

The safety and effectiveness of self-administered coffee enema

A systematic review of case reports

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Abstract

Background: As the self-administration of coffee enema is being used as a mean of self-care for detoxication in various indications, it is important that evidence-based public health information is provided for effective and safe use. However, the evidence is so far rare. This systematic review was conducted to investigate the safety and effectiveness of self-administered coffee enema in a wide range of use, and to provide evidence about its benefits and risks.

Methods: Relevant studies were retrieved from Ovid MEDLINE, Ovid Embase, the Cochrane Central Register of Controlled Trials, and the Cumulative Index to Nursing and Allied Health Literature; and also from oriental databases, KoreaMed, Korean Medical Database, Korean Studies Information Service System, National Discovery for Science Leaders, and Korea Institute of Science and Technology Information, Oriental Medicine Advanced Searching Integrated System, China National Knowledge Infrastructure, and Japan Science and Technology Information Aggregator. Considering self-administered coffee enema being used in a various indication, study population was not restricted. Any types of published studies that included outcomes of effectiveness and safety of self-administered coffee enema with or without comparators were eligible for this systematic review. Data on biomedical indications, patient-reported outcomes, and adverse events were collected. Descriptive analyses were planned because diverse health conditions and outcome variables did not allow for quantitative synthesis.

Results: Nine case reports that describe adverse events were identified and included in the analysis. Of these, 7 recent ones reported colitis after self-administration, mentioning that the most plausible cause assumed was the coffee fluid itself, which contained numerous chemical substances. Two others reported more critical adverse events. All 9 case reports with acceptable quality of evidence warned against the self-administration of the procedure. No study that reports the effectiveness of coffee enema was found.

Conclusions: Based on the evidences reviewed, this systematic review does not recommend coffee enema self-administration as a complementary and alternative medicine modality that can be adopted as a mean of self-care, given the unsolved issues on its safety and insufficient evidence with regard to the effectiveness.

Abbreviations: CAM = complementary and alternative medicine, CENTRAL = Cochrane Central Register of Controlled Trials, CINAHL = Cumulative Index to Nursing and Allied Health Literature, CNKI = China National Knowledge Infrastructure, J-STAGE = Japan Science and Technology Information Aggregator, KISTI = Korea Institute of Science and Technology Information, KMDbase = Korean Medical Database; KISS: Korean Studies Information Service System, NDSL = National Discovery for Science Leaders,

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OASIS = Oriental Medicine Advanced Searching Integrated System, RCTs = randomized controlled trials, ROBANS = risk of bias assessment tool for non-randomized studies.

Keywords: adverse events, coffee enema, disease management, gastroenterology

1. Introduction

The recent decade of observation in public health reveals that self-care is a significant policy component, particularly for taking account of the increasing number of patients with chronic diseases.^[1] Complementary and alternative medicine (CAM) is one of the frequently adopted approaches of self-care for those who are seeking for general health improvement and for patients who are trying to manage their symptoms of chronic diseases (e.g., pain, fatigue, and depression) or the adverse effects caused by conventional medicine (e.g., nausea).^[2] Therefore, providing evidence-based information of CAM modalities is of great interest to public health for supporting effective and safe self-care.^[2] However, scientific evidence is still insufficient and focus on several modalities while CAM has a wide variety, which drives this research.

The specific concern of this review is enema that uses coffee fluid. Enema therapy has a long history of being used as a detoxification treatment. As the interest on self-care through the self-administration of CAM increased, some people are willing to use enema to maintain their health.^[3] The most well-known and widely adopted methods are colon irrigation, retention enema, and coffee enema.^[4] Water with 2 different temperatures (warm and cool) that flow alternately, diluted Chinese herbal medicine, and diluted coffee are used as enema solution for colon irrigation, retention enema, and coffee enema, respectively.^[4]

