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REVIEW

Therapeutic Applications for Homeopathy in Clinical Practice

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ABSTRACT

Homeopathy was founded some two hundred years ago by Dr Samuel Christian Hahnemann. Over time, it has grown to be among the most frequently used forms of alternative medicine in Europe and the USA. It is underpinned by the principle of 'like cures like', where highly diluted substances are used for therapeutic purposes, by producing similar symptoms to when the substance is used in healthy people. Many studies have been published on the value of homeopathy in treating diseases such as cancer, depression, psoriasis, allergic rhinitis, asthma, otitis, migraine, neuroses, allergies, joint disease, insomnia, sinusitis, urinary tract infections and acne, to name a few. We conducted a comprehensive review of the literature on homeopathy and evaluated its effectiveness in clinical practice. While there is evidence of the clinical benefits of homeopathy, its formal application requires more rigorous randomised controlled trials.

Keywords: Homeopathy; Cancer therapy; Type 2 diabetes; Complementary and alternative medicine; COVID-19; Dermatology

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Key Summary Points

While homeopathy is among the most frequently applied forms of alternative medicine, there is a lack of familiarity with this therapeutic modality within everyday medical practice.

This review examines some of the available evidence in relation to the impact of homeopathy on a variety of common chronic diseases.

Homeopathy was found to have the potential for symptom improvement in certain diagnoses within the fields of internal medicine, oncology, obstetrics and mental health.

Although there is a paucity of studies on homeopathy within the context of standard clinical practice, an opportunity exists for further research into its application by utilising conventional study designs.

INTRODUCTION

In recent decades, while advances in biotechnology continue to expand efforts to improve diagnostic and therapeutic strategies, there remains increasing interest in complementary and alternative medicine (CAM) [1]. A growing number of physicians are attempting to understand, rather than to discard, these alternative methods a priori, in order to meet their patients' expectations adequately [1, 2].

Complementary and alternative medicine (CAM) are viewed as a group of medical and health care systems, practices and various products not presently considered part of conventional medicine' [3], and encompasses the use of pharmacologically active agents (homeopathy, vitamins, minerals, herbs/phytotherapy), special diets, physical techniques (acupuncture/acupressure, yoga, osteopathy, special exercises, massage, chiropractic) and psychological methods (mindfulness, relaxation, hypnosis) [4]. In the scientific literature, homeopathy is accordingly defined as a practice within the field of CAM involving the use of remedies derived from highly diluted vegetable, animal or mineral ingredients, aimed at managing a myriad of disorders [5].

The World Health Organization (WHO) established a Traditional Medicine Strategy, initially adopted for the 2002–2005 period [6]. This strategy aimed to integrate traditional medicine/complementary and alternative medicine (TM/CAM) into national health policies; and promote its safety, efficacy and quality, increase accessibility (especially for individuals of lower socioeconomic status), and encourage sound and appropriate use. This strategy was extended through the 2014–2023 period and is currently ongoing to 2025 and beyond. The initiative led to the merging of nomenclature from *Traditional Medicine* and *Complementary and Alternative Medicine* to *Traditional and Complementary Medicine*. In 2017, WHO introduced the term *Traditional, Complementary and Integrative Medicine* (TCIM) in recognition of the increasing role of integrative medicine, which combines proven TM/CAM and biomedical strategy, to enhance the role of traditional medical care in the health of respective populations harnessing the potential of traditional medicine to contribute to 'health, wellness and people-centred health care' as well as promote the safe and effective use of traditional medicine by regulating, researching and integrating traditional medicine products, practitioners and practice into health systems [7].

Homeopathy is hypothesised to work by stimulating natural healing mechanisms of the human body. Importantly, a panoply of homeopathic remedies may be applied to unique clinical contexts [8]. Homeopathic agents are defined as products prepared in accordance with standardised processes, as elaborated in various national homeopathic pharmacopoeias [9]. According to scientific literature, homeopathic therapy is based on four concepts: therapeutic similitude, research into the impact of medicines on disease-free people (known as 'proving' or pathogenetic trials in homeopathy), utilisation of substances which have undergone many serial dilutions with simultaneous shaking ('potentisation' or highly diluted substances) and prescription of agents adapted for the individual patient. In a recent systematic review studying the

prevalence of homeopathy use over a 12-month period across 11 countries (Australia, Canada, Germany, Israel, Japan, Norway, South Korea, Singapore, Switzerland, UK and USA), a minority but significant proportion of the study populations visited homeopaths and/or purchased homeopathic agents over the counter [10]. Currently, homeopathy is among the top ten most frequently practised forms of alternative medicine. According to the 2012 US National Health Interview Survey, 2.2% of the population (5 million) utilised homeopathy, which was a 15% increase from 1.8% (3.9 million) in 2007 [11, 12] According to the European Social Survey, the use of homeopathy varies between countries. A 2014 multinational study ($n = 40,185$) demonstrated the highest rates of use in Austria, Germany and Switzerland (10.9–12.8%), and the lowest in Norway and Poland (both < 1%) [13]. Another further 2023 survey ($n = 22,190$) demonstrated similar prevalence patterns of homeopathy use in these countries [13].

