

Homeopathy in Pediatric Dentistry

Çocuk Diş Hekimliğinde Homeopati

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ABSTRACT

Homeopathy is an alternative treatment approach that has been widely used for over 200 years. It is popularized as a safe and cost-effective alternative to allopathy. For a holistic approach, homeopathic remedies are used to improve not only patients' physical condition but also psychological or emotional condition. In dentistry, homeopathy has been used as an adjunct to conventional treatment since 18th century. Many studies indicate that the effect of homeopathic remedies is not different or superior to that of placebo. Institutions such as the World Health Organization and the Food and Drug Administration have not yet approved the ethics and safety of homeopathy as a treatment form. In recent years, regulations on homeopathy by many institutions have been increased, and its prevalence has been limited. Further clinical research is needed to elucidate whether homeopathic remedies can effectively treat conditions that appear to be linked to patients' spiritual, emotional, mental, and physical conditions, and whether this has a placebo effect. This review aimed to introduce the basics of homeopathy, which has been accepted as part of the Traditional and Complementary Medicine by the Turkish Ministry of Health as of 2016, and to discuss its possible applications in pediatric dental practice.

Keywords: pediatric dentistry, dentistry, homeopathy

ÖZ

Homeopati, 200 yıldan daha uzun süredir yaygın olarak kullanılan alternatif bir tedavi yaklaşımıdır. Allopatiyeye karşı güvenli ve uygun maliyetli bir alternatif olarak popülerleşmiştir. Homeopatik ilaçlar, bütünsel bir yaklaşım benimseyerek hastaların fiziksel durumları ile birlikte psikolojik veya duygusal durumlarını iyileştirmek için de kullanılmaktadır. Diş hekimliğinde 18. yüzyıldan beri geleneksel tedaviye ek olarak kullanıldığı bildirilmektedir. Yapılan çalışmaların birçoğu homeopatik ilaçların etkisinin plasebodan farklı ya da üstün olmadığını belirtmektedir. Homeopatinin bir tedavi biçimi olarak kullanımının etik ve güvenliği Dünya Sağlık Örgütü (DSÖ) ve Amerikan Gıda ve İlaç Dairesi (FDA) gibi kurumlar tarafından halen kabul görmemiştir. Son yıllarda birçok kurum tarafından homeopati ile ilgili olarak yapılan düzenlemeler artırılmış ve yaygınlığı sınırlandırılmıştır. Homeopatik ilaçların, hastaların ruhsal, duygusal, zihinsel ve fiziksel koşullarına bağlı görünen durumları tedavi edip etmediğini ve bunun plasebo etkisi olup olmadığını anlamak için daha fazla klinik araştırma yapılması gerekmektedir. Bu makalenin amacı, ülkemizde 2016 yılı itibarıyla Sağlık Bakanlığı tarafından Geleneksel ve Tamamlayıcı Tıp kapsamında kabul edilmiş olan homeopatinin temellerini tanıtmak ve çocuk diş hekimliğinde olası homeopatik uygulamaları gözden geçirmektir.

Anahtar Kelimeler: çocuk diş hekimliği, diş hekimliği, homeopati

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INTRODUCTION

Homeopathy is an alternative treatment approach existing for over 200 years. It originated from the combination of the German words *homoios*, which means “similar” or “alike,” and *pathos*, which signifies “sensation” and “illness,” and their origins were derived from the Greek words *homoios* and *patheia* (1, 2, 3). The origins of homeopathy trace back to Hippocrates; however, owing to its unknown mechanism of action, it continues to be a subject of debate among scientists, regarding it as a controversial topic. It is often labeled as pseudoscientific (2, 4, 5). However, it has become a cultural component of many countries and has rapidly gained popularity worldwide since the mid-1990s (3, 6). It has a broad range of applications, encompassing not only for humans and animals but also in agriculture and reproductive fields (7). The main reason for the widespread adoption of homeopathy, which emerged in the 19th century and has become increasingly popular, is rooted in the medical practices of the past. These practices often involved procedures such as bloodletting, instrument use such as cupping, incision in various parts of the patient’s body, and ineffective and potentially harmful treatment options (8).

Homeopathy is primarily based on the notion that the presence of disease-associated symptoms does not indicate a faulty state within the organism. Instead, these symptoms are manifestations of an individual’s protective and healing behaviors in response to stress and infection. It underscores that illness is not a result of succumbing to stress and infection factors within the body’s system but a response of the body’s struggle against these factors (9).

