

Acupuncture in the Treatment of COVID-19: An Exploratory Study

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Abstract

The coronavirus COVID-19 has presented a serious new threat to humans since the first case was reported in Wuhan, China on 31 December 2019. By the end of February 2020 the virus has spread to 57 countries with nearly 86,000 cases, and there is currently no effective vaccination available. Chinese herbal medicine has been used in this epidemic with encouraging results, but with concerns regarding disturbance of patients' digestive function. This study aims to explore the role of acupuncture in treating COVID-19 by investigating relevant current literature along with classical Chinese medicine texts on epidemics. Based on this analysis, acupuncture points and strategies are suggested for practitioners to use as a guide to treatment.

Keywords

Coronavirus, COVID-19, acupuncture, Chinese medicine, ghost points, infection, epidemic, pandemic.

Introduction

 Coronaviruses (CoV) can cause severe diseases like severe acute respiratory syndrome (SARS-CoV) or Middle East respiratory syndrome (MERS-CoV). The first case of a novel zoonotic coronavirus (nCoV) was reported in Wuhan, China on 31 December 2019 and it now presents a serious threat to humans.¹ One month later, nCov became a global emergent health issue and was renamed COVID-19 by the World Health Organization (WHO).² By 29 February (the time of writing), 38 days after the lockdown in Wuhan, China has 79,394 reported cases and 2,838 deaths, while 85,641 cases have been reported globally across 57 countries with 2,933 deaths.¹ Among those infected, 20 per cent are in intensive care. The WHO has already released 675 million dollars to help combat this global emergency, to cover the period from February to April,³ and has also gathered 300 top health professionals internationally to develop a vaccine before COVID-19 becomes pandemic.⁴ Despite Chinese

medicine experts apparently not being included in these efforts, in reality many studies from affected hospitals in China have reported that Chinese medicine has been playing an important role in the battle against COVID-19.^{5,6} Disappointingly, according to some Chinese medical academics, in some locations acupuncture has not featured as a treatment throughout the course of patients' infection, but only during the recovery period.⁷

Chinese medicine has a recorded history of over two thousand years of combating epidemics, with acupuncture playing a vital role alongside herbal medicine. For instance, Wu Youke (1580-1660) in his text *Zhen Jing* (Acupuncture Canons) pointed out how infectious qi attacks the human body via the mouth and nose and then penetrates inwards, as well as noting which acupoints should be employed in treatment.⁸

This study provides acupuncture strategies to treat COVID-19 and is based on both classical Chinese

medicine theory and current literature. The aim of this article is to shed new light on this urgent health struggle, and to help acupuncture practitioners contribute to their local communities.

Clinical manifestations of COVID-19

Chen et al.⁹ and Wang et al.¹⁰ each reported a case series based in two separate hospitals 10 miles apart in Wuhan during January 2020, which included a total of 237 subjects presenting with COVID-19. Chen et al.'s study documented infected patients as presenting with signs of fever (83 per cent) and cough (82 per cent), followed by dyspnoea (31 per cent), confusion (11 per cent) and headache (8 per cent), while 1 to 5 per cent of patients exhibited sore throat, rhinorrhoea, chest pain, diarrhoea, nausea and vomiting; 68 per cent of patients were male, 51 per cent experienced chronic illness and 75 per cent developed bilateral pneumonia. Wang et al.'s study reported the main symptoms as being fever (98.6 per cent), fatigue (69.6 per cent), dry cough (59.4 per cent), myalgia (34.8 per cent) and dyspnoea (31.2 per cent), with 54.3 per cent of the patients being male. Most of the patients in the two studies received antibiotic and antiviral treatments. The authors concluded that hypertension, diabetes, cardiovascular illness and malignancy are common comorbidities of COVID-19. Wang et al. point out that the best approach to COVID-19 is to avoid becoming infected in the first place, as the medication currently available is ineffective.