To date, there is a wealth of literature demonstrating the utilisation of homeopathy in managing a vast array of diseases, including respiratory (asthma, rhinitis, otitis, sinus infections, viral infections), neuropsychiatric (migraine headaches, depression, neurotic disorders, hypersensitivity disorders, insomnia, headaches), dermatologic (eczema, psoriasis, lichen planus) and others (arthritis, genitourinary infection, systemic hypertension and various malignancies) [14]. This review examines available literature on the application of homeopathy in these conditions.

METHODS

We conducted a literature review to answer the following research questions:

- What is the current knowledge on the use of homeopathy in clinical practice?
- Has the use of homeopathy achieved beneficial results in patients being treated for specific clinical entities?

Results were then appraised in relation to:

1. Population: patients using homeopathy, physicians and homeopaths who reported using homeopathic agents in the included studies
2. Intervention: homeopathic remedies
3. Control: conventional treatment or no treatment
4. Outcome: improvement in patients' conditions (or positive results)

Keywords were searched in respect of homeopathy (homeopathy; formulas, homeopathic; pharmacopoeias, homeopathic; materia medica and vitalism) and clinical practice (complementary and alternative medicine, health). The following search terms were used: ("homeopathy" OR "formulas, homeopathic" OR "pharmacopoeias, homeopathic" OR "materia medica" OR "vitalism") AND ("health" OR "complementary and alternative medicine").

Two electronic databases were searched using the search terms *homeopathy*, *cancer therapy*, *type 2 diabetes*, *complementary and alternative medicine*, *COVID-19* and *SARS-CoV-2*. Material retrieved was examined to omit overlapping results or duplicates. Publications in languages other than English, and those without full texts accessible online, were excluded.

This article is based on previously conducted studies and does not contain any new study with human participants or animals performed by any of the authors.

BACKGROUND

Homeopathy is a therapeutic system that is based on the use of infinitesimal but physiologically active doses of chemically neutral—or even toxic—substances derived from vegetable, animal and mineral sources with the intent to stimulate the body's innate defences. Homeopathic agents are believed to work on the basis of the principle of therapeutic similitude, the 'law of similars' (similia similibus curentur) or 'like heals like', where substances that typically cause disease symptoms in a healthy person may exert therapeutic effects in an ill person with such symptoms [15].

The *Homeopathic Pharmacopoeia Repertory* is a multivolume collection of pathologic symptomatology and proposed remedies. It was written in the first half of the 1800s by Dr Samuel Hahnemann. A number of materia medica have been written by diverse authors to date. The 1989 version of *The American Homeopathic Pharmacopoeia*, which included over 2000 agents, is a recognised reference work for homeopathic preparations and prescriptions [8]. Homeopathic agents are tested through a 'proofing' process (Hahnemann originally used the German *Prüfung*, meaning 'verification' or 'testing') on healthy individuals of various ages and sexes. Aside from vegetable, animal and mineral sources, there are three other sources of homeopathic agents, namely *sarcodes* (derived from healthy animal tissues or secretions), *nosodes* (derived from diseased tissues), and *imponderabilia* (derived from intangible sources, such as light and ionising/non-ionising radiation) [16]. 'Tautopathic' substances constitute another category of homeopathic agent, and are used to counteract the adverse effects of other medicines. Here, the same medicinal substance is used to prepare a remedy using the homoeopathic method of potentisation [16].

Various parts of plants are used to prepare homeopathic 'mother tinctures', which are undiluted source materials that are subsequently used as stock solutions in the manufacture of solutions of higher potencies. These include flowers, stems, leaves, bark, roots, seeds and occasionally entire plants. An example of one of the most frequent sources of homeopathic agents is European arnica (*Arnica montana*) [8]. It is suggested that *A. montana*, including at homeopathic dilutions, may be effective in the management of pain, oedema and ecchymoses resulting from trauma or surgery [17]. In herbal medicine, *Salvia officinalis* (termed the 'sacred plant' by Hippocrates) has been described as an antiseptic and anti-inflammatory [18], while *Allium ursinum* is known for its antimicrobial effect [19].

