

Review Article

Complementary and Alternative Therapies for Chronic Constipation

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Chronic constipation, an ancient disease, is prevalent, and costly in the general population. Complementary and alternative therapies are frequently used for constipation. This review introduces various methods of complementary and alternative therapies, including acupuncture, moxibustion, massage, and herbal medicine. Efficacy, safety, influence factors, sham control design, and mechanisms of these therapies are discussed and evaluated. Acupuncture or electroacupuncture was found to be most commonly used for constipation among these complementary and alternative therapies, followed by herbal medicine. Although only a small number of clinical studies are flawless, our review of the literature seems to suggest that acupuncture or electroacupuncture and herbal medicine are effective in treating constipation, whereas findings on massage and moxibustion are inconclusive. More well-designed clinical trials are needed to improve and prove the efficacy of the complementary and alternative therapies for constipation; mechanistic studies that would lead to wide spread use and improvement of the methods are also discussed in this review.

1. Introduction

Chronic constipation (CC) is a complaining problem for many patients with or without other diseases. The prevalence of constipation in the general adult population ranges from 2% to 26.9%, with a mean of 15.4%, revealed by an integrative literature review of 11 population-based studies. Female gender was identified as the first associated factor in all of these studies, and the second most common associated factor was advanced age [1].

Physical and mental components of quality of life (QoL) scores have been consistently reported to be low in both adult and pediatric patients with CC; meanwhile the greatest influence is seen in secondary care studies [2]. The mean expenditures per hospital costs for constipation increased from \$8869 in 1997 to \$17,518 in 2010, whereas the total charges increased from \$188,109,249 in 1997 to \$851,713,263 in 2010 (adjusted for long-term inflation) [3].

The vast majority of CC belongs to functional constipation (FC). According to the Rome III criteria [4], a standardized definition of FC is presented as follows.

Rome III Functional Constipation Criteria

- (1) It must include at least 2 of the following:
 - (a) straining during at least 25% of defecations,
 - (b) lumpy or hard stools in at least 25% of defecations,
 - (c) sensation of incomplete evacuation for at least 25% of defecations,
 - (d) sensation of anorectal obstruction/blockage for at least 25% of defecations,
 - (e) manual manoeuvres to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor),
 - (f) fewer than three defecations per week.

- (2) Loose stools are rarely present without the use of laxatives.
- (3) There are insufficient criteria for diagnosis of irritable bowel syndrome.

Criteria fulfilled for the previous three months with symptom onset at least 6 months prior to diagnosis.

This definition of FC is for adult patients. For child patients, there are other criteria [4] (as follows).

Rome III Functional Constipation Criteria

- (1) It must include two or more of the following in a child with a developmental age of at least 4 years with insufficient criteria for diagnosis of IBS:
 - (a) two or fewer defecations in the toilet per week,
 - (b) at least one episode of fecal incontinence per week,
 - (c) history of retentive posturing or excessive volitional stool retention,
 - (d) history of painful or hard bowel movements,
 - (e) presence of a large fecal mass in the rectum,
 - (f) history of large diameter stools which may obstruct the toilet.
- (2) Criteria are fulfilled at least once per week for at least months prior to diagnosis.

CC is very general, including all kinds of constipation, whereas functional constipation is only one major part of it. CC is classified into outlet obstruction constipation (OOC), slow transit constipation (STC), and both. The OOC is characterized with impaired relaxation and coordination of abdominal and pelvic floor muscles during evacuation [5]. STC is defined as prolonged stool transit (>3 days) through the colon [6]. In fact, most of patients with STC are associated with outlet obstruction [7, 8]. It was reported that more than half of patients with STC simultaneously had some degree of outlet obstruction [9, 10].

Pharmacologic agents for CC are available. However, 28% of participants were dissatisfied with their laxatives. In a large sample survey, as high as 83% of respondents indicated that they were absolutely or probably interested in other treatment options and complementary/alternative therapies [11]. In another survey, Johanson and Kralstein reported that the causes of laxatives dissatisfaction included “does not work well” or “inconsistent results” and safety-related or adverse-effect concerns [12]. In children, the adherence rate to medical therapies of constipation was reported to be low, attributed to financial difficulties (23.2% of cases) and side effects (40.2%) [13].

This article reviews complementary and alternative therapies for CC, including acupuncture, moxibustion, massage and herbal medicine.

2. Acupuncture

Acupuncture is an ancient Chinese Traditional Medicine therapy in which acupoints on skin are manually stimulated

by needles. It is usually termed hand-acupuncture. Electroacupuncture (EA) is a method in which electrical current is delivered to needles inserted into acupoints. Transcutaneous electroacupuncture (TEA) is similar to EA but the needles are replaced with electrodes. Auricular acupuncture (AA) is the one in which acupuncture is performed at acupoints on the skin of ear. All of the above methods had been used in the treatment of CC.

Clinic studies on acupuncture or EA for CC were searched in PubMed database from inception to October 2014. Keywords used in the search included “acupuncture” or “electroacupuncture” and “constipation”. The language of publications was instructed as English or abstract in English. Seventeen reports yielded from this search were summarized in Table 1.

2.1. Quality Assessment of Acupuncture Trials for CC. Among the 17 articles, 11 of them were RCT’s and 90% of the RCT studies were published after 2010. There were 6 high quality trials [14, 16, 17, 23, 24, 27] which could be assessed as 5 according to Jadad scoring system [31], but sample sizes of them were all small. A trial containing 553 samples was evaluated to have a Jadad score of less than 3 due to the flaw in design [15].

Multiple methods of the design for control were used in clinical studies on CC. The control groups in the literature included medications, other methods of stimulation, and acupuncture plus medications. Medications used in the control group included conventional medicine [15, 16, 23, 24] (Mosapride, Macrogol 4000, Lactulose) and Chinese herbal medicine [15, 22] (Fuzhengliqi mixture and Plantain and Senna Granule). Sham acupuncture [17, 27, 29], shallow acupuncture [16, 23, 24], regular electrical stimulation [19], and other methods of stimulation were performed as control methods. Combinational use of medications included EA plus Fuzhengliqi mixture [15], and EA plus Plantain and Senna Granule [22]. There was only one trial in which two kinds of stimulation methods, acupuncture and moxibustion, were used together [21].

The treatment duration [14–17, 22–24, 27] ranged from 4 weeks to 7 weeks, and the follow-up time [14–16, 22, 24, 26, 27] ranged from 4 weeks to 64 weeks. The primary outcome was the number of weekly spontaneous bowel movements. The secondary outcomes included opaque X-ray marker, patient’s satisfaction, and clinical symptom score (such as weekly defecation frequency, defecation time, stool characteristics, straining and abdominal pain). The questionnaires used in trials included Bristol score, Cleveland Clinic Score, and Quality of Life. Some indicators about mechanisms of acupuncture for constipation also were measured, including plasma motilin [15], plasma panopioid [29], and heart rate variability [17].

2.2. Efficacy and Safety of Acupuncture for CC. Several systematic reviews, including meta-analysis, indicated that acupuncture for CC was effective and did not cause obvious adverse events [32–36].

The overall efficacy rate of hand-acupuncture for chronic functional constipation was 52.0% [21]. It improved weekly

TABLE 1: Articles of acupuncture or EA for CC.

