Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Conclusions: The COVID-19 pandemic has had a substantial impact upon herbal medicine practice. Herbal practitioners are a source of information and support for patients with COVID-19 symptoms. However, herbal medicines used varied widely. Future research needs to evaluate these herbal medicines and to develop a comprehensive database on herbal substances used and their potential benefits and risks.

Keywords: Herbal medicine, COVID-19, survey; herbal practitioners; practice delivery

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Antiviral activity of Matricaria chamomilla in the treatment of COVID-19: Molecular Docking study

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Introduction: SARS-CoV-2 infection is a lethal disease caused by a Novel strain of coronaviruses. Although vaccinations of healthy people and meticulous treatment of infected people are the main global health concerns, some plant species have therapeutic effects against viral infections. Matricaria chamomilla is one of the most famous medicinal plants used to manage flu or flu-like symptoms due to its antiviral bioactivity. M. chamomilla belongs to a large group of medicinal herbs used by Persian scholars such as Avicenna and Rhazes to treat respiratory diseases. It has more than 120 chemical constituents, including terpenoids, flavonoids, and some components with potential medicinal activity. In this study, the inhibitory effect of 2 major flavonoid components of M. chamomilla, apigenin and luteolin, was studied for the main protease protein of SARS-CoV-2.

Methods: Molecular docking studies were performed using an inhouse batch script (DOCKFACE) of Auto Dock 4.2. The 3D structures of the selected flavonoids were retrieved from PubChem, and each ligand was optimized with MM+ then AM1 minimization method using HyperChem 8. The 3D crystal structure of the main protease protein of SARS-CoV-2 (PDB ID: 6LU7) was obtained from the Protein Data Bank (http://www.rcsb.org/pdb).

Results: Apigenin and luteolin exhibited good docking scores against 6LU7 receptor, -7.86 and -7.24, respectively, with a combination of hydrogen bonding, van der Waals, and other hydrophobic interactions in the docked complexes. Besides, the estimated inhibition constants, Ki, showed that luteolin exhibited a better inhibitory effect than apigenin.

Conclusions: Based on these results, the authors proposed that M. chamomilla can be considered as a valuable resource recommended for preventing SARS-CoV-2 invasion into the human body.

Keywords: COVID-19, M. chamomilla, Persian medicine, Molecular Docking, Herbal medicine

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Use of CAM during the first wave of the COVID-19 Pandemic: A Cross-sectional Survey

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Introduction: The COVID-19 pandemic lockdown has a profound impact on physical and mental well-being throughout the world. Previous studies have revealed that complementary and alternative medicine (CAM) is frequently used for and can be potential beneficial for strengthening physical and mental resilience. The aim of this study was therefore to determine the prevalence and associations for use of CAM during the first wave of the COVID-19 pandemic among a representative sample of women and men in Norway.

Methods: Computer assisted telephone interviews using an adapted questionnaire (1-CAM-QN) were conducted with 1000 randomly selected Norwegians aged 16 and above using multistage sampling in April and May 2020 applying age and gender quotas for each area. Descriptive statistics were carried out using Pearson’s Chi-square test, Fisher exact test, and independent samples T-tests to identify group differences.

Results: The study revealed that two thirds of the respondents (67%) had used CAM within the first three months of the COVID-19 pandemic, in particular CAM modalities that did not involve a provider. Most used were CAM natural remedies and dietary supplement (57%), mainly vitamins and minerals (43%), but self-help practices like yoga and meditation were also widely used (24%). Women used these therapies significantly more than men (77% vs. 58%).

Conclusions: In summary, it can be concluded that the first wave of the COVID-19 pandemic has not profoundly changed the overall need of Norwegian citizens to seek for care outside the conventional healthcare system, but rather has caused a shift in the type of CAM modalities used. It remains to be investigated whether this changed pattern is maintained during the whole period of the pandemic.

Keywords: Survey, Norway, CAM, COVID-19

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Traditional, Complementary and Integrative Medicine Use during the COVID-19 Outbreak in Hong Kong

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Introduction: Little evidence is available to support the use of traditional, complementary and integrative medicine (TCIM) during the COVID-19 pandemic. This study investigated the frequency and patterns of TCIM use during the pandemic and identified factors associated with its use among the general population in Hong Kong.

Methods: An online cross-sectional survey was conducted from November to December 2020. The survey solicited information on the respondents’ (1) sociodemographic characteristics, (2) risk perception of the pandemic, (3) use of TCIM before and during the pandemic, and (4) perceived effectiveness of TCIM. Logistic regression analysis was conducted to determine the potential predictors of TCIM use.

Results: TCIM was used by 48.5% (n=306/632) of respondents before the pandemic, and decrease significantly to 44.0% (n=278/632) during the pandemic (P=0.007). The greatest declines were in the rates of Chinese herbal medicine, acupuncture and massage/TuiNa. During the pandemic, the most popular forms of TCIM were vitamins or other dietary supplements (n=160, 25.3%) and Chinese herbal medicine (n=122, 19.3%). Respondents who reported using TCIM were more likely to be female (odds ratio[OR]=1.82, 95% confidence interval [CI]=1.29–2.59), to have attained a higher education level (OR=2.21, 95% CI=1.39–3.59), and older-aged (age >55 years: OR=1.77, 95%
Cl=1.04–3.02, as compared to 18–35 years). Respondents who resided in districts with a moderate to high number of confirmed COVID-19 cases (OR=1.60, 95% CI=1.07–2.42) and had a higher level of risk perception (OR=1.04, 95% CI=1.01–1.07) were also more likely to use TCIM during the pandemic.