Principles of Homeopathy

Homeopathy is grounded on three fundamental principles: the law of similars, minimum dose, and individualization. The law of similars adopts the principle of “like cures like.” Thus, in homeopathy, a specific disease can be treated with a substance that, when taken in high doses, produces symptoms similar to those caused by the disease. For example, bee venom, which causes itching, is used for treating pruritus, and coffee is used to treat insomnia (10). In the principle of minimum dose, the substance associated with the disease is transformed into a solution to reduce side effects and determine an effective dose; this solution is then serially diluted. These dilutions are referred to as potencies, and after these stages, the substance can become a homeopathic remedy (3, 11, 12). Moreover, the principle of individualization asserts that no single remedy is sufficient to treat every illness; this principle recognizes that each person’s illness can follow a unique course (9).

In homeopathy, all symptoms of a patient are matched with different homeopathic remedies. These symptoms encompass not only physical aspects but also emotional and mental ones. The homeopath not only addresses the primary afflictions but also inquires about minor discomforts, preferred and disliked foods, favored room temperatures, moments of happiness or unhappiness during the day, specific hours of the day when

the patient experiences certain feelings, and where the patient feels better or worse. By asking such questions, the homeopath could understand patient’s psychology, emotional state, and character. Through this acquired information, homeopaths may be able to treat the illness using a prepared medicinal solution (9, 13).

Substances Utilized in Drug Production and Prescription Process in Homeopathy

In homeopathy, solutions are prepared from substances such as minerals, viruses, plants, and animal sources (e.g., snake venom, protozoa, and microfungi), as well as from materials obtained from diseased but noninfected tissues. For instance, the “Psorinum” solution developed for treating pancreatic cancer is an alcoholic extract containing the surface of scabies-infested skin, crusts, and pus cells (14). In the homeopathy production process, homeopathic substances are combined with lactose sugar crystals and then pulverized, allowing to be dissolved in water multiple times. This procedure is called trituration. The next step is potentization to reduce the chemical toxicity of the substance and enhance, improve, or increase its medicinal effect. Potentization involves a series of dilutions through vigorous shaking between each solution. Currently, this process uses three different scales. Hahnemann introduced the C scale wherein each step involves diluting the product by a factor of 100. According to this scale, 1 unit of the substance is diluted with 99 units of the solvent (1C potency). In homeopathy, the potency of a solution is directly proportional to the number of dilution steps. Therefore, a solution made at 1C potency is assumed to have low potency. Higher potency levels may increase the duration of the effect (9, 11, 15). For localized symptoms, low potencies (below 12C) are prescribed, whereas for systemic treatment, higher potencies (30C–200C) are used. Evaluating whether symptoms are more emotional or physical should be taken into consideration. Homeopaths tend to give more importance to the patient’s emotional and mental states, as well as their physical condition. The more emotional and mental symptoms are present, the higher the potency of the solution is typically used (3). Figure 1 shows the adopted dilution–potency relationship in the prepared homeopathic solutions (11).



Figure 1: Dilution–potency relationship adopted in homeopathic solutions (11).

Critiques and Insufficiency of Scientific Foundations

Most scientists outside of the growing number of alternative medicine proponents reject homeopathy; these scientists

Table 1: Explanations regarding the potential efficacy of homeopathic preparations (31, 32).

Placebo Effect	Having high expectations toward homeopathic remedies can lead to this situation.
Therapeutic Effect of Consultation	While describing oneself to a homeopathic practitioner, the positive emotions a patient has can arise.
Spontaneous Remission without External Factors	The spontaneous recovery of numerous diseases without any external intervention is possible.
Unknown Therapeutic Factors	An unrelated food, exercise, environmental factors, or a procedure applied for the treatment of a different disease might show an effect.
Regression to the Mean	Considering the cyclical nature of many conditions or illnesses, symptoms evolve over time, and patients often seek the most assistance when their condition is at its worst. Nevertheless, the timing of patients' visit to the homeopath can align with the period of their improvement.
Nonhomeopathic Treatment	Patients can receive standard medical treatment and homeopathic treatment simultaneously, and in some cases, the initial medical treatment may contribute to the improvement of the condition.
Discontinuation of Unwanted Treatment	Homeopaths recommend that patients decline medical treatments, such as surgeries or drug applications, which could result in various side effects. Although discontinuing the initially administered medical treatment might seem to be the cause of improvement, this correlation is often linked to homeopathy. However, this scenario can pose a potential risk to the patient because the underlying disease remains untreated.

consider such practice as fraudulent and quackery (16, 17, 18). Currently, reliable statistical evidence for therapeutic effects remains to have no consensus, consistent with the absence of any biologically plausible pharmacological agent; nevertheless, the body of supporters of alternative medicine continues to grow (19). Additionally, proponents of homeopathy claim that homeopathic remedies possess as-yet-unidentified mechanisms of action (20). The notion that any homeopathic remedy has a distinction from the placebo effect remains inconclusive (19).

