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Herbal medicine and pattern identification for treating COVID-19: a rapid review of guidelines

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Abstract

Background: Coronavirus disease 2019 (COVID-19) is pandemic and has caused illness to many people worldwide. This review aimed to summarize and analyze the herbal formulae provided by the guidelines for their pattern identifications (PIs) and compositions of herbs to treat patients with COVID-19.

Methods: We searched 7 data sources for eligible traditional medicine guidelines up to March 6, 2020 and found a total of 28 traditional medicine guidelines that provide treatment measures for COVID-19.

Results: Of the 28 guidelines, there were 26 government-issued Chinese guidelines and 2 Korean guidelines. After standardizing the terminology of the PIs and herbal formulae, there were 8 PIs and 23 herbal formulae for the mild stage, 11 PIs and 31 herbal formulae for the moderate stage, 8 PIs and 21 herbal formulae for the severe stage, and 6 PIs and 23 herbal formulae for the recovery stage in the Chinese guidelines. In the Korean guidelines, there were 4 PIs and 15 herbal formulae for the mild stage, 3 PIs and 3 herbal formulae for the severe stage, and 2 PIs and 2 herbal formulae for the recovery stage. In the frequency analysis of herbs, Glycyrrhizae Radix et Rhizoma was found to be the herb with the highest frequency of usage in the Chinese guidelines.

Conclusion: This review can be used as guidance for the traditional medicine treatment of COVID-19. Clinical evidence is needed in the future to evaluate the efficacy of traditional medicine.

Keywords: Coronavirus disease 2019; Pattern identification; Herbal medicine; Chinese medicine; Korean medicine

1. Introduction

Coronavirus disease 2019 (COVID-19) is a newly identified strain of coronavirus that causes illness ranging from effects similar to the common cold to fatal diseases in people across the world.¹ This disease was first identified in early December 2019, and by the middle of March 2020, the World Health Organization (WHO) assessed COVID-19 as a pandemic.² As of March 2020, there have been more than 178,700 confirmed cases in at least 140 countries. The majority of cases were reported in mainland China, followed by Italy, Iran, Spain and South Korea.³

The common symptoms of COVID-19 include fever, cough, and shortness of breath. In severe cases, pneumonia may occur and ultimately lead to organ failure and even death.⁴ Currently, there are no available vaccines or specific medicines for the treatment of COVID-19. In light of the outbreak, various treatment modalities have been considered, including traditional medicine, which has been widely used during the past epidemic outbreaks, such as severe acute respiratory syndrome (SARS) and H1N1 influenza.⁵ To date, 2 countries, China and South Korea, have issued traditional medicine treatment guidelines on the prevention and treatment of COVID-19. Up to March 2020, there have been 7 versions of diagnosis and treatment guidelines issued by the National Health Commission of China⁶ and 2 versions of guidelines issued in South Korea.⁷

A recent systematic review suggested that “Based on historical records and evidence of SARS and H1N1 influenza prevention, Chinese herbal formula could be an alternative approach for the prevention of COVID-19 in high-risk populations”⁵ and it focused on prevention method but not treatment methods. Therefore, we aimed to systematically analyze

the herbal formulae in the guidelines for pattern identifications and herbal compositions recommended for treating patients with COVID-19.

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2. Methods

2.1. Data sources

The following data sources were searched on February 25, 2020 for eligible traditional medicine guidelines and searched up to March 6 to retrieve the updated version of the guidelines provided:

- Guidelines International Network (G-I-N)⁸
- “Chinese guidelines on Novel Coronavirus” resources⁹ by Evidence Aid
- The official government websites of all 31 provinces in mainland China (including municipal and autonomous regions)
- The Centre for Health Protection of the Hong Kong Special Administrative Region¹⁰
- Association of Korean Medicine and Korean Association of Traditional Pulmonary Medicine
- Japanese Association for Infectious Diseases and Japanese Respiratory Society¹¹
- Taiwan Centers for Disease Control¹²

2.2 Inclusion and exclusion criteria

This study focused on the recommended treatment modalities related to traditional medicine for COVID-19. All guidelines that provide traditional medicine treatment measures were included regardless of language, and publication types and years. Guidelines that only provide preventive measures without treatment measures were excluded.

Herbal formulae related to folk medicine were excluded only and other herbal formulae in these guidelines were included. As the guidelines were outlined based on regional characteristics, regional folk medicines, such as Tibetan medicine in Tibet, Mongolian

medicine in Inner Mongolia, and Miao medicine in Guizhou province, were integrated into their guidelines.

2.3 Data extraction and analyses

The data from each included guideline were extracted using a predefined data extraction table. The content of the data extraction tables comprised the stages of the disease, pattern identification, clinical symptoms, therapeutic principle, name and composition of herbal formulae, amount of herbs, and country or province of the provided guideline. The pattern identification and herbal formulae were analyzed according to the severity of the disease (mild, moderate, severe and recovered stages). The frequency of herbs recommended in the herbal formulae for each stage of disease was also computed and analyzed.

2.4 Terminology standardization

The terminology of pattern identification were standardized based on the clinical manifestation provided in the guidelines and Clinic Terminology of Traditional Chinese Medical Diagnosis and Treatment-Syndromes.¹³ The herbal formulae with missing names were also renamed by comparing the compositions of these herbal formulae with other named herbal formulae and double-checked them with the Dictionary of Traditional Chinese Medicine Formula¹⁴. All the terminologies were also standardized based on the WHO international standard terminologies for traditional medicine.¹⁵

3. Results

A total of 28 traditional medicine guidelines that provide treatment measures for COVID-19 were found. Of the 28 guidelines, there were 26 government-issued Chinese guidelines and 2 Korean medicine-professional associations-issued Korean guidelines. The Japanese government did not officially issue any traditional medicine guidelines on COVID-19, but they adopted a translated version of the national guideline issued by the National Health Commission of China. There were no official traditional medicine guidelines issued in Hong Kong or Taiwan.

In mainland China, there are currently 7 versions of national diagnosis and treatment guidelines, and traditional medicine content has been included since the third version.⁶ Using the government-issued national guidelines as a reference, 17 provinces, 4 municipalities and 4 autonomous regions in mainland China officially issued traditional medicine-related guidelines for the prevention and treatment of COVID-19. All the guidelines were devised by local health authorities according to regional characteristics and local prevalence of COVID-19 and have been continuously updated since the first issuance.⁵

In Korea, the Association of Korean Medicine and the Korean Association of Traditional Pulmonary Medicine each issued the first version of traditional medicine guidelines on the prevention and treatment of COVID-19 at the end of February 2020.⁷ Both guidelines were drafted by clinical experts who were also regularly updated by both associations to provide clinical guidance for the prevention and treatment of COVID-19 in South Korea.

In the frequency analysis of the herbs used in the herbal formulae for treating patients with COVID-19 according to the patients' disease stages and PIs (Tables 1-5), the results showed that there were 8 PIs and 23 herbal formulae for the mild stage (Table 1); 11 PIs and 31 herbal formulae for the moderate stage (Table 2); 8 PIs and 21 herbal formulae for the severe stage (Table 3); and 6 PIs and 23 herbal formulae for the recovery stage (Table 4) in the Chinese guidelines. The Korean guidelines suggested 4 PIs and 15 herbal formulae for the mild stage, 3 PIs and 3 herbal formulae for the severe stage, and 2 PIs and 2 herbal formulae for the recovery stage (Table 5).

Among the Chinese guidelines, we also found that most of the herbal formulae were recommended once in the respective guidelines. However, 17 herbal formulae were recommended several times by different guidelines, with a slight difference in the herbal compositions. The herbal formulae with the highest frequency of recommendation were the herbal formula of Shen Fu Tang with Su He Xiang Pill or Angong Niu Huang Pill in the severe stage and the combined formula of Xiang Sha Liu Junzi Tang and Li Zhong Pill in the recovery stage. In particular, Angong Niu Huang Pill, Zhi Bao Dan, Zi Xue San, and Su He Xiang Pill were the only prescriptions that were not required in the form of decoction and were only prescribed in the severe stage.

On the other hand, the herbal formula of Qingfei Paidu Tang, which is a combination of 4 different herbal formulae with 21 herbs (Tables 1-4), was recommended by the Chinese national diagnosis and treatment guidelines in the treatment of COVID-19 regardless of disease stage or regional status. This herbal formula was also recommended for the treatment of severe stage in the Korean guidelines (Table 5).

In addition, the frequency of the herbs used in the herbal formulae recommended by the Chinese guidelines for every stage and in total were computed (Figure 1). The results showed that these formulae contain 12 herbs with a frequency of use 30 or more times in the treatment formulae in all stages. Both *Armeniacae Semen Amarum* and *Ephedrae Herba* were found to be the top 10 herbs with the highest frequency of use in the mild, moderate and severe stages. The *Gypsum Fibrosum* and *Lepidii seu Descurainiae Semen* were also the top 10 most common herbs used in the moderate and severe stages. In addition, *Agastachis Herba*, *Forsythiae Fructus*, *Atractylodis Rhizoma*, and *Scutellariae Radix* were also highly used in both the mild and moderate stages. Notably, *Glycyrrhizae Radix et Rhizoma* was found in the top 10 herbs with the highest usage frequency in all four stages. It was also the herb with the highest frequency of usage in total.

4. Discussion

In this review, we systematically summarized and analyzed all the herbal formulae provided by the guidelines according to their pattern identification and herbal compositions. The Chinese medicine herbs used for the prevention of COVID-19 based on 23 provincial guidelines issued in mainland China were reviewed and analyzed in a recent publication.⁵ With reference to it, but in contrast, our review focused on the traditional medicine treatment measures recommended by all available guidelines. We extended our search of guidelines to nearby countries and reviewed guidelines issued by mainland China (25 provincial guidelines and 1 national guideline) and South Korea to conduct a more comprehensive review.

For the frequency analysis of herbs used in every Chinese guideline for COVID-19, each stage has several herbs that were not shown in the list of top 10 frequently used herbs for other stages. For instance, *Magnoliae Officinalis Cortex* and *Platycodonis Radix* could only be seen for the mild stage. *Magnoliae Officinalis Cortex* is often prescribed for the treatment of various gastrointestinal problems, such as fullness in the stomach, vomiting, and diarrhea from dampness. *Platycodonis Radix* is usually prescribed for coughs with excessive phlegm and sore throat due to exogenous pathogens.¹⁶ It could be inferred that gastrointestinal symptoms due to dampness and sore throat as well as coughing with sputum are the primary clinical manifestation in the mild stage of COVID-19. The active components contained in these 2 herbs also showed anti-inflammatory benefits in the *in vivo* studies of the acute lung injury model.^{17, 18}

In the severe stage, *Aconiti Lateralis Radix Praeparata* and *Rhei Radix et Rhizoma* were identified to be frequently used but not in other stages. This could be due to the extreme PIs

and clinical manifestations that are only found in severe patients. *Aconiti Lateralis Radix Praeparata* is known to treat heart failure and has anti-asthmatic and anti-epileptic properties.^{19, 20} The combination of *Aconiti Lateralis Radix Praeparata* and *Rhei Radix et Rhizoma* is also highly compatible, and this combination is often used in various herbal formulae. As these herbs have a certain degree of toxicity, they have to be used in caution and preferably are reserved for extreme cases.²¹

Moreover, there are 4 herbal medicines available only in the severe stage. *Angong Niuhuang Pill*, *Zhi Bao Dan*, *Zi Xue San*, and *Su He Xiang Pill* played a significant role in the severe stage treatment. *Angong Niuhuang Pill*, *Zhi Bao Dan*, *Zi Xue San* belongs to the First Aid Three Treasures of Chinese Medicine²², which is cold in nature and is used when the patient loses consciousness due to infectious disease-induced heat. In contrast, *Su He Xiang Pill* is an aromatic warm-natured medicine and is used when the patient loses consciousness due to a cold pathogen. All 4 herbal medicines were prescribed in different conditions of extremely severe or critical stages based on the patients' clinical manifestation, and they shared the same therapeutic principle to clear the orifices.