A few points are worth drawing out from these two reports:

- There are big differences in the major clinical manifestations of the illness as outlined in the two studies.
- A fair number of patients showed atypical symptoms, such as diarrhoea and nausea.
- Major complications appeared during hospitalisation, such as acute respiratory distress syndrome, arrhythmia and shock (Wang et al.).
- Traditional Chinese medicine texts that describe how epidemics have been fought through Chinese history can be used to address these points.

The Chinese medicine understanding of epidemic disease

The original Chinese term for epidemic, *li yi* (戾疫, literally 'ferocious epidemic'), has a recorded history of over two thousand years. In 524 BCE, the Zhou dynasty king Jing was admonished for his luxurious lifestyle, which he was advised put him at risk of contracting *li* (戾, ferocious qi).¹¹ Mozi (4th Century BCE) also mentions *li yi*, which was interpreted by Johnston (2010) as 'pestilence and plague'.¹²

Large-scale epidemics have emerged in China dozens of times since the

beginning of the first millennium, often occurring in cold and damp years as defined by five-phase philosophy.¹³ A large number of Chinese medicine scholars produced doctrines during or after such disasters that in time became famous. *Zhang Zhongjing* (150-129), who suffered the loss of many family members, composed the *Shang han lun* (Treatise on Cold Damage) in which he expounded that cold, wind or damp can invade the human body, penetrating from the yang channels of the outer body inwards the yin channels or organs. He stated that *li yi* is acute and infectious, its symptoms develop much swifter than typical *shang han* (cold damage), and can easily progress to a critical - even fatal - stage. It is important for physicians to intervene accurately and rapidly in such diseases to reverse the patient's situation.

Prior to the Ming dynasty, most Chinese medicine scholars believed *li yi* to be caused by cold, but this idea was challenged by Ming scholars such as Wu Youke after experiencing several epidemics that swept China, such as in

1641. Wu argued that cold only presents in winter, whereas warm epidemics (*wen yi* 温疫) can present in all seasons, and that *li yi* represents an extremely merciless exogenous qi that differs from the usual six exogenous forms of qi. Wu thought any acute epidemic disease related to unseasonable warmth, and should be treated with herbal medicine. He condemned some medical professionals for mistaking epidemic *yi qi* for *shang han* and therefore failing in their duty to adequately treat patients.¹⁴

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Warm disease theory was to cause many controversies; for instance, Qing dynasty scholars Ye Lin and Li Guanxian thought Wu may have confused his idea of warm disease with epidemic disease due to the phonetic similarity of their characters (温 warm and 瘟 epidemic – a character that did not exist in ancient Chinese).^{15,16} However, 瘟 was not only shown as an entry in the Chinese rhyme dictionary *Jiyun* (1037)¹⁷ but was also actually specifically identified and annotated by Wu in the chapter on *Miscellaneous Qi* in his text *Wen yi lun* (Treatise on Warm Epidemics).¹⁸ This warm versus cold controversy has still not been resolved, including Wu's conclusion that herbal medicine is the only cure for epidemic disease.

Regardless of whether or not Wu was correct on this point, the influence of the climate in Wuhan on the recent spread of COVID-19 can be understood using his theory. The Chinese medicine academic Tong¹⁹ as well as many other Chinese medicine scholars believe that the climate in Wuhan in December 2019, with its continuous rain and abnormal warmth, led to the epidemic by fostering cold and damp qi that impairs human yang qi, particularly in the Lung and Spleen. The facts on which this understanding is based are:

1. Patients mostly complain of fatigue, poor appetite, nausea, vomiting, fullness, diarrhoea or constipation, which points to damp-cold affecting the Spleen and Lung.
2. Patients' tongue coatings are very thick and greasy (described as *fu tai* 腐苔, a tongue coating that looks like rotten bean curd), indicating heavy dampness and turbidity.