Reference	Study design (participants)	Acupoints	Implementation of acupuncture	Key efficacy results	Adverse reactions
Wu et al., 2014 [14]	RCT (n = 104) adult	ST25, BL25, LI11, ST37	EA1: ST25, BL25 EA2: LI11, ST37 EA3: ST25, BL25, LI11, ST37 C: Mossapride citrate	Weekly frequency of defecation, defecation difficulty life, and quality score were all improved significantly in the four groups; in follow-up, weekly frequency of defecation of LI11 and ST37 (EA2) was superior to the other three groups	NA
Zhang et al., 2013 [15]	RCT (n = 553) adult	ST25, ST37, ST36, BL25, TE6	EA: 2 Hz/200 Hz D: Fuzhengliqi mixture EA + D: both of above C: Mossapride and Macrogol 4000	All groups decreased the defecation interval, stool property, constipation symptom grade, accompanying symptom grade, and GITT; EA + D was better than others; EA could keep long-term effect	No
Peng et al., 2013 [16]	RCT (n = 128) adult	ST25	EA-deep: 20 to 65 mm in depth EA-shallow: 5-8 mm depth D: lactulose oral liquid	All groups increased the weekly defecation frequency; EA-deep could keep long-term effect	No
Chen et al., 2013 [17]	RCT (n = NA) adult female	ST36, ST37, ST25, ST28, CV4, CV6	EA Sham-EA	EA improved constipation symptoms and increased autonomic nervous system activities, sham-EA not	NA
Zhou et al., 2012 [18]	RCT (n = 200) elder	AT3, 4i, AT3, AT4, CO7, CO17, AH8, CO18, Constipation Point	AT: according to the pattern/syndrome differentiation C: solid points	The effective rate: AT 92.0%, C 76.0%	NA
Xu et al., 2012 [19]	RCT (n = 64) adult	TE6, ST25, ST36, ST37	EA: Hwato neuro and muscle stimulator C: regular electronic stimulator	The effective rate of short term: EA 54.6%, C 29.0%	NA
Anders et al., 2012 [20]	Retrospective case series study (n = 10) children	Quchi (LI11)	Fixed indwelling acupuncture needles (0.9 mm in length)	After a median of 3 days of HIC, all children defecated within 2 h. Local constipation therapy was not required	No
L.-J. Wang and L.-L. Wang, 2011 [21]	RCT (n = 100) adult	Group 1: ST25, SP15, CV6, CV4, ST36, ST37, SP6. Group 2: BL33, BL34, BL5, BL23, BL20 Alternately	HA: punctured by hands HA + moxibustion: grain-shaped moxibustion was given at CV6, ST36, BL25, BL20, and others with puncture	The total effective rate: HA + moxibustion as 74.0% (37/50) versus 52.0% (26/50)	NA
Guo et al., 2011 [22]	RCT (n = 378) adult	ST25, ST37, ST36, BL25, TE6	EA: 2 Hz/100 Hz D: Plantain and Senna Granule EA + D: both of the above	All groups decreased the scores of defecation cycle, stool property, constipation symptom grade, accompanying symptom grade, and GITT; EA + D was better than others; EA and EA + D could keep long-term effect	No
Wang et al., 2010 [23]	RCT (n = 95) adult	ST25	EA-deep: 45 mm in depth EA-shallow: 5 mm in depth D: lactulose oral liquid	EA-deep and EA-shallow were significantly superior to D group in increasing number up to 4 and improved CCS. EA-deep worked faster than EA-shallow	NA
Wang et al., 2010 [24]	RCT (n = 95) adult	ST25	EA-deep EA-shallow D: Duphalac	EA-deep was similar to EA-shallow in number up to 4 and CCS, and its efficacy remained much longer	NA
Jin et al., 2010 [25]	Before-after study (n = 90) adult	Group 1: ST25, CV6, ST37; Group 2: BL33, BL34, BL25 Alternately	EA: BL33, BL34, ST25, T37	The scores of defecation frequency, difficulty degree of defecation, defecation time, endless sensation of defecation, stool quality, awareness of defecation, and QoL were obviously improved after treatment. The total effective rate was 67.7% (61/90)	NA
Ding et al., 2009 [26]	Before-after study (n = 30) adult	Group 1: ST25, SP15, SP14, CV6, CV4, ST36, ST37; Group 2: BL25, BL23, BL31, BL32, BL33, BL34, Ex-HNI Alternately	Deep needling was applied on acupoints of abdominal and back region and moxibustion was put on Ex-HNI	Reduced laxative, scores for awareness, and QoL. Increased frequency of defecation	No

TABLE 1: Continued.

Reference	Study design (participants)	Acupoints	Implementation of acupuncture	Key efficacy results	Adverse reactions
Zhang et al., 2007 [27]	RCT EA SA	TE6	EA: EA at Zhigou SA: EA at nonacupoint	EA could obviously improve CCS and CTT, decrease cathartics, effective rate of 94.4%	No
Zhu et al., 2003 [28]	Before-after study (n = 188) adult	ST25, ST36, ST37, BL25, BL57	HA	Total effective rate of 100%	NA
Broide et al., 2001 [29]	CCT-self (n = 17) child	NA	Treated by five weekly placebo acupuncture sessions, followed by 10 weekly true acupuncture sessions	The frequency of bowel movements increased only after 10 true acupuncture sessions	NA
Klauser et al., 1993 [30]	CCT-self (n = 8) adult	LI4, ST25, LE3, BL25	EA: 10 Hz	Stool frequencies and CCT were not altered	Two patients dropped out because symptoms worsened

RCT: randomized controlled trial; CCT: controlled clinical trial; HA: hand-acupuncture; EA: EA; AT: auriculotherapy; SA: sham acupuncture; D: drug; HA + D: hand-acupuncture + drug; EA + D: EA + drug; C: control; PE: patient's endurance; MA: mean age; PO: by mouth; CCS: Cleveland Constipation Score; number up to 4: the number of constipation patients whose defecation was up to 4 times per week; BMs, bowel movements; GITT: gastrointestinal transit time; TGITT: total gastrointestinal transit time; M-ITT: mouth-intestine transit time, CTT: colonic transit time; RCTT: right colonic transit time; LCTT: left colonic transit time; RSTT: rectosigmoid colonic transit time; MTL: motilin; QoL: quality of life; CI: confidence interval; QD, every day; BID: twice per day; TID: triple per day; NA: not acquirable.

TABLE 2: Acupoints appeared ≥ 3 times for CC in these 17 articles.

Acupoints	Times appeared
Tianshu (ST25)	13
Shangjuxu (ST37)	9
Dachangshu (BL25)	8
Zusanli (ST36)	7
Zhigou (TE6)	5
Qihai (CV6)	4
Guanyuan (CV4)	3
Zhongliao (BL33)	3
Xialiao (BL34)	3

spontaneous defecation times, abdominal pain, evacuation difficulty, endless sensation of defecation, obstruction sense of anus, laxative prescription dependence, and quality of life [21, 32], as well as psychological symptoms score [21].

The overall efficacy rate of EA for chronic functional constipation ranged from 54.6 to 94.4% [15, 19, 27]. EA increased the frequency of weekly defecation and the number of persons who had defecation 4 times or more a week (responder) [16, 23], decreased stool property, constipation symptom grade, accompanying symptom grade, and gastrointestinal transit time (GITT) [15, 22, 24, 27].

Several articles reported that acupuncture or EA outperformed conventional medicine, such as lactulose [16, 23, 24] and Plantain and Senna Granule [22]. This was different with the conclusion drawn from a systematic review which indicated that acupuncture was probably as effective as conventional medical therapy in the change of bowel movements and colonic transit activity [32]. This difference might be attributed to the small sample sizes in these trials. A trial including 553 patients reported that the effective rate of EA was not different from Fuzhengliqi mixture or Mosapride combined with Macrogol 4000 in short term but was superior to them in long term because constipation symptoms recurred in the two control groups [15].