Homeopathic solutions have been prepared in extremely low concentrations since the 1800s, and some of them contain virtually none of the original substance because of repeated dilutions; this concept is at the core of the issues regarding the mechanisms of action of homeopathic remedies. The Avogadro constant, which is used to determine the number of particles in a mole, is stated to be $6.02214076 \times 10^{23}$ (23, 24, 25). Therefore, a homeopathic substance at 12C ($1/10^{24}$) potency possibly has molecules of the homeopathic substance in the final solution after roughly diluting 1 mole. If further dilution is applied, such molecules may no longer be present in the solution (22, 26). Hence, the minimum amount of substance present in the solution would be one molecule; therefore, a 30C potency solution would need to contain at least one molecule of the original substance dissolved in 1×10^{57} molecules of water. This method would require a container that is approximately 30 billion times the size of the Earth (27). Supporters of modern homeopathy have developed a concept known as "water memory," suggesting that water can remember substances dissolved within it and transmit the effects when ingested. However, this concept contradicts the current understanding of matter, with no evidence to support the idea that water memory has biological or other detectable effects (28, 29). Pharmacological effects do not occur without any actual active component; this inconsistency is attributed to the law of mass action and the observed dose–response relationship of therapeutic drugs not aligning with homeopathy (30). Table 1 explains the potential efficacy of homeopathic preparations (31, 32).

Homeopaths assert that their procedures yield active solutions exclusively containing the specific homeopathic substances they determine, and these substances possess therapeutic properties. Nevertheless, critics focused on the potential that the water employed in the process might have interacted with a myriad of distinct materials over time. Homeopathic practitioners cannot present specific evidence as to why a particular homeopathic substance is selected (17).

Randomized Controlled Trials and Meta-analyses

In 1997, Linde et al. reviewed 186 placebo-controlled trials, utilizing 89 of them for meta-analysis assessment. They investigated whether the clinical effects of homeopathy are influenced by placebo, and found that such clinical effects cannot be solely attributed to placebo. Nevertheless, they underscored the absence of comprehensive and well-designed studies that could be independently replicated, particularly for specific diseases. The studies also highlighted the lack of substantial evidence demonstrating the specific clinical conditions for which a particular homeopathic treatment is clearly effective. In their own research, they identified two shortcomings in terms of providing scientific evidence for experiments. First, the credibility of the presented evidence often diminishes because of the involvement of low-budget studies conducted by homeopathy proponents. Second, the potential for publication bias within research related to homeopathy is highlighted (33).

In 2005, Shang et al. compared and assessed allopathy and homeopathy under placebo-controlled conditions. The outcomes could not confirm that homeopathy outperforms placebo, and they demonstrated that modern medicine holds significant advantages. They pointed out the cumulative impact of various sources of bias and the asymmetry in the funnel plot within the findings (34). Figure 2 depicts the funnel plot. However, they substantiated that the clinical effects of homeopathy arise from nonspecific placebo or context effects. Examples of context effects include the patient–practitioner

relationship in homeopathy, the patient's robust convictions regarding treatment efficacy, and the impact of cultural influences (35).

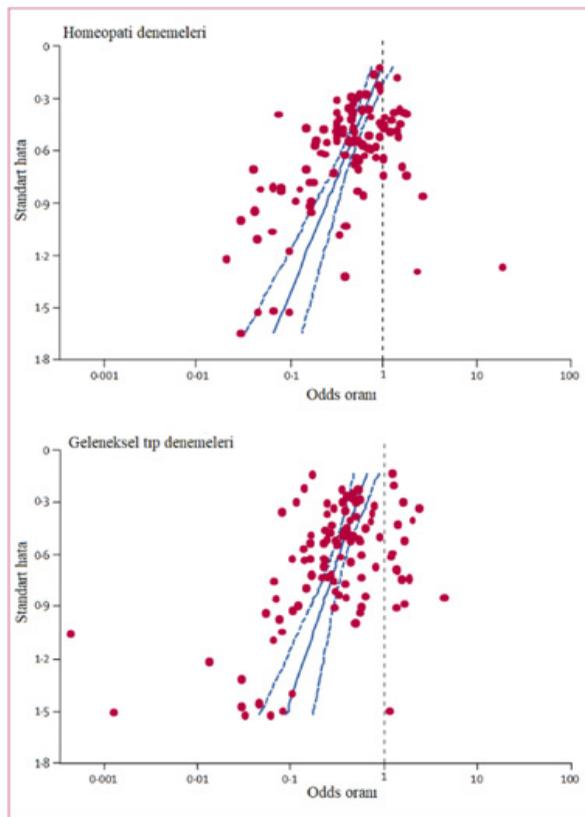


Figure 2: Funnel plot depicting the comparison between homeopathy and conventional medicine (35).