Tong and his team have drafted a four-stage differentiation and a treatment protocol, as follows:

1. Damp-cold stagnating the Lung;
2. Epidemic toxicity blocking the Lung;
3. Visceral obstruction causing collapse;
4. Lung and Spleen deficiency.

Subsequently, Wang et al.,²⁰ Ma et al.²¹ and Chen et al.^{22,23} have expanded on this general outline with detailed herbal prescriptions to be tailored to individual patients' conditions. The primary principles of treatment are to warm yang, disperse cold and eliminate damp. Hubei medical experts characterised the COVID-19 virus as 'loving cold and being afraid of warmth'.²³

The role of acupuncture in treating COVID-19

Somewhat dispiritingly, while scholars have delivered strategies for herbal medicine, acupuncture treatment has received little attention. This article aims to explore the feasibility of acupuncture treatment for COVID-19-infected patients, and is based on published herbal strategies for this disease as well as Chinese medicine theory. Professor

Sun, co-author of this article, has been practising Chinese herbal medicine and acupuncture in Europe for over 40 years. This analysis is based on his empirical observations of what is more likely to suit European patients.

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All Chinese medicine academics emphasise that this epidemic is characterised by damp, cold and toxicity, which easily lead to heat and stasis. Professor Sun underlines that the key to treatment is to identify whether the pattern is one of damp-cold toxin causing heat or heat-toxin mixing with damp. In patients with constitutional yang excess, damp-cold accumulation can quickly turn to damp-heat. In such cases, the treatment principle should be to eliminate damp-cold whilst simultaneously clearing heat. Heat toxin mixed with damp represents a different scenario; even though damp is also present, the root treatment is to clear heat and remove toxin, whilst additionally eliminating damp. If the former pattern is mistaken for the latter when treating with herbal medicine, then damp toxin could be aggravated further. In general, the primary treatment principles should be to boost Stomach and Spleen qi while at the same time 1) dispersing cold and scattering damp, 2) eliminating inner toxic qi by venting the exterior, and 3) increasing qi to eliminate turbidity.

Epidemic qi attacks the body rapidly and violently, therefore clinical features can change dramatically and vary significantly between cases. Severe symptoms can develop within just a few days. The following clinical possibilities should be borne in mind:

- Once damp-cold becomes significant, it can: a) block the Lungs causing dyspnoea; b) attack the Pericardium causing chest tension, nausea, cold sweat and shock; c) cause Kidney yang failure, inducing haematuria, dehydration, abnormal urination and weight loss; and d) damage the Stomach and Spleen, leading to vomiting and diarrhoea.
- Once damp-cold turns to heat, it will occlude the Lungs and yangming (Stomach and Large Intestine) resulting in fever, coughing, chest tension and shortness of breath, fatigue, poor appetite, nausea, vomiting, bloating,

diarrhoea or constipation, eventually destroying the body's yin and evolving into endogenous wind syndrome.

How can one avoid contracting such a ferocious epidemic virus? The *Nei jing* (Inner Classic) provides the answer: people with strong *zheng* (upright) qi will avoid the worst effects of epidemic infection despite the fact that everybody, no matter their age or gender, may be affected.²⁴ Because each individual has a different physical constitution, the manifestations of the disease will vary, and so a single herbal prescription cannot be universally effective for every patient. Acupuncture is conducted with patients on a one-to-one basis, and is oriented more to provide symptomatic relief than the generic herbal decoctions applied during epidemic periods. The relevant acupuncture protocols, based on the Chinese government four-stage differentiation scheme for treating COVID-19, are outlined below.

Suspected infection period

Invasion of the Lung by damp-cold: beginning of infection with fever, chills, joint and muscle pain, fatigue, sore throat, bitter taste in the mouth, dry throat, a pale tongue with thin white coating and a slightly rapid floating pulse. Acupuncture prescription:

- Lieque LU-7 + Zhaohai KID-6, Waiguan SJ-5 + Zulinqi GB-41 with even method.
- Hegu LI-4, Fengchi GB-20, Zhigou SJ-6, Neiguan P-6, Feishu BL-13, Yanglingquan GB-34, Zhongwan REN-12, Fenglong ST-40 and Zusanli ST-36 with reducing method.

