone acetate, some traditional Chinese herbs show a superior curative effect. For example, compared with megestrol acetate, *Gui Pi Tang* led to greater improvements in body weight, Karnofsky performance status, asthenia, fatigue, insomnia, palpitation; *Shen Qi Jiao Cao Tang* and *Yi Qi Yang Yin Tang* led to better improvements in Karnofsky performance status and related symptoms, and greater increases in the ALB and PAB concentrations; *Jian Pi Hua Tan Tang* led to greater increases in the ALB and PAB concentrations, in addition to greater improvements in appetite, Karnofsky performance status, and related symptoms; *Sheng He San* showed greater increases in ALB and PAB and greater decreases in TNF- α , IL-1, and IL-6 concentrations and superior improvements in the Karnofsky performance status and related symptoms; and *Ban Xia Xie Xin Tang* led to superior improvements in appetite, related symptoms, and quality of life. The combined use of *Yi Qi Yang Xue Tang* and compound *Ku Shen* injection better controlled ructus, nausea, vomiting, fatigue, anorexia, and insomnia. Compared with medroxyprogesterone acetate, the advantages of traditional Chinese herbs are primarily focused on improvements in body weight and quality of life, increases in ALB and PAB concentrations, and significant decreases in TNF- α and IL-6 concentrations. The clinical treatment plan for cancer cachexia is mainly nutritional support and the use of progesterone drugs such as megestrol and medroxyprogesterone.^[8-10] However, the effect of improving cancer cachexia remains unsatisfactory due to the poor efficacy of nutritional support and the side effects of progesterone drugs.^[8-10] The results of this review show that traditional Chinese herbs may represent an effective complementary and alternative treatment for cancer cachexia.

Our findings show that high-quality evidence of the effect of TCM technology in treating cancer cachexia is limited. Only four studies were identified including three on acupuncture and one on moxibustion. The identified studies showed that acupuncture could improve appetite, nausea, constipation, and quality of life among cancer cachexia patients but could not increase body weight. In one study,^[35] the patients' body weight and BMI decreased after eight sessions of acupuncture, and the average weight loss was 0.57%, which is less than the average weight loss of 5% in patients with palliative chemotherapy.^[36]

indicating that the acupuncture may slow weight loss. In another study,^[34] the patients' body weight decreased by an average of 12–15 lbs (i.e., ~5.5–6.8 kg) after an 8-week acupuncture intervention but also demonstrated a trend in weight gain in weeks 7 and 8. In the two identified acupuncture interventions, the FFM remained stable throughout and after the intervention period, indicating that acupuncture may prevent the progression of muscle wasting. More randomized controlled trials are required to explore the effect of acupuncture on body weight, BMI, and FFM in cancer cachexia patients. The only identified intervention related to moxibustion was the combination of moxibustion and traditional Chinese herbs. Although the results showed that the Karnofsky performance status and related symptoms were improved after the intervention, this is not necessarily representative of the effect of moxibustion on cancer cachexia. Therefore, well-designed randomized controlled trials are warranted to examine the feasibility and effectiveness of moxibustion in the treatment of cancer cachexia. In addition to acupuncture and moxibustion, other TCM technologies, such as cupping therapy and massage, should also be explored.

Finally, our findings suggest that traditional Chinese herbs, acupuncture, and moxibustion can be safely used in patients with cancer cachexia. Six studies evaluated the safety of traditional Chinese herbs, and no side effects were observed in four studies; in the other two studies, one case of constipation, one case of elevated blood pressure, one case of abdominal distension, two cases of nasal cavity bleeding, and six cases of thirst occurred. However, the side effects disappeared after stopping the drug. No side effects were observed related to moxibustion, and the observed side effects of acupuncture were rare and mild. Further examination of the contraindications of traditional Chinese herbs may further enhance patient safety and promote the use of TCM in treating cancer cachexia.

This review has several limitations. Methodological weaknesses do exist in the included studies; for example, most of the articles mention random grouping, but do not describe the detailed random allocation method, and the small sample sizes in some studies may lack the power to examine the effectiveness of interventions. These methodological weaknesses may lead to biased results in the individual studies and in this review. These limitations should be considered when interpreting the findings.