Ernst et al. examined the effects of a homeopathic arnica solution in eight patients with tissue trauma and observed that the effects were not superior to placebo (36). They also reviewed all systematic reviews up to that year and found that certain solutions still did not exhibit significant benefits or superiority over placebo (19).

Various studies are also being conducted in the field of psychology to investigate the effects of homeopathy. One study reviewed 168 cases of attention deficit hyperactivity disorder treated with ritalin as a homeopathic agent, and found that ritalin did not provide specific benefits (37). In a meta-analysis conducted by Rotella et al., homeopathy showed to be more effective than placebo, but no difference was observed between homeopathy and placebo for attention deficit hyperactivity disorder. Considering the available data, the clinical use of homeopathy remains to have insufficient evidence (38).

Organizations Associated with Homeopathy

In the field of homeopathy, three independent organizations have been recognized worldwide. The British Homeopathic

Association began its activities in 1902 to promote homeopathic practices among physicians and other healthcare professionals. In May 2019, its name was changed to Homeopathy UK (39). The Faculty of Homeopathy, located in the UK, was established in 1944, and it operates in the academic field (40). The Society of Homeopaths, established in 1978, operates as a private British company in the field of homeopathy (41).

Moreover, the British Homeopathic Dental Association was established in 1991 and is the only organization specifically active in the field of dentistry. This organization aimed to promote the use of homeopathy in dentistry and facilitate a professional understanding of this subject (42). Homeopathy Association in Türkiye was established in Istanbul in 2008 with the purpose of promoting homeopathy, training homeopathy experts, providing homeopathy consulting services, and conducting projects and research (43).

Ethics and Safety

A study conducted by homeopaths in 2000 observed that homeopathic agents were less likely to cause serious side effects (44). However, in 2012, a study systematically examining the potential side effects of homeopathy reported that homeopathy could potentially harm patients and consumers both directly and indirectly (45). Another systematic review and meta-analysis conducted in 2016 reported that the frequency of side effects observed in individuals using homeopathic treatments was similar to that in individuals using placebos and traditional medicines (46).

Some homeopathic agents contain active substances such as arsenic, belladonna, and poison ivy. In rare cases, these agents can be present in formulations in detectable amounts because of incorrect preparation or inadequate dilution (45). Serious symptoms such as seizures and even death can develop as side effects in some individuals, and cases of arsenic poisoning have been reported (47).

In 2016, the Food and Drug Administration (FDA) issued a safety alert warning on the use of homeopathic teething gels and tablets (48). These products are reportedly not properly diluted, containing dangerous amounts of belladonna. Reports of serious side effects in children who use them are consistent with belladonna toxicity (49).

Opting for homeopathic practices instead of evidence-based medicine in patients may increase the risk of missing timely diagnosis and appropriate treatment, thereby worsening the course of diseases, especially those requiring early diagnosis and treatment such as cancer (50, 51). The Pseudoscience Commission does not find homeopathy reliable because it leads to excessive spending on drugs that truly do not work and neglects known effective treatments, causing patients to waste money (52).

Regulations and Prevalence of Homeopathy Worldwide

Homeopathy has been practiced globally, and professional qualifications and licenses are required for practitioners in

many countries (53). According to a report published by the World Health Organization (WHO) in 2019, 100 out of the 133 countries surveyed in 2012 used homeopathy. Among these 100 countries, 22 had established guidelines for regulated homeopathic practices, and in 13 of them, health insurance coverage was provided for homeopathic practitioners (54). Furthermore, homeopathy has been integrated into the existing national healthcare systems in several countries, including India, Mexico, Pakistan, Sri Lanka, and the United Kingdom, since the year 2001 (53). In 2021, France removed all these medical integrations (54). In the USA, the FDA guideline allowing the sale of unapproved homeopathic drugs was also revoked in 2019, stating that no homeopathic products have been approved by the FDA anymore (55, 56)

Homeopathy is one of the most popular approaches in alternative medicine, showing a significant market worldwide. Although exact figures are unknown, available information on the sales of homeopathic remedies suggests a substantial share in the pharmaceutical market. According to the WHO, expenditures on homeopathic remedies were reported as \$2.9 billion in the USA in 2007, \$408 million in France in 2008, \$26 billion in China, \$62 million in the United Kingdom, \$346 million in Germany, and \$7.3 million in Australia (6).

