About Petal Life

Petal Life provides information on complementary alternative medicine (CAM). It is a resource on health and wellness with the purpose of providing knowledge to empower readers to make intelligent decisions about their lives. Petal Life provides credible wellness information gathered from peer-reviewed journals and scholarly sources. Credible wellness information is important to consumer safety and education.

Petal Life has been carefully crafted to include seven tabs or petals; the number seven is a significant number in some healing modalities and spiritual practices. Each tab provides properly cited, well-referenced articles on CAM and related topics, including Healing, Herbs, Nutrients, Wellness, Remedies, and other topics Of Interest.

Articles are on average 1,500 words long, although some may be longer or shorter, and will take 4 to 8 min to read, based on the speed of reading. A PDF of each article is available for easy access, downloading, or archiving.

Defining CAM

CAM is an acronym for complementary alternative medicine. CAM is often used interchangeably with alternative medicine, integrative medicine, holistic medicine, or traditional medicine, and there is much confusion as to their meaning. Each of these terms has a different meaning. The National Institutes of Health (NIH) acknowledges that the boundaries of CAM are not well defined (Caspi et al., 2003).

Complementary and Alternative Medicine

Although complementary and alternative are used together in the term CAM, each word has a different meaning. The National Center for Complementary and Integrative Health (NCCIH) explains that complementary and alternative are non-mainstream approaches, but complementary treatments are used alongside conventional medicine, and alternative treatments are used in place of conventional medicine (NCCIH, 2014). The challenge is that one person may consider a treatment as alternative and use it in place of an allopathic treatment, but another person may use the same treatment alongside an allopathic treatment and consider it complementary. The definitions of the terms are based on how the user applies them (Caspi et al., 2003).

Traditional Medicine

The term traditional implies a foundation in long-standing history. The World Health Organization (WHO, 2015) defines traditional medicine as:

> The knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, used in the maintenance of health and in the prevention, diagnosis, improvement or treatment of physical and mental illness. Traditional medicine covers a wide variety of therapies and practices which vary from country to country and region to region. In some countries, it is referred to as "alternative" or "complementary" medicine (CAM). (para. 1)

Once again, depending on how it is used, a traditional treatment could be considered as alternative or complementary.

Integrative Medicine

Integrative medicine is a contemporary concept representing how traditional medicine has integrated with conventional medicine (NCCIH, 2014). The term was first used in the 1990s in response to a shift in the approach in medicine, where it looked to heal, rather than fight disease (Caspi et al., 2003). Integrative medicine views the patient as an individual, and devises an approach that is unique to the person and best suited to their needs, regardless of whether treatment is

conventional, alternative, or a combination (Caspi et al., 2003). The University of Arizona's Center for Integrative Medicine defined integrative medicine as "healing-oriented medicine that takes account of the whole person, including all aspects of lifestyle; [that] emphasizes the therapeutic relationship between practitioner and patient, is informed by evidence, and makes use of all appropriate therapies" (Gale, 2014, p. 645). It looks at the patient as a whole, and engages the mind, spirit, and community to devise the treatment. Integrative medicine is becoming more common, as more patients combine CAM and allopathic treatments.

Holistic Medicine

Yet a fifth term is holistic medicine, which approaches each person as a whole, and looks at all aspects of their lives (Gale, 2014). Holistic medicine entails those disciplines whose goal is the "optimal attainment of the physical, mental, emotional, social, and spiritual aspects of health" (Caspi et al., 2003, p. 59). A holistic approach looks at both the symptoms and underlying causes of illness (Gale, 2014), and considers "all safe and appropriate modalities of diagnosis and treatment" (Caspi et al., 2003, p. 59). Thus, many modalities that are lumped within CAM can also be categorized as holistic. All integrative medicine approaches are holistic. Other healing modalities include Ayurvedic medicine, chiropractic, herbal medicine, homeopathy, massage, naturopathic medicine, nutritional therapies, psychotherapy, stress reduction, and Traditional Chinese Medicine (TCM) (Gale, 2014). Depending on their origin and how they are used, these could also be considered alternative, complementary, traditional, and/or integrative.

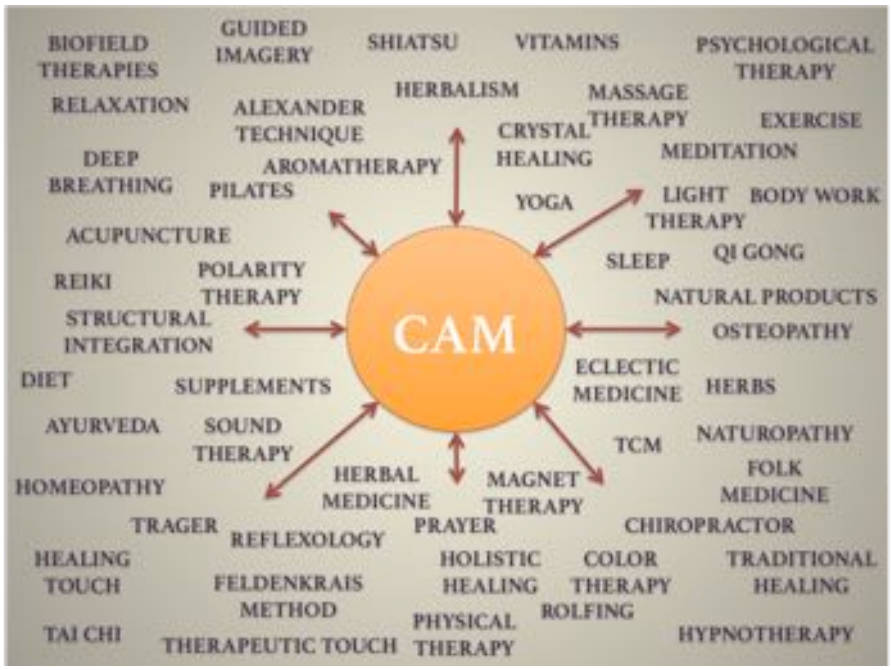
CAM

The concept of CAM is often tied to allopathic or conventional medicine. The American Psychological Association (APA) defines CAM as "a group of diverse medical and health-care systems, practice, and products that are not presently considered to be part of conventional medicine" (Dittman, 2004, p. 44). The NIH defines CAM as "the term for medical products and practices that are not part of standard care" (MedlinePlus, 2015, para. 1).

Regardless of the definition, CAM encompasses a wide array of practices, disciplines, and healing approaches. This poses another challenge in defining CAM, as the modalities within CAM are un-related and do not share much in common. According to the NCCIH there are three subsections of CAM. The first is natural products or herbs, minerals, probiotics, and vitamins (NCCIH, 2014). This poses confusion since this category is under supervision of the United States (US) Food and Drug Administration (FDA) under dietary supplements (Fennell, Liberato, & Zsembik 2008), which would imply that natural products are not complementary or alternative, but

mainstream. The second section of CAM is mind and body practices that consists of acupuncture, Alexander technique, chiropractors, Feldenkrais method, healing touch, hypnotherapy, massage therapy, meditation, naturopaths, osteopaths, Pilates, physical therapists, qi gong, Rolfing, Structural Integration, tai chi, Trager psychophysical integration, yoga, and many others (NCCIH, 2014). The third section consists of other approaches, such as Ayurveda, homeopathy, naturopathy, Traditional Chinese Medicine (TCM), and traditional healers (NCCIH, 2014).

Figure 1. CAM



As a means to provide a definition for CAM that encompassed all aspects and approaches to the term, the NIH proposed to define CAM as (Caspi et al., 2003):

> A broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical-period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting health and well-being. Boundaries within CAM and between CAM and the domain of the dominant system are not always sharp or fixed. (p. 61)

This definition acknowledged that CAM was based on the individual, society, and culture, and that the definition of CAM was in the hands of the users based on what an individual considers complementary, alternative, or integrative versus conventional or allopathic. However, the definition was not made official (Caspi et al., 2003).

The most common reasons people turn to CAM are growing up in a country or region that has a long history of CAM, having bad experiences with conventional medical care, wanting to have a choice in their treatment, feeling an integrative approach is most suitable, wanting relief of emotional stress without the side effects of prescription drugs, wanting natural and less invasive

treatments, wanting pain relief without facing potential dependency or addiction, and wanting alternative forms of treatment for serious illnesses, such as cancer (Gale, 2014).

In the US, the practices most closely associated with CAM are acupuncture, aromatherapy, chiropractic, exercise, herbs, home remedies, massage, meditation, prayer, psychological therapy, rest, sleep, vitamins, and yoga (Fennell et al., 2008). The NCCIH (2014) states that the most common CAM practices are chiropractic care, deep breathing, diet-based therapies, guided imagery, homeopathic treatment, massage, meditation, natural products, progressive relaxation, osteopathic care, and yoga.

Website Links

Alternative Medicine Foundation: http://www.amfoundation.org

American Psychological Association: http://www.apa.org

The Center for Mind-Body Medicine: http://cmbm.org

Food and Drug Administration: http://www.fda.gov

National Center for Complementary and Integrative Health: https://nccih.nih.gov

National Institutes of Health: http://www.nih.gov

The University of Arizona, Arizona Center for Integrative Medicine: https://integrativemedicine.arizona.edu

World Health Organization: http://www.who.int/en/

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Gale (2014). *The Gale Encyclopedia of Alternative Medicine*, (4th Ed). Farmington Hilla, MI: Gale Cengage Learning.