Pinelliae Praeparatum cum Zingiberis and *Citri Reticulatae Pericarpium* were only identified in the list of frequently used herbs in the recovery stage where patients may suffer from white and thin phlegm after their recovery. *Pinelliae Praeparatum cum Zingiberis* and *Citri Reticulatae Pericarpium* are major components of the herbal formula *Er Chen Tang*, which is usually prescribed to clear phlegm and dampness.¹⁶ Another herb, *Ophiopogonis Radix*, is conventionally used for nourishing yin and promoting fluid production. This herb is prescribed for dry cough caused by yin deficiency and is especially suitable for patients in the recovered stage.¹⁶

Glycyrrhizae Radix et Rhizoma is the herb with the highest frequency use overall regardless of disease stage. It is one of the antiviral herbal medicine which is approved by the China Food and Drug Administration (SFDA). Many studies have reported that this herb inhibits viral attachment, entry and replication, which is previously used in combating SARS.^{23, 24} Moreover, Glycyrrhizae Radix et Rhizoma also has an anti-inflammatory quality which is suitable for the treatment of inflammatory lung condition in COVID-19.²⁵

The herbal formula Qingfei Paidu Tang was recommended by both Chinese and Korean guidelines. In the Chinese guidelines, this formula is recommended for all stages. According to a recent publication²⁶, this herbal formula increases immunology and reduces inflammation by targeting the lung and spleen, which are the disease pathways of COVID-19. However, the herb Farfarae Flos was removed in the Korean guidelines due to its safety and toxicity.²⁷

This review has several limitations. First, the results of this review were obtained after standardizing the terms of the PIs and herbal formulae. Therefore, there might be a difference in the terms used in the provided guidelines. Second, this review does not include any direct evidence on the efficacy of traditional medicine in the clinical treatment of COVID-19. The results provided by this review are a summary of the traditional medicine guidelines, which can only be considered as guidance, and clinical verification is still required. Third, although this review summarized the most recent version of the national and provincial guidelines available up to March 6, 2020, the guidelines issued on COVID-19 by the Chinese government are constantly and frequently updated.

In conclusion, this review can be used as a reference in the traditional medicine treatment of COVID-19. Clinical studies are required to evaluate the efficacy and safety of traditional medicine and to provide clinical evidence. The integration of traditional medicine into conventional treatment may be an alternative approach for the treatment of COVID-19 in the future.

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Author contributions

Conceptualization: HWL and MSL. Methodology: LA and MSL. Software: LA and MSL. Validation: HWL, JYC, and JZ. Formal Analysis: LA and HWL. Investigation: LA, HWL and MSL. Resources: MSL. Data Curation: HWL and JYC. Writing – Original Draft: LA and HWL. Writing – Review & Editing: JYC, JZ and MSL. Visualization: HWL and MSL. Supervision: MSL. Project Administration: MSL. Funding Acquisition: MSL

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Conflict of interest

The authors declare no conflict of interest.

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Ethical statement

This research did not involve any human or animal experiment

Data availability

Data will be made available upon reasonable request.

Supplementary material

Supplement 1. English and Chinese terms of pattern identification, herbal formulae and herbs

name.

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Figure legend

Figure 1. Frequency of commonly used herbs in the herbal formulae for treating patients with COVID-19 in (A) mild stage; (B) moderate stage; (C) severe stage; (D) recovery stage; (E) total frequency of all stages.

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Table 1. Herbal medicines and pattern identification for treating mild stage patients with COVID-19