Türkiye was introduced to homeopathy approximately 175 years ago through John Martin Honigberger. Honigberger was a student of Hahnemann; he lived in Istanbul for 2 years, and during the plague outbreak, he administered treatments using homeopathic agents. Until 1998, no research had been conducted on homeopathy in Türkiye. However, since 2016, the Ministry of Health has declared that it is recognized as part of Traditional and Complementary Medicine (43).

Application Areas of Homeopathy in Dentistry

The use of homeopathic remedies by homeopaths in dentistry can be recommended for various conditions, such as stomatitis, xerostomia, neuralgia, temporomandibular joint disorders, sialorrhea, lichen planus, and bruxism (9). A study conducted in 2008 on rats indicated that the homeopathic plant *Symphytum* (comfrey) increased the peripheral bone density around titanium implants (57).

In 2009, Mousavi et al. conducted two single-blind clinical studies. The first study identified the effect of a homeopathic solution obtained from the *Strychnos ignia* plant on erosive oral lichen planus. In the examination where, average lesion size and pain measurements were evaluated at the end of a 4-month period, *Ignatia* was found to be successful (58). In the second study, 100 patients with minor aphthous ulcers were treated with individualized homeopathic remedies or placebo and then followed up for 6 days. Statistically significant results were obtained between the groups in terms of pain intensity and ulcer sizes on the 4th and 6th days (59).

Homeopathic Dana Ullman's book, which was published in 2002, provides suggestions and formulations for toothache. He recommends using a solution at 6C, 12C, or 30C potency

administered every 30 minutes for severe pain and every 2–4 hours for mild pain. In case of no improvement after three doses, he suggests applying a different prescription (9). Below are some of the recommended compounds for homeopathic solutions applied for certain dental conditions.

Hepar Sulphuris Calcareum is a compound obtained by mixing the sulfur-rich inner layer of oyster shells with sulfur and heating it. It is commonly used for treating sharp, needle-like pains caused by tooth abscess or extreme sensitivity to dental touch and cold sensation. Patients with this condition often exhibit halitosis. Figure 3 provides a visual representation of Hepar Sulphuris Calcareum (60).



Figure 3: Image of Hepar Sulphuris Calcareum belonging to the Homeopathy Plus! pharmaceutical company (60).

Ruta graveolens, also known as rue, is commonly used by individuals experiencing pain after dental interventions. It is also reported to be effective against alveolitis (9). Figure 4 presents a botanical illustration of the *Ruta* plant (61).



Figure 4: Botanical illustration of *Ruta graveolens* by Otto Wilhelm Thomé (61).

Mercurius solubilis, also known as black oxide of mercury, is preferred for use in individuals with excessive salivation and severe toothache. It is used during night pains and when pain increases with extremely cold or hot conditions. These patients are also prone to halitosis (9).

Atropa belladonna is also known as deadly nightshade. Its leaves produce the hallucinogenic substance “atropine.” It can be used for treating sudden throbbing toothaches that can appear and disappear abruptly. Patients with this condition have excessively red gum tissues and dry mouth (9). Figure 5 shows a botanical illustration of *A. belladonna* (62).



Figure 5: Illustration of *Atropa belladonna* found in Köhler’s Medicinal Plants book. (62).

Matricaria chamomilla, also known as wild chamomile, is recommended for patients with severe toothache that lessens when drinking cold beverages but worsens when consuming hot foods and drinks (9). Figure 6 shows a botanical illustration of wild chamomile (63).



Figure 6: Jacob Sturm’s illustration of *Matricaria chamomilla* (63).

Coffee: Drinking coffee is suggested as a treatment option for toothache, especially if it is relieved when drinking a cold beverage and worsens when drinking a warm water. Given that toothache burdens the patient both physically and mentally, consuming coffee with similar effects might be beneficial (9).

Homeopathic Practices in Pediatric Dentistry

The primary goal of pediatric dentistry is to instill positive attitudes and behaviors in children through treatment while maintaining their physical and mental well-being. In pursuit of this goal, similar to all other aspects of health, methods such as Ayurveda, acupuncture, naturopathy, and homeopathy can be employed in the field of oral and dental health (64, 65). Pediatric homeopathy is often valued by its proponents for its low cost, quick recovery time, minimal side effects, and noninvasive nature (64, 66). Considered as part of holistic dentistry, homeopathy is used to address issues such as dental phobia, tooth decay, and toothache (67, 68, 69). Table 2 presents symptoms related to various diseases and the homeopathic remedies that can be used for these symptoms (2). In addition to these agents, toothpastes and lip balms are suitable for homeopathic approaches and treatments. However, their effectiveness has not yet been proven, owing to insufficient evidence (67, 68, 69).