Damp-cold obstructing the Spleen: gastrointestinal discomfort, possibly fever, muscle pain, nausea, vomiting, diarrhoea, abdominal distension, fatigue, a pale tongue with a white greasy coating and a deep-slow or deep-delayed (*chen-chi*) pulse. Acupuncture prescription:

- Waiguan SJ-5 + Zulinqi GB-41, Neiguan P-6 + Gongsun SP-4 with even method.
- Zhigou SJ-6, Neiguan P-6, Feishu BL-13, Yanglingquan GB-34, Zhongwan REN-12, Fenglong ST-40, Tianshu ST-25, Yinlingquan SP-9, Zusanli ST-36 with even method.

Clinical treatment period

Initial stage:

Damp-cold occluding the Lung: possible fever, dry cough, bitter taste in mouth, dry throat, fatigue, chest tightness, nausea and/or vomiting, loose stools, pale or reddish tongue with white greasy coat, and a floating-soft pulse. Acupuncture prescription:

- Lieque LU-7 + Zhaohai KID-6, Neiguan P-6 + Gongsun SP-4, Waiguan SJ-5 + Zulinqi GB-41 with even method.

- Hegu LI-4, Chize LU-5, Zhongwan REN-12, Yanglingquan GB-34, Zusanli ST-36 and Qiuxu GB-40 with reducing method.

Intermediate stage:

Damp obstructing the middle and upper burner: Cough, white or yellowish sputum, rough expectorate, chest tightness, shortness of breath, stomach distension, nausea, abdominal bloating, poor appetite, loose stools, pale or reddish tongue with a white greasy coat and a floating-soft or weak pulse. Acupuncture prescription:

- Lieque LU-7 + Zhaohai KID-6, Neiguan P-6 + Gongsun SP-4, Waiguan SJ-5 + Zulinqi GB-41 with even method.
- Chize LU-5, Feishu BL-13, Yuji LU-10, Zhongwan CV-12, Fenglong ST-40, Yanglingquan GB-34, Zusanli ST-36, Tianshu ST-25 and Qiuxu GB-40 with reducing method.

Epidemic toxin obstructing the Lung, heat dropping into yangming: High fever, cough with yellow sputum, chest tightness, shortness of breath, panting, wheezing on exertion, bloated lower abdomen, constipation, red tongue with yellow greasy or dry coat and a slippery and rapid pulse. Acupuncture prescription:

- Lieque LU-7 + Zhaohai KID-6, Neiguan P-6 + Gongsun SP-4 with even method.
- Chize LU-5, Feishu BL-13, Shanzhong REN-17, Yuji LU-10, Hegu LI-4, Quchi LI-11, Tianshu ST-25, Fenglong ST-40 and Neiting ST-44 with reducing method.

Severe stage:

Internal obstruction causing collapse, yin and yang separating: Severe breathing difficulty, asphyxia (mechanical ventilation may be needed), unconsciousness, restlessness, sweaty and cold extremities, a dark purple tongue with thick or dry coat, and a large floating rootless pulse. Acupuncture prescription:

- Baihui DU-20, Guanyuan REN-4, Qihai REN-6, Zusanli ST-36, Feishu BL-13, Shanzhong REN-17 and Sanyinjiao SP-6 with reinforcing method, and moxibustion on Guanyuan CV-4 and Qihai CV-6.
- Tianshu ST-25 and Fenglong ST-40 with reducing method.