Animal sources have also been used to create homeopathic remedies. For example, 'apis' derived from the honeybee is used in the management of oedema, pain and hypersensitivity reactions to bee or wasp stings.

Chemical compounds are also utilised by homeopaths. For example, homeopathic iron phosphate, known as *Ferrum phosphoricum*, is indicated for symptoms of the common cold including fever, sore throat and cough [20].

The efficacy of homeopathic therapies has been documented extensively through case series and case studies, as well as clinical and experimental studies [8]. Homeopathy became very popular in the nineteenth century after mortality rates in homeopathic medical centres were found to be relatively diminished during epidemics of that era [21]. Although in the early twentieth century homeopathy was relegated to relative obscurity due to advances in modern medical practice, it again became increasingly popular between the late twentieth and early twenty-first centuries.

In homeopathy, patients are evaluated at four stages: history-taking, symptom/sign analysis, matching symptoms/signs with corresponding themes, and choosing the appropriate remedy or remedies. Homeopathic patients are assessed holistically to consider their physical, psychological/emotional and environmental condition [22].

THERAPEUTIC EFFICACY

There are many studies on the efficacy of homeopathy for various diseases in the medical literature, within the disciplines of internal medicine, oncology, obstetrics and mental health.

Dermatology

The second most frequent patient-initiated complementary and alternative therapy in treating dermatologic disease is homeopathy (up to 37.9% of individuals) [23]. Dermatitis was the commonest skin condition (48.3%), followed by acne (24.1%), infections (17.2%), dry skin (6.9%), psoriasis (6.9%) and rosacea (6.9%) [23].

The efficacy of homeopathic therapy for atopic dermatitis (AD) has been assessed in various studies [24, 25]. Individualised homeopathy was used in a case series of 17 patients aged 6–31 months previously treated with

conventional medical treatment and psychological therapy. These patients were assessed with a scale akin to the Glasgow Homeopathic Outcome Scale. The study demonstrated significant improvement of itch, sleep, satisfaction at work and daily life, as well as personal relationships [24]. A prospective trial compared long-term efficacy and cost-effectiveness between homeopathy and conventional therapies through quantitative and qualitative analyses on 135 children with AD, with 48 patients in the homeopathy arm [25]. At 36 months, SCORAD (SCORing Atopic Dermatitis; which rates the extent and intensity of AD including subjective ratings on pruritus and sleeplessness) between the two groups showed no significant difference, but costs were significantly higher for the homeopathy group [25]. Over 50% of patients treated with homeopathic remedies for atopic dermatitis in another cohort ($n = 60$, AD = 25) showed significant improvement clinically, in human relations, at work and in daily life [26].

The treatment of AD with classical homeopathy has been reported in a series of six cases, evaluated retrospectively with subject selection based on the Hanifin Rajka atopic dermatitis diagnostic criteria, with follow-up reviews evaluated according to changes in the SCORing Atopic Dermatitis Scale (SCORAD) [27]. Criteria derived from modification of the Naranjo scale (which seeks to determine whether a drug was the probable cause of an adverse reaction [28]) was used to determine efficacy [29]. HOM-CASE (Homeopathic Clinical Case Reports) [30], an extension for homeopathy of the CARE (Consensus-based Clinical Case Reporting), guidelines, were applied. This case series concluded that all cases improved and stabilised with complete skin clearance and patients did not experience high fever/acute inflammatory disease since AD onset/exacerbation. Five patients developed acute inflammatory disease as the chronic condition improved, and the remaining patient case experienced recurrence of a previous, more limited medical condition. Also, the case controls selected for no improvement in classical homeopathy showed noticeable skin clearance when acute inflammatory conditions occurred.

Homeopathic treatment of viral verrucae has been investigated in several studies [31, 32]. In a double-blind placebo-controlled trial ($n = 59$) on individualised homeopathic treatment of viral verrucae, the results favoured homeopathy compared with placebo. Most frequently utilised homeopathic agents were *Thuja occidentalis*, *Natrum muriaticum* and sulphur [31]. Another randomised double-blind trial involving a cohort of 60 children aged 6–12 years concluded that there was no significant benefit of homeopathy over placebo; however, the results suggested a greater number of patients experiencing remission in the treatment arm compared with the placebo arm [32].