Zhou et al. performed an RCT study and reported that the effective rate of AA for functional constipation was 92% [18]. However, the reliability of this conclusion was low due to small sample size and lack of control. It was indicated in a systematic review that no conclusion should be made on the effectiveness of acupuncture due to significant methodological flaws [34].

Acupuncture for the treatment of pediatric patients with hospital-induced constipation was evaluated in a pilot study for the feasibility and acceptability with encouraging results [20].

2.3. Most Popular Acupoints for CC. Acupoints used more than 3 times for CC in the 17 articles included ST25, ST37, BL25, ST36, TE6, CV6, CV4, BL33, and BL34 (Table 2). These acupoints usually are considered as representative choices adopted by doctors and researchers. The top five acupoints being used most frequently for treating CC are discussed here.

ST25 is on the upper abdomen, laterally to the umbilicus above the small intestine according to World Health Organization (WHO) standard acupoint locations [37]. EA at ST25 was reported to enhance small intestinal motility in rodent model of slow transit constipation [38]. However, in normal or fasted rats, EA at ST25 was found to produce inhibitory effects on jejunum electrical and mechanical activities [39, 40]. These findings seem to suggest that EA at ST25 exerts different effects under different conditions.

ST36 and ST37 are located on the anterior aspect of the leg and above of tibialis anterior muscle. ST36 is above ST37 [37]. Acupuncture stimulation of ST36 was reported to increase intragastric pressure and gastric peristaltic frequency in rats with gastric hypomotility [41]. In patients after abdominal surgery, ST36 was able to shorten the time of first flatus passage and improve gastrointestinal functions [42]. Significant acceleration of colonic transit with EA at ST36 was mediated via the sacral parasympathetic efferent pathway [43]. Acupuncture at ST37 was reported to alter rectal motility and the effect appeared one hour after needling [44].

BL25 is located on the lumbar region, at the same level as the inferior border of the spinous process of the fourth lumbar vertebra (L4), laterally to the posterior median line [37]. Acupuncture at BL25 reduced early postoperative inflammatory small bowel obstruction [45], improved symptoms of ulcerative colitis [46], and irritable bowel syndrome [47].

TE6 is located on the posterior aspect of the forearm, midpoint of the interosseous space between the radius and the ulna, proximal to the dorsal wrist crease [37]. EA at TE6 and ST36 was effective for adhesive ileus, remarkably improved abdominal pain and distention, and accelerated intestinal peristalsis [48].

The above discussion indicates that acupuncture or EA at all of the top five acupoints improves gastrointestinal motility. According to the anatomy of the nervous system, tibial nerve, L4 spinal nerve, and posterior interosseous nerve are under ST36 and ST37, BL25, and TE6, respectively. Therefore, acupuncture effects of these four acupoints are probably mediated via these nervous pathways. Special acupuncture technique is required on ST25 to get a better therapeutic effect. In this technique, the needle is inserted perpendicularly and slowly till penetrating the peritoneum, about 20–65 mm in depth [16]; direct intestinal stimulation might be implicated with this technique.

2.4. Influence Factors of Acupuncture for Constipation. There are several factors influencing the effective rate of acupuncture for CC [21, 27]. These include acupoint group, operative technique of puncture, stimulation parameters, and treatment interval.

Various acupoint groups had been used in clinical trials. All of acupoints for CC can be classified into four categories according to their locations: abdomen acupoints (ST25, ST28, CV4, CV6, SP15), lumbosacral acupoints (BL25, BL20, BL23, BL33, BL34), crus acupoints (ST36, ST37, BL57, SP6), and forearm acupoints (TE6, LI11, LI4). Acupoint groups result in the combination coming from at least one kind

of acupoints. Abdomen acupoints plus crus acupoints or forearm acupoints are counted as acupoint group regularly [14, 17, 19, 21, 22, 25, 26, 28, 30]. Lumbosacral acupoints are taken as a group usually [21, 25]. One trial used three kinds of acupoints simultaneously: abdomen, lumbosacral, and crus [15]. In five trials, only one acupoint was used [16, 20, 23, 24, 27]. No studies are available in the literature comparing different acupoint groups. Studies of searching optimal acupoint group are needed.

ST25, the most frequently used acupoint, was dealt with through a special operative technique of puncture which was named as deep-puncture technique [16, 23, 24]. Here is the deep-puncture technique of ST25: needle is inserted perpendicularly and slowly till penetrating the peritoneum, about 20–65 mm in depth [16]. Using the deep-acupuncture technique, the number of functional constipation patients whose defecation was up to 4 times per week was increased, compared with the shallow-acupuncture technique during the second treatment week [23]. However, at the fourth treatment week there was no difference between the two techniques in the number of responders, the defecation interval, stool property, constipation symptom grade, accompanying symptom grade, or GITT [16, 23]. At the 6-month follow-up, deep-acupuncture was reported to be still effective, whereas the shallow-acupuncture became ineffective [24]. The standard definition and operation about “deep-acupuncture” of ST25 was studied in the fields of anatomy and safety [49]. In acupuncture theory, the operative technique of puncture is considered as one of key factors that affects the outcomes of acupuncture. Therefore, the direction and depth of needling are required. This technique was applied in puncturing ST25 for constipation, but not for other acupoints and other diseases.

There are 11 trials which adopted EA for constipation among the 17 articles. The parameters used in EA treatment seem to be important. Different stimulation frequencies were used in these studies, including 2 Hz/200 Hz [15], 1 Hz/20 Hz [19], 2 Hz/100 Hz [22], and 10 Hz [30]. In rough, EA frequency can be divided into low-frequency (1 Hz, 2 Hz, 10 Hz, etc.) and high-frequency (100 Hz, 200 Hz, etc.). In acupuncture analgesia, high- and low-frequency of EA could facilitate the release of endogenous opioid peptides. The effect of low-frequency EA was found to be mediated by the κ opioid receptor, whereas high-frequency EA was reported to be mediated by the δ and μ opioid receptors [50]. However, it is unclear whether the EA frequencies for analgesia are applicable to EA for constipation and more studies are needed to determine the best EA stimulation frequency for constipation.

In addition to the stimulation frequency, the frequency of treatment (treatments per week) is also an important factor. Five treatments per week seemed to be most popular in the previous studies [15, 16, 22–24]. Most of acupuncturists believe that efficacy induced by acupuncture can be maintained for one or two days and thus require patients to receive treatment every day or every other day. However, one of major problems with clinical acupuncture is that the treatment is administered infrequently, such as 1 or 2 times per week, yielding insignificant or inconsistent results [30].

2.5. Sham Acupuncture Design. Sham acupuncture was used as control in two of the articles [17, 27]. Sham acupuncture design is based on two key points: one is the use of nonacupoints and the other is nonneedle. For blindfolding patients, sham needles were glued on skin. It looks like being inserted; however, this is exposed easily for experienced patients due to different feelings between the needle being inserted at the acupoint and the one placed on the surface of acupoint. Sham acupuncture at nonacupoints refers to needle manipulation at points that are not on any meridian or acupoints. Different from the specific technique of acupuncture, which can induce a higher intensity of *de qi* that substantially improves the therapeutic effect, acupuncture that does not induce *de qi* can also be regarded as sham acupuncture. This method of sham design was used in acupuncture for Bell's palsy, a recent RCT completed by Xu et al. [51], and appreciated by John Fletcher who is Editor-in-Chief of Canadian Medical Association Journal. Fletcher considered that results of that trial were reasonable because every patients received acupuncture, but with valid or invalid technique [52]. What calls for special attention is that valid or invalid technique should be defined according to different diseases and types of acupuncture. For example, EA-shallow being regarded as control in some trials [16, 23, 24] should not be designed as sham control, unless electric current was shut off.