CONCLUSION

Homeopathy is a considerably popular yet controversial field of science that has been used by various societies for decades. Considering all the studies reviewed, homeopathy having statistically significant benefits compared with placebo remains uneventful. Its effectiveness still has no clear and sufficient evidence; thus, patients undergoing this treatment procedure should be informed accordingly. Particularly when used for child health and pediatric oral and dental health, its validity is unconfirmed because of the scarcity of standardized studies. Hence, further clinical studies are required to verify whether homeopathic remedies have positive effects on symptoms seemingly related to a patient’s emotional, mental, or physical state, and whether these effects are independent of the placebo effect.

Today, the longest lifespans in recorded human history have been achieved. Through modern medicine, millions of people are saved from serious epidemic diseases every year. This accomplishment is made possible through modern diagnostic methods, double-blind studies, and scientifically conducted reliable research. In light of all these observations, modern medical science can potentially gain value from homeopathy, which has long been debated and defined as pseudoscientific. By doing so, a patient-centered, personalized approach can be established. This way, modern medicine can acquire new insights and can be taken a step further.

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REFERENCES

1. Beek L Van, Beekes RSP. *Etymological Dictionary of Greek*. Leiden: Brill. 2010.
2. Hoseinishad M, Nosratipour A, Mozzaff ar Moghaddam S, et al. Homeopathy in dentistry: A review. *International Journal of Contemporary Dental and Medical Reviews Int J Contemp Dent Med Rev*. 2015;1-5.
3. Saikiran KV, Kamatham R, Saha A, et al. Homeopathy in Pediatric dentistry – A review Homeopathy in Pediatric dentistry – A review. *Scholars Journal of Dental Sciences*. 2017;4:89-92.
4. Hahn RG. Homeopathy: Meta-analyses of pooled clinical data. *Forschende Komplementarmedizin*. 2013;20(5):376–81.
5. Ladyman J. *Philosophy of Pseudoscience: Reconsidering the Demarcation Problem*. Pigliucci M, Boudry M, editors. University of Chicago Press; 2013;48-49.
6. Safety issues in the preparation of homeopathic medicines [Internet]. WHO Press. 2009. Erişim linki: <https://www.who.int/medicines/areas/traditional/Homeopathy.pdf>
7. Sen S. Agrohhomeopathy : an Emerging Field of Agriculture for Higher Crop Productivity and Protection of Plants Against Various Stress. *International Journal of Research and Analytical Reviews*. 2018;5(4):52–6.
8. Ernst E, Kaptchuk T. Homeopathy revisited. *Archives of Internal Medicine*. 1996;156(16):2162-4.
9. Ullman D. Homeopathy A-Z. Kramer J, editor. Hay House Inc.; 2002;156.
10. Shaw D. Unethical aspects of homeopathic dentistry. *British Dental Journal*. 2010;209(10):493-6.
11. Lockie A. *Encyclopedia of Homeopathy*. 2nd ed. Singh D, editor. New York: DK Delhi; 2006.
12. Owen D. *Principles and Practice of Homeopathy The Therapeutic and Healing Process*. 1st ed. Churchill Livingstone Elsevier Ltd.; 2007;436.
13. Ullman D. Homeopathy: Medicine for the 21st Century [Internet]. California,USA: North Atlantic Books; 1991;277. Erişim linki: <https://books.google.com/books?hl=en&lr=&id=J7oestO-BnAC&pgis=1>
14. Johnson C. Primary Homeopathic Treatment of Cancers of the Pancreas, Stomach, Gallbladder, and Liver. *Natural Medicine Journal*. 2011;3(4).