Pattern Identification	Name of herbal formula	Composition of herbal formula (Latin name)
Cold-Dampness Obstructing the Lung	Sang Bei Zhiou San	Mori Radicis Cortex, Fritillariae Thunbergii Bulbus, Stemonae Radix, Asteris Radix et Rhizoma, Cynanchi Stauntonii Rhizoma et Radix, Platycodonis Radix, Schizonepetae Spica, Citri Reticulatae Pericarpium, Armeniacae Semen Amarum, Glycyrrhizae Radix et Rhizoma
	Jia Jian Zhengqi San + Da Yuan Yin + Shen Shu San	Agastachis Herba 10g, Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Magnoliae Officinalis Cortex 10g, Amomi Tsao-ko Fructus 6g, Ephedrae Herba 6g, Osterici seu Notopterygii Radix et Rhizoma 10g, Zingiberis Rhizoma Recens 10g, Arcaea Semen 10g Agastachis Herba 10g, Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Magnoliae Officinalis Cortex 10g, Amomi Tsao-ko Fructus 6g, Ephedrae Herba 6g, Armeniacae Semen Amarum 10g Osterici seu Notopterygii Radix et Rhizoma 10g, Zingiberis Rhizoma Recens 10g, Arcaea Semen 10g Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 9g, Pinelliae Rhizoma 9g, Magnoliae Officinalis Cortex 9g, Ephedrae Herba 9g, Amomi Tsao-ko Fructus 6g, Osterici seu Notopterygii Radix et Rhizoma 9g, Coptidis Rhizoma 6g, Zingiberis Rhizoma Recens 9g Bupleuri Radix 20g, Agastachis Herba 10g, Atractylodis Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Magnoliae Officinalis Cortex 10g, Arcaea Semen 15g, Amomi Tsao-ko Fructus 6g, Platycodonis Radix 10g, Gypsum Fibrosum 20g, Glycyrrhizae Radix et Rhizoma 6g, Batryticatus Bombyx 10g, Cicadae Periostracum 5g
Wind-Cold Assailing the Lung	Jing Fang Baidu San + Jiwei Qianghuo Pill	Schizonepetae Spica 10g, Saposhnikovia Radix 10g, Osterici seu Notopterygii Radix et Rhizoma 10g, Perillae Folium 10g, Atractylodis Rhizoma 12g, Citri Reticulatae Pericarpium 10g, Magnoliae Officinalis Cortex 10g, Amomi Tsao-ko Fructus 6g, Lithospermi Radix 15g, Forsythiae Fructus 15g, Belamcandae Rhizoma 9g, Dryopteridis Crassirhizomatis Rhizoma 10g, Agastachis Herba 10g Schizonepetae Spica 15g, Saposhnikovia Radix 15g, Chuanxiong Rhizoma 15g, Angelicae Dahuricae Radix 15g, Menthae Herba 10g, Platycodonis Radix 10g, Schizonepetae Spica 10g, Perillae Folium 10g, Osterici seu Notopterygii Radix et Rhizoma 10g, Isatidis Folium 10g, Aurantii Fructus Immaturus 10g, Citri Reticulatae Pericarpium 10g, Alpiniae Katsumadai Semen 10g
	Jing Fang Baidu San + Huo Po Xia Ling Tang	Schizonepetae Spica 15g, Saposhnikovia Radix 15g, Chuanxiong Rhizoma 15g, Angelicae Dahuricae Radix 15g, Menthae Herba 15g, Platycodonis Radix 30g, Pogostemonis Herba 15g, Perillae Folium 15g, Magnoliae Officinalis Cortex 15g, Atractylodis Macrocephalae Rhizoma 30g, Pinelliae Rhizoma Praeparatum 15g, Massa Medicata Fermentata 15g, Coicis Semen 30g, Poria Sclerotium 30g, Myriciticae Semen 15g, Armeniacae Semen Amarum 15g, Crataegi Fructus 30g, Dolichoris Semen 30g, Phragmitis Rhizoma 30g Schizonepetae Spica, Saposhnikovia Radix, Bupleuri Radix, Cynanchi Stauntonii Rhizoma et Radix, Platycodonis Radix, Agastachis Herba, Magnoliae Officinalis Cortex, Pinelliae Rhizoma, Poria Sclerotium, Atractylodis Rhizoma Macrocephalae, Coicis Semen, Amomi Fructus Rotundus Lonicerae Flos 15g, Forsythiae Fructus 15g, Schizonepetae Spica 15g, Arctii Semen 15g, Menthae Herba 10g, Platycodonis Radix 15g, Armeniacae Semen Amarum 10g, Cicadae Periostracum 10g, Batryticatus Bombyx 10g, Curcumae Longae Rhizoma 10g, Glycyrrhizae Radix et Rhizoma 6g Lonicerae Flos 15g, Forsythiae Fructus 15g, Saposhnikovia Radix 9g, Scutellariae Radix 15g, Arctii Semen 9g, Platycodonis Radix 9g, Phragmitis Rhizoma 18g, Bupleuri Radix 9g, Citri Reticulatae Pericarpium 9g, Glycyrrhizae Radix et Rhizoma 6g Mori Folium 10g, Chrysanthemi Flos 10g, Armeniacae Semen Amarum 10g, Lonicerae Flos 15g, Forsythiae Fructus 10g, Arctii Semen 10g, Glycyrrhizae Radix et Rhizoma 5g Lonicerae Flos 30g, Forsythiae Fructus 30g, Schizonepetae Spica 15g, Arctii Semen 15g, Menthae Herba 15g, Platycodonis Radix 30g, Armeniacae Semen Amarum 15g, Pogostemonis Herba 15g, Magnoliae Officinalis Cortex 15g, Poria Sclerotium 30g, Pinelliae Rhizoma Praeparatum 15g, Amomi Fructus Rotundus 15g, Coicis Semen 30g Dolichoris Semen 30g, Crataegi Fructus 30g, Massa Medicata Fermentata 15g, Phragmitis Rhizoma 30g
Wind-Heat Invading the Lung	Yin Qiao San + Sheng Jiang San	Ephedrae Herba, Cinnamomi Ramulus, Armeniacae Semen Amarum, Gypsum Fibrosum, Phragmitis Rhizoma, Benincasae Pericarpium, Persicae Semen, Zingiberis Rhizoma Recens, Coicis Semen, Zizyphi Fructus, Glycyrrhizae Radix et Rhizoma
	Yin Qiao San*	Ephedrae Herba, Armeniacae Semen Amarum, Coicis Semen, Amomi Tsao-ko Fructus, Magnoliae Officinalis Cortex, Arcaea Semen, Lasiosphaera seu Calvatia, Nelumbinis Folium, Artemisiae Annuae Herba, Forsythiae Fructus, Osterici seu Notopterygii Radix et Rhizoma, Atractylodis Rhizoma, Platycodonis Radix, Rhei Rhizoma Preparatum cum Vinum
External Cold and Interior Heat Warm Pathogen Invading the Lung	Da Qing Long Tang + Qianjing Weijing Tang	Ephedrae Herba, Cinnamomi Ramulus, Armeniacae Semen Amarum, Gypsum Fibrosum, Phragmitis Rhizoma, Benincasae Pericarpium, Persicae Semen, Zingiberis Rhizoma Recens, Coicis Semen, Zizyphi Fructus, Glycyrrhizae Radix et Rhizoma
	Ma Xing Yi Gan Tang + Sheng Jiang San/ Da Yuan Yin / Qianghuo Shengshi Tang	Ephedrae Herba, Armeniacae Semen Amarum, Coicis Semen, Amomi Tsao-ko Fructus, Magnoliae Officinalis Cortex, Arcaea Semen, Lasiosphaera seu Calvatia, Nelumbinis Folium, Artemisiae Annuae Herba, Forsythiae Fructus, Osterici seu Notopterygii Radix et Rhizoma, Atractylodis Rhizoma, Platycodonis Radix, Rhei Rhizoma Preparatum cum Vinum
Heat Pathogen Assailing the Lung	Huo Po Xia Ling Tang + Xiao Chaihu Tang	Agastachis Herba 10g, Magnoliae Officinalis Cortex 10g, Pinelliae Rhizoma Praeparatum 10g, Poria Sclerotium 15g, Bupleuri Radix 15g, Scutellariae Radix 10g, Codonopsis Pilosulae Radix 10g, Armeniacae Semen Amarum 10g, Coicis Semen 20g, Polyporus 10g, Alismatis Rhizoma 10g, Amomi Fructus Rotundus 10g, Sojae Semen Preparatum 10g, Tetrapanacis Medulla 10g, Zingiberis Rhizoma Recens 5g, Zizyphi Fructus 5g Armeniacae Semen Amarum 12g, Talcum 15g, Tetrapanacis Medulla 6g, Amomi Fructus Rotundus 5g, Lophatheri Herba 10g, Magnoliae Officinalis Cortex 6g, Coicis Semen 20g, Pinelliae Rhizoma Praeparatum 6g, Batryticatus Bombyx 6g, Curcumae Longae Rhizoma 9g, Cicadae Periostracum 6g, Atractylodis Rhizoma 6g, Scutellariae Radix 10g, Artemisiae Annuae Herba 10g, Bupleuri Radix 15g, Moslae Herba 12g, Forsythiae Fructus 15g Not reported
	Ma Xing Yi Gan Tang + Sheng Jiang San + Da Yuan Yin + Huo Po Xia Ling Tang + Ma Xing Yi Gan Tang + Sang Ju Yin + Yin Qiao San	Mori Folium, Chrysanthemi Flos, Platycodonis Radix, Armeniacae Semen Amarum, Forsythiae Fructus, Phragmitis Rhizoma, Glycyrrhizae Radix et Rhizoma, Menthae Herba, Lonicerae Flos, Lophatheri Herba, Schizonepetae Spica, Sojae Semen Preparatum Bupleuri Radix 15g, Pinelliae Rhizoma Praeparatum 9g, Scutellariae Radix 9g, Zizyphi Fructus 9g, Zingiberis Rhizoma Recens 9g, Mori Radicis Cortex 12g, Armeniacae Semen Amarum 9g, Fritillariae Thunbergii Bulbus 9g, Adenophorae Radix 9g, Gardeniae Fructus 9g, Sojae Semen Preparatum 6g, Scrophulariae Radix 12g, Forsythiae Fructus 9g, Glycyrrhizae Radix et Rhizoma 9g
Dampness Encumbering the Exterior and Interior	San Ren Tang + Sheng Jiang San + Da Yuan Yin	Agastachis Herba, Perillae Folium, Platycodonis Radix, Menthae Herba, Forsythiae Fructus, Phragmitis Rhizoma, Talcum, Atractylodis Rhizoma Macrocephalae, Poria Sclerotium, Citri Reticulatae Pericarpium, Magnoliae Officinalis Cortex, Glycyrrhizae Radix et Rhizoma Ephedrae Herba 6g, Gypsum Fibrosum 15g, Armeniacae Semen Amarum 9g, Osterici seu Notopterygii Radix et Rhizoma 15g, Lepidii seu Descurainiae Semen 15g, Dryopteridis Crassirhizomatis Rhizoma 9g, Lumbricus 15g, Cynanchi Paniculati Radix 15g, Agastachis Herba 15g, Eupatorii Herba 9g, Atractylodis Rhizoma 15g, Poria Sclerotium 45g, Atractylodis Macrocephalae Rhizoma 30g, Hordei Fructus Germanus 9g, Crataegi Fructus 9g, Massa Medicata Fermentata 9g, Magnoliae Officinalis Cortex 15g, Arcaea Semen 9g, Amomi Tsao-ko Fructus 9g, Zingiberis Rhizoma Recens 15g Ephedrae Herba 9g, Armeniacae Semen Amarum 9g, Amomi Tsao-ko Fructus 10g, Arcaea Semen 10g, Cicadae Periostracum 6g, Astragali Radix 15g, Forsythiae Fructus 15g, Atractylodis Rhizoma 15g, Platycodonis Radix 15g, Scutellariae Radix 12g, Arctii Semen 10g, Glycyrrhizae Radix et Rhizoma 6g
	Ma Xing Yi Gan Tang + Sheng Jiang San + Da Yuan Yin + Huo Po Xia Ling Tang + Ma Xing Yi Gan Tang + Sheng Jiang San + Da Yuan Yin	Armeniacae Semen Amarum 10g, Amomi Fructus Rotundus 15g, Pinelliae Rhizoma Zingibere et alumine 15g, Citri Reticulatae Pericarpium 10g, Poria Sclerotium 15g, Coicis Semen 20g, Tetrapanacis Medulla 15g, Agastachis Herba 15g, Magnoliae Officinalis Cortex 15g, Atractylodis Macrocephalae Rhizoma 15g, Smilacis Rhizoma 20g, Lophatheri Herba 15g, Phragmitis Rhizoma 15g, Zingiberis Rhizoma Recens 10g, Glycyrrhizae Radix et Rhizoma 10g Ephedrae Herba 5-10g, Armeniacae Semen Amarum 5-10g, Amomi Tsao-ko Fructus 5-10g, Arcaea Semen 5-10g, Cicadae Periostracum 6-12g, Forsythiae Fructus 10-20g, Atractylodis Rhizoma 10-20g, Scutellariae Radix 10-15g, Coicis Semen 10-15g, Glycyrrhizae Radix et Rhizoma 5-10g Ephedrae Herba, Armeniacae Semen Amarum, Amomi Tsao-ko Fructus, Arcaea Semen, Cicadae Periostracum, Forsythiae Fructus, Atractylodis Rhizoma, Platycodonis Radix, Scutellariae Radix, Arctii Semen, Glycyrrhizae Radix et Rhizoma
Heat Pathogen Assailing the Lung	Da Yuan Yin*	Arcaea Semen 10g, Amomi Tsao-ko Fructus 10g, Magnoliae Officinalis Cortex 10g, Anemarrhenae Rhizoma 10g, Scutellariae Radix 10g, Bupleuri Radix 10g, Paeoniae Radix Rubra 10g, Forsythiae Fructus 15g, Artemisiae Annuae Herba 10g, Atractylodis Rhizoma 10g, Isatidis Folium 10g, Glycyrrhizae Radix et Rhizoma 5g Ephedrae Herba 8g, Armeniacae Semen Amarum 10g, Gypsum Fibrosum 30g, Glycyrrhizae Radix et Rhizoma 10g, Arcaea Semen 10g, Magnoliae Officinalis Cortex 10g, Amomi Tsao-ko Fructus 10g, Anemarrhenae Rhizoma 10g, Paeoniae Radix 10g, Scutellariae Radix 15g Not reported
	Yin Qiao San + Ma Xing Yi Gan Tang + Ma Xing Yi Gan Tang + Xiao Chaihu Tang	Forsythiae Fructus, Lonicerae Flos los, Platycodonis Radix, Menthae Herba, Arctii Semen, Lophatheri Herba, Phragmitis Rhizoma, Sojae Semen Preparatum, Ephedrae Herba, Gypsum Fibrosum, Armeniacae Semen Amarum, Bupleuri Radix, Cicadae Periostracum, Glycyrrhizae Radix et Rhizoma Ephedrae Herba 5-10g, Armeniacae Semen Amarum 5-10g, Gypsum Fibrosum 30-50g, Forsythiae Fructus 10-20g, Scutellariae Radix 5-10g, Bupleuri Radix 10-15g, Coicis Semen 10-15g, Magnoliae Officinalis Cortex 5-10g, Poria Sclerotium 10-15g, Glycyrrhizae Radix et Rhizoma 5-10g Ephedrae Herba 6g, Armeniacae Semen Amarum 15g, Amomi Tsao-ko Fructus 6g, Arcaea Semen 10g, Cicadae Periostracum 10g, Forsythiae Fructus 20g, Atractylodis Rhizoma 10g, Platycodonis Radix 10g, Scutellariae Radix 15g, Coicis Semen 20g, Arctii Semen 15g, Moslae Herba 12g
Pathogen Invading the Stomach and Intestines No specific PI	Wang Shi Lian Po Yin + Huo Po Xia Ling Tang	Agastachis Herba 15g, Perillae Folium 15g, Sojae Semen Preparatum 15g, Atractylodis Rhizoma 15g, Magnoliae Officinalis Cortex 10g, Angelicae Decursivae Radix 15g, Bupleuri Radix 15g, Scutellariae Radix 10g, Artemisiae Annuae Herba 20g, Armeniacae Semen Amarum 10g, Osterici seu Notopterygii Radix et Rhizoma 10g, Lonicerae Flos 15g, Forsythiae Fructus 15g Ephedrae Herba 6g, Armeniacae Semen Amarum 9g, Coicis Semen 18g, Amomi Fructus Rotundus 9g, Agastachis Herba 9g, Magnoliae Officinalis Cortex 12g, Pinelliae Rhizoma Praeparatum cum alumine 9g, Poria Sclerotium 12g, Polyporus 9g, Scutellariae Radix 9g, Forsythiae Fructus 12g, Glycyrrhizae Radix et Rhizoma 6g Coptidis Rhizoma, Magnoliae Officinalis Cortex, Pinelliae Rhizoma Praeparatum, Agastachis Herba, Poria Sclerotium, Polyporus, Talcum, Amomi Fructus Rotundus, Armeniacae Semen Amarum, Coicis Semen, Tetrapanacis Medulla, Alismatis Rhizoma
	Qingfei Paidu Tang	Ephedrae Herba 9g, Glycyrrhizae Radix et Rhizoma 6g, Armeniacae Semen Amarum 9g, Gypsum Fibrosum 15-30g, Cinnamomi Ramulus 9g, Alismatis Rhizoma 9g, Polyporus 9g, Atractylodis Macrocephalae Rhizoma 9g, Poria Sclerotium 15g, Bupleuri Radix 6g, Scutellariae Radix 6g, Pinelliae Rhizoma 9g, Zingiberis Rhizoma Recens 9g, Asteris Radix 9g, Farfure Flos 9g, Belamcandae Rhizoma 9g, Asari Herba 6g, Dioscoreae Rhizoma 12g, Aurantii Fructus 6g, Citri Unshus Pericarpium 6g, Agastachis Herba 9g

* Name of the herbal formula is originally not reported, and the authors named them based on Dictionary of Traditional Chinese Medicine Formula.

Table 2. Herbal medicines and pattern identification for treating moderate stage patients with COVID-19