2.6. Mechanisms of Acupuncture for Constipation. Despite the fact that acupuncture for constipation has been proved effective in clinical studies [32], enhancing contractility in the distal colon [53], and accelerating colonic transit [43] in animal studies, mechanisms involved in these effects are still unclear. A lower level of motilin was noted in patients of functional constipation and found to be elevated with acupuncture at ST36 and ST37 [54]. EA at bilateral ST25 was reported to increase colonic smooth muscle thickness and number of Cajal cells considerably [38]. Vagal and parasympathetic mechanisms have also been implicated in the accelerative effect of acupuncture or EA on colon motility [55]. Overall, little is known on the mechanisms involved in the effect of acupuncture on constipation. More studies are needed to reveal possible pathways, such as neural pathway, endocrine pathway, opioid pathway, and/or serotonergic pathway.

3. Moxibustion

Moxibustion is a traditional therapy in Chinese Medicine to stimulate acupoints with burning moxa made from dried mugwort. Little has been reported in the literatures on the management of CC with moxibustion. A systematic review [56], published in 2010, only included 3 RCTs with a total of 256 patients, and no randomization or blinding (two in Chinese and one in Korean). Given that the methodological quality of these trials was poor, the review reported that there was insufficient evidence to suggest that moxibustion was an effective treatment for constipation [56].

In PubMed database, RCTs of moxibustion for CC were searched from its inception to October 2014 with keywords including “constipation” plus “moxibustion,” resulting in only

one high quality RCT published in 2011 in English. This trial was randomized, sham-controlled, patient blinded, and pilot clinical [57]. The trial noted that moxibustion treatment appeared safe but showed no positive effect on constipation [57].

However, this conclusion does not stand up to be scrutinized due to the design of sham control. Sham moxibustion used in this trial [57] was given with adding insulation below the moxa pillar in order to prevent the transfer of heat from patients. The sham moxa pillar looked similar to real moxa pillar on its appearance and burning procedure and that the smoke from moxa could be smelled and the burning could be observed. This method of sham moxibustion seems well established as blinded to the participants [58, 59]. However, sham moxibustion would be recognized easily by experienced patients and thus patients with previous experience of moxibustion should be excluded from a controlled study [59].

Studies of moxibustion for constipation have been so limited that no mechanistic research has been published. Long-term, larger sample size, rigorously designed, and mechanism studies are desired.

4. Massage

Massage is the manipulation of activating deeper and superficial layers of connective tissues and muscles using various techniques. It has been practiced for thousands of years in many ancient civilizations [60].

Seventeen clinic articles were derived from the PubMed search with keywords “massage” and “constipation” [61–77]. Among them, there are only 3 articles with a Jadad score ≥ 3 [31]. In spite of this, the 3 articles were in lack of sham control and blind method and of very small sample size. In brief, these 17 studies showed that massage increased defecation frequency [63, 65, 66, 76], relieved abdominal pain syndrome [66], and decreased Gastrointestinal Symptoms Rating Scale [66] and Constipation Assessment Scale [71] but could not decrease laxative use [66].

Various mediums have been used in manipulation of massage, but it is unclear which methods are better. Aroma oil, which is often used in massage, did not seem to be more effective than the meridian massage [65]. Massage may work on constipation in children and seniors. A study indicated that massage was beneficial to hospitalized children with constipation due to brain injury [61]. But it is not recommended because of the lack of sufficient evidence according to an integrative review of the literature [78]. Abdominal massage using essential oils seems helpful for constipation in the elderly [71].

It is difficult for massage to design a method of sham or blind technique. Various techniques of massage have been developed through thousands of years originated from different ancient civilizations. Up till now there is no well-recognized standard technique for massage. Therefore, technique of sham or blind massage could not be defined.

Abdominal massage was performed in patients with constipation and healthy volunteers with negative results.

Neither in patients, nor in healthy controls, did the abdominal massage alter stool frequency or colon transit measured by radiopaque markers [75].

There are a number of advantages with massage. Firstly, despite the fact that the trials about massage for constipation were various in terms of designs, patient samples, and types of massage used, there were no adverse side effects. Secondly, massage can be self-administrated or administrated by patients since it is easily learnt [77]. Thirdly, expenditure and cost-effectiveness could be reduced greatly since it can be self-administrated [79].

Overall, the experience of abdominal massage is appreciated by consumers, not only feeling embraced and in safe hands but also improving their bowel habits [62].

5. Herbal Medicine

Constipation, as an ancient disease, has been treated with many kinds of herbal medicines in the human history. According to quantity of herbal medicines, it can be divided into two types: single herb and multiple herbs. According to active ingredient of single herb, it also can be divided into two types: bulk laxative and stimulant laxative.

5.1. Single Herb Medicine

5.1.1. Bulk Herbal Laxative. Psyllium and *Ficus carica* are frequently used bulk laxatives. Psyllium increased stool frequency and improved stool consistency but was not effective on colon transit or anorectal motility [80]. Similar results were reported in CC patients with Parkinson's disease [81]. Psyllium increased more stool water content and weight, more total stool output, and higher O'Brien rank-type scores than docusate sodium according to a multicenter, randomized, double-blind, and parallel-design study in which 170 subjects with chronic idiopathic constipation were treated for 2 weeks [82]. About the efficacy of Psyllium for constipation, a general understanding is that its high fiber and mucilaginous content contribute to a laxative action. Gut-stimulatory effect of Psyllium, mediated partially by 5-HT₄ (5-hydroxytryptamine 4) receptor and muscarinic receptor activation, was beneficial as complement actor [83]. However, high dose Psyllium was effective on diarrhea resulting from its inhibitory effect on the gut possibly mediated by activation of nitric oxide-cyclic guanosine monophosphate pathways and blockade of Ca²⁺ channels [83].

Ficus carica was not used in clinic trials despite the fact that it is considered as laxative in some countries. *Ficus carica* paste for loperamide-induced constipation in rats increased pellet number, weight, water content, tension, and peristalsis of intestinal ileum, as well as thickness and mucin area in the distal colon [84]. No abnormal symptoms were observed on serum and whole blood parameters [84]. Similar results were obtained in constipated beagles induced by a high-protein diet and movement restriction [85]. The ameliorating effect on constipation was believed to be attributed to cellulose, one of the main components of *Ficus carica* [84, 85]. Cellulose improved fecal excretion by increasing water content and

bulk, elevating viscosity and shortening fecal transit time [86].

5.1.2. Stimulant Herbal Laxative. Anthranoid-containing laxatives, the most frequent in stimulant herbal laxatives, include senna, aloe, rheum officinale, and cascara.

Anthraquinones are effective components in this kind of stimulant herbal laxatives. Glycosides, naturally occurring from senna, aloe, rheum officinale, and cascara, pass unchangedly through the small intestine and are split into active ingredient rhein-anthrone by the colonic microbiota [87]. They were reported to improve stool frequency and consistency in a number of clinical studies [88–90]. Pseudomelanosis coli or melanosis coli which are a dark-brown discoloration of colon mucosa would be induced by anthraquinone in 9–12 months [91] and would disappear over weeks to months after termination of the use of anthraquinone [92]. It is controversial whether there is a link between pseudomelanosis coli and colorectal cancer.