MedlinePlus. (2015). Complementary and alternative medicine. *MedlinePlus, Trusted Health Information for You*. Retrieved on April 19, 2015 from http://www.nlm.nih.gov/medlineplus/complementaryandalternativemedicine.html

National Center for Complementary and Integrative Health. (2014). Complementary, alternative, or integrative health: what's in a name? *National Center for Complementary and Integrative Health.* Retrieved on January 20, 2015 from https://nccih.nih.gov/health/whatiscam

World Health Organization. (2015). Traditional medicine. *World Health Organization.* Retrieved February 16, 2015 from http://www.who.int/topics/traditional_medicine/en/

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Common Myths of CAM

Myths surrounding CAM (complementary alternative medicine) are relative and culturally based. What is considered CAM in one country may be the norm in another, and what is a new modality in one place may have been practiced in another for hundreds of years. Even in the same country, what is considered CAM can change with time. For instance, cognitive behavior therapy used to treat depression was at one point considered CAM, but as the therapy grew more prevalent it became mainstream and not CAM (Dittmann, 2004). The myths highlighted here are common in the United States (US), and these perceptions may be different in other areas or change with time.

Figure 1. CAM or Allopathic Medicine? *Image courtesy of http://pixabay.com*

Myth #1 Lack of Educational Requirements

Some believe that learning a CAM modality does not require extensive education. Some modalities do not require formal licensing, and educational requirements can vary. For instance, aromatherapists do no need education to practice, but the Aromatherapy Registration Council (ARC) can register those who have completed at least 200 hours of higher-level education, after completing a qualifying exam. There are modalities that require a four- to six-year degree, equivalent to that of a conventional medical degree. Naturopaths need to go through a four-year full-time program where they receive the same scientific courses as medical doctors, but also take holistic and naturopathic courses (Freeman, 2009). Their study incorporates counseling, herbal medicine, homeopathy, massage, nutrition, and sciences (Grace, Vemulpad, Reid, & Beirman, 2008). Chiropractic school is also a four-year full-time study program with a minimum of 4,200 hours of course work. Specialization requires three more years of study. Doctors of Osteopathic Medicine (DOs) require more training and certification than chiropractors, since they use the same range of diagnostics and treatments as medical doctors (Freeman, 2009).

When selecting a CAM practitioner ask for their level education to determine if they have been properly trained.

Myth #2 Lack of Qualification Required to Practice

Some believe that CAM practitioners are not qualified to treat and diagnose conditions. This may be true for many CAM modalities, but not for all. For instance, although aromatherapists do not need to prove their level of education to practice in the US, they do need to be licensed therapists to treat clients and prescribe essential oils for treatment (Freeman, 2009). Naturopathic doctors need to take a licensing examination after graduating from school, and some states require licenses to practice. In Australia, naturopaths can be primary care physicians, as they "have the knowledge and skills to assess patients, to provide on-going treatment for all aspects of a patient's health care and/or to direct patients for appropriate care" (Grace et al., 2008, p. 43). Chiropractors and DOs need to be licensed in their respective state to practice.

Licensing requirements vary by state and by modality. It is best to check the state's requirements to determine which CAM professions require a license.

Myth #3 Lack of Scientific Evidence in Support of CAM

Another misconception is that there is no scientific evidence supporting CAM modalities. Wikipedia (2015) states alternative medicine "is not founded on evidence gathered using the scientific method" and treatments' effectiveness "are not backed by scientific evidence" (para. 1). This makes CAM seem devoid of a scientific approach, which is inaccurate. The scientific method is commonly defined as a double blind randomized controlled trial (RCT) that includes an experimental group and a control group. The scientific method tests the efficacy of a therapy by giving the experimental group the treatment tested and the control group a similar treatment that offers no therapeutic value (a placebo). For the study to be double-blind, treatments need to be administered such that neither the practitioner nor the patient are aware of who is receiving the treatment and who is receiving the placebo. While this is hard to do in many CAM treatments, such as with aromatherapy where it would be hard to mask the scent of essential oils, it is possible in many others, such as with herbal supplements. In addition, an RCT indicates patients are assigned at random into the therapy or placebo group. Although it can be hard to conduct studies on CAM using an exact double blind RCT model, there is a plethora of scientific evidence on the efficacy of CAM treatments using varied study designs.

Clinical trials exist for a range of CAM modalities including acupuncture, aromatherapy, Ayurveda, diet, exercise, flower essences, guided imagery, homeopathy, hypnosis, meditation,

mindfulness, naturopathy, nutrition, prayer, psychotherapy, Reiki, supplements, therapeutic touch, Traditional Chinese Medicine (TCM), and yoga (Gale, 2014). However, some modalities within CAM are not well studied, such as Dynamic Phytotherapy or Homeobotanicals and Bach flower remedies. Also, some clinical trials are poorly designed, involve a comparison of two different CAM modalities, or are influenced by the placebo effect, deeming the trials problematic (Gale, 2014).

Myth #4 Conventional Doctors Do Not Support CAM

One of the most prevalent myths is that conventional or allopathic medical doctors have a negative attitude towards CAM. In many cases, patients will not disclose to their doctor that they are under CAM care for fear that the doctors will not approve or will respond negatively (Robinson & McGrail, 2004). Although some medical doctors feel that way, many not only respect CAM, but also work with CAM practitioners. This is the mainstay of integrative medicine and functional medicine, which focus on the best treatment for the patient, including CAM, allopathic, or both.

Allopathic doctors refer patients to CAM practitioners because CAM offers varied treatment options; CAM treatments can be more affordable, cause fewer side effects, and be less invasive; CAM focuses on preventing illness and promoting health; CAM offers treatments that are holistic, incorporating lifestyle, nutrition, and personal elements; and when allopathic approaches are ill received or ineffective (Grace et al., 2008).

Referrals also work the other way. CAM practitioners refer their patients to allopathic doctors for medical testing and diagnosing. CAM practitioners may not get involved in diagnosis because they are not trained or because they are legally restricted (Grace et al., 2008). Both allopathic and CAM practitioners can work together to provide treatment and a course of action.

Website Links

Alternative Medicine Foundation: http://www.amfoundation.org
American Association of Colleges of Osteopathic Medicine: http://www.aacom.org
American Association of Naturopathic Physicians: http://www.naturopathic.org
American Chiropractic Association: http://www.acatoday.org
American Osteopathic Association: http://www.osteopathic.org/Pages/default.aspx
Aromatherapy Registration Council: http://aromatherapycouncil.org
Institute of Functional Medicine: https://www.functionalmedicine.org
National Association for Holistic Aromatherapy: http://naha.org
North American Board of Naturopathic Examiners: https://www.nabne.org/home/

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Modern Origins of CAM in the West

Origins of complementary alternative medicine (CAM) are hard to specify due to lack of clear records. For instance, although the word aromatherapy was first used in the 1930s, a 60,000-year-old Neanderthal was found buried with aromatic plans (Freeman, 2009). But, the first use of aromatherapy is dated to Egypt in 3,000 B.C. Some CAM modalities trace back several thousands of years, such as Ayurveda that was developed up to 5,000 years ago (Gale, 2014). Others, particularly in the West, have a more recent inception. Hippocrates, the father of modern medicine, used herbal remedies in ancient Greece 2,500 years ago. Homeopathy originated in the 1700s, and naturopathy and chiropractic care are developments of the late 1800s (Gale, 2014). Despite their history, what is considered CAM has shifted throughout the years.

The 1800s

Aromatherapy, naturopathy, herbal medicine, and folk medicine were commonplace in Europe until the 1800s when the fields of "bacteriology, organic chemistry, anesthesiology, and radiology" that comprised scientific medicine were taught in medical schools in the United Kingdom, France, and Germany (Gale, 2014, p. 645). Added regulation and licensing requirements for these fields created a separation between the new medical mainstream and earlier practices of homeopathy, naturopathy, and others, turning the latter into alternative treatments (Gale, 2014).

Figure 1. Old Textbooks. *Image courtesy of http://pixabay.com*

In the early years of United States (US) medical education, the curriculum was comprised of chiropractic, eclectic medicine, homeopathy, and osteopathy (Gale, 2014). However, it changed to include European scientific medicine in the 1890s. Johns Hopkins University was the first to implement a program in its medical school, and others quickly followed. In the early 1900s over 150

medical schools taught scientific medicine and eclectic medicine, but by the 1930s, 66 of these medical schools had closed and scientific medicine was the only method taught (Gale, 2014).

The 1900s

A resurgence of alternative medicine in Canada, Europe, and the US occurred in the 1960s and 1970s with the New Age movement that brought an interest in astrology, Ayurveda, holistic healing, meditation, yoga, and Traditional Chinese Medicine (TCM), among others (Gale, 2014). In the US, this interest grew over the years, and in 1992 the National Institutes of Health (NIH) established the Office of Alternative Medicine (OAM), which was renamed to the National Center for Complementary and Alternative Medicine (NCCAM) in 1998 (Gale, 2014). It was again renamed to the National Center for Complementary and Integrative Health (NCCIH) in December of 2014 (NCCIH, 2014).

In the 1990s, the establishment of the OAM led to the creation of integrative medical centers to educate medical professionals and others about CAM, as well as treat patients with an integrative approach (Gale, 2014). The first of these centers were established in the University of Maryland School of Medicine and the University of Arizona College of Medicine, in 1991 and 1994 respectively (Gale, 2014). Other similar medical institutions have opened since, along with schools dedicated to CAM, such as American College of Healthcare Sciences, Bastyr University, National College of Natural Medicine, and the University of Natural Medicine.

Modern Applications

Some long-standing CAM modalities are still in use in the West. Ayurveda and TCM are practiced in many countries around the world, including Canada, Europe, and the US. Ayurvedic medicine and TCM, developed over 2,000 years ago, are taught in dedicated institutions as well as integrative facilities. Homeopathy and naturopathy, both developed in Germany, are still available.

