

Moxibustion for COVID-19: a systematic scoping review

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Abstract

Objective: Moxibustion has been widely used in the prevention and treatment of COVID-19. However, there is no systematic review of current topics and clinical findings on moxibustion for COVID-19. We conducted this scoping review to systematically summarize and analyze the themes and findings of published articles, and to provide an overview of current knowledge and practice of moxibustion for COVID-19.

Methods: PubMed, Embase, Cochrane Library, Web of Science, China National Knowledge Infrastructure, SinoMed, Wan Fang Data, and VIP databases were searched from inception until April 2022. The relevant data were presented through bar graphs, structured tables, and figures along with descriptive statistics and analysis. This scoping review was conducted based on the PRISMA-ScR Checklist.

Results: A total of 76 articles were reviewed: 47 reviews, 19 clinical research studies, seven systematic reviews (all were protocols), and three guidelines. All the studies were conducted by Chinese researchers and published from January 1, 2020 to March 14, 2022. The feasibility of moxibustion in the prevention and treatment of mild or moderate COVID-19 is based on the consensus of therapeutic mechanisms and effectiveness. The most adopted approach was the suspended and gentle moxibustion, and the most frequently applied or recommended acupoints were found to be ST36, CV8, CV6, CV4, CV12, GV14, BL13, LI4, ST25, and LR3.

Conclusions: As a convenient and safe traditional Chinese medicine (TCM) therapy with its specific feature, moxibustion has been significantly effective at ameliorating mild or moderate symptoms among COVID-19 patients. Further large-scale, well-designed research and international cooperation are still warranted in clinical evaluations of moxibustion.

Keywords: COVID-19, Moxibustion, Scoping review

Graphical abstract: <http://links.lww.com/AHM/A35>.

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Acupuncture and Herbal Medicine (2022) 2:3

Received 7 August 2022 / Accepted 20 September 2022

<http://dx.doi.org/10.1097/HM9.000000000000044>

Introduction

The catastrophic pandemic of the coronavirus disease 2019 (COVID-19) has had severe adverse effects on human life and the global social economy. As of 5:37 pm, CEST on June 3, 2022, 528,816,317 confirmed cases of COVID-19 had been reported to the World Health Organization (WHO) globally, with 6,294,969 related deaths^[1]. Epidemiological investigations have shown that COVID-19 has various signs and symptoms, including obvious fever and acute respiratory distress syndrome in most cases, and may cause multi-organ damage including respiratory, circulatory, digestive, or nervous system failures, etc^[2-4]. A proportion of survivors recovering from acute SARS-CoV-2 infection suffered from prolonged post-COVID condition illness, which lasted for weeks, months, or longer, and severely affected their quality of life^[5].

The “holistic” approach has been widely used to address multiple-organ problems in the pandemic^[6]. Traditional Chinese medicine (TCM), a comprehensive therapy with thousands of years’ history, has played a significant role in the prevention, treatment, and rehabilitation of COVID-19^[7]. TCM has been found to be effective in relieving patients’ symptoms and preventing transformation from mild to severe symptoms^[8]. Moxibustion, a major component of non-pharmacological TCM, has been widely adopted to address pandemics since ancient times, and to strengthen body conditions for the prevention of diseases^[9-10]. In the *Guidance for Acupuncture and Moxibustion Intervention for COVID-19 (second edition)*^[11] developed by China

Association of Acupuncture-Moxibustion (CAAM) in March 2020, moxibustion has been recommended for the prevention and treatment of COVID-19. Moreover, it was added as a supplemental treatment for COVID-19 convalescence by the *Guidelines for the Diagnosis and Treatment of COVID-19 by the National Health Commission (Trial Version 9)*^[12] in April 2022.

Scoping review is a research method used to identify literature on a specific topic or research area, to provide guidance on key concepts, research gaps, evidence sources and types for clinical practice, and policy-making and research, and can be used to effectively determine the field theme and clarify relevant concepts^[13–14]. To provide an overview of current knowledge and practice of moxibustion for COVID-19, we conducted this scoping review to systematically summarize and analyze the themes and findings of published articles on this topic.

Methods

This scoping review was conducted in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR)^[15] (Supplementary File S1, <http://links.lww.com/AHM/A28>). We reviewed literature in accordance with Arksey and O'Malley's methodological approach for scoping reviews^[13–15] through the following five stages: a) identification of the research questions, b) identification of the relevant studies, c) selection of studies for review, d) extraction and charting of the data, and e) summary of the results.

Review questions

This scoping review was conducted to address the following questions:

1. What are the target groups and clinical settings of moxibustion in the treatment of COVID-19?
2. What types/methods of moxibustion are suitable for addressing the pandemic?
3. What are the (main) theoretic and therapeutic characteristics of moxibustion for COVID-19?