Recovery stage:

Lung and Spleen qi deficiency, deficiency of yuan (original) qi: Shortness of breath, fatigue, poor appetite, nausea, abdominal distension and fullness, asthenic-type constipation, sticky loose stools, a pale swollen tongue with a greasy white coat and a deep, slow pulse. Acupuncture prescription:

- Guanyuan REN-4, Qihai REN-6, Zusanli ST-36 and Taixi KID-3 with reinforcing method and moxibustion at Guanyuan REN-4 and Qihai REN-6.

- Feishu BL-13, Pishu BL-20 and Shenshu BL-23 with reinforcing method.

Qi and blood deficiency, Liver and Kidney yin deficiency: Shortness of breath, fatigue, poor appetite, insomnia, asthenic-type constipation, flushing, night sweats, dry mouth, restless, dizziness, weak knees, scanty urine, a pale red tongue with scanty or flaking coat, thin and weak pulses. Acupuncture prescription:

- Guanyuan REN-4, Qihai REN-6, Zusanli ST-36, Sanyinjiao SP-6, Taixi KID-3, Yingu KID-10 and Ququan LIV-8 with reinforcing method.
- Taichong LIV-3 and Neiguan P-6 with even method.

Acupuncture point categories

The acupuncture prescriptions in this article are based on published papers on the Chinese medicine treatment of COVID-19, Chinese state-broadcast information combined with the classical Chinese medicine theory that has been used to deal with numerous epidemics over thousands of years. However, acupuncture is by its very nature an individualised therapy. Practitioners must take into consideration each patient's individual condition and constitution, and tailor the above prescriptions accordingly. It is recommended that practitioners bear in mind the following point categories during treatment.

Ghost points

There are many methods of acupuncture practised globally, each of which has its main focus area, such as musculoskeletal issues or emotional problems.¹³ Ghost point needling is one method that is relevant in the treatment of epidemics. Before the 1st century CE, the term *yi* (疫) was associated with ghosts or demons (*gui* 鬼), as in the term *yi gui* which appears in *Lunyu* (Analects of Confucius) by Confucius (551–479 BCE), where it is often rendered 'hungry ghost' in the English translations of the text.²⁵ Uncontrollable infectious diseases - *li yi* - were at this time regarded as evil *qi* and associated with ghosts.²⁶ Shaman doctors commonly used the term *gui* (ghost) as a term for unexplained illness and disease. Of course, symptoms of mental illness can be part of the clinical presentation during acute infectious disease.

Ghost points initially appeared in the Shang dynasty (1520-1030 BCE) and were used for fighting epidemics in the Zhou dynasty (1030-727 BCE), for example for treating coma during the Warring States Period (475-221 BCE). These points were later recommended by Sun Simiao (581-682) for treating mental-emotional illness such as madness.²⁷ The concept *gui* (ghost) should be seen within its historical context. Throughout most of the Han-Tang period,

frequent wars and epidemics resulted in great social and economic stress.²⁸ Cao Zhi (192-232 CE), the prince of the state of Wei expressed his grief for friends who died during an epidemic in 217 CE in *Shuo yi qi* (*Speaking Epidemic Qi*), and also described people's devastation and hopelessness during that disaster.⁸ The 'ghost *qi*' from unseasonable weather thus not only caused deadly epidemics but also consequent fear. That is, people have more anxiety during epidemic periods whether they become infected or not - which the needling of the ghost points can effectively counter. Unfortunately, since the systematic development of Chinese medicine in the Han dynasty and the cultural revolutions in the 20th century, medical scholars began to avoid use of practices involving the term 'ghost' in order to distance themselves from shamanism.¹⁵ Some modern authors believe that ghost points are actually related to the treatment of yin fire.²⁹ Obviously, when yin and yang separate, yang floats upwards and outwards; this creates a volatile, unbalanced state, which ferocious epidemic *qi* can easily take advantage of (and might explain why certain body types are infected more easily than others). However, it is the opinion of the authors of this article that these points can still be valid in the fight against today's epidemic threat, especially Shaoshang LU-11 and Yinbai SP-1, which can be applied throughout the whole treatment period of COVID-19. They are both jing-well points and are located at the end of the Lung and the beginning of the Spleen channels (the major organs primarily attacked by COVID-19). Their functions are as follows:

- Shaoshang (Lesser *Shang*, also known as *Gui Xin*, Ghost Trust) LU-11: Clears the Lung and purges fire, expels evil, treats cough and dyspnoea due to exogenous pathogenic *qi* occluding the Lung, as well as sore and swollen throat, nasal congestion and epistaxis.
- Yinbai (Hidden White, also known as *Gui Lei* or Ghost Fortress) SP-1: The *Zhenjiu Jiayi jing* (Systematic Classic of Acupuncture & Moxibustion) recommends this point for treating dyspnoea, asthma, abdominal distension, heat and fullness in the chest, violent diarrhoea, dyspnoea when lying supine, cold feet, epigastric glomus, nausea and vomiting, and poor appetite.

Confluent points

The confluent points of the Extraordinary Vessels are located in the limbs and can be exceptionally effective for opening the channels and easing body tension. However, they should be treated in a strict order.³⁰ The upper burner organs are the first targeted and obstructed by epidemic *qi*, followed by the middle burner and finally the lower burner. Therefore for acute infection by COVID-19, opening up the blockage in the upper burner should be the first priority. The actions of these points can be summarised as follows:

- Lieque LU-7 and Zhaohai KID-6: regulate qi and blood in the chest, thorax and upper abdomen, and balance the Ren Mai (Conception Vessel) and Yin Qiao Mai (Yin Motility Vessel)
- Neiguan P-6 and Gongsun SP-4: regulate abdominal qi and blood, and balance the Chong Mai (Penetrating Vessel) and the Yin Wei Mai (Yin Linking Vessel)
- Waiguan SJ-5 and Zulinqi GB-41: Release exterior tension and clear heat from the Liver and Gall Bladder, harmonise Yang wei mai (Yang Linking Vessel) the Dai Mai (Girdle Vessel) and Shao Yang channel collaterals.

The effect of his acupuncture was often instantaneous ...

Conclusion

This is a public domain data-based exploratory study which has limitations in terms of having no empirical evidence. Despite this, it is based on review and analysis of extensive documentation. As currently there is no cure for or vaccination to prevent COVID-19, exploring possible therapies to contribute to this recent global health crisis could prove vital. While results from Chinese herbal treatment in this area have been encouraging, they have involved unintended consequences, such as disturbing patients' Stomach and Spleen function. Historically, acupuncture has been used effectively to treat epidemic infectious diseases, and despite historical neglect, it could become a crucial weapon in the battle against COVID-19 and other future epidemics. Of course, practitioners should ensure that they are properly protected when working with infected patients, which means wearing a protective suit and administering acupuncture in a hospital environment (which brings its own challenges).

Inspiring evidence of the role of acupuncture has been appearing since the beginning of March 2020. Professor Zou Xu is a critical care medical expert from Guangdong TCM hospital. As one of the supporting medical staff in Wuhan Leishenshan hospital, he always takes acupuncture needles during his ward inspections to help COVID-19 infected patients, especially those with acute symptoms such as shortness of breath, coughing, dizziness, insomnia, restlessness, palpitations, diarrhoea or vomiting. The effect of his acupuncture was often instantaneous. A 72 year old female patient with high blood pressure and diabetic chronic illness complained of a lower back ache, whereupon Zou needled the point Taixi KID-3 and the patient was able to stand upright immediately. Zou explains that acupuncture can improve the patients' oxygen supply and consumption, helping them regain yuan-original qi while blocking the toxicity attacking the