Naturopathic practitioners need to be licensed to practice in most states in the US (Gale, 2014). Licensing varies from state to state, but in general, licenses are required to practice acupuncture, chiropractic, osteopathy, massage therapy, and reflexology. Other modalities of CAM available in the US include aromatherapy, biofield therapies, bodywork, color therapy, crystal healing, dietary supplements, guided imagery, herbal remedies, hypnosis, light therapy, magnet therapy, massage therapy, meditation, polarity therapy, prayer, qi gong, Reiki, relaxation techniques, Shiatsu, therapeutic touch, vitamins, and yoga, among others (Gale, 2014).

Website Links

American College of Healthcare Sciences: https://www.achs.edu

Bastyr University: http://www.bastyr.edu

John Hopkins Medicine: http://www.hopkinsmedicine.org

National Center for Complementary and Integrative Health: https://nccih.nih.gov

National College of Natural Medicine: http://www.ncnm.edu

National Institutes of Health: http://www.nih.gov

The University of Arizona, College of Medicine: http://medicine.arizona.edu

University of Maryland School of Medicine: http://medschool.umaryland.edu

University of Natural Medicine: http://universitynaturalmedicine.org

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National Center for Complementary and Integrative Health. (2014). Complementary, alternative, or integrative health: what's in a name? *National Center for Complementary and Integrative Health.* Retrieved on January 20, 2015 from https://nccih.nih.gov/health/whatiscam

Describing Ayurveda

The word Ayurveda means the science of life, and is believed to be the oldest healing tradition in the world, passed down thru generations from its inception thousands of years ago until today (Jayasundar, 2010). In Sanskrit, the language used in Ayurveda, *ayu* means life, and *veda* means science or knowledge (Patwardhan, 2014). Ayurveda is a holistic methodology that seeks to understand all the circumstances affecting the individual to develop a treatment that will not just treat the disease, but also bring an overall state of balance (Jayasundar, 2010; Pizzorno & Murray, 2013). There are eight specialties or branches in Ayurveda:

1. General Surgery (Shalya Tantra)
2. Ophthalmology and Otorhinolaryngology (Shalkya)
3. Medicine (Kaya Chikitsa)
4. Psychiatry (Bhutvidya)
5. Pediatrics, Obstetrics, Gynecology (Kumar-Bhritya)
6. Toxicology and Jurisprudence (Agada Tantra)
7. Geriatrics (Rasayana)
8. Fertility and Sterility (Vajikaran)

Prakruti, or the body type, constitution, or nature of an individual is central to Ayurveda (Patwardhan, 2014). Ayurveda looks at the individual as a whole person, and tailors its diagnostic and treatment approach to the patient's unique prakruti (Patwardhan, 2014). It considers the patient's age, climate, lifestyle, location, mental condition, occupation, physical condition, and season, among others (Jayasundar, 2010). Ayurveda evaluates the interrelationship between the details of life and the larger scope of nature (Patwardhan, 2014). It incorporates five elements in nature or mahabhootas (air, earth, ether, fire, and water), three humors or doshas in the body (vata, pitta, and kapha), seven tissues or dhatus in each being, and three resulting excretions or malas (Patwardhan, 2014; Pizzorno & Murray, 2013).

The three doshas, or tridoshas, are dynamic principles central to diagnosing and treatment. Vata is movement and is represented in the air principle, pitta is transformation and is represented in the fire principle, and kapha is support and growth and is represented in the water principle (Jayasundar, 2010; Pizzorno & Murray, 2013). Each dosha represents different features, functions, and regions in the body. Vata is "dryness, lightness, weightlessness, coldness, roughness, minuteness, and movement; pitta refers to parameters like slight unctuousness, penetrating, heat producing, lightness, bad smell, causing movement and liquidity; [and] kapha indicates unctuousness,

producing coldness, heavy, sluggish, smoothness, shining, firm/static" (Jayasundar, 2010, p. 910). The tridoshas are not hierarchical, and ideally exist in a balance in the body. When the three doshas are in balance, the body is in homeostasis. When the doshas are not in balance, disease occurs and treatment is focused on bringing balance.

Figure 1. Indian Spices. *Image courtesy of http://pixabay.com*

Prakruti plays a role in treatment, which is tailored to the individual (Patwardhan, 2014). Prakruti involves identifying the person's unique combination of doshas, and treatment is holistic, incorporating breathing exercises, detoxification techniques, diet, herbal remedies, lifestyle, massage therapy, medicinal treatments, meditation, mental activities, mineral remedies, physical activities, purification techniques, surgical techniques, and yoga (Gale, 2014; Jayasundar, 2010; Pizzorno & Murray, 2013). Treatments do not usually have side effects because they are judiciously selected. Ayurveda imparts healing responsibility on the patient by giving them control of implementing and maintaining changes to their activities, diet, and lifestyle (Jayasundar, 2010).

Origins

Ayurveda originated in the Indian subcontinent 3,000 to 5,000 years ago (Gale, 2014). The exact date is hard to identify, but scholars have traced Ayurvedic literature as far back as 6,000 B.C. (Pizzorno & Murray, 2013). Its origins were traced to the *Vedas*, which are "the oldest surviving written literature in the world" (Gale, 2014, p. 213). Vedas cover an array of subjects (Jayasundar, 2010). Some of the vedic books Ayurveda originates from are *Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya of Vagbhata,* and *Madhav Nidan,* which collectively contain descriptions of over 700 herbs, over 6,000 formulations, and over 5,000 signs and symptoms (Patwardhan, 2014).

Ayurveda was originally created "as a system of living harmoniously and maintaining the body so that mental and spiritual awareness could be possible" (Gale, 2014, p. 213). Ayurveda was

commonly used in India since before British colonial times, making the Indian subcontinent one of the most health literate in ancient times. Unfortunately, the British banned widespread practice of Ayurveda in the early 1800s, and almost swept it off the map. It regained popularity in India and around the world as people sought alternatives to allopathic medicine (Jayasundar, 2010).

Current Uses

Ayurveda is widely used in India, and in the early 2000s an estimated 80% of the Indian population used Ayurvedic treatments (Gale, 2014). It is practiced in Germany, Hungary, Italy, Switzerland, and the United States (US), among others (Patwardhan, 2014). In the US, Deepak Chopra and Maharishi Mahesh Yogi helped spread awareness and use of Ayurveda in the 1980s and 1990s (Gale, 2014). Ayurvedic medical centers can be found around the world. Also, Ayurvedic inspired treatments and services are offered in spas and healing and wellness centers.

Website Links

American Studies of Vedic Studies: http://www.vedanet.com

Ayurvedic and Naturopathic Medical Clinic: http://ayurvedicscience.com

Ayurvedic Institute: https://www.ayurveda.com

Bastyr University: http://www.bastyr.edu

International Vedic Institute: http://www.vedicschool.com

National Ayurvedic Medical Association: http://www.ayurvedanama.org

National Institute of Ayurveda, India: http://www.nia.nic.in

Rocky Mountain Institute for Yoga and Ayurveda: http://rmiya.org

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Patwardhan, B. (2014). Bridging Ayurveda with evidence-based scientific approaches in medicine. *The EPMA Journal 5*(1), 19-25. doi:10.1186/1878-5085-5-19.

Pizzorno, J. E. & Murray, M. T. (2013). *Textbook of Natural Medicine* (4th ed.). St. Louis, MO: Churchill Livingstone.

Traditional Chinese Medicine (TCM)

Traditional Chinese Medicine or TCM is a method of healing based on balancing different factors, such as yin (female principle) and yang (male principle); the five elements of earth, fire, metal, water, and wood; and humans' relation to nature (Gale, 2014; Gerber, 2001; Yuan, Guo, Liu, Sun, & Zhang, 2014). In TCM, humans are a microcosm within the universal macrocosm, and the principles that affect the universe are applicable to the human system (Gerber, 2001). Five axioms govern TCM, and they state that natural laws govern the universe; when people follow these laws, they live in harmony with the universe; the universe is dynamic, and forms of stagnation cause illness; all living things are connected; and humans are connected to the environment (Gale, 2014).

Figure 1. Qi Gong Balls. *Image courtesy of http://pixabay.com*

TCM originated in East Asia and was used in China, Japan, Korea, Tibet, and Vietnam for thousands of years before it spread to other parts of the world. It incorporates many modalities such as acupressure, acupuncture, Chinese herbal medicine, Chinese manipulation, cupping, diet, gua sha, massage, moxibustion, qigong, tai chi, and tui na (Gale, 2014; Yuan et al., 2014).

Origins

The specific date of origin of TCM is hard to trace. The first medical text, *Huangdi Nei Jing* or *The Yellow Emperor's Inner Cannon*, dates to the Yellow Emperor Huangdi who lived around 2,698 B.C. to 2,598 B.C. However, the documents believed to have influenced the practice of TCM are the *Nan Jing* or *The Classic of Difficult Issues*, written in the 1st or 2nd century A. D. (Pizzorno & Murray, 2013). Other documents of TCM date to the Han dynasty, which spanned from 206 B.C. to A.D. 220 (Gale, 2014). Tang emperors set up the first medical school for TCM in 629, and more institutions were established in subsequently (Gale, 2014).