Eligibility criteria

All types of published articles were searched for eligibility if they reported on the use of moxibustion in the prevention or treatment for COVID-19: original studies including randomized controlled trials (RCTs), non-RCTs (nRCTs), case-control studies, cohort studies, case series, case report, and qualitative clinical research, as well as systematic reviews, editorials and viewpoints, and guidelines were considered. Methods of moxibustion (in interventional trials) should be used in accordance with the theory of acupuncture and moxibustion: traditional moxa stick or cone moxibustion (based on suspended, circling, sparrow pecking-like or pressing technique), wheat-grain size cone moxibustion, material interposed moxibustion (with ginger, garlic, salt, and monkshood cake), needle warming moxibustion, blistering moxibustion, moxibustion using moxa burner or an electric machine, and other specific moxibustion techniques. We excluded articles that were irrelevant to COVID-19, duplicate publications, and texts that were unavailable

in full. Personal opinions, magazines, and news bulletins were also excluded.

Literature search

We searched PubMed, Embase, Cochrane Library, Web of Science, China National Knowledge Infrastructure, SinoMed, Wan Fang Data, and VIP databases from inception until April 2022. For each database, we developed an adequate research string that combined the term “COVID-19” with “moxibustion” “moxa” “acupoint” “interposed moxibustion” “needle warming moxibustion” “warm acupuncture” “moxa burner” or “electrical moxibustion,” and searched within titles, abstracts, and keywords (Supplementary File S2, <http://links.lww.com/AHM/A28>). We also searched the reference lists of all relevant papers in case of omitted literature. Search limiters were used when available (journal articles, English or Chinese language, and availability of the abstract).

Article selection and data extraction

Yi SW and Shan XJ conducted the literature search independently and screened the identified articles for relevance based on the title, keywords, and abstracts. After the preliminary screening, the relevance of the full-text articles was judged and screened out for eligibility by Yi SW and Jiang T. If judgments of certain literature were inconsistent, the authors discussed their disagreements to achieve consensus, or referred the issue to a third author (Deng SZ) for verification.

The following items were extracted from included articles using an Excel spreadsheet: first author, country and institution, date of publication, research type, target people, types of moxibustion, characteristics of the intervention (if available, including methods, acupoints, courses, and combinations), outcome indicators (if available), and thematic conclusions. Jiang T and Li L conducted data extraction independently and cross-checked after the process, and disagreements were resolved *via* discussion and consensus.

Results

A total of 1,043 records were retrieved with 624 remaining after re-checking. After preliminary screening based on reading title and abstract, 274 articles remained and 89 were evaluated for full-text eligibility. A total of 76 articles were finally retained for analysis, including 47 reviews, 19 clinical research (nine RCTs, six observational studies, three nRCTs, one protocol of RCT), seven systematic reviews (all were protocols), and three guidelines (Figure 1). All the studies were conducted by Chinese researchers (from 27 different provinces or regions) and published in 40 journals (51 Chinese and 25 English papers) from January 1, 2020 to March 14, 2022.

Consensus on the etiological and therapeutic mechanisms

Forty-seven reviews covered a wide range of topics, such as famous scholars' experience, evidence in literature, data mining, special moxibustion, mechanism of action, clinical application, and research progress (Supplementary Table S1, <http://links.lww.com/AHM/A28>).