Pattern Identification	Name of herbal formula	Composition of herbal formula (Latin name)
Warm Heat Pathogen	Ma Xing Shi Gan Tang	Ephedrae Herba 6g, Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Glycyrrhizae Radix et Rhizoma 6g, Cicadae Periostracum 6g, Rhei Rhizoma Preparata cum Vinum 6g, Agastachis Herba 10g
Congesting the Lung	Ma Xing Shi Gan Tang + Yin Qiao San	Ephedrae Herba, Armeniaceae Semen Amarum, Gypsum Fibrosum, Mori Radicis Cortex, Lonicerae Flos, Forsythiae Fructus, Scutellariae Radix, Fritillariae Pallidiflorae Bulbus, Glycyrrhizae Radix et Rhizoma, Phragmitis Rhizoma
	Ma Xing Shi Gan Tang* + Ganlu Xiaodu Dan + Sanghapi Yin	Ephedrae Herba, Armeniaceae Semen Amarum, Gypsum Fibrosum, Lonicerae Flos, Forsythiae Fructus, Scutellariae Radix, Curcumae longae Radix, Fritillariae Thunbergii Bulbus, Paeoniae Rubra Radix, Arisaematis Rhizoma Preparata cum Bovis Fel, Rhei Rhizoma Preparata cum Vinum, Coicis Semen
	Ma Xing Shi Gan Tang + Qianjing Weijing Tang	Scutellariae Radix 15g, Anemarrhenae Rhizoma 10g, Ephedrae Herba 10g, Armeniaceae Semen Amarum 9g, Amomi Fructus Rotundus 6g, Coicis Semen 30g, Mori Radicis Cortex 15g, Atractylodis Rhizoma 10g, Astragali Radix 10g, Lepidii seu Descurainiae Semen 15g
	Ma Xing Shi Gan Tang + Ma Xing Shi Gan Tang + Qianjing Weijing Tang	Ephedrae Herba 9g, Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Anemarrhenae Rhizoma 12g, Poria Sclerotium 10g, Phragmitis Rhizoma 30g, Oryzae Semen 30g, Benincasae Pericarpium 30g, Persicae Semen 12g, Fagopyri Radix 30g, Scutellariae Radix 12g, Platycodonis Radix 9g, Pinelliae Rhizoma 9g, Perillae Caulis 12g, Sappan Lignum 12g
	Qingqi Huan Tan Tang + Huo Po Xia Ling Tang	Citri Reticulatae Pericarpium 10-15g, Armeniaceae Semen Amarum 10-15g, Scutellariae Radix 10-15g, Trichosanthis Pericarpium 10-15g, Poria Sclerotium 15-30g, Agastachis Herba 15g, Magnoliae Cortex 10-20g, Artemisiae Annuae Herba 20-30g, Phragmitis Rhizoma 20-30g, Lonicerae Flos 15-30g, Pseudostellariae Radix 30g, Glycyrrhizae Radix et Rhizoma 5-10g
	Ma Xing Shi Gan Tang + Ganlu Xiaodu Dan + Sheng Jiang San	Ephedrae Herba 5-10g, Armeniaceae Semen Amarum 5-10g, Gypsum Fibrosum 30-50g, Talcum 10-20g, Artemisiae Scopariae Herba 10-30g, Scutellariae Radix 10-15g, Amomi Fructus Rotundus 5-10g, Agastachis Herba 10-15g, Atractylodis Rhizoma 10-15g, Lepidii seu Descurainiae Semen 10-20g, Forsythiae Fructus 10-15g, Batryticatus Bombyx 5-10g, Cicadae Periostracum 6-12g, Curcumae Longae Rhizoma 5-10g, Paeoniae Rubra Radix 10-15g, Glycyrrhizae Radix et Rhizoma 5-10g
Exterior Cold and Interior Heat Complicated by Dampness	Ma Xing Shi Gan Tang + Chuwen Huadu Tang + Sheng Jiang San	Ephedrae Herba 6g, Gypsum Fibrosum 30g, Armeniaceae Semen Amarum 10g, Glycyrrhizae Radix et Rhizoma 6g, Batryticatus Bombyx 10g, Curcumae Longae Rhizoma 9g, Cicadae Periostracum 6g, Menthae Herba 6g, Forsythiae Fructus 15g, Lonicerae Flos 15g, Scutellariae Radix 12g, Phragmitis Rhizoma 15g, Coicis Semen 20g, Caryophylli Flos 2g, Fritillariae Cirrhosae Bulbus 6g, Akebiae Caulis 12g, Moschus 0.4g
	Chaihu Da Yuan Yin + Leng Xiao Pill	Bupleuri Radix 12g, Magnoliae Cortex 15g, Amomi Tsao-ko Fructus 3g, Scutellariae Radix 15g, Aurantii Fructus 9g, Platycodonis Radix 10g, Arecae Semen 6g, Coicis Semen 20g, Ephedrae Herba 8g, Asari Herba 2g, Alumen 6g, Asteris Radix 15g, Peucedani Radix 15g, Farfarae Flos 15g, Gleditsiae Fructus 6g, Bambusae Silicea Concretio 5g, Aconiti Radix Preparata 3g, Moschus 0.4g
Dryness Invading the Lung	Sang Xing Tang + Qingxiao Ji Tang	Mori Folium 10g, Gypsum Fibrosum 30g, Eriobotryae Folium 30g, Armeniaceae Semen Amarum 15g, Ophiopogonis Radix 15g, Rehmanniae Radix 15g, Fritillariae Thunbergii Bulbus 15g, Adenophorae Radix 15g, Glycyrrhizae Radix et Rhizoma 6g
Cold-Dampness Obstructing the Lung	Ma Xing Yi Gan Tang	Ephedrae Herba 6g, Armeniaceae Semen Amarum 10g, Coicis Semen 30g, Glycyrrhizae Radix et Rhizoma 6g, Agastachis Herba 10g, Belamcandae Rhizoma 10g, Perillae Folium 6g, Atractylodis Rhizoma 3g, Magnoliae Cortex 6g, Citri Reticulatae Pericarpium 12g
Dampness Obstructing Middle Energizer	Jia Jian Zhengqi San* + Da Yuan Yin	Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Magnoliae Cortex 10g, Agastachis Herba 10g, Amomi Tsao-ko Fructus 6g, Ephedrae Herba 6g, Osterici seu Notopterygii Radix et Rhizoma 10g, Zingiberis Rhizoma Recens 10g, Arecae Semen 10g
	Qianjing Weijing Tang + San Zi Yangxin Tang + Shengyang Yiwei Tang	Phragmitis Rhizoma 20g, Coicis Semen 20g, Benincasae Pericarpium 30g, Persicae Semen 20g, Bupleuri Radix 12g, Citri Reticulatae Pericarpium 12g, Osterici seu Notopterygii Radix et Rhizoma 10g, Pinelliae Rhizoma 12g, Saposhnikovia Radix 15g, Astragali Radix 15g, Atractylodis Macrocephalae Rhizoma 15g, Panax ginseng Radix 6g, Perillae Semen 8g, Raphani Semen 12g, Moschus 0.4g
	Yi Jia Jian Zhengqi San	Agastachis Herba 15g, Magnoliae Cortex 15g, Armeniaceae Semen Amarum 10g, Poria Sclerotium 15g, Citri Reticulatae Pericarpium 10g, Massa Medicata Fermentata 15g, Hordei Fructus Germinatus 15g, Artemisiae Scopariae Herba 15g, Arecae Pericarpium 10g, Dolichoris Semen 30g, Glycyrrhizae Radix et Rhizoma 6g, Platycodonis Radix 10g, Coicis Semen 30g
Dampness Obstructing the Lung	Ma Xing Shi Gan Tang* + Qingqi Huan Tan Tang + Sanghapi Yin	Ephedrae Herba 9g, Armeniaceae Semen Amarum 10g, Lepidii seu Descurainiae Semen 20g, Mori Radicis Cortex 30g, Scutellariae Radix 15g, Benincasae Pericarpium 20g, Pinelliae Rhizoma 10g, Magnoliae Cortex 10g, Perillae Semen 15g, Brassicae Semen 10g, Trichosanthis Pericarpium 15g, Inulae Flos 9g, Cyperi Rhizoma 10g, Curcumae longae Radix 10g, Persicae Semen 10g, Astragali Radix 20g
	Ma Xing Yi Gan Tang + Da Yuan Yin	Ephedrae Herba 10g, Armeniaceae Semen Amarum 15g, Coicis Semen 20-30g, Amomi Tsao-ko Fructus 10-20g, Arecae Semen 10-15g, Forsythiae Fructus 10-30g, Atractylodis Rhizoma 10-15g, Magnoliae Cortex 10-15g, Scutellariae Radix 15g, Glycyrrhizae Radix et Rhizoma 5-10g
	Ma Xing Yi Gan Tang + Sheng Jiang San + Da Yuan Yin	Ephedrae Herba, Armeniaceae Semen Amarum, Coicis Semen, Amomi Tsao-ko Fructus, Arecae Semen, Cicadae Periostracum, Forsythiae Fructus, Atractylodis Rhizoma, Atractylodis Macrocephalae Rhizoma, Platycodonis Radix, Fritillariae Pallidiflorae Bulbus, Scutellariae Radix
Dampness toxin Congesting the Lung	Ma Xing Yi Gan Tang* + Da Yuan Yin	Ephedrae Herba 6g, Armeniaceae Semen Amarum 15g, Gypsum Fibrosum 30g, Coicis Semen 30g, Atractylodis Rhizoma 10g, Agastachis Herba 15g, Artemisiae Annuae Herba 12g, Polygoni Cuspidati Rhizoma et Radix 20g, Verbenae Herba 30g, Phragmitis Rhizoma 30g, Lepidii seu Descurainiae Semen 15g, Citri Grandis Rubrum Exocarpium 15g, Glycyrrhizae Radix et Rhizoma 10g