Implication for nursing and research

Nurses could play an important role in the integration of TCM and conventional cancer cachexia treatment by providing accurate, trusted, and evidence-based information regarding TCM to patients who are interested in this treatment option and assisting them to make an informed

decision. It is expected that nurses will have sufficient knowledge about the effectiveness and safety of TCM in treating cancer cachexia and the ability to confidently discuss TCM with patients who seek information about this therapy. Further research is required to evaluate nurses' knowledge and attitude toward TCM in the treatment of cancer cachexia. In line with this, strategies, such as the development of education and training programs, should be proposed to increase nurses' knowledge and help them to develop a positive attitude toward TCM as an option for patients with cancer cachexia. Besides, integrative medicine, including TCM for symptom management, should be integrated into the graduate curriculum and oncology specialty programs for nurses. Furthermore, it is worth noting that most of the included articles were written in Chinese which could not be shared worldwide even though they had high value. Thus, researchers in Asia, including China, are encouraged to publish their research in English in future.

Conclusions

Traditional Chinese herbs have the potential to improve appetite, weight, biomarkers, Karnofsky performance status, cachexia-related symptoms, and quality of life in cancer cachexia patients and show excellent safety. Importantly, some traditional Chinese herbs, including *Gui Pi Tang*, *Shen Qi Jiao Cao Tang*, *Yi Qi Yang Yin Tang*, *Jian Pi Hua Tan Tang*, and *Ban Xia Xie Xin Tang*, may have superiority in curative effects when compared with megestrol acetate and medroxyprogesterone acetate, which are the most common drugs used to treat cancer cachexia. Thus, traditional Chinese herbs are expected to be an effective and safe complementary and alternative treatment for cancer cachexia. However, high-quality evidence regarding the effect of TCM technology in treating cancer cachexia is limited. Acupuncture could improve appetite, nausea, constipation, and quality of life among cancer cachexia patients but could not increase patients' body weight. More randomized controlled trials are needed to explore the effect of acupuncture on body weight, BMI, and FFM among cancer cachexia patients. In addition to acupuncture, well-designed randomized controlled trials are warranted to explore the feasibility and effectiveness of other TCM technologies, such as moxibustion and cupping therapy, in patients with cancer cachexia. Nurses are expected to play an important role in the integration of TCM and conventional cancer cachexia treatment.

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Conflicts of interest

The corresponding author, Prof. Winnie W.K. So, is the Editor-in-Chief of the journal.

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Appendix

Appendix 1: The following databases were searched from inception to January 2021 for articles published in English or Chinese: The Cochrane Library, PubMed, EMBASE, CINAHL, China National Knowledge Infrastructure, and Wan Fang Database.