Homeopathic *Arctium lappa* was assessed for the management of acne vulgaris in one observational study ($n = 32$) with treatment endpoints of global acne grading score (GAGS), differences in lesion counts and acne-specific quality of life (QoL) scores [33]. Results indicated homeopathic *Arctium lappa* may lead to improvement by all endpoint measures. Another observational study ($n = 83$) of individualised homeopathic therapy in acne vulgaris was conducted using 17 homeopathic remedies, where patients were each assigned one homeopathic remedy and followed up at 6- to 8-week intervals [34]. Participants were divided into groups based on acne severity (mild, moderate or severe). The results were as follows: 68 (81.9%) patients achieved remission, 13 (15.7%) were lost to follow-up, and 2 (2.4%) failed to respond [34]. Mean time to achieving disease remission was approximately 1.9 months (varying between 1.5 and 6 months) and there was neither a relapse nor adverse effect. The most frequently utilised homeopathic agents in this study were homeopathic *Lycopodium clavatum* (38.6%), *Palladium metallicum* (15.7%) and *Platinum metallicum* (12.1%). The author concluded that individualised homeopathic therapy may be efficacious in the management of acne vulgaris [34].

A randomised single-blind trial involving 30 patients treated with homeopathic *Ignatia amara* for histologically confirmed oral lichen planus, where treatment endpoints included mean lesion size and pain scores, found a significantly more positive effect on these endpoints after use of *Ignatia amara* compared with

placebo [35]. A small case series ($n=4$) studying the effects of various homeopathic agents (*Ignatia amara*, *Aurum metallicum*, *Lycopodium* and *Carcinosinum*) on generalised lichen planus, with or without mucosal involvement, of varying disease durations (7 months; and 12, 21 and 27 years), suggested homeopathy achieved sustained remission in all cases [36].

A report of four children who received *Antimonium crudum* [37] described improvement in impetigo and bullous pemphigoid neonatorum, indicating this homeopathic agent may help reduce antibiotic overuse in children with infected inflammatory dermatoses.

Diabetes

WHO data reports worldwide prevalence of diabetes mellitus at approximately 143 million, with an anticipated rise to approximately 300 million by 2025 [38]. It has been suggested that in Germany, homeopathy was at least previously the most commonly utilised form of complementary medicine (14.5%) among paediatric patients with insulin-dependent diabetes [39]. A multicentred, prospective, observational study on the effects of individualised homeopathic therapy on diabetic polyneuropathy showed that homeopathy delivered a significant improvement in total symptom score ($p=0.0001$), as well as effective metabolic control, as demonstrated by lowered glycated haemoglobin (HbA1c) < 8.0, fasting plasma glucose (mean = 0.5 mmol/L, $p=0.0001$) and post-prandial hyperglycemia (average decrease of 1.5 mmol/L, $p=0.0001$) [40]. A separate non-randomised retrospective study ascertained that supplementing standard therapeutic modalities with individualised homeopathic remedies resulted in better glycaemic control in patients with type 2 diabetes mellitus (T2DM) compared with conventional care regimens only (control group) [41]. The drop in fasting blood glucose levels (BSL) and HbA1c was greater in patients with poor baseline metabolic control, defined by the change in BSL following at least 6 months of individualised homeopathic treatment. Patients receiving only standard treatment had a greater baseline fasting BSL ($p=0.044$) in comparison with the homeopathy group. Notably, time since diagnosis of diabetes was longer (over 20 years) for a greater proportion of patients in the latter group ($p=0.006$) as was the history of cardiovascular disease ($p=0.022$). The average decrease in fasting plasma glucose in the homeopathy group was significantly greater than that in the control group at 12 months: 2.24 mmol/L (95% confidence interval [CI] 3.47 to −1.01) vs 0.16 mmol/L (95% CI −1.72 to 2.04), $p=0.001$. The average change in HbA1c was also significantly higher (−1.11% (95% CI −2.17 to −0.05) vs 0.08% (95% CI −1.37 to 1.53), $p=0.046$). Most clinical trials studying the effects of homeopathic remedies on T2DM have utilised a single homeopathic agent such as *Selenium*, *Gymnema sylvestre*, *Cephalandra indica* or a combination of remedies, rather than individualised homeopathy [42]. Homeopathy may serve an adjunctive role in diabetes; however, evidence is lacking for higher-risk populations such as patients with poor glycaemic control and longer disease duration.