TCM remained mainstream until the early 20th century when China opened itself up to the West, allowing for Western style medical schools to be set up in Shanghai and other cities (Gale, 2014). Chinese Western medical physicians attempted to ban TCM in 1929, but the government prevented it, and instead promoted TCM (Gale, 2014). The official transformation of ancient

Chinese medicine into the TCM practiced today took place in the 1950s when Mao Zedong proclaimed, "Chinese medicine is a great treasure-house" and TCM was embraced in an effort to preserve "the spirit of a nation" (Pizzorno & Murray, 2013, p. 4). Currently, Western medical treatments and TCM are promoted in China, and are often used concurrently.

Current Uses

TCM remains the treatment of choice for many in East Asia and other parts of the word. The philosophy and practice of TCM has been perfected over thousands of years, and although some treatments have been modified or adapted, the doctrine remains the same. The increased desire to understand herbal remedies inspired the development of a toxicology database for Chinese herbal medicine. This motivated Western doctors to better understand potential adverse reactions of TCM remedies (Gale, 2014).

In the United States (US) and Canada there are over 50 TCM and acupuncture schools accredited by the Accreditation Commission for Acupuncture and Oriental Medicine (ACAOM) (Pizzorno & Murray, 2013). However, anyone studying in the US cannot be a Doctor of Oriental Medicine, as the standards are not high enough (Gale, 2014). TCM practitioners in the US are acupuncturists, herbalists, or both. Although it varies, most states require licenses for acupuncture and no state requires a license for herbalism. California is the only state that requires acupuncturists to pass an examination that covers both acupuncture and herbal medicine. The National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) offers certification in both acupuncture and herbal medicine (Gale, 2014).

Clinical Evidence

Due to the many modalities within TCM, the efficacy has been widely tested and a vast number of studies exist. A search on the National Center for Biotechnology Information yielded thousands of results. For instance, over 100 of the 700 herbs available in TCM "have been tested and found effective by the standards of Western science (Gale, 2014, p. 2420).

Yuan et al. (2014) looked at 75 studies on the treatment of chronic lower back pain and chronic neck pain with TCM, encompassing over 11,000 patients aged 17 to 90 years. Acupuncture, acupressure, and cupping were the most effective in treating low back and neck pain. In many cases, acupuncture was superior to massage, medication, and physical therapy, however it was not as effective as traction and manipulation. Acupuncture was equally effective to TENS or transcutaneous electrical nerve stimulation. Cupping was slightly more effective in reducing neck pain than non-steroidal anti-inflammatory drugs (NSAIDs). Tai chi was as effective as other forms

of exercise; and Chinese manipulation was more effective than Chinese massage in treating chronic low back pain and chronic neck pain (Yuan et al., 2014).

A review on the effect of tai chi on 824 patients with chronic obstructive pulmonary disease (COPD) indicated that tai chi improved exercise capacity and health-related quality of life (Wu et al., 2014). TCM herbs and medications have been effective in supporting breast, colorectal, liver, lung, and stomach cancer treatments in, *in vitro* and *in vivo* studies, by supporting apoptosis and/or reducing proliferation and metastasis of cancer cells (Xia et al., 2014). Many other studies can be found on the effectiveness of TCM in treating different conditions.

Website Links

The Accreditation Commission for Acupuncture and Oriental Medicine: http://www.acaom.org
American Association of Acupuncture and Oriental Medicine: http://www.aaaomonline.org
California Department of Consumer Affairs Acupuncture Board: http://www.acupuncture.ca.gov
National Center for Biotechnology Information: http://www.ncbi.nlm.nih.gov
National Certification Commission for Acupuncture and Oriental Medicine: http://www.nccaom.org

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Homeopathy Defined

Homeopathy comes from the Greek words *homeos*, meaning like or similar, and *pathos*, meaning disease or suffering (Pizzorno & Murray, 2013). Both words together mean "like disease" (Gale, 2014, p. 1166). Homeopathic medicine believes that substances that cause disease can be curative if they are used in highly diluted amounts (Gale, 2014). Homeopathic remedies stimulate the body to heal, and can be derived from plant, mineral, or chemical substances (Pizzorno & Murray, 2013).

Homeopathy is governed by three principles: the Principle of Similars, the Principle of Infinitesimal Dose, and the Principle of Specificity of the Individual. The Principle of Similars says that like cures like, and that the disease-causing element can bring about healing (Freeman, 2009).

The Principle of Infinitesimal Dose states that homeopathic remedies are diluted to include the least amount of the healing element needed to produce a cure- the greater the dilution, the more effective or potent the medication (Gerber, 2001). Potentization of homeopathic remedies comes from these repeated dilutions, which energize remedies and "release their full healing potential" (Petersen, 2014, p. 41). This can involve succussion, trituration, or electronic imprinting. Succussion is the "process of striking a liquid remedy firmly onto a resilient surface to imprint the remedy's vibratory patterns into the solvent" (Petersen, 2014, p. 42). Trituration is used for solid or insoluble remedies, and the original substance is dried, ground, and mixed with lactose to a potency of 6X. Electronic imprinting uses electronic devices to imprint the remedies (Petersen, 2014).

Figure 1. Homeopathic Remedies

The third principle, the Principle of Specificity of the Individual, states that illness is specific to an individual, and although two people could be suffering from similar symptoms, they may be prescribed different remedies (Gale, 2014). Each person has a unique diet, lifestyle, and personality, and the remedy must match the profile and symptoms of the patient (Freeman, 2009; Gale, 2014).

In homeopathic philosophy, disease arises when a person's defenses weaken, making the body susceptible to bacteria, stresses, toxic elements, and other factors (Pizzorno & Murray, 2013). The goal of homeopathy is to bring the body to homeostasis by incorporating the body, mind, and emotions into the healing process (Gale, 2014). The initial consultation with a homeopathic doctor can be lengthy with an extensive case-taking process. Symptoms are recorded in great detail, and include body type, emotional manifestations, food cravings and aversions, mental manifestations, metabolic reactions, physical manifestations, reactions to environmental stimuli, sleep patterns and positions, thirst, and others (Pizzorno & Murray, 2013).

Because remedies are so diluted, they are considered to be safe. There may be side effects, but those are considered part of the healing process (Pizzorno & Murray, 2013). Homeopathic medicines are generally less expensive than allopathic drugs (Gale, 2014).

Origins

Hippocrates was the first to teach the Law of Similars over 2,400 years ago, but it was not until the 1790s that a German physician, Samuel Christian Hahnemann, founded homeopathy (Freeman, 2009). He started practicing medicine in 1781, but after seeing his children and his patients get repeatedly ill, and their symptoms worsen with treatment, he became disillusioned with medicine at the time (Gale, 2014). He discovered homeopathy when treating malaria with *Chinchona officinalis*, a Peruvian bark that mimicked the symptoms of malaria, and was used to make quinine, a drug to treat malaria (Gale, 2014; Pizzorno & Murray, 2013). He determined that malaria was cured when symptoms similar to it were brought about in the patient. This is how he discovered the law of similars, *similia similibus curentor*, or like cures like (Gale, 2014).

Hahnemann continued testing other remedies and compiled his discoveries in the *Organon* and *Materia Medica Pura*. He gained recognition treating a cholera outbreak in 1831 with a 96% success rate, when allopathic treatment was only 41% successful (Gale, 2014). This success spread the use of homeopathy to other countries.

In the United States (US) the first homeopathic medical school was established in 1835 in Allentown, Pennsylvania (Freeman, 2009). In the early 1900s over 15% of doctors were homeopathic doctors, and there were 22 homeopathic medical schools, almost 100 homeopathic doctors, and over 1,000 homeopathic pharmacies (Freeman, 2009; Gale, 2014). However, by the 1930s these had closed down and the practice of homeopathy greatly decreased due to the advent of scientific medicine and the formation of the American Medical Association. A renewed interest in

alternative healing methods in the 1960s brought resurgence to the use of homeopathy. By 1993, 2.5 million Americans used homeopathic remedies (Gale, 2014).

Current Uses

More than 500 million people around the world use homeopathy (Freeman, 2009). Homeopathy is practiced in many countries including Argentina, Brazil, France, Germany, India, Mexico, United Kingdom, and increasingly in the US and Canada (Pizzorno & Murray, 2013). There are more than 6,000 homeopaths in Germany, more than 5,000 in France, and more than 100 homeopathic colleges in India (Freeman, 2009). In the US and Canada, the Accreditation Commission for Homeopathic Education in North America has accredited the Canadian College of Homeopathic Medicine and Northwestern Academy of Homeopathy. There are other training programs available through other schools (Gale, 2014).

Homeopathic practitioners are certified by the National Center for Homeopathy and the North American Society of Homeopaths. The Council for Homeopathic Certification provides a certification exam and code of ethics, and those who pass the exam are able to use the title of CCH or Certification in Classical Homeopathy. The Homeopathic Academy of Naturopathic Physicians also offers an exam, and successful completion grants the DHANP certification or a Diplomate in the Homeopathic Academy of Naturopathic Physicians (Gale, 2014).

Clinical Evidence

Allopathic doctors and scientists believe that homeopathic medicines are ineffective, because of the high level of dilution of homeopathic remedies (Gerber, 2001). However, published studies have demonstrated that homeopathic treatments are effective for "treatment of headache, bruising, cancer-related symptoms, attention-deficit-hyperactivity disorder in children, asthma, upper respiratory tract infections, otitis media, arthritis, allergies, male infertility, influenza, cardiac insufficiency, herpes, osteoarthritis, acquired immunodeficiency syndrome, and chronic fatigue syndrome" (Pizzorno & Murray, 2013, p. 320).