15. Lessell CB. *A textbook of dental homeopathy*. Saffron Walden: The CW Daniel Company Ltd; 1995.
16. Baran GR, Kiani MF, Samuel SP. Science, Pseudoscience, and Not Science: How Do They Differ? In: *Healthcare and Biomedical Technology in the 21st Century*. New York: Springer; 2014;19-57.
17. Smith K. Homeopathy Is Unscientific And Unethical. *Bioethics*. 2012;26(9):508-12.
18. Tuomela R. Chapter 4: Science, Protoscience, and Pseudoscience. In: *Rational Changes in Science: Essays on Scientific Reasoning*. Springer; 1987;83-101.
19. Ernst E. A systematic review of systematic reviews of homeopathy. *The Journal of Clinical Pharmacology*. 2002;54(6):577-82.
20. Vickers A, Zollman C. Homeopathy: How can homeopathy work ? *British Medical Journal*. 1999;319:1115-8.
21. Ernst E. Is homeopathy a clinically valuable approach? *Trends in Pharmacological Sciences*. 2005;26(11):547-8.
22. Grimes DR. Proposed mechanisms for homeopathy are physically impossible. *Focus on Alternative and Complementary Therapies*. 2012;17(3):149-55.
23. IUPAC. *Compendium of Chemical Terminology*. 2nd ed. 1997.
24. de Bievre P, Peiser HS. 'Atomic weight'-the name, its history, definition, and units. *Pure and Applied Chemistry*. 1992;64(10):1535-43.
25. The International System of Units (SI) [Internet]. 9th ed. 2019. 134 p. Erişim linki: <https://www.bipm.org/utis/common/pdf/si-brochure/SI-Brochure-9-EN.pdf>
26. Baum M, Ernst E. Should We Maintain an Open Mind about Homeopathy?. [Internet]. *American Journal of Medicine*. 2009;122(11):973-4. Erişim linki: <http://dx.doi.org/10.1016/j.amjmed.2009.03.038>
27. Park RL. *Alternative Medicine And The Laws Of Physics*. *Skeptical Inquirer*. 1997;21(5).
28. Maddox J, Randi J, Stewart W. "High-dilution" experiments a delusion. *Nature*. 1988;334(6180):287-91.
29. When to believe the unbelievable. *Nature*. 1988;333:788.
30. Levy G. Kinetics of drug action: An overview. *Journal of Allergy and Clinical Immunology*. 1986;78(4 Pt 2):754-61.
31. Shelton JW. *Homeopathy: How It Really Works*. Prometheus; 2004;318.
32. Brien S, Lachance L, Prescott P, et al. Homeopathy has clinical benefits in rheumatoid arthritis patients that are attributable to the consultation process but not the homeopathic remedy: a randomized controlled clinical trial. *Rheumatology*. 2010;50(6):1070-1082.
33. Linde K, Clausius N, Ramirez G, et al. Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials. *Lancet*. 1997;350(9081):834-43.
34. Sterne JA, Egger M. Funnel plots for detecting bias in meta-analysis: guidelines on choice of axis. *Journal of Clinical Epidemiology*. 2001;54(10):1046-55.
35. Shang A, Huwiler-Müntener K, Nartey L, et al. Are the clinical effects of homeopathy placebo effects? Comparative study of placebo-controlled trials of homeopathy and allopathy. *Lancet*. 2005;366(9487):726-32.
36. Ernst E, Pittler MH. Efficacy of Homeopathic Arnica. *Archives of Surgery*. 1998;133(11):1187-90.
37. Coulter MK, Dean ME. Homeopathy for attention deficit/hyperactivity disorder or hyperkinetic disorder. *Cochrane Database of Systematic Reviews*. 2007;17(4).
38. Rotella F, Cassioli E, Falone A, et al. Homeopathic Remedies in Psychiatric Disorders: A Meta-analysis of Randomized Controlled Trials. *Journal of Clinical Psychopharmacology*. 2020;40(3):269-75.
39. British Homeopathic Association [Internet]. Homeopathy UK. Erişim linki: <https://homeopathy-uk.org>