Oncology

Use of homeopathy among patients with cancer is increasing. It has been suggested that compared with the situation in the USA, homeopathic therapy is one of the most frequently used treatments for malignancy-related symptoms in Europe (among 12–24% of patients with cancer) [43]. Research has shown amelioration of side effects from medications and improved health-related quality of life in patients with cancer who use homeopathic agents; however, these conclusions are mostly drawn from publications on homeopathy, and evidence of the impact on patient survival is still limited [44]. In one study, 21 out of 25 patients with breast cancer who presented with radiation-induced skin itching experienced improvement of symptoms with homeopathy [45]. Remedies mostly included *Causticum*, *Fluoric acidum*, gamma rays, *Ignatia*, *Kali bichromicum*, *Psorinum* and *Rhus toxicodendron*. In a placebo-controlled trial ($n=32$), Traumeel S®, a homeopathic formulation containing *Arnica montana* and other plant extracts and minerals, significantly diminished the

duration and severity of chemotherapy-induced stomatitis in stem-cell transplant recipients aged 3–25 years. Stomatitis did not develop in 33% of those treated compared with 7% in the placebo group. Stomatitis worsened in 47% of the treatment group versus 93% of the non-treatment group [46]. In a randomised controlled trial involving 410 patients with cancer, homeopathy in addition to conventional therapy was found to improve patients' wellbeing [47]. The homeopathy group showed an increase in scores of global health status by an average of 7.7 (95% CI 2.3–13.0, $p=0.005$) and of subjective wellbeing by 14.7 (95% CI 8.5–21.0, $p<0.001$). In a laboratory study on cell lines of human mammary neoplasia, ultra-diluted homeopathic agents demonstrated a cytotoxic effect by inducing cell cycle arrest and apoptosis [48]. In a 2011 observational study, symptoms of physical fatigue decreased in subjects treated with homeopathic agents in addition to conventional anticancer therapy [49]. A case series ($n=3$) of biopsy-confirmed early-stage cutaneous T cell lymphoma (mycosis fungoides) suggested that individualised homeopathic therapy potentially induces long-term remission in these patients with minimal complications and side effects [50].

In a case report of a 3-year-old Indian girl first managed surgically for embryonic carcinoma with immature teratoma and reviewed over 6 years, subsequent treatment by classical homeopathy principles was followed by the patient remaining cancer-free [51]. Cancer marker expression decreased while the patient developed severe skin eruptions, which were consistent with the laws of classical homeopathic treatment.

These studies suggest that homeopathy has the potential to reduce adverse effects caused by therapeutic modalities such as chemotherapy, radiotherapy and surgery; and it may also play a role in treating various types of cancers.

Asthma

Adjunctive individualised homeopathy has been found to contribute significantly to treatment response in adults with bronchial asthma compared with placebo, in terms of spirometry, peripheral blood eosinophils, serum IgE levels and symptom severity (both objective and patient-reported) [52]. In an observational study homeopathic therapy led to significant improvement in allergic and asthmatic symptoms, potentially reducing required dosage and subsequent costs of conventional medicines [53].

The efficacy of adjunctive individualised homeopathic therapy was assessed in a prospective observational study of 30 paediatric patients with asthma. This study demonstrated a reduction in severity of symptoms following individualised homeopathic therapies [54].

Overall, these studies support an integrative approach with adjunctive homeopathy in more effective reduction of symptom severity in patients with asthma.

Depression

Depression is one of the most prevalent conditions worldwide and is a leading cause of lost years of life in women aged 15–44 years [55]. The effectiveness of homeopathic agents has been reported in treating patients with depression, by evaluating multiple studies including double-blind randomised controlled trials (RCTs) [56]. One trial demonstrated clinical evidence of benefit in 83 patients diagnosed with depression following individualised homeopathic therapy. Significant improvements at 3, 6, 9 and 12 months ($p=0.001$) were observed in various clinical scores including Clinical Global Impression (CGI-1), Clinical Global Improvement (CGI-2), Beck Depression Inventory (BDI), and the 17-point Hamilton Depression Rating Scale (HDRS) [57]. On the basis of these studies, homeopathy may be more effective than placebo and equally effective as conventional antidepressants in terms of treatment efficacy.

Obstetric Medicine

Complementary medicine is being increasingly integrated into maternity care. Analysis from the Avon Longitudinal Study of Parents and Children (ALSPAC) showed frequent utilisation of homeopathic agents (14.4%, $n=14,115$) by pregnant women in the UK, with homeopathic

Arnica being the most frequently used remedy [58]. In this cohort, homeopathy was the second most popular system of CAM. Midwives generally support integration of CAM practices in obstetric care as it promotes patient autonomy and provides a safe alternative to conventional therapies [59]. A placebo-controlled, randomised, double-blind study observed that homeopathic therapy with *Arnica montana* and *Bellis perennis* could better resolve postpartum haemorrhage compared with placebo, measured by mean change in haemoglobin levels at 72 h postpartum [60].