**Conclusion:** TCIM was used commonly in Hong Kong during the COVID-19 pandemic, although the frequency of use was lower than that reported before the pandemic. While vaccination, social distancing and basic hygiene remain the mainstay of controlling the pandemic, health authorities should also proactively provide evidence-based information to the public regarding the effectiveness and safe use of TCIM for COVID-19 prevention and treatment.

**Keywords:** COVID-19, Complementary Medicine, Integrative Medicine, Traditional Medicine, Cross-sectional Survey

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Role of Nutrients for COVID-19 recovery: an integrative approach

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**Introduction:** Many patients (“long-haulers”) suffer lingering illness following COVID-19. The aim of this presentation is to evaluate the evidence of nutrient deficiencies affecting immune function and chronic symptoms from COVID-19 infection in a subgroup of patients. We will discuss the potential benefit of supplementing with multi-nutrients as an integrative approach to reducing long-hauler symptoms.

**Methods:** A narrative review followed a search of Medline/Pubmed, CINAHL, Google Scholar for studies published between January 2000 and March 2021, using key terms “coronavirus”, “COVID-19”, “immune system”, “inflammation”, “microbiome”, “oxidative stress”, “mitochondrial function”, “micronutrients”, “vitamin”, “minerals”, and “antioxidants”. Six reviews were selected which examined on the role of nutrients in immune and neurological function, including inflammatory processes, microbiome homeostasis, and mitochondrial function.

**Results:** Symptoms of long-haulers may be similar to myalgic encephalomyelitis/chronic fatigue syndrome associated with mitochondrial dysfunction due to oxidative stress. Similar findings of chronic inflammation and microbiome dysbiosis associated with mood disorders also suggest the association between nutrient deficiencies and immunoneurological functions. Nutrients required for optimal immune function included: antioxidants such as CoQ10 is required for mitochondrial function and is depleted quickly during acute immune response. Vitamins C and E and selenium also have antioxidant properties that can decrease proinflammatory cytokines and increase leukocyte and NK cell function. The B vitamins are involved in decrease pro-inflammatory cytokines and increase NK cell activities. Similarly, these nutrients are required for optimal neurological functioning in the CNS.

**Conclusion:** Initial evidence suggests chronic inflammatory processes in the CNS may contribute to the symptoms of COVID-19 long-haulers. Given the complementary roles of different nutrient in immune response and CNS pathways, integrating multiple nutrients as treatment for long-haulers warrants further study.

**Keywords:** post-covid syndrome, long hauler, micronutrient treatment; narrative review

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Therapeutic effects and safety of oral Chinese patent medicine for COVID-19: A rapid systematic review and meta-analysis of randomized controlled trials

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**Introduction:** Chinese patent medicine (CPM) is an indispensable part of traditional Chinese medicine. Coronavirus Disease 2019 (COVID-19) manifests as an acute respiratory infectious disease. This systematic review aimed to evaluate the therapeutic effects and safety of oral CPM for COVID-19.

**Methods:** We included randomized controlled trials (RCTs) that tested oral CPM for the treatment of COVID-19 identified from publications in CNKI, Wanfang, VIP, Web of Science, SinoMed, PubMed, Embase, BioRxiv, MedRxiv and arXiv before November 2nd, 2020. The risk of bias for each trial was assessed using the Cochrane Risk of Bias Tool 2.0. RevMan 5.4 software was used for data analyses. The certainty of the evidence was assessed using the online GRADEpro tool.

**Results:** Seven RCTs including 1079 participants were identified. The overall bias was assessed as “some concerns” for all included trials. Oral CPM investigated were: Lianhua Qingwen capsule/ granules (连花清瘟胶囊/颗粒, LHQW), Jinhua Qinggan granules (金银花颗粒, JHQG), Huoxiang Zhengqi dripping pills (藿香正气滴丸, HXZQ), Toujie Quwen granules (透解祛瘟颗粒, TQW) and Lianhua Qingke granules (连花清咳颗粒, LHQK). Compared with conventional western therapy alone for people with COVID-19: regarding the main outcomes, the results showed that oral CPM combined with conventional western therapy improved cure rate (RR = 1.20, 95% CI 1.04 to 1.38, involving LHQW and TQW), reduced aggravation rate (RR = 0.50, 95% CI 0.29 to 0.85, involving LHQW, JHQG, LHQK and TQW); with regard to additional outcomes, the results showed that add-on oral CPM shortened the duration of fever, cough and fatigue, improved the recovery rate of cough and fatigue, and increased the improvement and recovery rate of chest CT manifestations. There were some differences in therapeutic effects among various CPMs for the same COVID-19 outcome. The use of TQW and LHQG appeared not to increase the risk of adverse events, but JHQG may cause mild diarrhea.

**Conclusions:** Low-certainty or very low-certainty evidence demonstrated that oral CPM may have add-on potential therapeutic effects for patients with non-serious COVID-19. There are some differences in therapeutic effects between different oral CPMs for the same outcome of COVID-19. The use of TQW and LHQG probably does not increase the risk of adverse events, but JHQG may cause mild diarrhea in patients. The conclusion of this review needs to be further confirmed by well-designed clinical trials with adequate sample sizes.

**Keywords:** Coronavirus Disease 2019; COVID-19; Chinese patent medicine; Chinese herbal medicine; Systematic review; Meta-analysis

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Chinese Herbal Medicine Used With or Without Conventional Western Therapy for COVID-19: an evidence review of clinical studies