5.2. Multiple Herbs Medicine. Multiple herbs medicine means two or more of single herb medicines are used in combination. For example, Psyllium and senna as a group occurs in a lot of over-the-counter brands. Agiolax, a representative sample, comprising *Plantago ovata* 52 g, ispaghula husk 2.2 g, and *Tinnevelly senna* Pods 12.4 g per 100 g granules, was proved superior to lactulose in measurement of mean daily bowel frequency, stool consistency, and ease of evacuation in a double-blind crossover study [93]. The expansion of Psyllium and stimulation of sennosides under safe and recommended doses are perfect in cooperation.

5.3. Chinese Herbal Medicine. Chinese herbal medicine for constipation is complex on its formation. Usually, it comprises not only multiple herbal laxatives but also some other herbs which contribute to relieve side effect of stimulant herbal laxatives, for example, Ma Zi Ren Pill [94–96] and CCHI [97].

Ma Zi Ren Pill, who's other name is Hemp Seed Pill, comprises six herbs: Semen Cannabis Sativae, Radix Paeoniae, Semen Pruni Armeniacae, Fructus Immaturus Citri Aurantii, Radix et Rhizoma Rhei, and Cortex Magnoliae. According to the Chinese traditional medicine theory, it moistens the intestines, relaxes the bowel, and promotes the movement of Qi [95]. An 18-week prospective, randomized, double-blind, placebo-controlled clinical study on 120 subjects documented that Ma Zi Ren Pill increased complete spontaneous bowel movement and decreased straining at evacuation and no serious adverse effects were noted [95].

CCHI comprises six herbs: *Panax ginseng* C. A. Meyer, *Zingiber officinale* Rosc., *Glycyrrhiza uralensis* Fisch., *Atractylodes macrocephala* Koide, *Aconitum carmichaelii* Debx., and *Rheum tanguticum* Maxim [97]. A randomized, double-dummy, double-blind, and placebo-controlled trial on 120 participants showed that CCHI was superior to lactulose in spontaneous bowel movements [97]. Another high quality trial showed that efficacy of CCHI could be proved, but maintenance effect needs further trial [98].

The two Chinese herbal medicines were tested in high quality trials. However, the evidence and reliability of many others are compromised by methodological flaws [99]. Further randomized, placebo-controlled, double-blind trials need to be promoted and reported in detail [99].

6. Conclusion

Among the four kinds of complementary and alternative therapies for constipation discussed in this review, the efficacy of acupuncture and herbal medicine has been indicated. Well-designed high quality studies are needed to investigate the efficacy of moxibustion and massage for constipation. Since constipation is a chronic and highly prevalent disease, convenient and cost-effective therapies are needed. Therefore, complementary and alternative medicine is expected to play a more important role in the future. Novel and innovative therapies of complementary and alternative medicine are needed in treating constipation. To increase the efficacy of existing methods, combinational methods may be explored. Equally, if not more importantly, mechanistic studies are needed in order to improve and disseminate the application of the available complementary and alternative therapies for constipation.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

References

- [1] F. M. Q. Schmidt and V. L. C. D. G. Santos, "Prevalence of constipation in the general adult population: an integrative review," *Journal of Wound, Ostomy & Continence Nursing*, vol. 41, no. 1, pp. 70–76, 2014.
- [2] J. Belsey, S. Greenfield, D. Candy, and M. Geraint, "Systematic review: impact of constipation on quality of life in adults and children," *Alimentary Pharmacology and Therapeutics*, vol. 31, no. 9, pp. 938–949, 2010.
- [3] S. Sethi, S. Mikami, J. Leclair et al., "Inpatient burden of constipation in the United States: an analysis of national trends in the United States from 1997 to 2010," *American Journal of Gastroenterology*, vol. 109, no. 2, pp. 250–256, 2014.
- [4] Rome Foundation, "Guidelines—Rome III diagnostic criteria for functional gastrointestinal disorders," *Journal of Gastrointestinal and Liver Diseases*, vol. 15, no. 3, pp. 307–312, 2006.
- [5] A. E. Foxx-Orenstein, M. A. McNally, and S. T. Odunsi, "Update on constipation: one treatment does not fit all," *Cleveland Clinic Journal of Medicine*, vol. 75, no. 11, pp. 813–824, 2008.
- [6] J. F. Gallegos-Orozco, A. E. Foxx-Orenstein, S. M. Sterler, and J. M. Stoa, "Chronic constipation in the elderly," *The American Journal of Gastroenterology*, vol. 107, no. 1, pp. 18–25, 2012.
- [7] J. Ragg, R. McDonald, R. Hompes, O. M. Jones, C. Cunningham, and I. Lindsey, "Isolated colonic inertia is not usually the cause of chronic constipation," *Colorectal Disease*, vol. 13, no. 11, pp. 1299–1302, 2011.
- [8] R. Tomita and E. R. Howard, "Clinical studies on anorectal myectomy for chronically constipated patients with outlet