Phlegm-Heat Congesting the Lung	Qingwen Baidu Yin* + Sheng Jiang San	Ephedrae Herba 9-12g, Armeniaceae Semen Amarum 9g, Gypsum Fibrosum 30g, Trichosanthis Fructus 30g, Scutellariae Radix 12g, Mori Radicis Cortex 30g, Fritillariae Thunbergii Bulbus 9g, Eriobotryae Folium 9g, Adenophorae Radix 12g, Cicadidae Periostracum 6g
Phlegm-Heat Congesting the Lung	Ma Xing Shi Gan Tang + Ganlu Xiaodu Dan + Sheng Jiang San	Ephedrae Herba 8g, Armeniaceae Semen Amarum 12g, Gypsum Fibrosum 30g, Glycyrrhizae Radix et Rhizoma 10g, Talcum 30g, Artemisiae Scopariae Herba 20g, Scutellariae Radix 15g, Amomi Fructus Rotundus 10g, Agastachis Herba 15g, Pinelliae Rhizoma 15g, Atractylodis Rhizoma 15g, Lepidii seu Descurainiae Semen 20g, Forsythiae Fructus 15g, Batryticatus Bombyx 5g, Cicadae Periostracum 5g, Curcumae Longae Rhizoma 10g, Rhei Radix et Rhizoma 5g, Paradisi Rhizoma 10g, Moutan Cortex Radicis 15g, Paeoniae Rubra Radix 15g, Curcumae longae Radix 15g, Acori Tatarinowii Rhizoma 15g, Rehmanniae Radix 15g, Scrophulariae Radix 15g
	Xuan Bai Cheng Qi Tang + Huanglian Jiedu Tang + Jiedu Huoxue Tang	Ephedrae Herba 8g, Armeniaceae Semen Amarum 12g, Gypsum Fibrosum 30g, Rhei Radix et Rhizoma 10g, Trichosanthis Fructus 30g, Persicae Semen 10g, Paeoniae Rubra Radix 15g, Lepidii seu Descurainiae Semen 20g, Coptidis Rhizoma 3g, Scutellariae Radix 10g, Mori Radicis Cortex 10g, Paradisi Rhizoma 10g, Moutan Cortex Radicis 15g, Curcumae longae Radix 15g, Acori Tatarinowii Rhizoma 15g, Rehmanniae Radix 15g, Scrophulariae Radix 15g
	Ma Xing Yi Gan Tang + Sheng Jiang San + Da Yuan Yin	Ephedrae Herba 10g, Armeniaceae Semen Amarum 15g, Gypsum Fibrosum 30g, Coicis Semen 30g, Amomi Tsao-ko Fructus 10g, Arecae Semen 10g, Cicadae Periostracum 10g, Forsythiae Fructus 20g, Atractylodis Rhizoma 15g, Platycodonis Radix 15g, Scutellariae Radix 15g, Citri Semen 15g, Glycyrrhizae Radix et Rhizoma 10g
	Ma Xing Shi Gan Tang + Qingqi Huan Tan Tang	Ephedrae Herba 9g, Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30-50g, Glycyrrhizae Radix et Rhizoma 10g, Fritillariae Thunbergii Bulbus 15g, Trichosanthis Fructus 15g, Scutellariae Radix 15g, Platycodonis Radix 15g, Aurantii Fructus 15g, Poria Sclerotium 20g, Lepidii seu Descurainiae Semen 15g, Hououmyniae Herba 30g, Atractylodis Macrocephalae Rhizoma 15g, Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma 10g
Epidemic Toxin Blocking the Lung	Ma Xing Shi Gan Tang + Da Yuan Yin + Sheng Jiang San + Xuan Bai Cheng Qi Tang	Ephedrae Herba 6g, Ephedrae Herba (6) 6g, Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Amomi Tsao-ko Fructus 6g, Arecae Semen 10g, Atractylodis Rhizoma 10g, Lepidii seu Descurainiae Semen 10g, Persicae Semen 10g, Amomi Tsao-ko Fructus 6g, Arecae Semen 10g, Atractylodis Rhizoma 10g, Agastachis Herba 12g, Moschus 0.4g
	Xuan Bai Cheng Qi Tang + San Xiao Yin + Huo Po Xia Ling Tang	Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Trichosanthis Fructus 30g, Rhei Radix et Rhizoma 6g, Ephedrae Herba 6g, Lepidii seu Descurainiae Semen 10g, Persicae Semen 10g, Amomi Tsao-ko Fructus 6g, Arecae Semen 10g, Atractylodis Rhizoma 10g, Agastachis Herba 12g, Moschus 0.4g
	Ma Xing Shi Gan Tang* + Da Yuan Yin	Armeniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Trichosanthis Fructus 30g, Rhei Radix et Rhizoma 6g, Ephedrae Herba 6g, Lepidii seu Descurainiae Semen 10g, Persicae Semen 10g, Amomi Tsao-ko Fructus 6g, Arecae Semen 10g, Atractylodis Rhizoma 10g
	Ma Xing Shi Gan Tang + Sheng Jiang San + Huanglian Jiedu Tang	Ephedrae Herba 6g, Armeniaceae Semen Amarum 9g, Gypsum Fibrosum 30g, Agastachis Herba 12g, Pinelliae Rhizoma 12g, Poria Sclerotium 15g, Magnoliae Cortex 12g, Amomi Fructus Rotundus 12g, Coicis Semen 30g, Alismatis Rhizoma 9g, Sojae Semen Preparatum 12g, Scrophulariae Radix 12g, Trichosanthis Radix 12g, Glycyrrhizae Radix et Rhizoma 9g
	Xuan Bai Cheng Qi Tang* + Da Yuan Yin	Ephedrae Herba 6g, Ephedrae Herba 6g, Armeniaceae Semen Amarum 9g, Gypsum Fibrosum 30g, Lepidii seu Descurainiae Semen 9g, Trichosanthis Fructus 30g, Amomi Tsao-ko Fructus 6g, Arecae Semen 12g, Atractylodis Rhizoma 9g, Persicae Semen 9g, Rhei Radix et Rhizoma 6g
Heat Pathogen Assailing the Lung	Xuan Bai Cheng Qi Tang + Huanglian Jiedu Tang	Ephedrae Herba, Armeniaceae Semen Amarum, Gypsum Fibrosum, Arisaematis Rhizoma Preparata cum Bovis Fel, Rhei Rhizoma Preparata cum Vinum, Lepidii seu Descurainiae Semen, Bubali Cornu, Persicae Semen, Paeoniae Rubra Radix, Hirudo, Coicis Semen, Glycyrrhizae Radix et Rhizoma
	Ma Xing Shi Gan Tang	Ephedrae Herba 10g, Gypsum Fibrosum 30g, Armeniaceae Semen Amarum 10g, Glycyrrhizae Radix et Rhizoma 6g, Trichosanthis Fructus 30g, Rhei Radix et Rhizoma 6g, Lepidii seu Descurainiae Semen 30g, Penillae Folium 30g, Amomi Tsao-ko Fructus 6g, Arecae Semen 6g, Atractylodis Rhizoma 10g
	Bai Hu Tang + Qingying Baidu Yin	Gypsum Fibrosum 30g, Scrophulariae Radix 20g, Rehmanniae Radix 15g, Moutan Cortex Radicis 15g, Lophatheri Herba 10g, Lonicerae Flos 15g, Forsythiae Fructus 15g, Scutellariae Radix 15g, Menthae Herba 20g, Paeoniae Rubra Radix 15g, Curcumae longae Radix 15g, Lepidii seu Descurainiae Semen 10g, Glycyrrhizae Radix et Rhizoma 10g
	Ma Xing Shi Gan Tang + Yin Qiao San	Ephedrae Herba 9g, Armeniaceae Semen Amarum 9g, Gypsum Fibrosum 30g, Mori Radicis Cortex 15g, Lonicerae Flos 20g, Forsythiae Fructus 15g, Scutellariae Radix 12g, Fritillariae Thunbergii Bulbus 15g, Glycyrrhizae Radix et Rhizoma 9g, Dendrobii Herba 15g, Panacis Quinquefolii Radix 15g
		Ephedrae Herba, Armeniaceae Semen Amarum, Gypsum Fibrosum, Mori Radicis Cortex, Lonicerae Flos, Forsythiae Fructus, Scutellariae Radix, Fritillariae Thunbergii Bulbus, Glycyrrhizae Radix et Rhizoma
		Ephedrae Herba 10g, Armeniaceae Semen Amarum 10-15g, Gypsum Fibrosum 20-30g, Mori Radicis Cortex 15g, Lonicerae Flos 20-30g, Forsythiae Fructus 20-30g, Scutellariae Radix 15g, Fritillariae Thunbergii Bulbus 15g, Glycyrrhizae Radix et Rhizoma 5-10g
No specific PI	Qingfei Paidu Tang	Ephedrae Herba 9g, Glycyrrhizae Radix et Rhizoma 6g, Armeniaceae Semen Amarum 9g, Gypsum Fibrosum 15-30g, Cinnamomi Ramulus 9g, Alismatis Rhizoma 9g, Polyporus 9g, Atractylodis Macrocephalae Rhizoma 9g, Poria Sclerotium 15g, Bupleuri Radix 6g, Scutellariae Radix 6g, Pinelliae Rhizoma 9g, Zingiberis Rhizoma Recens 9g, Asteris Radix 9g, Farfarae Flos 9g, Belamcandae Rhizoma 9g, Asari Herba 6g, Dioscoreae Rhizoma 12g, Aurantii Fructus 6g, Citri Unshui Pericarpium 6g, Agastachis Herba 9g