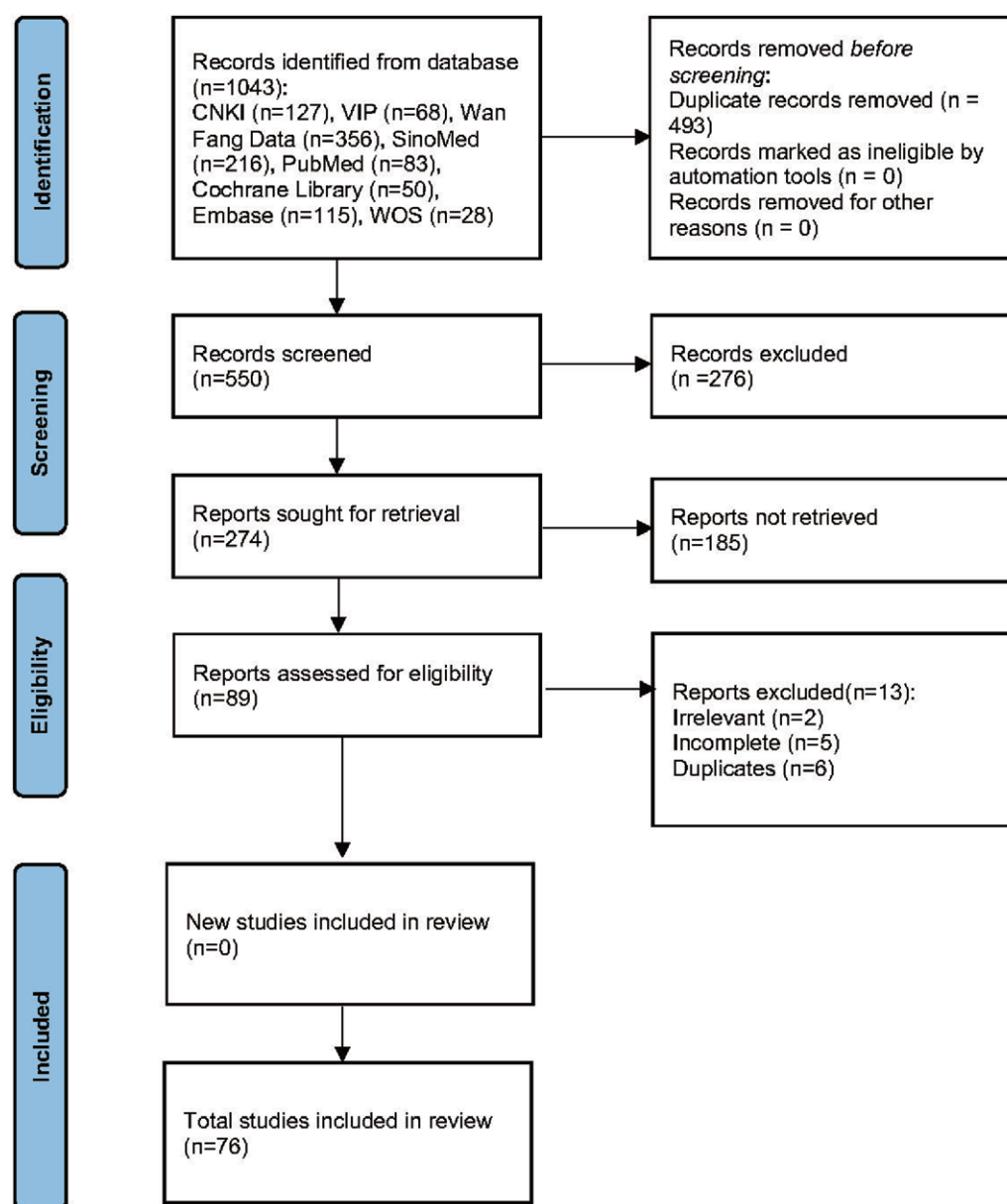


Figure 1. Flow diagram of articles identified and excluded.

Generally, consensus on the potential pathogenesis of the pandemic following the theoretical basis of TCM has been reached. Most COVID-19 patients mainly exhibit the symptoms of fever, cough, fatigue, and loss of appetite, which belong to the category of plague in TCM, the main disease being “wet poison,” also known as the “damp-toxicity plague” (*Shi Du Yi*). This disease occurs in the lungs and spleen, and the basic pathogenesis is characterized by wetness, toxicity, stasis, and closure^[16]. Moreover, because the pandemic outbreak began in the middle of the winter when the climate was cold and damp, it was classified as “cold-dampness plague” (*Han Shi Yi*)^[17]. The ups and downs of body *yang* and *qi* determine the susceptibility and prognosis of individuals to COVID-19.

As one of the characteristic therapies of TCM, moxibustion works by stimulating the acupuncture points or specific parts of the body surface with burning moxa leaves to stimulate the self-regulation function of the human body, and to achieve the purpose of disease prevention and treatment^[9-18]. China has thousands of years

of history of the application of moxibustion to prevent plague and treat infectious lung diseases. Moxibustion has been uniquely effective in dispelling poison, avoiding impurities, driving away the cold, and raising the body's *yang qi*^[9]. The selected reviews focused on the role of moxibustion in the prevention of the pandemic, and its feasibility in the treatment at the onset of the disease and for patients' recovery:

- 1) The disinfection and sterilization effect of moxa smoke and the germination effect as “natural vaccine”: Moxa fumigation and disinfection are comparable to or more optimized than ultraviolet disinfection^[19-22]. Moxa smoke can form a drug membrane in the indoor air and the upper respiratory tract to prevent bacteria and viruses^[18].
- 2) The anti-inflammatory effect of moxibustion therapy during the infective stage: There is a large amount of clinical evidence on moxibustion in the treatment of viral pneumonia. Animal experiments have shown that moxibustion can effectively protect the lung tissue of mice with influenza virus infection pneumonia by regulating inflammatory mediators, immunity, and

neuropeptides^[9,23–34]. Wu et al.^[25] explored the relationship between moxibustion and coagulation and fibrinolysis system and found that moxibustion can improve microcirculation, prevent thrombosis, and inhibit the high expression of the transforming growth factor- β (TGF- β), tumor necrosis factor α (TNF- α), interleukin-1 (IL-1), and interleukin-6 (IL-6). He et al.^[26] found that acupuncture can activate the cholinergic anti-inflammatory pathway and achieve the visceral protection effect of asthma with the help of neuroimmune regulation.