In 1991, a study conducted by Kleijnen et al. over a 25-year period included 105 controlled clinical trials, and 81 of these had successful results from treatment with homeopathic remedies (Gale, 2014; Pizzorno & Murray, 2013). A meta-analysis published by Linde et al. indicated that out of 89 studies, there was a 2.45 favorability ratio towards homeopathy (Pizzorno & Murray, 2013). A study in 1997 in Munich found that in 95% of the cases homeopathy was more effective than a placebo (Hahn, 2013). Another study looked at 110 homeopathic trials, and determined that

homeopathic remedies were as effective as conventional medication (Hahn, 2013). In 13% of the cases, homeopathy was more effective (Hahn, 2013).

Eighty-one children in Nicaragua aged six months to 5 years suffering from acute diarrhea participated in a study that compared homeopathic treatment to a placebo. The children who received homeopathic treatment recovered much faster than the children receiving a placebo (Gerber, 2001). A comparison study amongst 60 patients suffering from migraine looked at homeopathic remedy against a control. Those who received homeopathic treatment reduced the frequency of migraine attacks, and some decreasing from 10 attacks to less than two. In addition, after a four-month period, 78.8% of the control group required medication to treat migraine, and only 21% of those receiving homeopathic remedies required medication (Freeman, 2009). Another study on 144 people suffering from hay fever found that homeopathic remedies significantly reduced symptoms, such as sneezing, runny nose, and eye irritation. In addition, participants reduced their antihistamine intake by 50% (Freeman, 2009).

A 2008 study by Witt et al. looked at 3,709 chronically ill patients who had been treated with homeopathy in Germany and Switzerland. The patients covered 103 homeopathic care centers, and diagnoses included allergic rhinitis, atopic dermatitis, headaches, and recurrent infections. During an eight-year period, the severity of the disease had decreased over time, and patients had improved mentally, physically, and in quality of life (Pizzorno & Murray, 2013). Other studies indicated that homeopathy was an effective adjuvant to cancer treatment, and aided in improving adverse effects from radiotherapy, chemotherapy-induced stomatitis, and radiodermatitis (Freeman, 2009). More evidence is available indicating the effectiveness of homeopathy.

Website Links

Accreditation Commission for Homeopathic Education in North America: http://www.achena.org
American Medical Association: http://www.ama-assn.org/ama
Canadian College of Homeopathic Medicine: http://www.homeopathycanada.com
Council for Homeopathic Certification: http://www.homeopathicdirectory.com
Homeopathic Academy of Naturopathic Physicians: http://www.hanp.net
International Foundation for Homeopathy: http://www.homeopathyfoundation.nl/index.html
National Center for Homeopathy: http://www.nationalcenterforhomeopathy.org
North American Society of Homeopaths: https://www.homeopathy.org
Northwestern Academy of Homeopathy: http://www.homeovista.org

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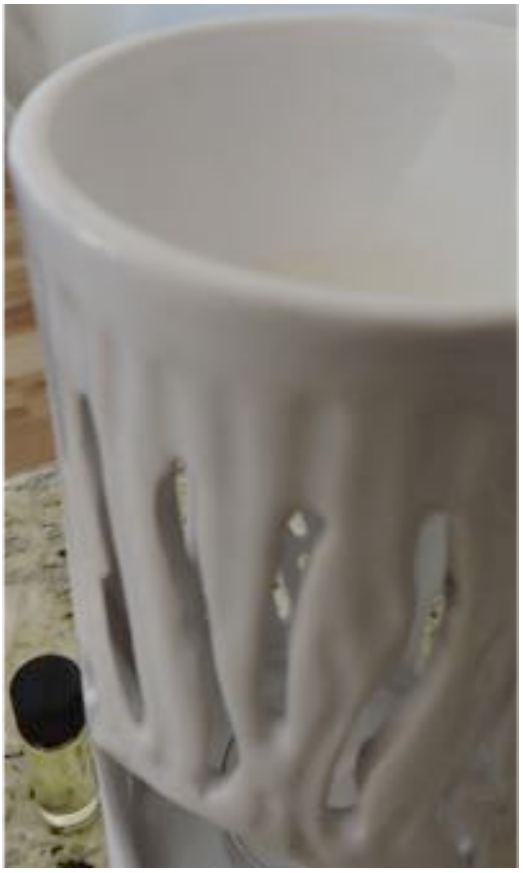
Description of Aromatherapy

Figure 1. Essential Oil and Aroma Burner



Aromatherapy is the therapeutic use of essential oils and other extracts from aromatic plants that are administered through inhalation, topical application, or other methods. Essential oils are extracted for therapeutic or medical purposes, and for overall wellness (Buckle, 2003; Rhind, 2012). Aromatherapy is one of the fastest growing modalities within CAM (complementary alternative medicine), as it is believed to improve physical and psychological conditions, and aid in curing, mitigating, or preventing diseases (Lis-Balchin, 2006).

Essential oils are extracted through distillation from all parts of the plant that contain essential oil components, including the fruit, flower, leaf, stem and bark, seed, and roots (Chiu, 2010). Extraction from citrus fruits involves expression from the peel of the fruit (Freeman, 2009). Once the oils are extracted, they are mixed with other substances, such as alcohols, lotions, or oils (WebMD, 2015). Essential oils are up to 100 times more concentrated than the plant, and need to be diluted before they are used, and be used in small amounts (Freeman, 2009).

It is important to use the scientific name for essential oils because common names may be misleading. For example, *Lavandula angustifolia* and *Lavandula latifolia* are commonly known as lavender, but *L. angustifolia* is relaxing and *L. latifolia* is stimulating (Lillehei & Halcon, 2014).

Origins

Almost every tradition has a history of using aromatics including in Australia, China, France, India, and Tibet (Freeman, 2009). The earliest account dates 60,000 years to a Neanderthal skeleton found near seeds of aromatic plants (Freeman, 2009). Egyptians are the first recorded users of aromatherapy and perfumery, with evidence dating to 3,000 B.C. (Rhind, 2012). Pharaohs were buried with jars of perfume containing essential oils of frankincense and myrrh, and aromatherapy was used when embalming bodies in preparation for mummification (Buckle, 2003). In the seventeenth century, scented body parts from these mummies were distilled to extract the aromatic

components for use as medicines. The Egyptian Papyrus Ebers manuscript, written around 2,800 B.C., indicated essential oils such as frankincense, galbanum, myrrh, and myrtle were used to treat disease (Buckle, 2003).

The oldest Chinese herbal text, *Pen Ts'ao*, dated to around 2,700 B.C. to 3,000 B.C. and included aromatic remedies. Ayurveda has used aromatic herbs in treatment for more than 2,500 years (Gale, 2014). Ancient Greeks learned the art of perfumery from the Egyptians, and later spread it to the Romans (Rhind, 2012). Both Greeks and Romans used fragrances in their baths and religious rituals. The Greek physician Pedanios Dioscorides included medicinal uses of aromatics in *De Materia Medica* written in 60 A.D. It was used as "the standard textbook for Western medicine for 1,500 years" (Gale, 2014, p. 155).

Distillation to make aromatic waters was developed in the eighth century by a Persian pharmacist named Jabir Ibn Hayyan (Rhind, 2012). The use of aromatics in medicine started in the tenth century by a prominent Persian physician named Abd Allah Ibn Sina, also known as Avicenna (Buckle, 2003). Avicenna also invented the alembic, a device used for distilling essential oils. These and other Arabian physicians of the time played an important role in developing herbal medicine (Buckle, 2003).

It was not until 1937 that the term aromatherapy was first used. René-Maurice Gattefossé, a French chemist and perfumer, discovered the therapeutic properties of lavender (*L. angustifiola)* when he burned himself badly and lavender oil stopped gangrenous gasification on wound. This inspired him to study other essential oils, and he collected his discoveries in *Aromatherapie: The Essential Oils – Vegetable Hormones* (Buckle, 2003). He wrote that the scents of essential oils had antimicrobial and physiological properties (Lis-Balchin, 2006). Gattefossé inspired aromatherapy's modern holistic approach (Rhind, 2012).

Jean Valnet was a French physician who spent time researching aromatherapy, and used botanical aromatics to treat patients in World War II. He published his discoveries in 1964 in *Aromatherapie, Traitement Des Maladies Par Les Essences Des Plantes* (Gale, 2014). Valnet also developed a system of blending essential oils that is still used today (Rhind, 2012).

Marguerite Maury, originally Austrian, moved to France to become a nurse. Similarly to Gattefossé and Valnet, she researched essential oils and published her works. She classified essential oils by clinical uses such as "surgery, radiology, dermatology, gynecology, general medicine, psychiatry, spa treatment, physiotherapy, sports, and cosmetics" (Buckle, 2003, p. 21). Maury used

essential oils externally, and revamped the application of essential oils through massage that was originally created by Hippocrates. Many of her techniques are still used today (Rhind, 2012).

Clinical Evidence

Studies have demonstrated essential oils are effective as antibacterials, anti-carcinogenics, antifungals, anti-inflammatories, antimicrobials, antivirals, bronchodilators, and decongestants; in controlling atopic dermatitis; and treating dysmenorrhea, dyspepsia, gastroesophageal reflux, headache, hepatic and renal stones, hyperlipoproteinemia, infantile colic, irritable bowel syndrome, joint pain, nausea, neuralgia, nipple pain, osteoarthritis, pain, prostatitis, and pruritis, (Husnu Can Baser & Buchbauer, 2009). Biochemically, the active constituents of essential oils produce these effects (Husnu Can Baser & Buchbauer, 2009).