- obstruction in childhood," *Hepato-Gastroenterology*, vol. 55, no. 86-87, pp. 1600-1605, 2008.
- [9] C. P. Sanmiguel and E. E. Soffer, "Constipation caused by functional outlet obstruction," *Current Gastroenterology Reports*, vol. 5, no. 5, pp. 414-418, 2003.
 - [10] A. D'Hoore and F. Penninckx, "Obstructed defecation," *Colorectal Disease*, vol. 5, no. 4, pp. 280-287, 2003.
 - [11] S. Müller-Lissner, J. Tack, Y. Feng, F. Schenck, and R. S. Gryp, "Levels of satisfaction with current chronic constipation treatment options in Europe—an internet survey," *Alimentary Pharmacology & Therapeutics*, vol. 37, no. 1, pp. 137-145, 2013.
 - [12] J. F. Johanson and J. Kralstein, "Chronic constipation: a survey of the patient perspective," *Alimentary Pharmacology and Therapeutics*, vol. 25, no. 5, pp. 599-608, 2007.
 - [13] S. A. Steiner, M. R. F. Torres, F. J. Penna et al., "Chronic functional constipation in children: adherence and factors associated with drug treatment," *Journal of Pediatric Gastroenterology and Nutrition*, vol. 58, no. 5, pp. 598-602, 2014.
 - [14] J. N. Wu, B. Y. Zhang, W. Z. Zhu, R. S. Du, and Z. S. Liu, "Comparison of efficacy on functional constipation treated with electroacupuncture of different acupoint prescriptions: a randomized controlled pilot trial," *Zhongguo Zhen Jiu*, vol. 34, no. 6, pp. 521-528, 2014.
 - [15] C. Zhang, L. Guo, X. Guo, and G. Li, "Short and long-term efficacy of combining Fuzhengliqi mixture with acupuncture in treatment of functional constipation," *Journal of Traditional Chinese Medicine*, vol. 33, no. 1, pp. 51-59, 2013.
 - [16] W.-N. Peng, L. Wang, Z.-S. Liu et al., "Analysis on follow-up efficacy and safety of slow transit constipation treated with individualized deep puncture at Tianshu (ST 25): a multi-central randomized controlled trial," *Zhongguo Zhen Jiu*, vol. 33, no. 10, pp. 865-869, 2013.
 - [17] C.-Y. Chen, M.-D. Ke, C.-D. Kuo, C.-H. Huang, Y.-H. Hsueh, and J.-R. Chen, "The influence of electro-acupuncture stimulation to female constipation patients," *The American Journal of Chinese Medicine*, vol. 41, no. 2, pp. 301-313, 2013.
 - [18] X. X. Zhou, Y. Zhong, and J. Teng, "Senile habitual constipation treated with auricular therapy based on the pattern/syndrome differentiation: a randomized controlled trial," *Zhongguo Zhen Jiu*, vol. 32, no. 12, pp. 1090-1092, 2012.
 - [19] J. Xu, C.-S. Jia, L. Qin, and X.-K. Xu, "Comparative study on therapeutic effect between SXDZ-100 and SDZ-II on chronic functional constipation," *Zhongguo Zhen Jiu*, vol. 32, no. 1, pp. 79-82, 2012.
 - [20] E. F. Anders, A. Findeisen, A. Nowak, M. Rüdiger, and T. I. Usichenko, "Acupuncture for treatment of hospital-induced constipation in children: a retrospective case series study," *Acupuncture in Medicine*, vol. 30, no. 4, pp. 258-260, 2012.
 - [21] L.-J. Wang and L.-L. Wang, "Randomized controlled study on chronic functional constipation treated with grain-shaped moxibustion and acupuncture," *Zhongguo Zhen Jiu*, vol. 31, no. 4, pp. 320-324, 2011.
 - [22] L.-K. Guo, C.-X. Zhang, and X.-F. Guo, "Acupuncture combined with Chinese herbal medicine plantain and Senna Granule in treatment of functional constipation: a randomized, controlled trial," *Journal of Chinese Integrative Medicine*, vol. 9, no. 11, pp. 1206-1214, 2011.
 - [23] C.-W. Wang, N. Li, H.-B. He, J.-Q. Lü, and Z.-S. Liu, "Effect of electroacupuncture of Tianshu (ST 25) on the rational symptoms of functional constipation patients and evaluation on its efficacy satisfaction: a single-center, prospective, practical and randomized control trial," *Zhen Ci Yan Jiu*, vol. 35, no. 5, pp. 375-379, 2010.
 - [24] C.-W. Wang, H.-B. He, N. Li, Q. Wen, and Z.-S. Liu, "Observation on therapeutic effect of electroacupuncture at Tianshu (ST 25) with deep needling technique on functional constipation," *Zhongguo Zhen Jiu*, vol. 30, no. 9, pp. 705-708, 2010.
 - [25] X. Jin, Y.-J. Ding, L.-L. Wang et al., "Clinical study on acupuncture for treatment of chronic functional constipation," *Zhongguo Zhen Jiu*, vol. 30, no. 2, pp. 97-101, 2010.
 - [26] S.-Q. Ding, Y.-J. Ding, and X.-F. Wang, "Study on thirty patients with slow-transmission constipation treated by acupuncture and moxibustion," *Chinese Journal of Integrated Traditional and Western Medicine*, vol. 29, no. 11, pp. 1031-1034, 2009.
 - [27] Z.-L. Zhang, X.-Q. Ji, S.-H. Zhao et al., "Multi-central randomized controlled trials of electroacupuncture at Zhigou (TE 6) for treatment of constipation induced by stagnation or deficiency of qi," *Zhongguo Zhen Jiu*, vol. 27, no. 7, pp. 475-478, 2007.
 - [28] Z. Zhu, H. Li, L. Chen, G. Wang, and C. Kan, "Acupuncture treatment of habitual constipation," *Journal of Traditional Chinese Medicine*, vol. 23, no. 2, p. 133, 2003.
 - [29] E. Broide, S. Pintov, S. Portnoy, J. Barg, E. Klinowski, and E. Scapa, "Effectiveness of acupuncture for treatment of childhood constipation," *Digestive Diseases and Sciences*, vol. 46, no. 6, pp. 1270-1275, 2001.
 - [30] A. G. Klauser, A. Rubach, O. Bertsche, and S. A. Muller-Lissner, "Body acupuncture: effect on colonic function in chronic constipation," *Zeitschrift für Gastroenterologie*, vol. 31, no. 10, pp. 605-608, 1993.
 - [31] A. R. Jadad, R. A. Moore, D. Carroll et al., "Assessing the quality of reports of randomized clinical trials: is blinding necessary?" *Controlled Clinical Trials*, vol. 17, no. 1, pp. 1-12, 1996.
 - [32] T. Zhang, T. Y. Chon, B. Liu et al., "Efficacy of acupuncture for chronic constipation: a systematic review," *The American Journal of Chinese Medicine*, vol. 41, no. 4, pp. 717-742, 2013.
 - [33] W.-F. Du, L. Yu, X.-K. Yan, and F.-C. Wang, "Met-analysis on randomized controlled clinical trials of acupuncture and moxibustion on constipation," *Zhongguo Zhen Jiu*, vol. 32, no. 1, pp. 92-96, 2012.
 - [34] M.-K. Li, T.-F. D. Lee, and K.-P. L. Suen, "A review on the complementary effects of auriculotherapy in managing constipation," *Journal of Alternative and Complementary Medicine*, vol. 16, no. 4, pp. 435-447, 2010.
 - [35] L.-W. Lin, Y.-T. Fu, T. Dunning et al., "Efficacy of traditional Chinese medicine for the management of constipation: a systematic review," *The Journal of Alternative and Complementary Medicine*, vol. 15, no. 12, pp. 1335-1346, 2009.
 - [36] T. Takahashi, "Acupuncture for functional gastrointestinal disorders," *Journal of Gastroenterology*, vol. 41, no. 5, pp. 408-417, 2006.
 - [37] W. R. O. f. t. W. Pacific, *Who Standard Acupuncture Point Locations in the Western Pacific Region*, World Health Organization, Manila, Philippines, 2008.
 - [38] J.-H. Sun, H. Guo, L. Chen et al., "Effect of electroacupuncture at 'Tianshu'(ST 25) on colonic smooth muscle structure and interstitial cells of cajal in slow transit constipation rats," *Zhen Ci Yan Jiu*, vol. 36, no. 3, pp. 171-175, 2011.
 - [39] H. P. Wang, Q. G. Qin, K. Liu, X. Y. Gao, and B. Zhu, "Effects of acupuncture at 'tianshu' (st 25) on electrical and mechanical motor of jejunum smooth muscles at different phases of the interdigestive migrating motor complex in normal rats," *Zhen Ci Yan Jiu*, vol. 39, no. 2, pp. 117-123, 2014.