- 3) The effect of moxibustion in the prevention and treatment of pulmonary fibrosis that occur during and after recovery from COVID-19: CT images of patients with COVID-19 showed prolonged residual fibrous cords during their transition period^[27–28]. Moxibustion has been proven to play a role in preventing and treating lung fibrosis by influencing the various developmental process, and the mechanism may be related to delaying the development of epithelial cell-stromal cell transformation^[9,25,29–31].

Overview of clinical research

A total of 1420 patients with COVID-19 were enrolled in 19 clinical trials^[32–50], including 689 acute-infected hospitalized cases, 438 cases in the recovery phase, and 293 participants in the observation period (ie, suspected patients that were under quarantine or that needed to self-isolate, or healthy community residents of quarantine control regions). Study sample sizes ranged from 7 to 240. Sixteen studies (84.2%) reported the sexes of the participants (481 male and 449 female) and 15 studies (78.9%) reported the age, ranging from 6 to 76 years. A summary of the included clinical studies is provided in Table 1.

Interventions involved the combination of moxibustion with herbal decoction^[35,42,45,49–50], conventional therapy^[36,40], cupping^[46], acupoint applications^[34,39,41], and musicotherapy according to the theory of five elements^[32]; seven studies (four controlled trials^[33,37–38,43] and three case series^[44,47–48]) solely applied moxibustion. The most widely adopted moxibustion method was the suspended and gentle moxibustion (keeping the moxa stick lit at a certain distance from the skin thus giving the patient a warm sensation and not a burning one) (12/19, 63.16%). Three studies used moxa burners or containers; two of them conducted indirect moxibustion by interposing salt between the skin and moxa cone, or sticking heating pads onto the skin with herbal powder inside. One used thunder-fire wonder moxibustion (pressing the hot drug moxa stick onto the few layers of cloth or paper that cover the skin, to let the heat penetrate deep into the body). In one study, lit moxa sticks were only placed in the isolation ward to compare the effect of indoor disinfection with that of the air disinfection machine. Conventional therapy and routine quarantine were the most frequently used controls in RCTs and nRCTs.

Duration, frequency, and duration of treatment were reported in 18 studies (94.7%). The treatment time ranged from 8 to 15 minutes/point and lasted 25 to 60 minutes; frequency of treatment included once every three days, once every other day, once and twice a day, respectively. The course of treatment ranged from 3 to 30 days. After comprehensive statistics, 10 minutes/

acupoint (7 cases, 36.8%), 30 minutes/acupoint (6 cases, 31.6%), 1 day (13 cases, 68.4%) and 2 weeks of treatment (6 cases, 31.6%) were the most common. The most frequently used acupoints were ST 36 (11, 57.9%), DU 14 (six points, 31.6%), RN 8 (four points, 21.1%), RN 6 (four points, 21.1%), BL 13 (four points, 21.1%), etc (Figure 2A–C).

The main outcome indicators included total clinical response rate, TCM syndrome score, and PCR negative conversion rate. Symptom indexes also included Symptom Check List-90 (SCL-90), Fatigue Assessment Instrument, Pittsburgh Sleep Quality Index, Self-rating Anxiety Scale, Self-rating Depression Scale, etc. Immunoglobulin (IgA, IgM, IgG) levels were most often selected for laboratory tests. They also included blood cell analysis, biochemical indexes (leukocyte, granulocyte, lymphocyte, CRP), interleukin-6 (IL-6), and an absolute number of peripheral blood T lymphocyte subsets.

Characteristics of treatment and acupoint selection

We identified three distinct themes of clinical research on moxibustion for COVID-19

- 1) The application of moxibustion as an addictive therapy (in infection or recovery period) for the release of disease-related signs and symptoms, including pulmonary manifestations (cough, shortness of breath, throat discomfort), fatigue, muscle weakness, loss of appetite, diarrhea, etc.
- 2) The improvement of psychological discomfort or disorders such as depression, anxiety, and insomnia among COVID-19 patients, people in quarantine, or medical staff.
- 3) The preventive application of moxibustion to increase people's immune function or constitution.