Coffee enema was initially introduced as a part of the Gerson Therapy, which was developed by Dr Max Gerson in the 1930s for the treatment of degenerative diseases such as skin tuberculosis, diabetes, and most notably, cancer.^[5] The mechanism that claimed to treat cancer is through liver and intestinal detoxification by coffee enema—the kahweol and cafestol in coffee enhance the activity of glutathione (GSH) S-transferase (GST), a major antioxidant enzyme that neutralizes free radicals by 600% to 700%. These free radicals are then absorbed by the –SH groups of GSH in the bile, becoming bile salts that are flushed out of the gallbladder into the intestines for excretion through the colon. After detoxification, cancer cells are destroyed by an allergic inflammatory reaction.^[6]

The standard procedure of coffee enema initially proposed by Gerson is as follows: add 3 rounded tablespoonful of slightly roasted drip ground coffee into approximately 1 L of boiling distilled or filtered water, and continue boiling for 3 minutes and then simmer for 15 minutes. After cooling and filtering, add water to compensate for the evaporation until it reaches about 900 mL. Prepare the solution close to body temperature, and make it flow slowly to the rectum through a tube that hangs at <45 cm above the body. In general, the process would take 12 to 15 minutes. It is recommended that coffee enema should be used twice a day.^[5]

Self-administering coffee enema is relatively simple; however, a concern has been raised because harmful consequences of using it have been reported. As the modality is adopted among laypersons for various indications as a detoxification therapy (e.g., constipation, obesity, and pain relief),^[7] a scientific investigation not only on its safety but effectiveness is necessary. Therefore, a

systematic review was conducted to provide evidence-based information for the practical and safe use of coffee enema as a means of self-care. For the purpose, we intended to examine relevant outcomes indicating effectiveness or safety in all population in every types of published primary studies with or without comparators.

2. Methods

2.1. Literature search

Although it originated from the Gerson Therapy, coffee enema is also being used as an oriental medicine treatment.^[4] As such, 12 databases, including those of oriental and international countries, were used for comprehensive literature search. As 4 international core databases, Ovid MEDLINE, Ovid Embase, the Cochrane Central Register of Controlled Trials (CENTRAL), and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were used. Utilizing Korean databases referred to a Korean guidance for conducting systematic reviews,^[8] and as a result, 5 core databases (KoreaMed, Korean Medical Database [KMbase], Korean Studies Information Service System [KISS], National Discovery for Science Leaders [NDSL], and Korea Institute of Science and Technology Information [KISTI]) and 1 database specific to oriental medicine (Oriental Medicine Advanced Searching Integrated System [OASIS]) were used. Among the core databases of China and Japan, those that allowed English search (China National Knowledge Infrastructure [CNKI], and Japan Science and Technology Information Aggregator [J-STAGE], respectively) were adopted.

The search terms were established by combining “coffee,” “enema,” and words of self-administering (“self-administer,” “self-treat,” “self-perform,” “at home”). In the international databases where Medical Subject Headings (MeSH) was available, MeSH terms of coffee and enema (exp Coffee/ AND exp Enema/) were used with keywords. In the other databases where MeSH was unavailable, only keywords were used. A manual search for additional studies was also performed by reviewing the references of relevant studies. The final update of the literature search was conducted in January 2017. The search was conducted by researchers (HS, HJS, and HS).

2.2. Study selection

All types of participants, either patients or healthy people, as well as all types of published studies, with or without comparisons, were considered. Studies were excluded if coffee enema was not self-administered. Specifically, if it was reported that the enema was performed by an oriental physician and/or at an oriental hospital, the study was excluded. Whether self-administered or not is unclear, we contacted the authors for clarification; if they did not respond, the study was excluded. For the outcomes, disease-specific biomedical indicators, patient-reported outcomes (e.g., quality of life), and adverse events were reviewed. When those outcomes were not reported and/or when it was not

possible to observe the exclusive effects of coffee enema (e.g., mixed interventions), the studies were excluded. Two reviewers (HS and HS) separately performed the study selection, and any discrepancy was resolved through discussion.