A study on 20 hospitalized children with HIV used Roman chamomile *Chamaemelum nobile* and lavender *L. angustifolia* essential oils to treat pain. The children saw reduced need for analgesic drugs and some felt complete relief from pain (Buckle, 1999). *L. angustifolia* essential oil reduced pain by 50% on 100 patients in a critical care unit (Buckle, 1999). Peppermint *Mentha piperita* essential oil was found to produce an analgesic effect to relieve headaches (Buckle, 1999). A systematic review on aromatherapy indicated that essential oil of pepper helped reduce craving for cigarettes, inhalation of geranium essential oil reduced anxiety, a daily massage of a blend of essential oils onto the scalp helped treat alopecia, and massage with lavender or chamomile essential oils was effective in reducing anxiety and improving a sense of well-being (Cooke & Ernst, 2000). Lillehei & Halcon (2014) conducted a systematic review of essential oils used in sleep studies, and found that jasmine, lavender, and peppermint essential oils were effective in improving quality of sleep. A blend of basil, juniper, lavender, and sweet marjoram also improved sleep.

It is often difficult to study the effects of essential oils following the scientific method of a double-blind randomized controlled trial (RCT) because the application of aromatherapy through essential oils involves touch and smell, and these elements cannot be blinded (Buckle, 1999). Nonetheless, plenty of clinical evidence is available on aromatherapy.

Website Links

Alliance of International Aromatherapists: http://www.alliance-aromatherapists.org

Aromatherapy Registration Council: http://aromatherapycouncil.org

National Association for Holistic Aromatherapy: http://naha.org

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Herbal Medicine or Herbalism

Herbalism is the study of herbs involving a holistic approach that incorporates ecological, emotional, medical, mental, and physical applications (Hoffman, 2003). Herbalism draws from various herbal traditions to study how herbs can be used to treat and prevent disease (Gale, 2014). Herbal medicine has several branches, one of which is phytotherapy, a "medical modality that uses whole plants to treat whole people, facilitating the healing process within the framework of holistic medicine" (Hoffman, 2003, p. 6). Other branches include phytochemistry, the study of chemicals in plants; phytopharmacy, the preparation of natural drugs; and phytopharmacology, the study of chemical constituents of plants (Weiss & Fintelmann, 2000).

Figure 1. Pau D'Arco *Tabebuia avellanedae*

Herbal traditions have existed in every culture throughout the world, and have been integral to long-standing healing traditions such as Ayurveda and Traditional Chinese Medicine (TCM). In Western approaches, herbal medicine uses a combination of clinical experience and traditional use of plant remedies maintained in oral and written folklore (Gale, 2014).

Herbal medicine is based on the premise that medicinal plants have beneficial effects, and these can be obtained from the active constituents within the plant (Rodriguez-Fragoso, Reyes-Esparza, Burchiel, Herrera-Ruiz, & Torres, 2008). Active constituents are believed to work synergistically, each greater collectively than when acting individually. When constituents are isolated they are weaker or not as potent (Rodriguez-Fragoso et al., 2008).

Herbal treatments use whole or parts of the fresh plant. Alternatively, active constituents may be extracted from the plants as decoctions, extracts, infusions, teas, tinctures, or other forms. Active constituents can also be purified and studied in labs to determine their clinical effect, how to synthesize them in the lab, or how to change and patent them (Gale, 2014).

Herbal medicine is the foundation for modern drugs and pharmaceutics, as many originated from herbs (Gerber, 2001). For example, aspirin or acetylsalicylic acid was derived from salicylic

acid extracted from willow plants, and digoxin is the synthetic version of digitalis, the active constituent of foxglove (Gerber, 2001). Opium poppy was the first narcotic, birth control pills came from *Dioscorea villosa*, a Mexican yam, and vincristine and vinblastine used in cancers treatments came from *Catharanthus roseus* or Madagascar periwinkle (Freeman, 2009).

Herbal medicines are believed to be safe because they are natural. This is often true, but some herbs have side effects, are toxic, interact with other herbs and drugs, and even cause death (Rodriguez-Fragoso et al., 2008). Others do not. Some herbs are infected with contaminants, such as heavy metals, which are purposefully or illegally placed, and these can have deleterious effects on health. Others work synergistically with conventional medicines and produce enhanced effects that are beneficial to health (Rodriguez-Fragoso et al., 2008). Some are safe to use on everyone, including children, chronically ill patients, elderly people, or pregnant women, while others are not. Thus, it is important to study and understand herbs and their proper use.

Origins

The first recorded evidence of herbal remedies dates back 60,000 years. A Neanderthal skeleton was found near seeds of aromatic plants, marking the origin of aromatherapy. The skeleton was also found with eight species of herbal plants that were believed to be healing. These plants are still used medicinally today (Freeman, 2009).

The origin of Western herbal medicine is credited to the Greeks, although they were heavily influenced and gathered knowledge from the Babylonians, Egyptians, and Persians (Gale, 2014). The Greek physician and herbalist Hippocrates, who lived 2,500 years ago, is regarded as the father of modern medicine. He considered that diet, good quality water, climate, and social environment played a role in disease, and he incorporated herbal remedies to bring back health (Gale, 2014). Another Greek, Theophrastus, wrote the founding text in botany, *Historia Plantarum*, in the 4th century B.C. In the 1st century B.C., the Greek physician Pedanius Dioscorides wrote *De Materia Medica*, one of the most influential texts in western herbalism, used for over 1,500 years as a standard reference book among herbal practitioners (Gale, 2014). The book had plant drawings and details about their administration, dosage, medicinal properties, and possible toxicity (Gerber, 2001).

Galen of Pergamum, a Roman physician, developed the Galenic medical system that was used throughout the Middle Ages, and involved complex formulas and drastic techniques, such as blood letting. It was a rigid system that pushed herbal healers out of the mainstream. With the Black Pague in 1348 the Galenic medical system lost its zenith, as many lost their lives (Gale, 2014).

Herbalism persisted with medieval monks and women continuing to use herbal traditions, even though the Catholic Church persecuted them (Gale, 2014).

The discovery of the New World exposed European botanists to new plants, which expanded their knowledge on herbal medicines. They learned from Native Americans how to use native medicinal plants. In 1597, the English physician and gardener John Gerard published *The Herball or General Historie of Plantes*, which compiled these discoveries, and also provided descriptions of more than 1,000 English plants and flora (Gale, 2014). European colonists brought plant specimens and herbal knowledge back to the New World, which contributed to the spread of these plants to North America. Juan Badianus, a native Mexican Indian physician, published some of this knowledge in a manuscript in 1552 (Gale, 2014). American herbalism originated as a blend of European and Native American herbal traditions.

Later medical developments, like alchemy, homeopathy, and naturopathy that were developed in the 17th, 18th, and 20th centuries, kept herbalist practices within natural therapies, but herbalism was no longer the mainstream approach to healing (Gale, 2014). The advent of modern medicine in the late 1800s and early 1900s pushed herbalism more to the periphery, particularly in the United States (US). However, other countries continued to rely on herbal treatments, which were often more affordable and readily available than allopathic options (Gale, 2014).

Current Approach

At the turn of the 21st century, an estimated 80% of the global population relied on herbal remedies (Gale, 2014). Germany is the world leader in ensuring herbal safety and efficacy, as they follow the same approval process for herbs as for drugs (Freeman, 2009). The German Commission E expert panel develops monographs on herbs, and checks their safety and efficacy through clinical trials, field and case studies, and medical expertise. Herbal remedies in Germany are covered by insurance and an estimated 70% of physicians prescribe them (Freeman, 2009).

Around 5 billion dollars were spent on herbal products in the US in 2013 (Gale, 2014). However, herbalism is not part of allopathic treatment. Herbal products are considered dietary supplements and regulated by the US Food and Drug Administration (FDA). The efficacy of these supplements is not based on clinical studies, but on traditional use and anecdotal evidence (Gale, 2014). In 1994, the Dietary Supplement Health and Education Act (DSHEA) allowed herbal products to be labeled with the nutritional support, safety, side effects, and warnings, but not with any therapeutic claims. The DSHEA prohibits labeling an herb as able to treat, cure, or prevent a disease (Freeman, 2009). Dietary supplements are a branch of CAM. The approach is different in

England, Italy, France, and Germany, where herbal medicinal products are available by prescription and over-the-counter (Gale, 2014).

In the US, herbal medicine is not a licensed practice. But, practice and prescriptions are regulated in some states. However, Western herbal studies are available nationwide. Herbalism is part of the curriculum in Naturopathic medical colleges to obtain a Doctor of Naturopathy, as well as Ayurvedic, Homeopathic, Traditional Chinese Medicine, and other programs.

Website Links

American Botanical Council: http://abc.herbalgram.org/site/PageServer

American Herbalists Guild: http://www.americanherbalistsguild.com

Food and Drug Administration: http://www.fda.gov

Herb Research Foundation: http://www.herbs.org/herbnews/

Natural Medicines: https://naturalmedicines.therapeuticresearch.com

United Plant Savers: http://www.unitedplantsavers.org

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Turmeric or *Curcuma longa*

Curcuma longa is from the Zingiberaceae family, which also includes ginger and cardamom. It is commonly known as turmeric, curcuma, haldi, Indian saffron, yellow ginger, and yellowroot (Pizzorno & Murray, 2013; Ulbricht, 2010; Wichtl, 2004). The roots and rhizomes are cultivated from plants grown in Asia, particularly China, India, Indonesia, Japan, and Taiwan, and in Africa (Pizzorno & Murray, 2013; Wichtl, 2004).

The most therapeutic active constituent is curcumin, a curcuminoid present at 0.3 to 5.4%. It also contains gum and resins; sugars, mostly as 28% glucose, 12% fructose, and 1% arabinose; proteins; vitamins; minerals, such as calcium chloride; 4 to 14% volatile oils composed of turmerone, atlantone, and zingiberone; 2 to 7% essential oils, consisting of sesquiterpenes; woody fiber; and brown and yellow coloring matter (Gale, 2014; Pizzorno & Murray, 2013; Wichtl, 2004).