Generally, results of the clinical research have yielded positive effects of moxibustion in improving scores of related symptoms, especially the typical symptoms in the acute phase like cough, breathlessness, and fatigue. It was also proved to be effective for treating the prolonged symptoms and attenuation of lung and spleen among convalescent patients^[42–50]. Particularly, moxibustion showed major advantages in the prevention and curing of psychological discomfort among recovery cases and quarantined individuals^[32–34,37,39,41,44]. Moreover, it was proved effective in improving several indexes of laboratory tests, particularly immunoglobulin (IgA, IgM, IgG) levels and several inflammatory indicators^[34–38]. Seven research protocols for systematic reviews have not been completed owing to the lack of clinical studies on COVID-19 and the associated symptoms of diarrhea, anorexia, abdominal pain, dyspnea, and anxiety disorders. In addition, incidence of adverse events was reported by one study—moxa stick-related itching in two cases^[48].

As for the acupoint selection, according to our systematic review, the most frequently applied or recommended acupoints in clinical trials and reviews were ST36 (39 times, 17.73%), CV8 (22 times, 10.00%), CV6 (21 times, 9.55%), CV4 (21 times, 9.55%), CV12 (18 times, 8.18%), GV14 (14 times, 6.36%), BL13 (12 times, 5.45%), LI4 (10 times, 4.55%), ST25 (seven times, 3.18%), and LR3 (six times, 2.73%). The major functions of the above acupuncture points include tonifying *qi* and blood, strengthening spleen and warming

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Table 1
(Continued)

Study	Types of research	Population	N (T/C)	Age (T/C)	Intervention	Control	Acupuncture points	Courses	Outcomes
Chen, 2020 ^[48]	Case series	Observation period, infection period, convalescence period	192 [#]	-	Material interposed moxibustion	-	Observation period: ST36, CV5, CV12; Infection period: LI4, LR3, ST36, CV4; Convalescent period: GV14, BL13, BL17, ST36, LU6	10d	① ③
Zhang, 2020 ^[49]	Case series	Infection period	7 [#]	22~50(35.71 ± 9.32) [#]	Suspended and gentle moxibustion combined with herbal medicine	-	LU9, LU7, LI4, LR3, ST36, CV8	2~5w	① ③
Ma, 2021 ^[50]	Case series	Recovery	18 [#]	6~64	Suspended and gentle moxibustion combined with herbal medicine	-	CV12, GV14, GV12	-	① ⑥ ⑦

RCT: randomized controlled trial; nRCT: non-randomized controlled trial; T: treatment group; C: control group; - not mention; *M (Q/R): # total number and age ranges (mean±SD) of included participants.

Acupuncture points: BL13: Feishu; BL17: Geshu; BL23: Shenshu; CV5: Qihai; CV6: Shenque; CV12: Zhongwan; CV13: Shangwan; CV14: Dazhui; GV12: Shenzhu; GV14: Mingmen; GV20: Baihui; GB31: Fengshi; KI1: Yongquan; LI4: Hegu; LI11: Quchi; LR3: Taichong; LR14: Qimen; LU5: Chize; LU6: Chize; LU7: Lieque; LU9: Taiyuan; SP9: Yinlingquan; ST25: Tianshu; ST32: Futu; ST36: Zusanli; ST40: Fenglong; PC6: Neiguan.

Outcome measurements: ① Evaluation of clinical symptoms via scores, scales, symptom check list, etc.; ② Pittsburgh sleep quality index (PSQI); ③ self-rating anxiety scale (SAS) & self-rating depression scale (SDS); ④ WHO self-reporting questionnaire 20 (SRQ-20); ⑤ 6 min walking test (6MWT); ⑥ Immunoglobulin (IgA, IgM, IgG) levels; ⑦ Biochemical indicators (blood cells, inflammatory factors, lymphocytes); ⑧ PCR negative conversion rate/time; ⑨ Days of hospitalization; ⑩ Others (tongue image, whether isolation is lifted, TCM constitution, air quality in ward, moxibustion acceptance rate).

meridians; warming *yang* to disperse cold, relaxing the lungs to regulate *qi*; tonifying the lungs to strengthen body resistance; strengthening the spleen and stomach, and soothing and clearing the mind. The meridian distribution of the main acupoints including the Lung, Stomach, Bladder, Large intestine, Liver, *Ren* and *Du* meridians (Supplementary Table S2, <http://links.lww.com/AHM/A28>).