2.3. Evaluation of the risk of biases

For studies that investigate the effectiveness of coffee enema, the researchers adopted the Cochrane risk of bias tool^[9] for randomized controlled trials (RCTs) and the risk of bias assessment tool for nonrandomized studies (Risk of Bias Assessment tool for Non-randomized Studies [RoBANS]).^[10] For case reports, critical appraisal checklist for case reports developed by Moola et al^[11] was used. If a case report satisfied 5 appraisal items out of 8, the case report was regarded to have an acceptable quality and thus, included in this systematic review. Two independent reviewers (HS and HS) performed the risk of bias and a consensus was reached with another reviewer (HS) in cases of inconsistency.

2.4. Data extraction

A predetermined and structured data extraction form was used. The author(s), the publication year, the study type, participant information (i.e., number, age, sex, and condition), intervention details, efficacy and safety outcomes, and the authors' conclusions were extracted accordingly. Two reviewers (HS and HJS) separately performed the data extraction and cross-checked the data.

2.5. Data analyses

A meta-analysis was not possible because of the heterogeneity in the study designs, health conditions of the participants, specific procedures of administration, and outcome variables. Therefore, a descriptive analysis was performed.

2.6. Ethical statement

This study was carried out in strict accordance with the recommendations in the CARE and PRISMA guidelines. Institutional review board permission is not required for conducting systematic review and meta-analysis.

3. Results

3.1. Literature search

From the database search, the abstracts of 11,364 studies were generated and subsequently reviewed for potential relevance. The full texts of the 297 studies with potential relevance were retrieved and screened, among which 291 were excluded by the exclusion criteria. As such, 7 case reports were selected from the database search. In addition, 2 others were identified from the manual search. Therefore, 9 case reports on self-administered coffee enema were finalized for the analysis (Fig. 1).