According to a survey conducted in 2014 in a Scottish maternity service, homeopathy was the third most often prescribed CAM treatment [61]. Also, a five-patient case series described the successful treatment of infertility in women using homeopathy [62].

These studies form a basis to support further research into the application of homeopathy in obstetrics.

Coronavirus Infections

SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) and MERS (Middle East respiratory syndrome) are two closely related coronaviruses that can lead to fatal complications. Results of a review of homeopathic agents administered to patients infected with SARS-CoV-2 [63] are summarised in Table 1.

In December 2019, when Chinese health authorities reported an outbreak of severe pneumonia of unknown cause, researchers reported potential clinical benefit of some traditional Chinese medicines (TCM), such as Snow Lotus (*Saussuea involucrata*), which act to enhance innate immunity [64, 65]. In an open-label, randomised, placebo-controlled, exploratory trial in India, patients were randomly assigned to one of four groups ($n = 50$ each): *Arsenicum album* 30C (*Ars. alb.*), *Camphora* 1M (*Camph.*), *Bryonia alba* 30C (*Bry. alb.*) and placebo (Pl.). The researchers found that administration of Bry. alb. 30C was associated with a greater number of patients with asymptomatic COVID-19 (177 out of 200) testing negative by day 15 compared with administration of *Ars. alb.*, *Camph.* or Pl., raising the possibility of homeopathy as a potential therapy for COVID-19 [66]. Another study in Hong Kong analysed the symptomatic improvement in patients with COVID-19 ($n = 18$) after receiving *Bry. alb.* 30C. Patient-rated symptom severity and general wellbeing was reduced by 20% in the initial 12 h and 70–95% by day 3. Patients treated with homeopathic *Gelsemium sempervirens* (30C potency) showed 20–50% improvement in symptoms in the first 12 h and 70–100% by day 3. In the same trial, those treated with *Arsenicum album* and *Eupatorium* (both at 30C potency) experienced a 50% reduction in symptom severity within the initial 12 h, and 100% recovery by day 3 [67]. In an Italian cohort, 50 subjects underwent therapy with *Ars. alb.*, *Phosphorus*, *Atropa belladonna*, *Antimonium*

Table 1 Homeopathic agents administered three times daily for symptoms of SARS-CoV-2

Symptom	Agent (at 30C potency)
Fear of demise, panic about the pandemic (with or without fever)	Arsenic
Sudden appearance of any symptom accompanied by the fear of death	Aconite
Sudden onset of symptoms with congestion	Belladonna
Fever with muscular pain with/without cough	Bryonia
Deeper/bone pain with/without fever and with flu-like symptoms	Eupatorium
Itching burning throat with dryness also, dry cough	Wyethia
Extreme weakness and flu-like symptoms	Gelsemium

tartaricum, *Eupatorium perfoliatum*, *Hepar sulphuris*, *Lycopodium clavatum* and *Kalium phosphoricum*. The researchers tested the feasibility of homeopathic treatment in an epidemic situation. The hospitalisation rate in the 50 patients treated homeopathically for COVID-19 was 0% [68]. There was no comparator group, but hospitalisation rates for patients without homeopathic remedies were significant. Despite these results, more research on integrative medicine involving homeopathy in treating SARS-CoV-2 is required to provide potential therapeutic alternatives.

A retrospective observational study [69] investigated cases already treated by homeopaths with classical homeopathy for symptoms of COVID-19. In the study, 367 patients (166 men, 201 women) were selected, who met the eligibility criteria (average age 42.75 years). The average follow-up period was 6.5 days (standard deviation, SD = 5.3). There were 255 confirmed cases of COVID-19, with 61 probable and 51 suspected cases. For treatment, the most often used remedy was *Ars. alb.*, and over 73% of patients with COVID-19 (including approximately 79% of severe cases) improved with classical homeopathic treatment. The number of remedies required per individual correlated inversely with improvement ($p < 0.01$). Fever, the most common symptom at presentation (74.4%), was associated with an increased likelihood of improvement ($p < 0.01$), and improvement was inversely associated with age, but not with sex ($p < 0.01$). The study concluded that classical homeopathy was associated with improvement in SARS-CoV-2 infection, and this improvement was even more significant for severe diseases [69].