* Name of the herbal formula is originally not reported, and the authors named them based on Dictionary of Traditional Chinese Medicine Formula.

Table 3. Herbal medicines and pattern identification for treating severe stage patients with COVID-19

Pattern Identification	Name of herbal formula	Composition of herbal formula (Latin name)
Internal Block and External Collapse	Shen Fu Tang + Su He Xiang Pill / Angong Niu Huang Pill	Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 10g, Corni Fructus 15g, Su He Xiang Pill / Angong Niu Huang Pill
	Shen Fu Tang* + Su He Xiang Pill / Angong Niu Huang Pill / Zi Xue San	Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 10g, Corni Fructus 15g, Su He Xiang Pill / Angong Niu Huang Pill / Zi Xue San
Toxin Blocking the Lung	Shen Fu Tang + Su He Xiang Pill / She Xiang Niu Huang Pill	Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 10g, Corni Fructus 15g, Su He Xiang Pill / Angong Niu Huang Pill / She Xiang Niu Huang Pill
	Shen Fu Tang	Panax ginseng Radix, Aconiti Lateralis Radix Praeparata, Asparagi Radix, Ophiopogonis Radix, Rhei Radix et Rhizoma, Lonicerae Flos, Bubali Cornu, Corni Fructus, Schisandrae Fructus, Phragmitis Rhizoma, Glycyrrhizae Radix et Rhizoma *Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 10g, Aconiti Tatarinowii Rhizoma 10g, Curcumae longae Radix 10g, Corni Fructus 10g, Schisandrae Fructus 10g, Zingiberis Rhizoma 15g, Glycyrrhizae Radix et Rhizoma 10g
Toxin Blocking the Lung	Sheng Mai San + San Shi Tang + Angong Niu Huang Pill	Panaxcis Quinquefolii Radix, Ophiopogonis Radix, Schisandrae Fructus, Gypsum Fibrosum, Rubrum, Talcum, Gypsum Fibrosum, Ameniaceae Semen Amarum, Lonicerae Flos, Tetrapanax Medulla, Bambusae Caulis in Taeniam, Angong Niu Huang Pill
	Si Ni Jia Renshen Tang + Angong Niu Huang Pill / Zi Xue San	1. Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 15g, Corni Fructus 20g, Angong Niu Huang Pill / Zi Xue San 2. Ginseng Radix 5-10g, Aconiti Lateralis Radix Praeparata 6-10g, Corni Fructus 20-25g, Angong Niu Huang Pill / Zi Xue San 3. Ginseng Radix, Aconiti Lateralis Radix Praeparata, Corni Fructus, Bambusae Silicea Concretio, Angong Niu Huang Pill / Zi Xue San
Toxin Blocking the Lung	Si Ni Jia Renshen Tang + (Zhi Xue San) + Su He Xiang Pill / Angong Niu Huang Pill	Panax ginseng Radix 20-30g, Aconiti Lateralis Radix Praeparata 30-60g, Corni Fructus 15-20g, Zhi Xue San, Su He Xiang Pill / Angong Niu Huang Pill
	Xuanbai Chengqi Tang	Ameniaceae Semen Amarum 10g, Gypsum Fibrosum 30g, Trichosanthis Fructus 30g, Rhei Radix et Rhizoma 6g, Ephedrae Herba 6g, Lepidii seu Descurainiae Semen 10g, Persicae Semen 10g, Magnoliae Cortex 10g, Amomi Tsao-ko Fructus 6g, Atractylodis Rhizoma 10g * Trichosanthis Fructus 30g, Curcumae longae Radix 10g, Lepidii seu Descurainiae Semen 30g, Salviae Miltiorrhizae Radix 30g, Lumbricus Corpus 15g, Bombycis Faeces 15g, Atractylodis Rhizoma 15g, Polyporus 30g, Rhei Radix et Rhizoma 10g, Aurantii Immaturus Fructus 15g, Gardeniae Fructus 15g, Panax ginseng Radix 30g Gypsum Fibrosum, Ameniaceae Semen Amarum, Rhei Radix et Rhizoma, Trichosanthis Fructus, Ephedrae Herba, Anemarrhenae Rhizoma, Scutellariae Radix, Phragmitis Rhizoma, Glycyrrhizae Radix et Rhizoma * Ephedrae Herba 6g, Ameniaceae Semen Amarum 9g, Gypsum Fibrosum 15g, Glycyrrhizae Radix et Rhizoma 3g, Agastachis Herba 10g, Magnoliae Cortex 10g, Atractylodis Rhizoma 15g, Amomi Tsao-ko Fructus 10g, Pinelliae Rhizoma Praeparatum 9g, Poria Sclerotium 15g, Rhei Radix et Rhizoma 5g, Astragali Radix 10g, Lepidii seu Descurainiae Semen 10g, Paeoniae Radix Rubra 10g * Gypsum Fibrosum 45g, Ephedrae Herba 10g, Ameniaceae Semen Amarum 10g, Lonicerae Flos 15g, Anemarrhenae Rhizoma 10g, Bubali Cornu 30g, Fritillariae Thunbergii Bulbus 10g, Trichosanthis Fructus 30g, Rhei Radix et Rhizoma 10g, Magnoliae Cortex 15g, Lumbricus Corpus 20g, Lepidii seu Descurainiae Semen 20g, Paeoniae Radix Rubra 20g, Astragali Radix 20g
Toxin Blocking the Lung	Ma Xing Shi Gan Tang + Xuanbai Chengqi Tang	Ephedrae Herba, Ameniaceae Semen Amarum, Gypsum Fibrosum, Mori Radicis Cortex, Fritillariae Thunbergii Bulbus, Glycyrrhizae Radix et Rhizoma
	Ma Xing Shi Gan Tang + Sang Bei San	Ameniaceae Semen Amarum, Gypsum Fibrosum, Trichosanthis Fructus, Rhei Radix et Rhizoma, Mori Radicis Cortex, Fritillariae Thunbergii Bulbus
Toxin Blocking the Lung	Xuan Bai Cheng Qi Tang + Sang Bei San (Self-prescribed) Tingli Xiefei Tang	Lepidii seu Descurainiae Semen 15g, Trichosanthis Fructus 9g, Fagopyri Radix 30g, Tripterospermi Chinensis Herba 30g, Scutellariae Radix 30g, Perillae Fructus 9g, Allii Macrostemis Bulbus 12g, Pinelliae Praeparatum cum Zingiberis 12g, Cinnamomi Ramulus 9g, Paeoniae Radix Alba 15g, Chuanxiong Rhizoma 15g, Brassicae Semen 9g
	Shen Fu Tang	Ginseng Radix Rubra 10g, Aconiti Lateralis Radix Praeparata 10g, Corni Fructus 30g, Ophiopogonis Radix 20g, Notoginseng Radix 10g
Blazing of both qi and nutrient	Shen Fu Tang + Su He Xiang Pill / Angong Niu Huang Pill	Panax ginseng Radix 30g / Panax ginseng Radix 10g, Panacis Quinquefolii Radix 15g, Aconiti Lateralis Radix Praeparata 15g, Su He Xiang Pill / Angong Niu Huang Pill
	Xuanbai Chengqi Tang + Huanglian Jiedu Tang + Jiedu Huoxue Tang	Ameniaceae Semen Amarum 9g, Gypsum Fibrosum 30g, Trichosanthis Fructus 15g, Rhei Radix et Rhizoma 6g, Ephedrae Herba 9g, Lepidii seu Descurainiae Semen 15g, Persicae Semen 10g, Paeoniae Radix Rubra 15g, Glycyrrhizae Radix et Rhizoma 9g, Trichosanthis Fructus 15g, Ophiopogonis Radix 20g Ameniaceae Semen Amarum 5-10g, Gypsum Fibrosum 30-50g, Trichosanthis Fructus 10-15g, Rhei Radix et Rhizoma 3-5g, Ephedrae Herba 5-10g, Lepidii seu Descurainiae Semen 10-20g, Persicae Semen 5-10g, Paeoniae Radix Rubra 10-15g, Glycyrrhizae Radix et Rhizoma 5-10g Ameniaceae Semen Amarum 15g, Gypsum Fibrosum 20-30g, Trichosanthis Fructus 15g, Rhei Radix et Rhizoma 5g, Ephedrae Herba 10g, Lepidii seu Descurainiae Semen 15-20g, Persicae Semen 10g, Paeoniae Radix Rubra 15g, Glycyrrhizae Radix et Rhizoma 5-10g Ameniaceae Semen Amarum, Gypsum Fibrosum, Trichosanthis Fructus, Rhei Radix et Rhizoma, Ephedrae Herba, Lepidii seu Descurainiae Semen, Persicae Semen, Paeoniae Radix Rubra, Curcumae longae Radix, Glycyrrhizae Radix et Rhizoma Bubali Cornu 30g, Rehmanniae Radix 15g, Scutellariae Radix 15g, Moutan Cortex Radicis 15g, Gypsum Fibrosum 30-50g, Gardeniae Fructus 10g, Scrophulariae Radix 15g, Fritillariae Thunbergii Bulbus 15g, Forsythiae Fructus 15g, Anemarrhenae Rhizoma 15g, Platycodi Radix 15g, Salviae Miltiorrhizae Radix 15g, Persicae Semen 15g, Lumbricus Corpus 15g, Chuanxiong Rhizoma 15g, Pseudostellariae Radix 15g, Glycyrrhizae Radix et Rhizoma 10g Gypsum Fibrosum 30-60g, Anemarrhenae Rhizoma 30g, Rehmanniae Radix 30-60g, Bubali Cornu 30g, Paeoniae Radix Rubra 30g, Scrophulariae Radix 30g, Forsythiae Fructus 15g, Moutan Cortex Radicis 15g, Coptidis Rhizoma 6g, Lophatheri Herba 12g, Lepidii seu Descurainiae Semen 15g, Glycyrrhizae Radix et Rhizoma 6g
Toxin Flowing through Five Viscera	Xiang Sha Liu Junzi Tang + Shen Su Jiangqi Tang	Ginseng Radix 7g, Aucklandiae Radix 6g, Magnoliae Cortex 30g, Perillae Folium 8g, Poria Sclerotium 15g, Atractylodis Rhizoma Macrocephalae 15g, Citri Reticulatae Pericarpium 12g, Glycyrrhizae Radix et Rhizoma 6g, Panax quinquefolius Radix 20g, Aurantii Fructus 10g, Cynanchi Stauntonii Rhizoma et Radix 15g, Panacis Quinquefolii Radix 6g, Fritillariae Thunbergii Bulbus 20g, Moschus 0.4g
Depletion of Essential Qi	Poge Jiuxin Tang + Guai Lou Xie Bai Banxia Tang + Danshen Yin	Aconiti Lateralis Radix Praeparata 20g, Corni Fructus 20g, Ossa Draconis and Concha Ostreae 20g, Magnetium 15g, Fluorinum 20g, Glycyrrhizae Radix et Rhizoma 12g, Ginseng Radix 15g, Faeces Trogopterori 12g, Allii Macrostemis Bulbus 12g, Pinelliae Rhizoma 12g, Poria Sclerotium 20g, Zingiberis Rhizoma Recens 5g, Dioscoreae Rhizoma 20g, Lili Bulbus 15g, Zingiberis Rhizoma 5g, Lycii Fructus 15g, Psoraleae Fructus 12g, Cuscutae Semen 15g, Astragali Radix 15g, Schisandrae Fructus 6g, Persicae Semen 15g, Ameniaceae Semen Amarum 15g, Asari Herba 3g, Brassicae Semen 15g, Bambusae Succus 20g, Jujubae Fructus 10 pieces, Salviae Miltiorrhizae Radix 10g, Santali Albi Lignum 3g
Exhaustion of Yin and Collapse Of Yang	Shen Fu Long Mu Tang	Ginseng Radix, Aconiti Lateralis Radix Praeparata, Ossa Draconis, Concha Ostreae
Toxin Clouding the Orifices	Zi Xue Dan / Zhi Bao Dan / Angong Niu Huang Pill / Su He Xiang Pill	Not available
Cold Epidemic Blocking the Lung	Xiao Qinglong Tang	Ephedrae Herba 10g, Paeoniae Radix Alba 10g, Asari Herba 3g, Zingiberis Rhizoma 10g, Glycyrrhizae Radix et Rhizoma 5g, Cinnamomi Ramulus 10g, Schisandrae Fructus 5g, Pinelliae Rhizoma Praeparatum 10g, Lepidii seu Descurainiae Semen 10g, Citri Reticulatae Pericarpium 10g, Atractylodis Rhizoma 10g, Magnoliae Cortex 10g, Codonopsis Pilosulae Radix 10g
No specific PI	Qingfei Paidu Tang	Ephedrae Herba 9g, Glycyrrhizae Radix et Rhizoma 6g, Ameniaceae Semen Amarum 9g, Gypsum Fibrosum 15-30g, Cinnamomi Ramulus 9g, Alismatis Rhizoma 9g, Polyporus 9g, Atractylodis Macrocephalae Rhizoma 9g, Poria Sclerotium 15g, Bupleuri Radix 16g, Scutellariae Radix 6g, Pinelliae Rhizoma 9g, Zingiberis Rhizoma Recens 9g, Asteris Radix 9g, Farfarae Flos 9g, Belamcandae Rhizoma 9g, Asari Herba 6g, Dioscoreae Rhizoma 12g, Aurantii Fructus 6g, Citri Unshui Pericarpium 6g, Agastachis Herba 9g