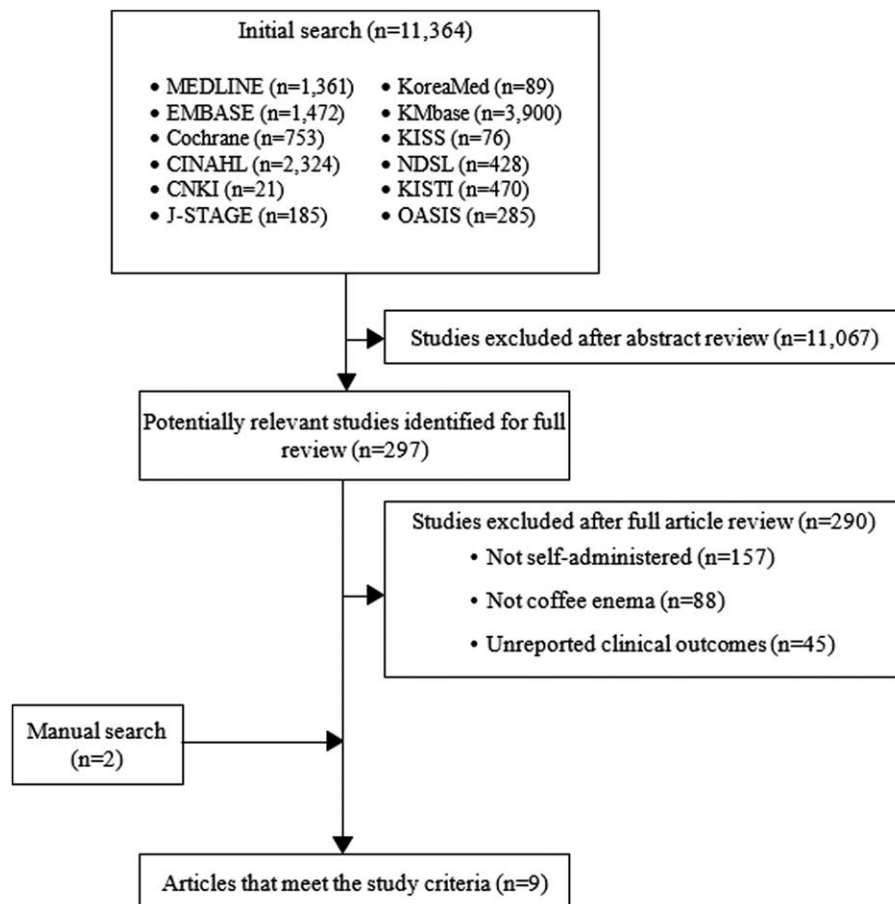


Figure 1. Workflow of identifying related studies.

3.2. Evaluating the risk of biases

Most of case reports were adequately reported patient's demographic characteristics, patient's clinical history according to timeline, the current clinical condition of the patient on presentation, diagnostic tests or assessment methods, and the results. Whereas, 3 (33.3%) of 9 case reports did not clearly described the procedure of self-administered coffee enema. Because the case reports investigated the adverse cases of self-administered coffee enema, the post-intervention clinical condition was not described in all 9 case reports whereas the adverse events of unanticipated events were well-identified. Following the pre-determined criteria, all 9 case reports were found acceptable quality and therefore; included in this systematic review. The results are summarized in Table 1.

3.3. Safety of self-administered coffee enema

Among the 9 case reports, 3 were from the United States,^[12–14] 5 were from Korea,^[15–19] and 1 was from Japan.^[20] The characteristics and results are summarized in Table 2.

Seven relatively recent ones^[14–20] reported similar adverse events induced by self-administered coffee enema. Although the ages of the patients in these case reports varied, they were mostly women and had used coffee enema to relieve constipation or bowel cleansing. The intervention of coffee enema was described in 4 case reports,^[15–18] which were mostly comparable to the standard method of Gerson, except Lee et al^[16] reported higher temperature and longer retaining time. After self-administering coffee enema, the patients of the 7 case reports experienced pain in lower abdomen or occasionally, in the anal region with bloody stool. As a consequence of self-administering coffee enema, colitis was diagnosed in 4 case reports^[16–18] and in the other 3,^[14,19,20] rectal burn or perforation was observed through medical imaging.

The mechanism by which coffee enema induced the burn suggested in 5 case reports among the 7 relatively recent case reports. Two^[14,19] suggested that the high temperature of the coffee fluid might be the cause, and it was proposed that the coffee should be cooled off before use. Other 3^[16–18] more explored potential mechanisms for the coffee enema-induced adverse events based on those mechanisms associated with the adverse effects of enema therapy in general. These include the high temperature and/or high pressure of the enema fluid, the chemical residues (e.g., cleanser or disinfectant) inside the catheter, or the thermal injury caused by the catheter. While none of those were found as plausible causes of colitis, the coffee fluid itself was newly proposed to be the most plausible cause.

As cited in the 3 case reports, caffeine was shown to induce inflammation in animal experiments—it induced smooth muscle relaxation through the adenosine A_{2b} receptor, suppressed the functions of mononuclear cells and macrophagocytes, and increased the emission of mast cell mediators. Furthermore, 1 of the 3 case reports was concerned that the coffee fluid contained a mixture of compounds of natural occurrence—including chlorogenic acid, caffeine, cafestol, and kahweol—none of which should be ruled out for a cause of colitis.^[17]

Two case reports in the 1980s^[12,13] reported more critical adverse events that are complicated by patient conditions compared with the recent 7 case reported elaborated above. The status of the 3 patients in the 2 early case reports was fragile because of fatal diseases: 2 had advanced breast cancer with metastases and 1 had multiple diseases—colitis or cholecystitis,

Table 1
Critical appraisal of case reports included in this review.