Embase		
Sets	Search strategies	Results
#1	exp neoplasm/or exp carcinoma/or (cancer* or tumo* or neoplas* or malignan* or Oncolog* or carcinoma* or adenocarcinoma* or choriocarcinoma* or leukemia* or leukaemia* or metastat* or sarcoma* or teratoma* or hodgkin* or nonhodgkin* or lymphoma* or melanoma* or myeloma*). ti, ab.	5,816,209
#2	exp body weight loss/or exp malnutrition/or exp cachexia/or (cachexia or cachexic or weight or underweight or malnutrition or wasting). ti, ab.	1,324,714
#3	exp Chinese herb/or exp Chinese medicine/or exp herbal medicine/or exp herbaceous agent/or exp Chinese drug/or exp acupuncture/or exp acupuncture point/or exp auricular acupuncture/or exp moxibustion/or exp massage/or (TCM or TCHM or Traditional Chinese medicine or Traditional Medicine or Chinese herbal drugs or Chinese herbal medicine or herb or herbal medicine or Chinese herb Cupping or baguan or Massage or Acupuncture or Acupoint stimulation or Moxibustion or Tuina). ti, ab.	220,739
#4	#1 AND #2 AND #3	1921
CINAHL		
Sets	Search strategies	Results
#1	MH "Neoplasms+" or MH "Carcinoma+"	571,308
#2	TI cancer* OR TI tumo* OR TI neoplas* OR TI malignan* OR TI Oncolog* OR TI carcinoma* OR TI adenocarcinoma* OR TI choriocarcinoma* OR TI leukemia* OR TI leukaemia* OR TI metastat* OR TI sarcoma* OR TI teratoma* OR TI hodgkin* OR TI nonhodgkin* OR TI lymphoma* OR TI melanoma* OR TI myeloma*	484,470
#3	AB cancer* OR AB tumo* OR AB neoplas* OR AB malignan* OR AB Oncolog* OR AB carcinoma* OR AB adenocarcinoma* OR AB choriocarcinoma* OR AB leukemia* OR AB leukaemia* OR AB metastat* OR AB sarcoma* OR AB teratoma* OR AB hodgkin* OR AB nonhodgkin* OR AB lymphoma* OR AB melanoma* OR AB myeloma*	437,572
#4	#1 OR #2 OR #3	785,561
#5	(MH "Wasting Syndrome+") OR (MH "Cachexia") OR (MH "Malnutrition") OR (MH "Weight Loss+")	33,439
#6	TI cachexia OR TI cachexic OR TI weight OR TI underweight OR TI malnutrition OR TI wasting	45,660
#7	AB cachexia OR AB cachexic OR AB weight OR AB underweight OR AB malnutrition OR AB wasting	155,039
#8	#5 OR #6 OR #7	186,694
#9	(MH "Medicine, Chinese Traditional+") OR (MH "Drugs, Chinese Herbal") OR (MH "Acupuncture+") OR (MH "Acupuncture, Ear") OR (MH "Acupuncture Points") OR (MH "Moxibustion") OR (MH "Massage+")	49,181
#10	TI TCM OR TI TCHM OR TI "Traditional Chinese medicine" OR TI "Traditional Medicine" OR TI "Chinese herbal drugs" OR TI "Chinese herbal medicine" OR TI herb OR TI "herbal medicine" OR TI "Chinese herb Cupping" OR TI baguan OR TI Massage OR TI Acupuncture OR TI "Acupoint stimulation" OR TI Moxibustion OR TI Tuina	22,659
#11	AB TCM OR AB TCHM OR AB "Traditional Chinese medicine" OR AB "Traditional Medicine" OR AB "Chinese herbal drugs" OR AB "Chinese herbal medicine" OR AB herb OR AB "herbal medicine" OR AB "Chinese herb Cupping" OR AB baguan OR AB Massage OR AB Acupuncture OR AB "Acupoint stimulation" OR AB Moxibustion OR AB Tuina	34,205
#12	#9 OR #10 OR #11	68,280
#13	#4 AND #8 AND #12	417

PubMed		
Sets	Search strategies	Results
#1	“Neoplasms”[MeSH Terms] OR “Carcinoma”[MeSH Terms] OR (“cancer”[Title/Abstract] OR “tumo”[Title/Abstract] OR “neoplas”[Title/Abstract] OR “malignan”[Title/Abstract] OR “oncolog”[Title/Abstract] OR “carcinoma”[Title/Abstract] OR “adenocarcinoma”[Title/Abstract] OR “choriocarcinoma”[Title/Abstract] OR (“leukemia”[All Fields] AND “leukaemia”[Title/Abstract]) OR “metastat”[Title/Abstract] OR “sarcoma”[Title/Abstract] OR “teratoma”[Title/Abstract] OR “hodgkin”[Title/Abstract] OR “nonhodgkin”[Title/Abstract] OR “lymphoma”[Title/Abstract] OR “melanoma”[Title/Abstract] OR “myeloma”[Title/Abstract])	4,541,661
#2	“Weight Loss”[MeSH Terms] OR “Malnutrition”[MeSH Terms] OR “Cachexia”[MeSH Terms] OR “Cachexia”[Title/Abstract] OR “cachexic”[Title/Abstract] OR “weight”[Title/Abstract] OR “underweight”[Title/Abstract] OR “Malnutrition”[Title/Abstract] OR “wasting”[Title/Abstract]	1,016,751
#3	“medicine, chinese traditional”[MeSH Terms] OR “drugs, chinese herbal”[MeSH Terms] OR “Acupuncture”[MeSH Terms] OR “Acupuncture Therapy”[MeSH Terms] OR “acupuncture, ear”[MeSH Terms] OR “Moxibustion”[MeSH Terms] OR “Massage”[MeSH Terms] OR “TCM”[Title/Abstract] OR “TCHM”[Title/Abstract] OR “traditional chinese medicine”[Title/Abstract] OR “traditional medicine”[Title/Abstract] OR “chinese herbal drugs”[Title/Abstract] OR “chinese herbal medicine”[Title/Abstract] OR “herb”[Title/Abstract] OR “herbal medicine”[Title/Abstract] OR “chinese herb”[Title/Abstract] OR “Cupping”[Title/Abstract] OR “baguan”[Title/Abstract] OR “Massage”[Title/Abstract] OR “Acupuncture”[Title/Abstract] OR “acupoint stimulation”[Title/Abstract] OR “Moxibustion”[Title/Abstract] OR “Tuina”[Title/Abstract]	142,813
#4	#1 AND #2 AND #3	1232