Lung. Most importantly, acupuncture is not aiming to destroy the epidemic qi, but instead it can influence the conditions of its survival in the body.³¹ Zou's team was in charge of 16 patients, of which six patients volunteered for Chinese medicine treatment alone; as of 1st March 2020, all six have fully recovered and have been discharged from hospital.³² In another 'Report from the Front Line in Wuhan', Professor Liu Li Hong has also documented the work of his team treating patients with COVID-19 in Wuhan, emphasising the importance of acupuncture in helping patients immediately with symptoms such as stuffiness in the chest, shortness of breath, abdominal discomfort, itchy throat, cough, dizziness, pain and sweating.³³ 📄

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Endnotes

1. World Health Organization (2020). Coronavirus, available at: <<https://www.who.int/health-topics/coronavirus>>. [Accessed 22 February 2020].
2. World Health Organization (2020). Novel Coronavirus (2019-nCoV) Situation Report - 22 SITUATION IN NUMBERS Total and New Cases in Last 24 Hours, [online] available at <<https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200211-sitrep-22-ncov.pdf>> [Accessed 22 February 2020].
3. World Health Organization (2020). Emergency Ministerial meeting on COVID-19 organized by the African Union and the Africa Centres for Disease Control and Prevention, available at <<https://www.who.int/dg/speeches/detail/emergency-ministerial-meeting-on->