Study ID	1. Were patient's demographic characteristics clearly described?	2. Was the patient's history clearly described and presented as a timeline?	3. Was the current clinical condition of the patient on presentation clearly described?	4. Were diagnostic tests or assessment methods and the results clearly described?	5. Was the intervention(s) or treatment procedure(s) clearly described?	6. Was the post-intervention clinical condition clearly described?	7. Were adverse events (harms) or unanticipated events identified and described?	8. Does the case report provide takeaway lessons?	Overall appraisal:		
									Include <input type="checkbox"/>	Exclude <input type="checkbox"/>	Seek further info <input type="checkbox"/>
Choi et al, 2005 ^[15]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Include		
Eisele and Reay, 1980 ^[12]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Include		
Jones and Norris, 2010 ^[14]	Yes	No	No	Yes	Yes	No	Yes	Yes	Include		
Keum et al, 2010 ^[17]	Yes	No	Yes	Yes	No	No	Yes	Yes	Include		
Kim et al, 2012 ^[19]	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Include		
Lee et al, 2008 ^[16]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Include		
Margolin and Green, 1984 ^[13]	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Include		
Sashiyama et al, 2008 ^[20]	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Include		
Seo et al, 2009 ^[16]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Include		

Table 2**Characteristics of the case reports that reported adverse events (9 case reports).**