Consensus and guidance

Moxibustion has been recommended in three national guidelines for the prevention and treatment of COVID-19:

- 1) *Guidance for Acupuncture and Moxibustion Intervention for COVID-19 (second edition)* issued by CAAM^[11]. Self-moxibustion is recommended at home under the instruction of a physician. Self-moxibustion is applied by the patient at ST36, PC6, LI4, CV6, and SP6 for approximately 10 minutes at each acupoint. Moreover, the plaster, i.e., moxibustion-thermal plaster, can be used at ST36, PC6, CV6, CV4, BL13, BL12, BL20, GV14, etc.
- 2) *Guidelines for Integrative Medicine Rehabilitation in the Recovery Period of Novel Coronavirus Pneumonia (first edition)*^[51]. Moxibustion was suggested for physiotherapy rehabilitation for discharged patients. Wheat-grain size cone moxibustion was applied at CV8, CV6, CV4, GV4, BL23, BL12, and BL43, with 3 to 5 days of treatment once and five times for each course. Moxibustion can be used in conjunction with acupuncture therapy.
- 3) *Guidelines for the Diagnosis and Treatment of COVID-19 by the National Health Commission (Trial Version 9)*^[12]. Moxibustion therapy was added to the guidance for the convalescence of COVID-19 after the last revision in April 2022. ST36 is recommended for the strengthening of the body. Moreover, material interposed moxibustion patches are recommended at GV14, BL13, BL20, and LU6 for 40 minutes for each patch, once a day.

Discussion

Disease prevention advantages of moxibustion with respect to the pandemic

TCM has played an active role in the prevention, treatment, and rehabilitation of COVID-19. “Non-drug” approaches like acupuncture, moxibustion, cupping, and *qigong* have been widely used to help patients release physical and mental discomforts. Moxibustion therapy has unique advantages in warming the meridian and dispersing cold, and aids in the strengthening and protection of the “healthy *qi*” of the body to avoid the “evil *qi*” (pathogenic factors). Moreover, the anti-inflammatory and disinfection effects of moxibustion have been confirmed^[10,52-53].

Moxibustion has been an important method for preventing and treating plagues since ancient times. In records of the *Handbook of Prescriptions for Emergencies* (Zhǒu Hòu Bèi Jí Fāng, 肘后备急方) of the Jin dynasty, it was reported that applying moxibustion at four corners of the bed can prevent the patient from contracting plague, which indicates that moxibustion can be used for disinfection. It has been recorded by Sun Simiao of the Tang dynasty in his book *Thousand Pieces of Essential Gold Formulae* (Qiān Jīn Yào Fāng, 千金要方), “When traveling to the Shu or Wu region, two or three moxa cones are needed.” Records on the treatment