* Name of the herbal formula is originally not reported, and the authors named them based on Dictionary of Traditional Chinese Medicine Formula.

Table 4. Herbal medicines and pattern identification for treating recovery stage patients with COVID-19

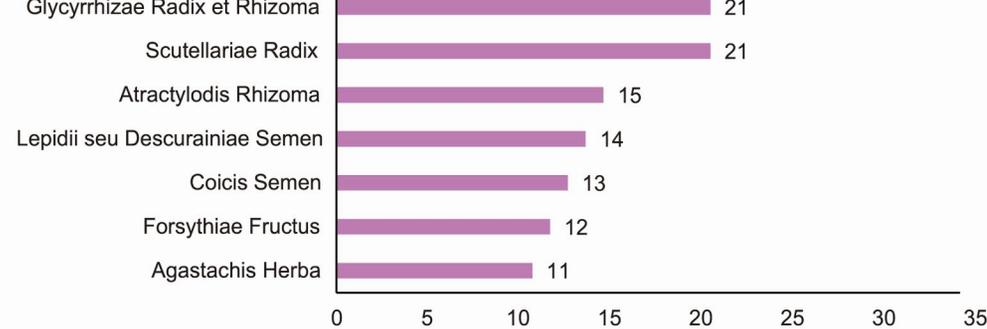
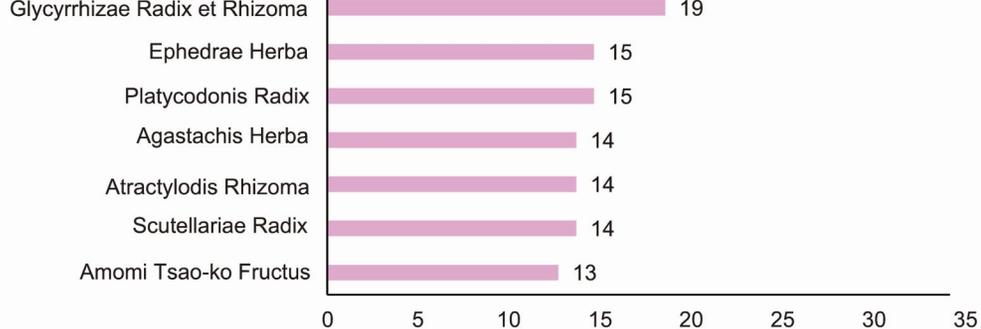
Pattern Identification	Name of herbal formula	Composition of herbal formula (Latin name)
Dual efficiency of Qi and Yin	Er Chen Tang + Wang Shi Qingshu Yiqi Tang	1. Panacis Quinquefolii Radix 15g, Dendrobii Herba 10g, Ophiopogonis Radix 15g, Anemarrhenae Rhizoma 9g, Lophatheri Herba 10g, Coptidis Rhizoma 6g, Glycyrrhizae Radix et Rhizoma 6g, Poria Sclerotium 15g, Pinelliae Rhizoma Praeparatum 9g, Citri Exocarpium Rubrum 10g, Citri Reticulatae Pericarpium 15g, Hordei Fructus Germinatus 20g 2. Panacis Quinquefolii Radix 20g, Dendrobii Herba 10g, Ophiopogonis Radix 10g, Anemarrhenae Rhizoma 10g, Lophatheri Herba 10g, Coptidis Rhizoma 3g, Glycyrrhizae Radix et Rhizoma 6g, Poria Sclerotium 15g, Pinelliae Rhizoma 10g, Citri Exocarpium Rubrum 10g, Citri Reticulatae Pericarpium 10g, Hordei Fructus Germinatus 30g
	Shengmai San* + Shen Ling Baizhu San	Codonopsis Radix 10g, Poria Sclerotium 15g, Atractylodis Macrocephalae Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Bambusae Caulis in Taeniam 10g, Glehniae Radix 15g, Ophiopogonis Radix 10g, Schisandrae Fructus 6g, Albizziae Cortex 15g, Setariae Fructus Germinatus 15g, Hordei Fructus Germinatus 15g, Glycyrrhizae Radix et Rhizoma 6g
Spleen-Lung Qi Deficiency	Buzhong Yiqi Tang* + Shashen Maidong Tang	Astragali Radix 15g, Pseudostellariae Radix 15g, Lophatheri Herba 15g, Adenophorae Radix 15g, Ophiopogonis Radix 15g, Phragmitis Rhizoma 20g, Trichosanthis Radix 9g, Polygonati Odorati Rhizoma 6g, Imperatae Rhizoma 20g, Glycyrrhizae Radix et Rhizoma 10g
	Maiwei Buzhong Yiqi Tang	Pseudostellariae Radix, Ophiopogonis Radix, Schisandrae Fructus, Astragali Radix, Atractylodis Macrocephalae Rhizoma, Citri Reticulatae Pericarpium, Angelicae Sinensis Radix, Glehniae Radix, Armeniacae Semen Amarum, Eriobotryae Folium, Lili Bulbus, Glycyrrhizae Radix et Rhizoma
	Shengmai San	Pseudostellariae Radix 15g, Ophiopogonis Radix 30g, Schisandrae Fructus 10g, Astragali Radix 30g, Atractylodis Macrocephalae Rhizoma 20g, Citri Reticulatae Pericarpium 10g, Angelicae Sinensis Radix 15g, Glehniae Radix 15g, Armeniacae Semen Amarum 10g, Glycyrrhizae Radix et Rhizoma 6g
	Shashen Maidong Tang*	Adenophorae Radix 15g, Ophiopogonis Radix 15g, Astragali Radix 15g, Massa Medicata Fermentata 20g, Paeoniae Radix Rubra 15g, Mori Cortex 15g, Lycii Cortex 15g, Aurantii Fructus 10g, Artemisiae Apiaceae Herba 15g, Rehmanniae Radix Crudus 15g
	Shashen Maidong Tang* + Zhuye Shigao Tang	*1. Adenophorae Radix 10g, Glehniae Radix 10g, Ophiopogonis Radix 15g, Panacis Quinquefolii Radix 6g, Schisandrae Fructus 6g, Gypsum Fibrosum 15g, Lophatheri Herba 10g, Mori Folium 10g, Phragmitis Rhizoma 15g, Salviae Miltiorrhizae Radix 15g, Salviae Miltiorrhizae Radix 15g, Glycyrrhizae Radix et Rhizoma 6g *2. Adenophorae Radix 15g, Ginseng Radix 9g, Codonopsis Radix 9g, Pseudostellariae Radix 15g, Ginseng Radix 9g, Panacis Quinquefolii Radix 9g, Asparagi Radix 9g, Ophiopogonis Radix 9g, Lophatheri Herba 9g, Mori Folium 9g, Cicadae Periostracum 6g, Lycii Cortex 9g, Atractylodis Rhizoma 15g, Setariae Fructus Germinatus 15g
	Buzhong Yiqi Tang + Caihu Sugan San	Ginseng Radix Rubra, Astragali Radix praeparata cum melle, Citri Reticulatae Pericarpium, Angelicae Sinensis Radix, Bupleuri Radix, Platycodonis Radix, Corni Fructus, Amomi Fructus, Atractylodis Macrocephalae Rhizoma, Polygoni Multiflori Radix, Coicis Semen
	Huangqi Liu Junzi Tang	Astragali Radix praeparata cum melle 30g, Amomi Fructus 6g, Codonopsis Radix 15g, Poria Sclerotium 15g, Atractylodis Macrocephalae Rhizoma 10g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma 9g, Agastachis Herba 10g, Glycyrrhizae Radix et Rhizoma 6g
	Huangqi Xiangsha Liu Junzi Tang	Astragali Radix praeparata cum melle 30g, Amomi Fructus 6g, Codonopsis Radix 15g, Poria Sclerotium 15g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma 9g, Agastachis Herba 10g
	Xiangsha Liu Junzi Tang + Li Zhong Pill	1. Pinelliae Rhizoma Praeparatum 9g, Citri Reticulatae Pericarpium 10g, Codonopsis Radix 15g, Astragali Radix praeparata cum melle 30g, Poria Sclerotium 15g, Agastachis Herba 10g, Amomi Fructus 6g *2. Citri Reticulatae Pericarpium 10g, Codonopsis Radix 15g, Astragali Radix praeparata cum melle 30g, Poria Sclerotium 15g, Agastachis Herba 10g, Amomi Fructus 6g *3. Pinelliae Rhizoma Praeparatum 9g, Citri Reticulatae Pericarpium 10g, Codonopsis Radix 15g, Astragali Radix praeparata cum melle 30g, Atractylodis Macrocephalae Rhizoma 10g, Poria Sclerotium 15g, Agastachis Herba 10g, Amomi Fructus 6g, Glycyrrhizae Radix et Rhizoma 6g
	Xiangsha Liu Junzi Tang*	Codonopsis Radix 15g, Astragali Radix praeparata cum melle 30g, Poria Sclerotium 15g, Pinelliae Rhizoma Praeparatum 9g, Citri Reticulatae Pericarpium 9g, Agastachis Herba 9g, Amomi Fructus 6g
Shen Ling Baizhu San	Panax ginseng 10g, Atractylodis Macrocephalae Rhizoma 15g, Poria Sclerotium 15g, Lablab Semen Album 30g, Amomi Fructus 6g, Nelumbinis Semen 30g, Glycyrrhizae Radix et Rhizoma 6g, Platycodonis Radix 10g, Dioscoreae Rhizoma 15g, Coicis Semen 30g, Hordei Fructus Germinatus 30g, Massa Medicata Fermentata 10g	
Xiangsha Liu Junzi Tang	1. Codonopsis Radix 12g, Astragali Radix 20g, Pinelliae Rhizoma Praeparatum 9g, Citri Reticulatae Pericarpium 6g, Poria Sclerotium 15g, Oryzae Semen 30g, Aucklandiae Radix 6g, Amomi Fructus 5g, Ophiopogonis Radix 12g, Moutan Cortex 10g, Glycyrrhizae Radix et Rhizoma 6g *2. Codonopsis Radix 20g, Astragali Radix praeparata cum melle 20g, Atractylodis Macrocephalae Rhizoma 15g, Poria Sclerotium 10g, Juglandis Semen 6g, Polygonati Rhizoma 15g, Glehniae Radix 12g, Ophiopogonis Radix 10g, Inulae Flos 6g, Rubiae Radix 10g, Curcumae Radix 10g, Coicis Semen 15g, Benincasae Semen 20g, Persicae Semen 12g, Perillae Fructus 10g, Dalbergiae Odoriferae Lignum 3g, Glycyrrhizae Radix et Rhizoma 6g *3. Astragali Radix 15g, Pseudostellariae Radix 15g, Corni Fructus 15g, Scutellariae Radix 15g, Notopterygi Rhizoma seu Radix 9g, Bupleuri Radix 9g, Scrophulariae Radix 12g, Trichosanthis Radix 12g, Glycyrrhizae Radix et Rhizoma 6g	
Lung-Stomach Yin Deficiency	Bufei Tang + San Zi Yangqin Tang	Adenophorae Radix 15g, Ophiopogonis Radix 15g, Polygonati Odorati Rhizoma 10g, Lablab Semen Album 20g, Mori Folium 10g, Trichosanthis Radix 20g, Glycyrrhizae Radix et Rhizoma 6g
Shashen Maidong Tang	Pseudostellariae Radix / Panacis Quinquefolii Radix 15g, Ophiopogonis Radix 18g, Schisandrae Fructus 9g, Pinelliae Rhizoma Praeparatum 9g, Citri Reticulatae Pericarpium 9g, Poria Sclerotium 15g, Fructus Amomi 6g, Lablab Semen Album 15g	
Dual Damage of Qi and Fluid	Shengyang Yiwei Tang + Zhuye Shigao Tang + Xiao Chaihu Tang + Buzhong Yiqi Tang + Shengmai Yin	Astragali Radix 18g, Codonopsis Radix 9g, Poria Sclerotium 15g, Atractylodis Macrocephalae Rhizoma 12g, Pinelliae Rhizoma Praeparatum 9g, Paeoniae Radix Alba 9g, Lophatheri Herba 6g, Alismatis Rhizoma 12g, Angelicae Pubescentis Radix 9g, Notopterygi Rhizoma seu Radix 9g, Bupleuri Radix 9g, Scrophulariae Radix 12g, Trichosanthis Radix 12g, Glycyrrhizae Radix et Rhizoma 6g
Liver Depression and Spleen Deficiency	Xiaoyao San + Si Ni San	Bupleuri Radix 6g, Aurantii Fructus 10g, Paeoniae Radix Rubra 10g, Angelicae Sinensis Radix 10g, Poria Sclerotium 30g, Atractylodis Macrocephalae Rhizoma 15g, Menthae Herba 10g, Glycyrrhizae Radix et Rhizoma 6g
Unclear Residual Heat	Maimendong Tang + Chaihu Qingzao Tang	Panax quinquefolius Radix 20g, Ophiopogonis Radix 12g, Citri Reticulatae Pericarpium 12g, Platycodonis Radix 9g, Trichosanthis Fructus 12g, Saposhnikoviae Radix 12g, Anemarrhenae Rhizoma 10g, Crassifoliorum Rhizoma 12g, Atractylodis Rhizoma 6g
	Zhuye Shigao Tang + Qingzao Jiufei Tang	Lophatheri Herba 15g, Gypsum Fibrosum 20g, Pseudostellariae Radix 15g, Ophiopogonis Radix 20g, Pinelliae Rhizoma 10g, Eriobotryae Folium 15g, Polygonati Odorati Rhizoma 15g, Scrophulariae Radix 15g, Armeniacae Semen Amarum 10g, Glycyrrhizae Radix et Rhizoma 10g
	Zhuye Shigao Tang + Si Junzi Tang	Lophatheri Herba 15g, Gypsum Fibrosum 15-20g, Pseudostellariae Radix 20-30g, Ophiopogonis Radix 10-15g, Pinelliae Rhizoma 10g, Atractylodis Macrocephalae Rhizoma 15-20g, Poria Sclerotium 15-20g, Glycyrrhizae Radix et Rhizoma 5-10g
	Zhuye Shigao Tang	Lophatheri Herba, Gypsum Fibrosum, Pseudostellariae Radix, Ophiopogonis Radix, Pinelliae Rhizoma, Oryzae Semen, Phragmitis Rhizoma, Setariae Fructus Germinatus, Glycyrrhizae Radix et Rhizoma
No specific PI	Qingfei Paidu Tang	Ephedrae Herba 9g, Glycyrrhizae Radix et Rhizoma 6g, Armeniacae Semen Amarum 9g, Gypsum Fibrosum 15-30g, Cinnamomi Ramulus 9g, Alismatis Rhizoma 9g, Polyporus 9g, Atractylodis Macrocephalae Rhizoma 9g, Poria Sclerotium 15g, Bupleuri Radix 16g, Scutellariae Radix 6g, Pinelliae Rhizoma 9g, Zingiberis Rhizoma Recens 9g, Asteris Radix 9g, Farfarae Flos 9g, Belamcandae Rhizoma 9g, Asari Herba 6g, Dioscoreae Rhizoma 12g, Aurantii Fructus 6g, Citri Unshus Pericarpium 6g, Agastachis Herba 9g

* Name of the herbal formula is originally not reported, and the authors named them based on Dictionary of Traditional Chinese Medicine Formula.

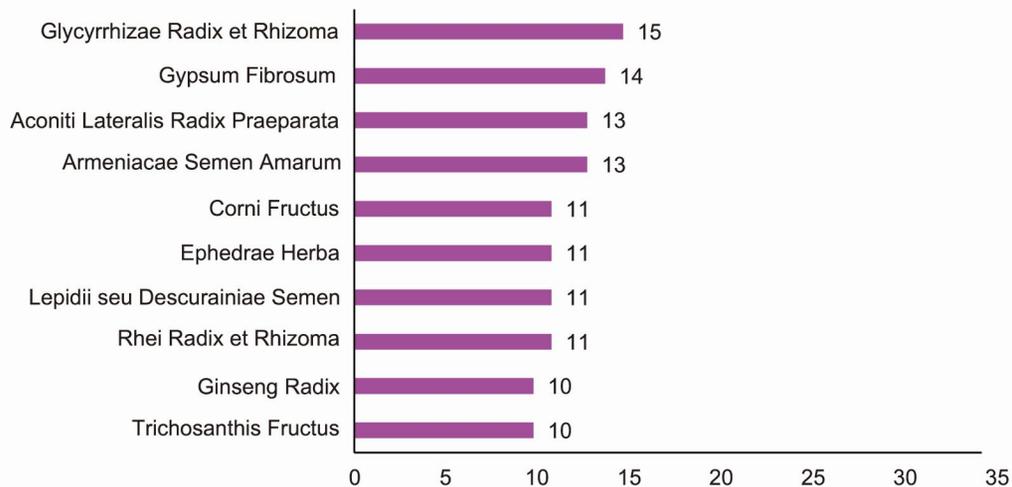
Table 5. Herbal medicines and pattern identifications for treating the patients with COVID-19 (Korean guidelines)