Other Disease Entities

The benefits of homeopathy in other disease entities have also been demonstrated. In one systematic review, homeopathy showed positive effects on oral health [70]. Additionally, homeopathy was one of the therapies most commonly sought for rheumatologic diseases such as progressive destruction and disability of joints, and as a patient preference due to intolerance of adverse effects with conventional treatment. Individualised homeopathic remedies have also been shown to produce positive effects for rheumatologic conditions [71]. In addition, an investigation into the effects of homoeopathic treatment of children suggested significant improvement of symptoms of upper respiratory tract infections. The success rate for respiratory tract infection was 77%, patients with allergic rhinitis and conjunctivitis reported 63% improvement, while 54% improvement was observed in subjects with lower respiratory tract diseases. The likelihood of considerable symptom improvement or resolution was significantly higher in patients with upper respiratory tract infections (OR 4.2, 95% CI 1.6–11.4) and patients who were followed up for at least 12 months. The researchers concluded that disease type and follow-up duration were the most important factors in determining the likelihood of successful treatment with homeopathic remedies, especially in children [72].

A study at an Italian homoeopathy centre ($n = 2592$) found significant amelioration or remission of a broad range of chronic disorders even after prior treatment with conventional therapies [73]. Participants previously treated with conventional medicine for symptoms from respiratory (29.4%), digestive tract (17%) and dermatologic (14.7%) diseases were recruited; 47% reported major improvement while only 0.5% reported worsening. A study on an antidiabetic homeopathic agent *Gymnema sylvestre* demonstrated in vitro antineoplastic activity by diminishing expression of the *Bcl2* antiapoptotic gene and increasing expression of the cytochrome *c* and caspase-3 genes which encode proteins involved in apoptotic signalling in human melanoma cells [74]. In another study, *Phytolacca decandra* showed anticancer potential by stimulating caspase-mediated signalling, as well as production of reactive oxygen species in human melanoma cells [75].

Acute upper respiratory tract infections as well as otorhinolaryngologic disorders are frequent in young children [76]. A study of complex homeopathic CalSuli-4-02 tablets reported significantly fewer symptoms related to upper respiratory tract infections and greater treatment satisfaction with no complication [77].

Interestingly, there was also a decrease in antibiotic use during homeopathic treatment.

DISCUSSION

One of the greatest diagnosticians in history and the 'father of modern medicine', William Osler, once said, 'Medicine is the science of uncertainties but also the art of probabilities.' In recent times it has also been said that homeopathy has had considerable achievements worldwide, aiding millions of patients with evidence from clinical and laboratory studies, but full recognition and appreciation from modern medicine had not yet come [78, 79].

Studying the effects of homeopathy may be difficult in certain clinical conditions. Multicentre, double-blind, placebo-controlled studies looking at the efficacy of homeopathic treatment in allergic rhinitis or diarrhoea in children concluded that evidence to suggest that homeopathy differed from placebo was insufficient [80, 81].

An analysis of homeopathic and conventional medicine clinical trials in parallel estimated the degree of trial error in both, through one of the largest meta-analyses investigating homeopathic clinical trials [82]. After reviewing the literature from 19 international databases, the authors tested placebo-controlled homeopathic trials against conventional medicine clinical trials investigating similar clinical syndromes and found comparable therapeutic outcomes between the two groups. Study errors were analysed in funnel plots and meta-regression models. In total, 110 homeopathic studies and 110 conventional medicine studies were analysed, with a median number of study participants of 65 (ranging from 10 to 1573). Double-blind studies with adequate randomisation were considered superior in terms of methodology. Twenty-one studies on homeopathic remedies and nine studies on the conventional medicine group were included. Smaller, lower-quality studies exhibited better treatment outcomes than larger, higher-quality studies. Similar rates of methodological errors were found between both homeopathic and conventional medicine studies. Subsequent analyses showed a weak effect of homeopathic treatments and a strong effect of conventional ones. It was inferred from the results that effects of homeopathic remedies were likely due to a placebo effect, but other researchers have criticised the meta-analysis, highlighting potential selection bias; and that findings would not be conclusive because of the great heterogeneity between the analysed studies [82, 83].

Products sold over the counter in pharmacies may be labelled as homeopathic but also contain an active substance in the traditional sense—therefore not being truly homeopathic. These products may be dangerous; and unregulated, they potentially cause harm to consumers. One example is Zicam, a homoeopathically classified nasal gel used to treat symptoms of upper respiratory tract infections that was withdrawn from the market in June 2009 after the US Food and Drug Administration (FDA) received 130 reports of anosmia following its use. An FDA report also noted that the manufacturing company had received more than 1000 complaints about this adverse effect without reporting it to higher authorities, and likely mislabelled the substance in material doses as homeopathic [84]. This example highlights the need for clear regulations governing the practice of homeopathy to protect both consumers and practitioners. Another homeopathic remedy, *Sabadilla officinarum*, is frequently used as a constituent to treat symptoms of upper respiratory tract infections [85]. However, it contains toxic alkaloids used as vermicides and insecticides [86], which may not be given safely to humans in material doses [87].