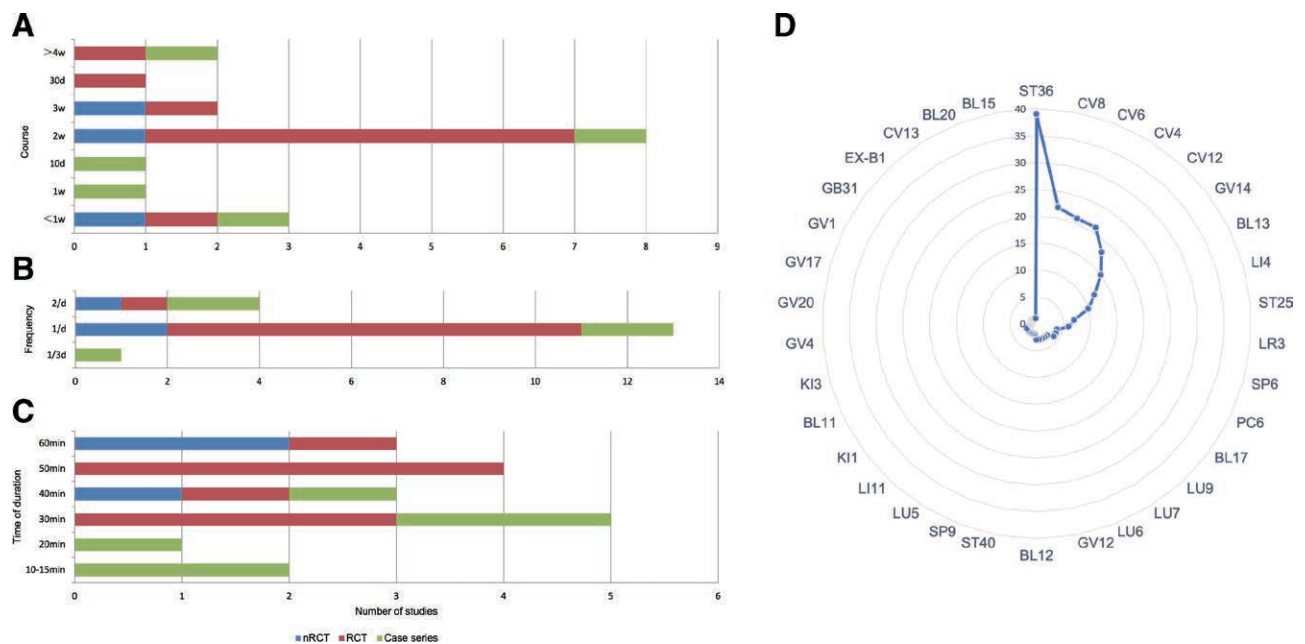


Figure 2. Characteristics of treatment and acupoint selection of moxibustion for COVID-19. (A–C) Treatment courses, frequency, and time of duration of each session (statistics of clinical research); (D) frequency of selection acupoints in clinical research and reviews. d: day(s); min: minutes; nRCT: Non-randomized controlled trial; RCT: Randomized controlled trial; w: week(s).

of cholera and plague in Lingnan area of China in the late Qing dynasty confirmed the significance of moxibustion in the prevention of infectious diseases^[53].

Suboptimal health status means that people’s physical, psychological, and emotional aspects are in a state of low quality (a status between health and illness), which is closely related to the physical situation, social environment, and psychological status, etc. Acupoints CV8, CV4, and CV6 belong to the *Ren Meridian*, which is “the sea of *yang*.” Therefore, the acupoints have the function of supplementing and reinforcing of *yang qi* of the body, and are often used for preventing diseases by strengthening the body health. According to the records in *Bian Que Heart Book* (Biǎn Què Xīn Shū, 扁鹊心书), “when there is no disease, frequent moxibustion at CV4, CV6, GV4, and CV12 may maintain more than 100 years of life though not up to immortality.” ST36 (Zu Sanli) has been pointed out by Sun Simiao who stated that “all diseases can be treated with moxibustion at Sanli for three cones” and “to avoid diseases, do not keep Sanli dry,” which illustrated the importance of moxibustion at ST36 for disease prevention and health care^[54–55]. Studies have proven that moxibustion at CV4 and ST36 can significantly increase the level of serum IL-2, reduce the level of serum IL-6, and enhance immune function^[56].

Consideration of treatment methods for different patient groups

WHO has affirmed moxibustion therapy as an effective way for the treatment of COVID-19 patients with mild and moderate symptoms, according to the report of the WHO Expert Meeting on Evaluation of TCM in the Treatment of COVID-19 held in Geneva on March 31, 2022^[57]. Moxibustion can be used for the observation, infection, and recovery periods of COVID-19 in accordance with current research. Zang-fu organs and

meridians syndrome differentiation should be considered for treatment approaches, under the principle of “easy to operate, simple and easy to implement, safe and effective.” Selection of acupoints should adhere to the basic idea of “fewer but better,” with priority being given to the major acupoints; appropriate addition and subtraction should be considered along with clinical manifestations.

For the selection of acupoints, according to the current research, ST36, CV8, CV6, and CV4 are recommended for individuals under observational conditions, or daily healthcare. Moxibustion at CV8, CV6, and ST36 can increase the activity of NK cells and the level of interleukin 2 (IL-2)^[58]; after moxibustion at ST36, T lymphocytes and the conversion rate of their subsets increased in mice, and levels of IgA and IgG increased significantly^[59]. Therefore, moxibustion is recommended for patients during the observation period to improve the immune defense and adaptive adjustment ability of the body.

Infected patients always showed mild, moderate, and severe manifestations. ST6, CV8, and SP9 can be used as major points for patients with mild and moderate symptoms like fatigue, body aches, nausea, sticky stool, etc. Two groups of acupoints are recommended based on the guidance of CAAM: 1) LI4, LR3, CV22, LU5, LU6, ST36, SP6 at frontal side and 2) BL11, BL12, BL13, BL15, BL17 at posterior side^[11]. For each treatment time, two to three acupoints can be used in either groups for mild or moderate patients, and adjustment of acupoints should be applied by syndrome differentiation: CV4, BL43, and LU7 can be added for patients with cold-dampness stagnation of lung; GV14, BL13, and GV13 for patients with damp-heat stagnation of lung. For patients with severe or critical symptoms, acupuncture is recommended as adjunction instead of moxibustion, combined with conventional or emergency treatment to reduce lung exudation and stabilize blood oxygen saturation.