Study ID	Patient	Intervention	Results	Conclusions of authors
Choi et al, 2005 ^[15]	<ul style="list-style-type: none"> • A 34-year-old female patient experiencing constipation • Frequent use of constipation medicine and glycerin enema for 15 years. 	<ul style="list-style-type: none"> • One self-administration of coffee enema to relieve constipation. • Enema fluid (1000 mL) was administered 10 cm inside the rectal canal and was retained for 10 minutes. 	<ul style="list-style-type: none"> • Abdominal pain and bloody stool that lasted for 4 days. • Diagnosed as colitis through colonoscopy. 	<ul style="list-style-type: none"> • The mechanism of the adverse event is undefined. • The indiscreet use of self-administered coffee enema causes adverse effects and should be prevented through proper education.
Eisele and Reay, 1980 ^[12]	<ul style="list-style-type: none"> • A 46-year-old female patient with intermittent right upper-quadrant pain for 20 years, subsequently diagnosed with colitis or cholecystitis, achlorhydria, degenerative arthritis, and cholelithiasis • A 37-year-old woman with breast cancer metastasized to the lymph nodes who underwent radical mastectomy, immunotherapy, and chemotherapy. 	<ul style="list-style-type: none"> • Both patients self-administered coffee enema several times at a high frequency along with a "special diet." • Pain patient: starting with a total of 10 or 12 times, as frequently as 3 or 4 times an hour per night, and then once per hour. • Cancer patient: 4 times a day with 0.95 L of coffee. 	<ul style="list-style-type: none"> • Both patients died. • Pain patient: experienced grand seizures followed by cardiorespiratory arrest. • Cancer patient: experienced vomiting, chest and abdominal pain, dizziness, and dyspnea before death. 	<ul style="list-style-type: none"> • Coffee caused sodium and chloride depletion as well as fluid overload based on the osmotic concentration gradients across the colonic mucosa. • The increased use of this therapy is expected to cause consequent morbidity and mortality.
Jones and Norris, 2010 ^[14]	<ul style="list-style-type: none"> • A 47-year-old female patient. • Conditions not reported. 	<ul style="list-style-type: none"> • One self-administration of coffee enema for bowel cleansing. • The enema fluid was immediately discharged because of pain. • Coffee plus 1 L of water was cooled off, administered and retained for 10 minutes. 	<ul style="list-style-type: none"> • Hematochezia, rectal pain, and pain with defecation for 3 days. • Rectal burn was observed through sigmoidoscopy. • Hematochezia, tenesmus, spastic anal pain, and lower abdominal pain. • Diagnosed as proctocolitis. 	<ul style="list-style-type: none"> • Coffee should be cooled off prior to use to prevent complications such as rectal burn.
Keum et al, 2010 ^[17]	<ul style="list-style-type: none"> • A 60-year-old woman experiencing chronic constipation. 	<ul style="list-style-type: none"> • Coffee plus 1 L of water was cooled off, administered and retained for 10 minutes. 	<ul style="list-style-type: none"> • Hematochezia, tenesmus, spastic anal pain, and lower abdominal pain. • Diagnosed as proctocolitis. 	<ul style="list-style-type: none"> • Although the mechanism responsible for the adverse event is unknown, the possibility of chemical colitis should be considered. • Coffee enema has no proven benefits and carries a considerable risk of provoking unwanted complications. • Coffee enema may cause serious complications and its use should be reconsidered.
Kim et al, 2012 ^[19]	<ul style="list-style-type: none"> • A 27-year-old woman experiencing constipation 	<ul style="list-style-type: none"> • A hot coffee enema 	<ul style="list-style-type: none"> • Lower abdominal and anal pain • Necrotic mucosal lesions in the rectum developing to rectal perforation and peritonitis through CT scan 	<ul style="list-style-type: none"> • Coffee enema may cause serious complications and its use should be reconsidered.
Lee et al, 2008 ^[16]	<ul style="list-style-type: none"> • A 69-year-old male patient experiencing constipation. • Intermittently received treatment for constipation-type irritable bowel syndrome. 	<ul style="list-style-type: none"> • One self-administration of coffee enema to relieve constipation and abdominal pain. • The 40 °C enema fluid was administered 15 cm inside the rectal canal and was retained for 20 minutes. 	<ul style="list-style-type: none"> • Abdominal pain and bloody stool that lasted for 7 days. • Diagnosed as colitis through colonoscopy. 	<ul style="list-style-type: none"> • The most plausible mechanism of this adverse event is the caffeine in coffee, which causes an inflammatory reaction. • It is necessary to warn against the indiscreet use of self-administered coffee enema.
Margolin and Green, 1984 ^[13]	<ul style="list-style-type: none"> • A 23-year-old female patient with advanced breast cancer metastasized to hepatic lesions. • Failed to respond to standard chemotherapy. 	<ul style="list-style-type: none"> • Several self-administrations of coffee enema at a high frequency together with another alternative therapy. 	<ul style="list-style-type: none"> • Hepatic failure occurred, and the patient died. • Before death, stool, and blood cultures showed polymicrobial enteric septicemia. 	<ul style="list-style-type: none"> • The septicemia was believed to be induced by enema therapy in the setting of severely compromised hepatic function and portal hypertension.
Sashiyama et al, 2008 ^[20]	<ul style="list-style-type: none"> • A 29-year-old female patient experiencing constipation. 	<ul style="list-style-type: none"> • One self-administration of coffee enema to relieve constipation. • Enema fluid was immediately discharged because of pain. 	<ul style="list-style-type: none"> • Hematochezia and rectal pain. • Rectal burn was observed through proctoscopy. 	<ul style="list-style-type: none"> • Not reported.
Seo et al, 2009 ^[18]	<ul style="list-style-type: none"> • A 40-year-old female patient experiencing constipation. • Frequently used anti-constipation medicine for 20 years. 	<ul style="list-style-type: none"> • One self-administration of coffee enema to relieve constipation. • The enema fluid (600 mL) at a temperature slightly higher than the body temperature was administered 10 cm inside the rectal canal and was retained for 15 minutes. 	<ul style="list-style-type: none"> • Abdominal pain and bloody stool that lasted for 3 days. • Diagnosed as colitis through colonoscopy. 	<ul style="list-style-type: none"> • Defining the mechanism of this adverse event is difficult. • Enema is only effective when used with scientifically proven fluid and proper indication.

achlorhydria, degenerative arthritis, and cholelithiasis—with severe right upper-quadrant pain.