Historical Uses:

Turmeric has been used in India and China within Ayurveda, Traditional Chinese Medicine (TCM), and herbal medicine to treat a variety of diseases (Gale, 2014; Thavorn, Mamdani, & Straus, 2014). It protected the liver, prevented gallstones, increased the flow of bile, was an anti-inflammatory, was a remedy for eye discharges, treated jaundice, reduced flatulence and colic, increased menstrual flow, relieved insomnia, and relieved pain. It also was a dye for fabrics and medicines, and a condiment in curry powder and mustard (Gale, 2014; Pizzorno & Murray, 2013).

Current Uses:

Turmeric is a root widely used as a spice for cooking and herbal supplements. Turmeric is indicated as an anti-dyspeptic, antiphlogistic, carminative, cholecystokinetic, choleretic, and stomachic (Weiss & Fintelmann, 2000; Wichtl, 2004). It can be consumed as an alcohol extract, capsule, infusion, powder, spice, tablet, tea, and tincture (Pizzorno & Murray, 2013; Weiss & Fintelmann, 2000). Curcumin has been extracted and included in ointments or other supplements, such as Meriva or Theracurmin (Pizzorno & Murray, 2013). There is no reported toxicity after consuming turmeric at standard dosages. It has been considered safe at up to 8,000 mg daily for up to 3 months (Pizzorno & Murray, 2013). The daily recommended therapeutic dose is up to 12 g of powdered decoction; 5 to 15 mL of a fluid

Figure 1. Turmeric *Curcuma longa* Powder

extract or tincture prepared at a 1:1 vol / vol equivalent; or 1,200 to 1,400 mg of standardized extract (Stargrove, Treasure, & McKee, 2008).

Turmeric, its essential oil, and its natural extracts are Generally Recognized as Safe (GRAS) by the United States (US) Food and Drug Administration (FDA) (Wichtl, 2004). The *Botanical Safety Handbook* includes turmeric under the list of herbs "not to be used during pregnancy unless otherwise directed by an expert qualified in the appropriate use of this substance" (Hoffman, 2003, p. 394). Curcumin can be an irritant (Weiss & Fintelmann, 2000), and has some drug interactions, affecting the absorption of the beta-blocker talinolol; norfloxacin; chemotherapy agents camtothecin, mechlorethamine, and doxorubicin; and drugs metabolized through the CYP3A4, CYP1A2, and CYP2A6 pathways (Pizzorno & Murray, 2013). Specific dosages, possible contra-indicatory effects, and drug interactions should be reviewed with a health care provider.

Clinical Evidence:

Clinical studies indicated turmeric was antiaging, anticarcinogenic anti-inflammatory, antimicrobial, antioxidant, antiplatelet, cardio-protective, carminative, choleretic, hepatoprotective, and neuroprotective. It also protected the gastrointestinal (GI) tract; increased secretions of gastrin, secretin, bicarbonate, gastric wall mucus, and pancreatic enzymes; inhibited intestinal spasms and formation of ulcers; and improved dyspepsia (Pizzorno & Murray, 2013; Thavorn et al., 2014). Turmeric and curcumin have been used in clinical applications as antioxidants to prevent heart disease and slow down aging (Pizzorno & Murray, 2013).

Turmeric and curcumin can protect against cancer development and serve as adjunct treatment support to cancer treatments. In a study on 16 smokers, a group of 6 who received turmeric excreted a reduced number of mutagens in their urine (Pizzorno & Murray, 2013). An 18-month long study on 62 patients, who had not responded to surgery, radiation, or chemotherapy to treat ulcerating oral carcinoma or cutaneous squamous cell carcinoma, responded after taking an ointment with 0.5% curcumin. The patients saw a 90% reduction in the smell of their lesions, 70% reduction in itching and exudate, 50% reduction in pain, and 10% reduction in the size of the lesions (Pizzorno & Murray, 2013).

Curcumin proved to be as effective as non-steroidal anti-inflammatory drugs (NSAIDs) in reducing inflammation and aiding in wound healing. In a study with 50 patients with osteoarthritis, those who received 1,000 mg of Meriva, which contained 200 mg of curcumin, experienced a 58% improvement in symptom scores, increased capacity to walk on a treadmill from 76 to 332 meters,

and reduced blood anti-inflammatory markers. The study was repeated on 100 patients with the same results (Pizzorno & Murray, 2013).

Natural Medicines, formerly Natural Standard, provided a Grade C to scientific evidence that turmeric helped to prevent blood clots; treated stomach problems such as dyspepsia and peptic ulcer disease; prevented gallstones and stimulated bile flow; reduced low-density lipoproteins or LDL cholesterol levels; treated viral infections; toned and protected the liver; treated rheumatic conditions; and treated chronic skin ulcers and scabies when used topically. In addition, turmeric and curcumin had anti-cancer effects and anti-inflammatory activity; and curcumin improved cognitive function and had activity against HIV (Ulbricht, 2010). A grade C indicates that there is unclear or conflicting scientific evidence. Thus, more studies are needed to continue testing the effectiveness of turmeric.

Website Links

American Botanical Council: http://abc.herbalgram.org/site/PageServer

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Food and Drug Administration: http://www.fda.gov

Herb Research Foundation: http://www.herbs.org/herbnews/

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Ginger or *Zingiber officinale*

Zingiber officinale or ginger is from the Zingiberaceae family, which also includes turmeric, red ginger, shell ginger, and cardamom, and is also commonly known as African ginger, black ginger, bordia, hornroot, ingwer, and zenzero. The roots and rhizomes are cultivated from Asia, mainly China, India, and Japan, although it is now cultivated in Haiti, Jamaica, and Nigeria (Pizzorno & Murray, 2013; Ulbricht, 2010; Wichtl, 2004).

Figure 1. Ginger *Zingiber officinale*

Ginger contains up to 50% starch; about 9% protein; 6 to 8% lipids, mostly triglycerides, phosphatidic acid, lecithin, and free fatty acids; 2% protease; 1 to 3% volatile oils, composed mostly of the sesquiterpenes bisabolene, zingiberene, and zingiberol; pungent principles; aromatic ketones or gingerols; niacin or vitamin B_3, and vitamin A; and 4 to 10% oleoresins with gingerols, gingerdiols, gingerdiones, dihydrogingerdiones, and shogaols (Gale, 2014; Hoffman, 2003; Pizzorno & Murray, 2013; Wichtl, 2004). The most therapeutically potent component is gingerol, a volatile oil that reduces inflammation and gives ginger its pungency. It can be found in concentrations as high as 33% (Gale, 2014; Pizzorno & Murray, 2013).

Historical Uses:

Chinese have been using ginger since the 4th century B.C. to treat stomachache, diarrhea, nausea, cholera, hemorrage, rheumatism, and toothache (Pizzorno & Murray, 2013). The Greeks ate it after dinner as a digestive, and were credited for creating an early version of gingerbread, which involved wrapping a piece of ginger in bread (Gale, 2014). The English added it to beer "to soothe the stomach", and in the 1800s it was made into powder and tea to treat "indigestion, gas, nausea, and infant diarrhea" (Gale, 2014, p. 995). Eclectic physicians from the 1800s in the United States (US) used ginger as a "carminative, diaphoretic, appetite stimulant, and local counterirritant" (Pizzorno & Murray, 2013, p. 1148).

Current Uses:

Ginger has been used in Asian and Indian cuisines; as a spice in cooking in other cuisines, baked goods, and candies; in beverages such as ales, beer, ginger ale, infusions, liqueurs, and teas; in cosmetic products like creams, perfumes, and soaps; and in broths, capsules, lozenges, poultices, and powder (Gale, 2014; Hoffman, 2003; Pizzorno & Murray, 2013).

Ginger is anti-emetic, cholagogic, digestive tonic, spasmolytic, and stomachic. It promotes saliva and gastric juices secretion, and increases peristalsis (Weiss & Fintelmann, 2000; Wichtl, 2004). It is used as a cardiovascular remedy, a carminative, diaphoretic, rubefacient, and an emmenagogue to stimulate menstruation (Hoffman, 2003)

Ginger has been used to treat motion sickness as well as morning sickness during pregnancy (Hoffman, 2003). It is an antimicrobial, has been used by Japanese to treat food poisoning, and can help treat ulcers caused by the bacteria *Helicobacter pylori* (Gale, 2014). Ginger tea is used to treat coughs (Gale, 2014). Ginger has stimulant action and encourages circulation, making it effective in treating rheumatic problems (Hoffman, 2003). Ginger poultices are used to treat knee pain and osteoarthritis inflammatory effects (Gale, 2014).

The Food and Drug Administration (FDA) considers ginger as an herb that is Generally Recognized As Safe or GRAS (Wichtl, 2004). Ginger may cause miscarriages and is not recommended for pregnant women when consumed in amounts higher than adequate in daily food intake, or no more than 2 g per day (Gale, 2014; Hoffman, 2003). A suggested dose for healthy adults is 2 to 4 g per day (Stargrove, Treasure, & McKee, 2008). Large doses of 12 g or higher can cause gastric problems, heartburn, and ulcers (Gale, 2014; Hoffman, 2003). Ginger may reduce blood-clotting time, and interact with the digestion of blood thinners, digoxin, fat-soluble vitamins, iron, phenothiazines, sulfa drugs, and tetracycline (Gale, 2014). Specific dosages, possible contra-indicatory effects, and drug interactions should be reviewed with a health care provider.