40. Faculty of Homeopathy [Internet]. Faculty of Homeopathy. Erişim linki: <https://www.facultyofhomeopathy.org>
41. The Society of Homeopaths Ltd [Internet]. Companies House. Erişim linki: <https://beta.companieshouse.gov.uk/company/01392004>
42. British Homeopathic Association. [Internet]. British Homeopathic Association Erişim linki: <http://www.bhda.co.uk/>
43. Türkiye’de Homeopati [Internet]. [cited 2021 Apr 17]. Erişim linki: <https://homeopatidernegi.org/turkiyede-homeopati/>
44. Dantas F, Rampes H. Do homeopathic medicines provoke adverse effects? A systematic review. *British Homoeopathic Journal*. 2000;89:35-8.
45. Posadzki P, Alotaibi A, Ernst E. Adverse effects of homeopathy: A systematic review of published case reports and case series. *International Journal of Clinical Practice*. 2012;66(12):1178–88.
46. Stub T, Musial F, Kristoffersen AA, et al. Adverse effects of homeopathy, what do we know? A systematic review and meta-analysis of randomized controlled trials. *Complementary Therapies in Medicine* [Internet]. 2016;26:146-63. Erişim linki: <http://dx.doi.org/10.1016/j.ctim.2016.03.013>
47. Chakraborti D, Mukherjee S, Saha K, et al. Arsenic toxicity from homeopathic treatment. *Journal of Toxicology*. 2003;41(7):963–7.
48. FDA warns against the use of homeopathic teething tablets and gels [Internet]. FDA. 2016 [cited 2021 Jul 30]. Erişim linki: <https://www.fda.gov/news-events/press-announcements/fda-warns-against-use-homeopathic-teething-tablets-and-gels>
49. Mole B. FDA: Homeopathic teething gels may have killed 10 babies, sickened 400”. [Internet]. *Ars Technica UK*. 2016. Erişim linki: <https://arstechnica.com/science/2016/10/fda-homeopathic-teething-gels-may-have-killed-10-babies-sickened-400/>
50. Altunc U, Pittler M, Ernst E. Homeopathy for childhood and adolescence ailments: systematic review of randomized clinical trials. *Mayo Clinic Proceedings*. 2007;82(1):69–75.
51. Malik I, Gopalan S. Use of CAM results in delay in seeking medical advice for breast cancer. *European Journal of Epidemiology*. 2002;18(8):817-22.
52. Homeopathy as pseudoscience [Internet]. Commission on Pseudoscience and Research Fraud. 2017. Erişim linki: <http://klnran.ru/en/2017/02/memorandum02-homeopathy/>
53. World Health Organization. Programme on Traditional Medicine. Legal status of traditional medicine and complementary/ alternative medicine : a worldwide review. 2001. World Health Organization. [Internet]. Erişim linki: <https://apps.who.int/iris/handle/10665/42452>
54. World Health Organization. [Internet]. WHO global report on traditional and complementary medicine. 2019. World Health Organization. Erişim linki: <https://apps.who.int/iris/handle/10665/312342>
55. Kolton EA, Prochnow JJ, Koepke CM. FDA Toughens Enforcement of Homeopathic Products . *The National Law Review*. 2019;9(301).
56. FDA Homeopathic Products [Internet]. 2020. Erişim linki: <https://www.fda.gov/drugs/information-drug-class/homeopathic-products>
57. Sakakura CE. Influence of homeopathic treatment with comfrey on bone density around titanium implants: a digital subtraction radiography study in rats. *Clinical Oral Implants Research*. 2008;19(6):624-8.
58. Mousavi F. Ignatia in the treatment of oral lichen planus. *Homeopathy*. 2009;98(1):40-4.
59. Fahimeh M, Mojaver YN, Asadzadeh M, et al. Homeopathic treatment of minor aphthous ulcer: a randomized, placebo-controlled clinical trial. *Homeopathy*. 2009;98(3):137-41.
60. Know Your Remedies: Hepar Sulphuris Calcareaum (Hep.). HomeopathyPlus [Internet]. Erişim linki: <https://homeopathyplus.com/know-your-remedies-hepar-sulphuris-calcareaum-hep-s-c/>
61. Ruta graveolens illustration [Internet]. Erişim linki: https://commons.wikimedia.org/wiki/File:Illustration_Ruta_graveolens0.jpg
62. Atropa belladonna illustration [Internet]. Erişim linki: https://en.wikipedia.org/wiki/File:Atropa_belladonna_-_Köhler-s_Medizinal-Pflanzen-018.jpg
63. Matricaria chamomilla illustration [Internet]. Erişim linki: https://commons.wikimedia.org/wiki/File:Matricaria_recutita_Sturm13045.jpg
64. Goel P, Torwane N, Hongal S, et al. Homeopathic medicine-An Adjuvant for Dentistry: A Review. *International Ayurvedic Medical Journal*. 2014;2(2):203-10.
65. Thakur N, Bagewadi A, Keluskar V. Holistic dentistry: Natural approaches to oral health. *Journal of International Oral Health*. 2011;1(3):9-13.
66. Andhare M, Rajender A, Dhuldhwaj R, et al. Homeopathic dentistry: Mystery or myth-A review. *International Journal of Science and Research*. 2016;5(7).
67. Chopra P. Homeopathy in Dentistry -An Overview. *International Journal of Contemporary Dentistry*. 2011;2(2).
68. Fischer R. Dentistry and homeopathy: An overview. *American Institute of Homeopathy*. 1985;78:140-7.
69. Dodwad V, Malhotra S, Nayyar N. Toothpaste wars: To assess the efficacy of a herbal, homeopathic and a conventional toothpaste in the control of plaque and gingivitis-A clinicobiochemical study. *Indian Journal Of Stomatology*. 2011;2(2).