The case report of Eisele and Reay^[12] included one patient with cancer and another with multiple diseases, who rejected the conventional treatment at hospitals and administered coffee enema by themselves at a high frequency to relieve the symptoms caused by their diseases; both patients died shortly thereafter. The autopsy results revealed “low-salt patterns” (i.e., low sodium and chloride levels, and a relatively low potassium level) in both deaths. The authors concluded that it is induced by coffee fluid because it did not contain sodium and chloride, and that the excessive use of this fluid produced osmotic concentration gradients by which sodium and chloride levels drastically decreased to depletion levels. Such electrolyte imbalance was found as the most plausible cause of the deaths.

In Margolin and Green,^[13] a breast cancer patient who had metastasis to the liver began frequent self-administration of coffee enema. Later, this patient experienced hepatic failure and died thereafter. Although bacteremia that results from enema use is rare because of the clearance of the hepatic reticuloendothelial system, the stool and blood cultures obtained before death revealed polymicrobial enteric septicemia in this patient. For this reason, the author believed that the septicemia was induced by coffee enema under the condition of a severely compromised hepatic function and portal hypertension.

All 8 case reports with conclusions^[12–19] warned against the self-administration of coffee enema because of the absence of scientific evidence on the effectiveness and proper indication for administration, and, mostly, because of possible adverse events of which the mechanism is not yet clarified.

3.4. Effectiveness of self-administered coffee enema

No studies reported the effectiveness of self-administered coffee enema.

4. Discussion

This systematic review examined the effectiveness and safety of coffee enema as a means of self-care. Unfortunately, this systematic review did not find any reports on the clinical effectiveness of self-administered coffee enema in the literature. Only there were 2 case reports that report the effectiveness of coffee enema as sole intervention, which were administered by an oriental physician. According to the reports, coffee enema was effective for relieving constipation as caffeine increased the intestinal motility when absorbed in the intestinal mucosa,^[21] and decreasing lipids and cholesterol as well as improving thyroid function.^[22]

In regards to safety, based on acceptable quality of evidence, this systematic review revealed the risk of adverse events caused by the self-administration of coffee enema, which mostly include rectal burns and colitis. So far, the case reports in this systematic review could not clarify the mechanism of the adverse events and thus; asked for caution to use coffee enema by oneself.

On the matter of how much and why risky, we searched for more evidence on adverse events of coffee enema, and found 2 case reports. One reported 1 case of colon and rectum injury after coffee enema by an oriental physician.^[23] On the other hand, another case report reported 2 minor adverse events (i.e., nausea and abdominal inflation, respectively) among 42 cases while using coffee enema to treat constipation.^[21] With evidences of serious adverse events of coffee enema by themselves, and

inconsistent evidences by oriental physicians, the possibility is that a conductor’s level of skill is related to the safety issue. However, with very limited quantity and quality of the related evidences, we believe trials investigating self-administered coffee enema are needed to draw more concrete conclusions on either in terms of effectiveness or safety with plausible mechanism.

Meanwhile, we would like to address more about caffeine which was suggested as a possible contributing substance in both side of case reports that reported adversity and effectiveness. There were 2 pharmacological trials^[24,25] that specifically investigate whether coffee enema is effective or harmful because of its caffeine content. The results found that neither nor adversity was caused by caffeine. Therefore, the available evidence so far does not support caffeine as a substance that produces benefits or adverse events in the administration of coffee enema.

We declare several limitations of this systematic review. First, it is possible that the evidence is incompletely reviewed, which is a common concern when conducting a systematic review. Second, the quantity and quality of the included studies might be insufficient to draw a solid conclusion. Thus, further studies on the safety and effectiveness of the self-administration of coffee enema are needed in the future.

5. Conclusions

This systematic review was conducted to provide evidence utilized for public health information on the safe and effective use of coffee enema as a means of self-care. Despite several limitations, this systematic review clearly evidences potential adverse effects of self-administered coffee enema while its effectiveness is unclear. Therefore, coffee enema as a CAM modality cannot be adopted for self-care.

Author contributions

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Writing – review & editing: Hyun-Ju Seo, Heeyoung Lee, Sun Mi Choi, Sanghun Lee.

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