Homeopathy currently has a variable presence around the world. The degree of regulation or standardisation is equally variable from one country to the next. In certain jurisdictions the practice of homeopathy requires licensing or qualifications in conventional medicine from accredited universities.

In the USA products labelled and marketed as 'homeopathic' have not yet been reviewed by the FDA, limiting overall safety and efficacy and any subsequent role in treating or preventing systemic disease. Rigorous evidence-based drug evaluations by the FDA play a critical role

in ensuring that therapeutic agents are manufactured through high-quality processes and are both safe and effective in their intended uses. For this reason, products that have not been evaluated may carry a risk of harm to consumers, or conversely, consumers may have to forgo treatment despite proof of safety and efficacy on an individual level [88].

The Federal Food, Drug and Cosmetic Act stipulates that homeopathic products are subject to the same approval, tampering and mislabelling requirements as other medicinal products. There is currently no FDA-approved homeopathic product [88].

On December 6, 2022, the FDA issued its latest guidance on Homeopathic Drug Products, which describes the agency's approach to prioritising regulatory actions for homeopathic products that pose the greatest risk to patients [88].

In 1988, the FDA issued Compliance Policy Guide (CPG) 400.400, Conditions Under which Homeopathic Medicines May Be Marketed, which described the agency's enforcement policy, but this was withdrawn on October 24, 2019 as it was considered inconsistent with the agency's risk-based approach to regulatory and enforcement actions [88].

As a result, while ostensibly aimed at public safety, the position of the FDA on homeopathic remedies may still be lacking in objectivity, despite use of homeopathic agents in the USA for centuries. Unregulated composition of some medicinal products marketed as homeopathic should not give rise to a situation where the entire modality of homeopathy is considered inefficacious.

Considering the efficacy of homeopathy appears evident in the scientific data we have available. Homeopathic medications already in use with no reported adverse events should not be affected by the official FDA position.

Despite the lack of support for homeopathy on account of insufficient scientific evidence, homeopathy thrives and is even actively supported by the health systems of many countries. It has been said that for more than two centuries homeopathic practitioners have called upon researchers to consider the paradoxical phenomena (rebound effect and therapeutic similarity) without any prejudice, and to challenge the current dogmatic therapeutic paradigms with new approaches, even when it is difficult for peers to accept new ideas [15].

CONCLUSIONS

The current evidence supports a positive role for homeopathy in health and wellbeing across a broad range of different diseases in both adult and paediatric populations. However further research to assess its cost-effectiveness and clinical efficacy in larger studies is required. These findings may encourage healthcare providers and policymakers to consider the integration of homeopathic therapies into current medical practice, to provide a greater sense of patient autonomy and improve the consumer experience.

Medicine is dynamic and continues to evolve. Conventional medicine, while backed by the largest body of evidence thus far to support its safety and efficacy, still has its limitations in terms of side effects and subsequent effects on quality of life. This analysis calls for more in-depth assessment of the current research on homeopathy across a larger range of diseases.

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Declarations

Conflict of Interest. Nicoleta Maricica Maftei, Alexandru Nechifor, Brandon Tan, Alina Mihaela Elisei, Ana Maria Pelin, Luiza Nechita, Alin Laurentiu Tatu, Liang Joo Leow and Lawrence Chukwudi Nwabudike have nothing to disclose. Authors Nicoleta Maricica Maftei, Alexandru Nechifor, Alina Mihaela Elisei, Ana Maria Pelin, Luiza Nechita, Alin Laurentiu Tatu and Nwabudike acknowledge the academic support of the University of Galati, Romania, through its Multidisciplinary Integrated Centre for Dermatologic Interface Research. Authors Liang Joo Leow and Lawrence Chukwudi Nwabudike acknowledge the European Academy of Dermatology and Venereology's Leadership Development Programme for providing a forum through which this Romanian-Australian collaboration was made possible. Liang Joo Leow is an Editorial Board member of *Advances in Therapy*. Liang Joo Leow was not involved in the selection of peer reviewers for the manuscript nor any of the subsequent editorial decisions.

Ethical Approval. This article is based on previously conducted studies and does not contain any new study with human participants or animals performed by any of the authors.

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