- [40] Z. Yu, Y. B. Xia, M. X. Lu, J. Lin, W. J. Yu, and B. Xu, "Influence of electroacupuncture stimulation of 'tianshu' (ST 25), 'quchi' (LI 11) and 'shangjuxu' (ST 37) and their pairs on gastric motility in the rat," *Zhen Ci Yan Jiu*, vol. 38, no. 1, pp. 40–47, 2013.
- [41] C.-C. Yan, Y. Peng, Y.-P. Lin et al., "Effect of manual acupuncture stimulation of 'Zusanli' (ST 36) on gastric motility, and SP and motilin activities in gastric antrum and nucleus raphe magnus in gastric hyperactivity and hypoactivity rats," *Zhen Ci Yan Jiu*, vol. 38, no. 5, pp. 345–351, 2013.
- [42] H.-L. Chao, S.-J. Miao, P.-F. Liu et al., "The beneficial effect of ST-36 (Zusanli) acupressure on postoperative gastrointestinal function in patients with colorectal cancer," *Oncology Nursing Forum*, vol. 40, no. 2, pp. E61–E68, 2013.
- [43] M. Iwa, M. Matsushima, Y. Nakade, T. N. Pappas, M. Fujimiya, and T. Takahashi, "Electroacupuncture at ST-36 accelerates colonic motility and transit in freely moving conscious rats," *American Journal of Physiology: Gastrointestinal and Liver Physiology*, vol. 290, no. 2, pp. G285–G292, 2006.
- [44] Y. Liu and Y.-L. Chen, "Analysis of information detection of biological energy on Shangjuxu (ST 37) with acupuncture," *Chinese Acupuncture & Moxibustion*, vol. 30, no. 6, pp. 481–484, 2010.
- [45] L.-P. Shen, J. Guan, and K.-Y. Ding, "Clinical observation on electroacupuncture combined with acupoint injection for treatment of early postoperative inflammatory intestinal obstruction," *Zhongguo Zhen Jiu*, vol. 30, no. 1, pp. 27–30, 2010.
- [46] H.-J. Li, G.-P. Li, and H.-Y. Li, "Clinical observation on acupoint catgut embedding therapy for treatment of ulcerative colitis," *Chinese Acupuncture & Moxibustion*, vol. 26, no. 4, pp. 261–263, 2006.
- [47] Z.-M. Shi, Y.-S. Zhu, Q.-X. Wang, and M.-N. Lei, "Comparative study on irritable bowel syndrome treated with acupuncture and Western medicine," *Zhongguo Zhen Jiu*, vol. 31, no. 7, pp. 607–609, 2011.
- [48] Q. Wen, W.-W. Chen, J. Li, Y. Zhao, N. Li, and C.-W. Wang, "Adhesive ileus treated by electroacupuncture at Zhigou (TE 6) and Zusanli (ST 36): a randomized controlled study," *Zhongguo Zhen Jiu*, vol. 32, no. 11, pp. 961–965, 2012.
- [49] J.-X. Duan and Z.-S. Liu, "Review on the safety of deep acupuncture at Tianshu (ST 25)," *Acupuncture Research*, vol. 35, no. 3, pp. 232–235, 2010.
- [50] J.-S. Han, "Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies," *Trends in Neurosciences*, vol. 26, no. 1, pp. 17–22, 2003.
- [51] S.-B. Xu, B. Huang, C.-Y. Zhang et al., "Effectiveness of strengthened stimulation during acupuncture for the treatment of bell palsy: a randomized controlled trial," *Canadian Medical Association Journal*, vol. 185, no. 6, pp. 473–479, 2013.
- [52] J. Fletcher, "Acupuncture—no sham," *Canadian Medical Association Journal*, vol. 185, no. 6, article 459, 2013.
- [53] D. Luo, S. Liu, X. Xie, and X. Hou, "Electroacupuncture at acupoint ST-36 promotes contractility of distal colon via a cholinergic pathway in conscious rats," *Digestive Diseases and Sciences*, vol. 53, no. 3, pp. 689–693, 2008.
- [54] S. Aydin, E. Donder, O. K. Akin, F. Sahpaz, Y. Kendir, and M. M. Alnema, "Fat-free milk as a therapeutic approach for constipation and the effect on serum motilin and ghrelin levels," *Nutrition*, vol. 26, no. 10, pp. 981–985, 2010.
- [55] J. Yin and J. D. Z. Chen, "Gastrointestinal motility disorders and acupuncture," *Autonomic Neuroscience: Basic and Clinical*, vol. 157, no. 1–2, pp. 31–37, 2010.
- [56] M. S. Lee, T.-Y. Choi, J.-E. Park, and E. Ernst, "Effects of moxibustion for constipation treatment: a systematic review of randomized controlled trials," *Chinese Medicine*, vol. 5, article 28, 2010.
- [57] J.-E. Park, J.-U. Sul, K. Kang, B.-C. Shin, K.-E. Hong, and S.-M. Choi, "The effectiveness of moxibustion for the treatment of functional constipation: a randomized, sham-controlled, patient blinded, pilot clinical trial," *BMC Complementary & Alternative Medicine*, vol. 11, article 124, 2011.
- [58] J. E. Park, C. H. Han, K. W. Kang, M. S. Shin, D. S. Oh, and S. M. Choi, "A sham moxibustion device and masking test," *Journal of Korean Oriental Medicine*, vol. 13, pp. 93–100, 2007.
- [59] B. Zhao, X. Wang, Z. Lin, R. Liu, and L. Lao, "A novel sham moxibustion device: a randomized, placebo-controlled trial," *Complementary Therapies in Medicine*, vol. 14, no. 1, pp. 53–60, 2006.
- [60] P. Weerapong, P. A. Hume, and G. S. Kolt, "The mechanisms of massage and effects on performance, muscle recovery and injury prevention," *Sports Medicine*, vol. 35, no. 3, pp. 235–256, 2005.
- [61] M. J. Nam, Y. I. Bang, and T. I. Kim, "Effects of abdominal meridian massage with aroma oils on relief of constipation among hospitalized children with brain related disabilities," *Journal of Korean Academy of Nursing*, vol. 43, no. 2, pp. 247–255, 2013.
- [62] K. Lämås, U. H. Graneheim, and C. Jacobsson, "Experiences of abdominal massage for constipation," *Journal of Clinical Nursing*, vol. 21, no. 5–6, pp. 757–765, 2012.
- [63] D. McClurg, S. Hagen, S. Hawkins, and A. Lowe-Strong, "Abdominal massage for the alleviation of constipation symptoms in people with multiple sclerosis: a randomized controlled feasibility study," *Multiple Sclerosis*, vol. 17, no. 2, pp. 223–233, 2011.
- [64] T. K. T. Lai, M. C. Cheung, C. K. Lo et al., "Effectiveness of aroma massage on advanced cancer patients with constipation: a pilot study," *Complementary Therapies in Clinical Practice*, vol. 17, no. 1, pp. 37–43, 2011.
- [65] M. Chung and E. Choi, "A comparison between effects of aroma massage and meridian massage on constipation and stress in women college students," *Journal of Korean Academy of Nursing*, vol. 41, no. 1, pp. 26–35, 2011.
- [66] K. Lämås, L. Lindholm, H. Stenlund, B. Engström, and C. Jacobsson, "Effects of abdominal massage in management of constipation—a randomized controlled trial," *International Journal of Nursing Studies*, vol. 46, no. 6, pp. 759–767, 2009.
- [67] L. M. T. Silva, A. Cignolini, R. Warren, S. Budden, and A. Skowron-Gooch, "Improvement in sensory impairment and social interaction in young children with autism following treatment with an original Qigong massage methodology," *The American Journal of Chinese Medicine*, vol. 35, no. 3, pp. 393–406, 2007.
- [68] M. A. Khan, I. P. Bobrovnikii, A. S. Potapov, M. I. Bakanov, E. V. Komarova, and A. V. Petrova, "Effects of interference currents, crypmassage and their combination on lipid peroxidation in children with chronic constipation," *Voprosy Kurortologii, Fizioterapii, i Lechebnoï Fizicheskoi Kultury*, no. 5, pp. 31–32, 2006.
- [69] Ş. Ayaş, B. Leblebici, S. Sözü, M. Bayramoğlu, and E. A. Niron, "The effect of abdominal massage on bowel function in patients with spinal cord injury," *American Journal of Physical Medicine & Rehabilitation*, vol. 85, no. 12, pp. 951–955, 2006.