Pattern Identification	Name of herbal formula	Composition of herbal formula (Latin name)
Mild		
Exterior heat	Jin Fang Baidu San	Osterici Radix 4g, Araliae Continentalis Radix 4g, Bupleuri Radix 4g, Angelicae Decursivae Radix 4g, Poria Sclerotium 4g, Ginseng Radix 4g, Aurantii Fructus Immaturus 4g, Platycodi Radix 4g, Cnidii Rhizoma 4g, Schizonepetae Spica 4g, Saposhnikovia Radix 4g, Glycyrrhizae Radix et Rhizoma 2g
	Jiuwei Qianghuo Tang	Osterici Radix 6g, Saposhnikovia Radix 6g, Atractylodis Rhizoma 4.8g, Cnidii Rhizoma 4.8g, Angelicae Dahuricae Radix 4.8g, Scutellariae Radix 4.8g, Rehmanniae Radix Crudus 4.8g, Asiasari Radix et Rhizoma 2g, Glycyrrhizae Radix et Rhizoma 2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g, Allii Fistulosi Bulbus 4g
	Sang Ju Yin	Armeniacae Semen 8g, Forsythiae Fructus 6g, Menthae Herba 3.2g, Mori Folium 10g, Chrysanthemi Flos 4g, Platycodi Radix 8g, Glycyrrhizae Radix et Rhizoma 3.2g, Phragmitis Rhizoma 8g
	Yin Qiao San	Lonicerae Flos 40g, Forsythiae Fructus 40g, Platycodi Radix 24g, Menthae Herba 24g, Actii Semen 24g, Glycine Semen Preparatum 20g, Glycyrrhizae Radix et Rhizoma 20g, Lophatheri Herba 16g, Schizonepetae Spica 16g
	Gegen Jieji Tang	Paeoniae Radix 12g, Ephedrae Herba 8g, Scutellariae Radix 8g, Paeoniae Radix 6g, Cinnamomi Ramulus 4g, Glycyrrhizae Radix et Rhizoma 3.2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g
	Daochi Jiangqi Tang	Rehmanniae Radix Crudus 12g, Akebiae Caulis 8g, Scrophulariae Radix 6g, Trichosanthis Semen 6g, Angelicae Decursivae Radix 4g, Osterici Radix 4g, Araliae Continentalis Radix 4g, Schizonepetae Spica 4g, Poria Sclerotium 4g, Saposhnikovia Radix 4g, Alismatis Rhizoma 4g
	Qingjin Jianghuo Tang	Citri Unshius Pericarpium 6g, Armeniacae Semen 6g, Poria Sclerotium 4g, Pinelliae Tuber 4g, Platycodi Radix 4g, Fritillariae Thunbergii Bulbus 4g, Angelicae Decursivae Radix 4g, Trichosanthis Semen 4g, Scutellariae Radix 4g, Gypsum Fibrosum 4g, Aurantii Fructus Immaturus 3.2g, Glycyrrhizae Radix et Rhizoma 1.2g, Zingiberis Rhizoma Crudus 4g
	Ma Xing Gan Shi Tang + Qianjin Weijing Tang + Xiao Xianxiong Tang	Ephedrae Herba 5g, Armeniacae Semen 10g, Gypsum Fibrosum 20g, Glycyrrhizae Radix et Rhizoma 10g, Phragmitis Rhizoma 20g, Benincasae Pericarpium 15g, Coicis Semen 20g, Persicae Semen 10g, Trichosanthis Pericarpium 10g, Scutellariae Radix 10g, Pinelliae Rhizoma 10g, Rhei Radix et Rhizoma 5-10g, Paeoniae Radix 10g, Aurantii Fructus Immaturus 10g, Arceae Semen 10g, Lepidii seu Descurainiae Semen 15g, Perillae Folium 10g, Platycodi Radix 10g, Anemarrhenae Rhizoma 10g
	Ma Xing Shi Gan Tang + Qingqi Huanan Tang	Ephedrae Herba 9g, Armeniacae Semen 10g, Gypsum Fibrosum 30-50g, Glycyrrhizae Radix et Rhizoma 10g, Fritillariae Thunbergii Bulbus 15g, Trichosanthis Fructus 15g, Scutellariae Radix 15g, Platycodi Radix 15g, Aurantii Fructus Immaturus 15g, Poria Sclerotium 20g, Lepidii seu Descurainiae Semen 15g, Houttuyniae Herba 30g, Atractylodis Rhizoma Alba 15g, Atractylodis Rhizoma 15g, Citri Reticulatae Pericarpium 10g, Pinelliae Rhizoma 10g
	Agastachis Herba 6g, Perillae Folium 4g, Angelicae Dahuricae Radix 2g, Arceae Pericarpium 2g, Poria Sclerotium 2g, Magnoliae Cortex 2g, Atractylodis Rhizoma Alba 2g, Citri Unshius Pericarpium 2g, Pinelliae Tuber 2g, Platycodi Radix 2g, Glycyrrhizae Radix et Rhizoma 2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g	
Dampness	Huoxiang Zhengqi San	Agastachis Herba 6g, Perillae Folium 4g, Angelicae Dahuricae Radix 2g, Arceae Pericarpium 2g, Poria Sclerotium 2g, Magnoliae Cortex 2g, Atractylodis Rhizoma Alba 2g, Citri Unshius Pericarpium 2g, Pinelliae Tuber 2g, Platycodi Radix 2g, Glycyrrhizae Radix et Rhizoma 2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g
	Huo Po Xia Ling Tang	Coicis Semen 16g, Poria Sclerotium 12g, Armeniacae Semen 12g, Glycine Semen Preparatum 12g, Agastachis Herba 8g, Pinelliae Tuber 6g, Polyporus 6g, Alismatis Rhizoma 6g, Magnoliae Cortex 4g, Amomi Fructus Rotundus 2.4g
	Da Yuan Yin	Arceae Semen 10g, Amomi Tsao-ko Fructus 10g, Magnoliae Cortex 10g, Anemarrhenae Rhizoma 10g, Scutellariae Radix 10g, Bupleuri Radix 10g, Paeoniae Radix Rubra 10g, Forsythiae Fructus 15g, Artemisiae Annuae Herba 10g, Atractylodis Rhizoma 10g, Isatidis Folium 10g, Glycyrrhizae Radix et Rhizoma 5g
Yin Qiao San + San Ren Tang	Lonicerae Flos 15g, Forsythiae Fructus 15g, Platycodi Radix 10g, Actii Semen 10g, Phragmitis Rhizoma 20g, Menthae Herba 10g, Armeniacae Semen 10g, Amomi Fructus Rotundus 6g, Coicis Semen 20g, Tetrapanacis Medulla 10g, Paeoniae Radix 10g, Pinelliae Rhizoma 10g, Talcum 20g, Arceae Semen 10g, Amomi Tsao-ko Fructus 5g, Scutellariae Radix 10g, Glycyrrhizae Radix et Rhizoma 3g	
Cold-Dampness Obstructing the Lung	Gegen Jieji Tang + Buhuanjin Zhengqi San	Paeoniae Radix 12g, Ephedrae Herba 8g, Scutellariae Radix 8g, Atractylodis Rhizoma 8g, Paeoniae Radix 6g, Cinnamomi Ramulus 4g, Agastachis Herba 4g, Pinelliae Tuber 4g, Citri Unshius Pericarpium 4g, Magnoliae Cortex 4g, Glycyrrhizae Radix et Rhizoma 3.2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g
	Xiao Chaihu Tang + Buhuanjin Zhengqi San	Bupleuri Radix 12g, Scutellariae Radix 8g, Atractylodis Rhizoma 8g, Pinelliae Tuber 4g, Ginseng Radix 4g, Agastachis Herba 4g, Citri Unshius Pericarpium 4g, Magnoliae Cortex 4g, Glycyrrhizae Radix et Rhizoma 2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g
Severe		
No specific PI	Qingfei Paidu Tang	Ephedrae Herba 9g, Glycyrrhizae Radix et Rhizoma 6g, Armeniacae Amarum Semen 9g, Gypsum Fibrosum 15-30g, Cinnamomi Ramulus 9g, Alismatis Rhizoma 9g, Polyopus 9g, Atractylodis Macrocephalae Rhizoma 9g, Poria Sclerotium 15g, Bupleuri Radix 6g, Scutellariae Radix 6g, Pinelliae Rhizoma 9g, Zingiberis Rhizoma Recens 9g, Asteris Radix 9g, Belamcandae Rhizoma 9g, Asari Herba 6g, Dioscoreae Rhizoma 12g, Aurantii Fructus 6g, Citri Unshius Pericarpium 6g, Agastachis Herba 9g
	Ma Xing Shi Gan Tang	* Ephedrae Herba 6g, Armeniacae Amarum Semen 9g, Gypsum Fibrosum 15g, Glycyrrhizae Radix et Rhizoma 3g, Agastachis Herba 10g, Magnoliae Cortex 10g, Atractylodis Rhizoma 15g, Amomi Tsao-ko Fructus 10g, Pinelliae Rhizoma Praeparatum 9g, Poria Sclerotium 15g, Rhei Radix et Rhizoma 5g, Astragali Radix 10g, Lepidii seu Descurainiae Semen 10g, Paeoniae Radix 10g
	Shen Fu Tang + Su He Xiang Pill	Ginseng Radix 15g, Aconiti Lateralis Radix Praeparata 10g, Corni Fructus 15g, Su He Xiang Pill
Recovery		
No specific PI	Shen Zhu Jianpi Tang + Shengmai San	Liriodii Tuber 8g, Ginseng Radix 4g, Atractylodis Rhizoma Alba 4g, Poria Sclerotium 4g, Crataegi Fructus 4g, Citri Unshius Pericarpium 4g, Magnoliae Cortex 4g, Schisandrae Fructus 4g, Paeoniae Radix 3.2g, Ponciri Fructus Immaturus 3.2g, Glycyrrhizae Radix et Rhizoma 2g, Hordei Fructus Germinatus 2g, Amomi Fructus 2g, Massa Medicata Fermentata 2g, Zingiberis Rhizoma Crudus 4g, Zizyphi Fructus 4g
	Shen Zhu Jianpi Tang + Qingshu Yiqi Tang	Atractylodis Rhizoma 6g, Poria Sclerotium 4g, Atractylodis Rhizoma Alba 3g, Crataegi Fructus 4g, Ginseng Radix 3g, Citri Unshius Pericarpium 3g, Magnoliae Cortex 4g, Cimicifugae Rhizoma 4g, Astragali Radix 4g, Paeoniae Radix 3.2g, Ponciri Fructus Immaturus 3.2g, Alismatis Rhizoma 2g, Paeoniae Radix 2g, Angelicae Gigantis Radix 2g, Liriodii Tuber 2g, Citri Unshius Pericarpium Immaturus 2g, Glycyrrhizae Radix et Rhizoma 2g, Hordei Fructus Germinatus 2g, Amomi Fructus 2g, Massa Medicata Fermentata 2g, Phellodendri Cortex 1.2g, Schisandrae Fructus 9g

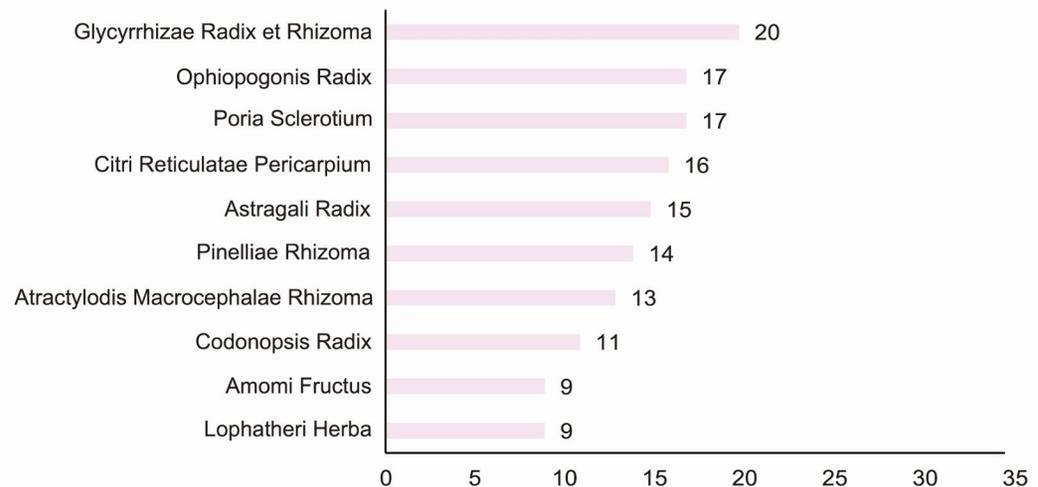
* Name of the herbal formula is originally not reported, and the authors named them based on Dictionary of Traditional Chinese Medicine Formula.



(C) Severe stage



(D) Recovery stage



(E) Total frequency