Cochrane		
Sets	Search strategies	Results
#1	MeSH descriptor: [Neoplasms] explode all trees OR MeSH descriptor: [Carcinoma] explode all trees OR (cancer* or tumo* or neoplas* or malignan* or Oncolog* or carcinoma* or adenocarcinoma* or choriocarcinoma* or leukemia*, leukaemia* or metastat* or sarcoma* or teratoma* or hodgkin* or nonhodgkin* or lymphoma* or melanoma* or myeloma*):ti, ab, kw	238,363
#2	MeSH descriptor: [Cachexia] explode all trees OR MeSH descriptor: [Weight Loss] explode all trees OR MeSH descriptor: [Malnutrition] explode all trees OR (cachexia or cachexic or weight or underweight or malnutrition or wasting): ti, ab, kw	119,668
#3	MeSH descriptor: [Medicine, Chinese Traditional] explode all trees OR MeSH descriptor: [Drugs, Chinese Herbal] explode all trees OR MeSH descriptor: [Herbal Medicine] explode all trees OR MeSH descriptor: [Acupuncture] explode all trees OR MeSH descriptor: [Acupuncture Therapy] explode all trees OR MeSH descriptor: [Acupuncture Points] explode all trees OR MeSH descriptor: [Acupuncture, Ear] explode all trees OR MeSH descriptor: [Moxibustion] explode all trees OR MeSH descriptor: [Massage] explode all trees OR (TCM or TCHM or Traditional Chinese medicine or Traditional Medicine or Chinese herbal drugs or Chinese herbal medicine or herb or herbal medicine or Chinese herb or Cupping or Massage or Acupuncture or Acupoint stimulation or Moxibustion or Tuina):ti, ab, kw	36,676
#4	#1 AND #2 AND #3	211

CNKI

TKA=(癌+瘤+白血病 + 霍奇金病 + 非霍奇金病) AND TKA=(恶病质 + 体重减轻 + 体重降低 + 体重下降 + 体重减少 + 消瘦 + 体重过轻 + 营养不良 + 营养丢失 + 营养失调) AND TKA=(中医 + 中草药 + 草药 + 中药 + 拔罐 + 按摩 + 针灸 + 穴位刺激 + 艾灸 + 推拿 + 耳穴按压)

Type = Journal(期刊论文), degree thesis/dissertation(学位论文)

Language = Chinese

RESULTS: 527 hits

Wangfang Data

(题名或关键词:(癌 or 瘤 or 白血病 or 霍奇金病 or 非霍奇金病)) and (题名或关键词:(恶病质 or 体重减轻 or 体重降低 or 体重下降 or 体重减少 or 消瘦 or 体重过轻 or 营养不良 or 营养丢失 or 营养失调)) and (题名或关键词:(中医 or 中草药 or 草药 or 中药 or 拔罐 or 按摩 or 针灸 or 穴位刺激 or 艾灸 or 推拿 or 耳穴按压))

Type = Journal(期刊论文), degree thesis/dissertation(学位论文)

Language = Chinese

RESULTS: 376 hits