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For convalescent patients, commonly used acupoints include GV14, BL13, CV13, CV12, BL7, ST36, LU6, etc. In addition, CV17, BL13, LU1, CV13, and SP 9 can be added for patients with *qi* deficiency of lung and spleen based on their clinical manifestation; CV17 and CV8 can be applied for patients with *qi* and *yin* deficiency if they exhibit obvious fatigue and breathlessness. KI3 and SJ4 can be added for dry mouth and obvious thirst; BL15 and BL14 can be added for palpitation; LI4, KI7, and ST36 can be added for heavy sweating; HT7, EX-HN3, EX-HN22, and KI1 can be added for insomnia.

It has been found that moxibustion may work *via* bidirectional immune regulation of the body. After moxibustion at ST36 and BL43, the level of peripheral T lymphocytes and their subsets changed significantly, and that of CD3⁺ cells and the ratio of CD4⁺/CD8⁺ cells were significantly higher after treatment. According to animal studies, moxibustion at GV14 and SP9 could enhance the phagocytosis and killing activity of macrophages in mice, as well as the release of TNF and NO, and increase expression of IL-2R α and IL-2R β in spleen lymphocytes; moxibustion at GV14, BL3 and GV13 could reduce the inhibitory factors of erythrocyte immune adhesion, and increase the red blood cell C3b receptor garland rate and red blood cell immune complex garland rate^[60-61].

Self-moxibustion under non-contact diagnosis and treatment mode

Many studies applied a mode of non-contact diagnosis and treatment because of the pandemic burden, that is, building an online doctor-patient interactive diagnosis and treatment platform. Online self-moxibustion application is taught by the doctor in charge of the isolated residents, patients, or their caregivers, and they are expected to complete follow-up treatment by themselves at home. They can also learn the procedure from related videos or related content on social media. Compared with acupuncture, it is easier and more practical for patients to conduct conventional moxibustion by themselves. Over the study period, subjects may be asked for filming the process of own operation and sending it to the research assistant. After qualification, the subjects begin to implement the moxibustion, and give feedback on the feeling of using the moxibustion method every day, that is, if dizziness, nausea, and other adverse reactions have occurred during the process^[33-39]. Generally, moxibustion is a simple, safe, and effective approach for self-management at home but requires additional data from clinical research for its feasibility.

Moreover, according to research, handhold suspension and gentle moxibustion is the most used approach, so it is suitable for home care under epidemic situation. However, for patients with respiratory symptoms, moxibustion devices with the function of smoke elimination are more recommended, to avoid the stimulation of the respiratory tract with moxa smoke. For guiding operation, the duration of moxibustion at each acupoint lasts 10 to 15 minutes, once per day. However, in clinical practice, moxibustion is rarely applied to acupoints one by one. Instead, devices like moxa burners or boxes are

used commonly to cover multiple acupuncture points simultaneously in one treatment session. A session generally lasts at least 30 minutes, which is a long time for the application of certain special procedures, such as heat sensitive moxibustion, and thunder-fire wonder moxibustion.

Limitations

There are several limitations to this study. Because of the language restriction, we only included articles published in English and Chinese, and all the included studies were conducted in China, which may lead to an omission of eligible research. Moreover, more than half of the included articles were reviews with broad topics, and we only synthesized the major results or perspectives of each review but did not track their references for the comprehensive exploration. In addition, owing to the lack of follow-up data in the study, this report does not provide information on long-term outcomes and patients' quality of life.

Conclusions

TCM offers alternative approaches to treating COVID-19 with its unique strengths in preemptive prevention, differentiated medication, and multi-targeted intervention. Moxibustion, a convenient and safe TCM therapy of its specific feature, has achieved significant effects in improving mild or moderate symptoms of COVID-19 patients, curing psychological discomfort among recovery cases and quarantined individuals, and preventing diseases by health benefits and air sterilization. Further large-scale, well-designed research and international cooperation is still warranted in clinical evaluations of moxibustion.

Conflict of interest statement

The authors declare no conflict of interest.

Funding

This work is supported by the National Natural Science Foundation of China: a study on the correlation between TCM syndromes and disease outcome of COVID-19 (82004505); National Key Research and Development Program of China: Real-world study of traditional Chinese medicine for COVID-19 (2021YFC0863200).

Author contributions

Meng Xia, Bo Pang, Hai Lu, and Tao Jiang conceived and designed the article. Shaowei Yi, Xinjue Shan, and Tao Jiang drafted the article. Shizhe Deng and Yinan Qin provided critical version of the manuscript. All authors contributed to the revision of the manuscript and approved the final manuscript.

Ethical approval of studies and informed consent

Not applicable.

Acknowledgments

None.

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How to cite this article: Xia M, Pang B, Yi SW, Shan XJ, Deng SZ, Qin YN, Jiang T, Lu H. Moxibustion for COVID-19: a systematic scoping review. *Acupunct Herb Med* 2022;2(3):162–171. doi: 10.1097/HM9.0000000000000044