- [70] B. Albers, H. Cramer, A. Fischer, A. Meissner, A. Schürenberg, and S. Bartholomeyczik, "Abdominal massage as intervention for patients with paraplegia caused by spinal cord injury—a pilot study," *Pflege Zeitschrift*, vol. 59, no. 3, pp. 2–8, 2006.
- [71] M.-A. Kim, J.-K. Sakong, E.-J. Kim, and E.-H. Kim, "Effect of aromatherapy massage for the relief of constipation in the elderly," *Taehan Kanho Hakhoe Chi*, vol. 35, no. 1, pp. 56–64, 2005.
- [72] S. Y. Jeon and H. M. Jung, "The effects of abdominal meridian massage on constipation among cva patients," *Taehan Kanho Hakhoe Chi*, vol. 35, no. 1, pp. 135–142, 2005.
- [73] A. König, S. Radke, H. Molzen et al., "Randomised trial of acupuncture compared with conventional massage and 'sham' laser acupuncture for treatment of chronic neck pain—range of motion analysis," *Zeitschrift für Orthopädie und Ihre Grenzgebiete*, vol. 141, no. 4, pp. 395–400, 2003.
- [74] Y. Zhang, Y. L. Zhang, and Y. Q. Cheng, "Clinical observation of constipation due to deficiency of vital energy treated by massage and finger pressure methods," *Chinese Journal of Nursing*, vol. 31, no. 2, pp. 97–98, 1996.
- [75] A. G. Klauser, J. Flaschenträger, A. Gehrke, and S. A. Müller-Lissner, "Abdominal wall massage: effect on colonic function in healthy volunteers and in patients with chronic constipation," *Zeitschrift für Gastroenterologie*, vol. 30, no. 4, pp. 247–251, 1992.
- [76] S. Woodward, C. Norton, and K. L. Barriball, "A pilot study of the effectiveness of reflexology in treating idiopathic constipation in women," *Complementary Therapies in Clinical Practice*, vol. 16, no. 1, pp. 41–46, 2010.
- [77] D. McClurg and A. Lowe-Strong, "Does abdominal massage relieve constipation?" *Nursing Times*, vol. 107, no. 12, pp. 20–22, 2011.
- [78] J. Alcantara, J. D. Alcantara, and J. Alcantara, "An integrative review of the literature on the chiropractic care of infants with constipation," *Complementary Therapies in Clinical Practice*, vol. 20, no. 1, pp. 32–36, 2014.
- [79] K. Lämås, L. Lindholm, B. Engström, and C. Jacobsson, "Abdominal massage for people with constipation: a cost utility analysis," *Journal of Advanced Nursing*, vol. 66, no. 8, pp. 1719–1729, 2010.
- [80] W. Ashraf, F. Park, J. Lof, and E. M. M. Quigley, "Effects of psyllium therapy on stool characteristics, colon transit and anorectal function in chronic idiopathic constipation," *Alimentary Pharmacology and Therapeutics*, vol. 9, no. 6, pp. 639–647, 1995.
- [81] W. Ashraf, R. F. Pfeiffer, F. Park, J. Lof, and E. M. M. Quigley, "Constipation in Parkinson's disease: objective assessment and response to psyllium," *Movement Disorders*, vol. 12, no. 6, pp. 946–951, 1997.
- [82] J. W. Mcrorie, B. P. Daggy, J. G. Morel, P. S. Diersing, P. B. Miner, and M. Robinson, "Psyllium is superior to docusate sodium for treatment of chronic constipation," *Alimentary Pharmacology & Therapeutics*, vol. 12, no. 5, pp. 491–497, 1998.
- [83] M. H. Mehmood, N. Aziz, M. N. Ghayur, and A.-H. Gilani, "Pharmacological basis for the medicinal use of psyllium husk (*Ispaghula*) in constipation and diarrhea," *Digestive Diseases and Sciences*, vol. 56, no. 5, pp. 1460–1471, 2011.
- [84] H. Y. Lee, J. H. Kim, H. W. Jeung et al., "Effects of *Ficus carica* paste on loperamide-induced constipation in rats," *Food and Chemical Toxicology*, vol. 50, no. 3-4, pp. 895–902, 2012.
- [85] H.-G. Oh, H.-Y. Lee, M.-Y. Seo et al., "Effects of ficus carica paste on constipation induced by a high-protein feed and movement restriction in beagles," *Laboratory Animal Research*, vol. 27, no. 4, pp. 275–281, 2011.
- [86] E. H. Hwang and H. J. Lee, "Effects of alginic acid, cellulose and pectin level on bowel function in rats," *The Korean Journal of Nutrition*, vol. 30, no. 5, pp. 465–477, 1997.
- [87] J. Lemli, "Metabolism of sennosides—an overview," *Pharmacology*, vol. 36, supplement 1, pp. 126–128, 1988.
- [88] J. A. Marlett, B. U. K. Li, C. J. Patrow, and P. Bass, "Comparative laxation of psyllium with and without senna in an ambulatory constipated population," *The American Journal of Gastroenterology*, vol. 82, no. 4, pp. 333–337, 1987.
- [89] A. P. Passmore, K. Wilson-Davies, C. Stoker, and M. E. Scott, "Chronic constipation in long stay elderly patients: a comparison of lactulose and a senna-fibre combination," *British Medical Journal*, vol. 307, no. 6907, pp. 769–771, 1993.
- [90] O. Kinnunen and J. Salokannel, "The carry-over effect on the bowel habit in elderly long-term patients of long-term bulk-forming products containing stimulant laxative," *Acta Medica Scandinavica*, vol. 222, no. 5, pp. 477–479, 1987.
- [91] M. Willems, H. R. van Buuren, and R. de Krijger, "Anthranoid self-medication causing rapid development of melanosis coli," *Netherlands Journal of Medicine*, vol. 61, no. 1, pp. 22–24, 2003.
- [92] G. S. Speare, "Melanosis coli. Experimental observations on its production and elimination in twenty-three cases," *The American Journal of Surgery*, vol. 82, no. 5, pp. 631–637, 1951.
- [93] A. P. Passmore, K. W. Davies, P. G. Flanagan, C. Stoker, and M. G. Scott, "A comparison of agiolax and lactulose in elderly patients with chronic constipation," *Pharmacology*, vol. 47, no. 1, pp. 249–252, 1993.
- [94] L. L. D. Zhong, C. W. Cheng, Y. Chan et al., "Chinese herbal medicine (Ma Zi Ren Wan) for functional constipation: study protocol for a prospective, double-blinded, double-dummy, randomized controlled trial," *Trials*, vol. 14, no. 1, article 366, 2013.
- [95] Z. X. Bian, C. W. Cheng, and L. Z. Zhu, "Chinese herbal medicine for functional constipation: a randomised controlled trial," *Hong Kong Medical Journal*, vol. 19, supplement 9, pp. 44–46, 2013.
- [96] C.-W. Cheng, Z.-X. Bian, L.-X. Zhu, J. C. Y. Wu, and J. J. Y. Sung, "Efficacy of a Chinese herbal proprietary medicine (Hemp Seed Pill) for functional constipation," *The American Journal of Gastroenterology*, vol. 106, no. 1, pp. 120–129, 2011.
- [97] C.-H. Huang, J.-S. Lin, T.-C. Li et al., "Comparison of a chinese herbal medicine (cchl) and lactulose as first-line treatment of constipation in long-term care: a randomized, double-blind, double-dummy, and placebo-controlled trial," *Evidence-Based Complementary and Alternative Medicine*, vol. 2012, Article ID 923190, 12 pages, 2012.
- [98] C.-H. Huang, Y.-C. Su, T.-C. Li et al., "Treatment of constipation in long-term care with chinese herbal formula: a randomized, double-blind placebo-controlled trial," *Journal of Alternative and Complementary Medicine*, vol. 17, no. 7, pp. 639–646, 2011.
- [99] C.-W. Cheng, Z.-X. Bian, and T.-X. Wu, "Systematic review of Chinese herbal medicine for functional constipation," *World Journal of Gastroenterology*, vol. 15, no. 39, pp. 4886–4895, 2009.