- covid-19-organized-by-the-african-union-and-the-africa-centres-for-disease-control-and-prevention> [Accessed 22 February 2020].
4. World Health Organization (2020). World experts and funders set priorities for COVID-19 research, [online] available at <<https://www.who.int/news-room/detail/12-02-2020-world-experts-and-funders-set-priorities-for-covid-19-research>> [Accessed on 22 February 2020].
 5. Xinhua (2020). Hospital steps up efforts to push forward TCM treatment for novel coronavirus patients, [online] available at <http://www.xinhuanet.com/english/2020-02/18/c_138795615.htm> [accessed 22 February, 2020].
 6. Xinhua (2020). Expert Highlights Traditional Chinese Medicine in Fight against Novel Coronavirus, [online] available at <http://www.xinhuanet.com/english/2020-02/19/c_138796388.htm> [accessed February 22, 2020].
 7. Xinhua (2020). Traditional Chinese medicine offers oriental wisdom in fight against novel virus, [online] available at <http://www.xinhuanet.com/english/2020-02/18/c_138795197.htm> [accessed 22 February, 2020].
 8. Hanson, M. (2013). *Speaking of Epidemics in Chinese Medicine: Disease and the Geographic Imagination in Late Imperial China*. Routledge: New York, N.Y. p.100.
 9. Chen, N., Zhou, M., Dong, X. et al. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study, *The Lancet*, [online] available at <[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30211-7/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30211-7/fulltext)> [Accessed 22 February, 2020].
 10. Wang, D., Hu, B., Hu, C. et al. (2020). Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China, *JAMA*, [online] available at <<https://jamanetwork.com/journals/jama/fullarticle/2761044>> [accessed 11 February, 2020].
 11. Wu, M., (2016). *Collation and Research of Ancient Documents VII (Gu wen xian zheng li yu yan jiu)*. Zhonghua Shu Ju: Beijing
 12. Johnston, I. (2010). *The Mozi: A Complete Translation*. Chinese University Press: Hong Kong, 12.7
 13. Wang, M., (2018). *More Than Acupuncture: Questions and Answers About Chinese Medicine*. Friesen Press: Victoria, Canada
 14. Bradley, R. (2019). Plague death tolls in the early seventeenth century, in Bell, D. P. (2019). *Plague in the Early Modern World: A Documentary History*. Routledge: Abingdon, New York.
 15. Unschuld, P.U. (2016). *Nan Jing: The Classic of Difficult Issues*. University of California Press: Berkeley, p. 438
 16. Li Guanxian & Cao Bingzhang (1990). *Zhi yi bi bian*. Yuelu Shushe: Hunan, China
 17. Zhu Zekui (1999). *Zhu shi han zi yuan dian VI*. Longwen: Taipei, Taiwan, p. 9
 18. Wu Youke (2018). *Wen yi lun*. ZhongGuo YiYao KeJi ChuBanShe: Beijing
 19. Xinhua (2020). Interpreting the Treatment Plan of Traditional Chinese Medicine in New Coronavirus Infected Pneumonia Diagnosis and Treatment Plan (Trial Implementation Fourth Edition), [online] available at <http://www.gov.cn/zhengce/2020-01/28/content_5472789.htm> [accessed 23 February 2020].
 20. Wang Y., Qi, W. et al. (2020). TCM Clinical Features and Syndrome Differentiation of COVID-19, *Journal of Traditional Chinese Medicine*, 61(4) [online] available at: <<https://kns.cnki.net/KCMS/detail/11.2166.R.20200129.1258.002.html>> [Accessed 24 February 2020].
 21. Ma J., Chen, M., Wang, Y. (2020). Summary of TCM Syndromes of New Coronavirus (2019-nCoV) Syndrome, *Beijing Journal Of Traditional Chinese Medicine*, 11.5635 [online] available at <<http://kns.cnki.net/kcms/detail/11.5635.R.20200207.1616.002.html>> [Accessed 23 February 2020].
 22. Chen R., Luo, Y. et al. (2020). TCM Syndrome Treatment and Analysis of Typical Cases Based on 52 Cases of New Coronavirus Pneumonia in Wuhan, *Journal of Traditional Chinese Medicine*, 11-2166. [online] available at <<http://kns.cnki.net/kcms/detail/11.2166.R.20200220.1443.002.html>> [accessed 23 February 2020].
 23. Chinanews (2020). Experts say the epidemic is still in a phase of outbreak, drug treatments are still being evaluated, [online] available at <<https://m.chinanews.com/wap/detail/zw/sh/2020/02-10/9085006.shtml>> [Accessed 22 February 2020]
 24. Ni, M. (1995). *The Yellow Emperor's Classic of Medicine: A New Translation of the Neijing Suwen with Commentary*. Shambhala: Boston
 25. Qian, D. (1978). *Lun yu han song ji jie*. Jijiezhong Yinxing: Taipei, Taiwan
 26. Benedict, C. (1996). *Bubonic Plague in Nineteenth-Century China*. Stanford University Press: Stanford, California
 27. Van Kervel, P.C. (2010). *Acupuncture Celestial Treatments for Terrestrial Diseases: Causes and Development of Diseases & Treatment Principles and Strategies*. Lan Di Press: Kockengen
 28. Cao, X. (2005). *Zhong yi jian shen shu*. Shanxi Kexue Jishu Chubanshe: Xian
 29. Flaws, B. & Lake, J. (2001). *Chinese Medical Psychiatry: A Textbook & Clinical Manual: Including Indications for Referral to Western Medical Services*. Blue Poppy Press: Boulder, Colorado
 30. Sun, P. (2011). *The Treatment of Pain with Chinese Herbs and Acupuncture*. Churchill Livingstone: Edinburgh
 31. Chen, Y. (2020). Follow-up with Professor Zou Xu, an expert in intensive medicine: Acupuncture to eliminate the disease devil, *Guangdong Channel-People's Network*, available at: <<http://gd.people.com.cn/n2/2020/0302/c123932-33843108.html>> [Accessed 8 March 2020].
 32. Xu, P. (2020). Great news! 6 pure Chinese medicine patients treated with new coronary pneumonia discharged, *Chinanews.com*, available at: <http://www.chinanews.com/shipin/cns/2020/03-01/news849695.shtml> [Accessed 8 March 2020].
 33. Liu, L. (2020). Report from the Front Line in Wuhan, *Classical Chinese Medicine*, available at <<https://classicalchinesemedicine.org/report-from-front-line-wuhan/?fbclid=IwAR2vXVokJpL5kOUMKrkEQGAEMFJSzsbQgydh9ScfB6lGnBg8X-BA8LJYpE>> [Accessed 8 March 2020].