Clinical Evidence:

Studies indicate that ginger has antioxidant, antihyperlipidemic, choleretic, cardiotonic, and gastrointestinal effects (Pizzorno & Murray, 2013). It inhibits the synthesis of prostaglandins, thromboxane, and leukotriene, which make it an effective anti-inflammatory. Ginger inhibits platelet aggregation, has thermogenic properties, and antibacterial activity (Pizzorno & Murray, 2013). Natural Medicines, formerly Natural Standard, provided a Grade B to evidence indicating ginger could treat nausea and vomiting during pregnancy. A grade B means there is good scientific evidence, but additional studies are needed to confirm the evidence (Ulbricht, 2010). Natural

Medicines provided a grade C, indicating unclear or conflicting scientific evidence, for the use of ginger to treat migraine, motion sickness, nausea caused from chemotherapy, nausea and vomiting after surgery, osteoarthritis, rheumatoid arthritis, and urinary disorders; and for its action as an anti-platelet agent, to shorten labor, and to support weight loss (Ulbricht, 2010).

A German study from 1999 showed that ginger increased digestive movement (Gale, 2014), which is believed to be how ginger acts to reduce nausea and vomiting (Pizzorno & Murray, 2013). In 1982, a study showed that 940 mg ginger was more effective than 100 mg of Dramamine in treating nausea and vomiting due to motion sickness (Pizzorno & Murray, 2013). Ginger was tested on naval cadets and a dose of 1 g was found to reduce vomiting and cold sweating when sailing in heavy seas. Other studies showed that ginger reduced vertigo, nausea, and tachygastric activity (Pizzorno & Murray, 2013). Evidence showed that 1 to 1.5 g of ginger daily was effective in treating nausea and vomiting after surgery. Also, ginger helped to alleviate nausea and vomiting due to chemotherapy (Pizzorno & Murray, 2013).

Even though there are conflicting indications about the use of ginger on pregnant women, low doses of ginger have decreased nausea and vomiting related to pregnancy (Pizzorno & Murray, 2013). A dose of 250 mg taken four times per day reduced nausea and vomiting in 19 out of 27 women who were pregnant for less than 20 weeks. Other studies showed that ginger was as effective or more effective than vitamin B_6 in treating nausea and vomiting during pregnancy (Pizzorno & Murray, 2013).

A study conducted from 3 months to 2.5 years with 28 patients with rheumatoid arthritis, 18 patients with osteoarthritis, and 10 patients with muscular discomfort, indicated that 500 to 1,000 mg daily of ginger helped relieve pain and swelling in 75% of the patients with either form of arthritis, and in 100% of the patients with muscular discomfort (Pizzorno & Murray, 2013). Another study with 261 patients suffering from osteoarthritis of the knee showed that those who consumed ginger had less general pain, reduced knee pain after standing and walking, and a reduced need to take rescue medication, when compared to a control group (Pizzorno & Murray, 2013).

Ginger has varied uses and proven clinical effects. When consumed around 2 g per day it has great benefits to health.

Website Links

American Botanical Council: http://abc.herbalgram.org/site/PageServer

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Tulsi or *Ocimum sanctum*

Ocimum sanctum is from the Lamiaceae family. It is commonly known as tulsi or holy basil, and should not be confused with sweet basil or *Ocimum basilicum*, which also belongs to the Lamiaceae family and is used in Italian and Asian foods (Ulbricht, 2010). Other common names for tulsi include basilici herba, common basil, garden basil, green holy basil, hot basil, Indian basil, kala tulsi, *Ocimum tenuiflorum*, Rama tulsi, sacred basil, Thai basil, and vicenin (Petersen, 2014; Ulbricht, 2010). In Sanskrit, tulsi means the incomparable one, and in India, tulsi is known as the queen of herbs and Mother medicine of nature (Cohen, 2014; Mandal, Mandal, & Pal, 2012; Ulbricht, 2010). The herb is native to India and other parts of Asia, but can be found globally (Ulbricht, 2010).

Every part of the tulsi plant has beneficial properties, but the components found in the leaves are the most studied. Leaves are a source of volatile oils or essential oils and ethanolic extracts (Shimizu et al., 2013). The main active constituent is eugenol, which provides much of the therapeutic activity to the herb (Mandal et al., 2012). Tulsi also contains alkaloids, ascorbic acid, camphor, carvacrol, flavonoids, glycosides, linalool, manganese, methyl chavicol, methyl eugenol, phenols, proteins, resins, saponins, sodium, steroids, tannins, triterpenoids, ursolic acid, vitamin A, vitamin C, and zinc (Balakumar, Rajan, Thirunalasundari, & Jeeva, 2011; Inbaneson, Ravikumar, Suganthi, 2012; Mandal et al., 2012; Petersen, 2014). The essential oil is a good source of eugenol and methyl eugenol, alpha and beta-caryophyllene, carvacrol, linalool, germacrene A, beta-ocimene, and cinnamyl acetate (Petersen, 2014b).

Figure 1. Tulsi Plant Outside a Home. *Image courtesy of http://pixabay.com*

Historical Uses:

Tulsi was used for its medicinal and spiritual properties and often considered the "elixir of life" (Cohen, 2014, p. 252). In India it was and is used in religious ceremonies, and to protect homes (Ulbricht, 2010). In Ayurveda, it dried tissues, managed stress, prepared the body for spiritual rituals, prevented illness, reduced fever, treated colds, treated skin conditions, and promoted health, wellbeing, and longevity (Cohen, 2014; Ulbricht, 2010). It was used in the Siddha system of medicine to treat conditions affecting the skin and liver, and as an antidote for snake and scorpion

bites (Shimizu et al., 2013). In Traditional Chinese Medicine (TCM), tulsi was a spasmolytic for the stomach, provided kidney support, increased circulation, and treated snake and insect bites (Ulbricht, 2010).

Current Uses:

Tulsi improves complexion, and fosters beauty, calmness, intelligence, and stamina (Cohen, 2014). It is used to heal wounds, lower blood glucose and lipid levels, protect against eye infections, and treat allergies, arthritis, asthma, back pain, bad breath, cardiac conditions, diarrhea, dysentery, gastric disorders, genitourinary disorders, hiccups, indigestion, malaria, mouth sores, ringworm, sore throat, ulcers, and vomiting (Cohen, 2014; Shimizu et al., 2013; Ulbricht, 2010). Tulsi is an adaptogenic, analgesic, anthelmintic, anti-carcinogenic, anticatarrh, anti-diabetic, anti-inflammatory, antioxidant, antimicrobial, antipyretic, antitussive, carminative, demulcent, expectorant, galactagogue, hepatoprotective, immunomodulator, and radioprotective (Hoffman, 2003; Shimizu et al., 2013; Ulbricht, 2010).

The Food and Drug Administration (FDA) considers tulsi as Generally Recognized As Safe or GRAS. However, it should be used with caution by those taking blood sugar medications or those with hypoglycemia or diabetes (Ulbricht, 2010). There are reports holy basil has anti-fertility effects, and should be avoided by women trying to conceive (Petersen, 2014).

Standard doses vary from 1 to 2.5 g of dried herb (Petersen, 2014). As a preventative and health promoter 300 to 2,000 mg should be consumed daily, and as a therapeutic 600 to 1,800 mg should be consumed daily (Ulbricht, 2010). Tulsi tea can be prepared with 2 g of herbs (Ulbricht, 2010). It can be consumed as a dried herb, extract, food, or supplement. Specific dosages, possible contra-indicatory effects, and drug interactions should be reviewed with a health care provider.

Clinical Evidence:

Tulsi has been studied in animal and human studies, and been found to be an effective adaptogenic, analgesic, anti-carcinogenic, anti-cataract, anticoagulant, antidiabetic, anti-diarrheal, antiemetic, anti-hypercholesterimic, antihypertensive, anti-inflammatory, antimicrobial, antioxidant, antitussive, cardioprotective, chemoprotective, diaphoretic, hepatoprotective, immunomodulatory, insect repellant, memory enhancer, neuroprotective, radioprotective, and spasmolytic (Cohen, 2014). It has been used to prevent arthritis, allergies, asthma, and ulcers (Cohen, 2014).

An *in vitro* study determined that ethanolic exctract from tulsi at a concentration of 800 μg / mL and essential oil of tulsi at 1% vol / vol inhibited the proliferation of pancreatic cancer cells (Shimizu et al., 2014). Tulsi decreased the motility of cells, invaded them, and decreased the size of

the tumor. The ethanolic extract was 20 to 40 times more effective than the essential oil. However, when tested in mice, the same effects were present, but were not as strong (Shimizu et al., 2014).

Another study found that a 95% ethanol extract of tulsi enhanced antioxidant enzymes and displayed anti-metastatic activity. A follow-up study showed ethanolic extract from tulsi significantly reduced osteoponin, a glycoprotein involved in tumor migration and metastasis; prevented adhesion of lung cancer cells, which is a component of metastasis; and inhibited some metabolic pathways associated with cancer (Kwak et al., 2014). Tulsi is also effective in preventing cancer by reducing damage within DNA and aiding in the apoptosis of precancerous and cancerous cells (Cohen, 2014).

Extracts of tulsi have antibacterial activity against *Escherichia coli*, *Staphylococcus aureus, Vibrio cholerae*, and others. A study showed that an extract of 50 g of dried herb in 50% ethanol had antibacterial activity against *Salmonella enterica,* the bacteria that cause typhoid fever that is resistant to antibiotic treatments (Mandal et al., 2012). Whole plant extracts showed activity against *Plasmodium falciparum*, the parasite that causes malaria (Inbaneson et al., 2012). Leaf extracts and essential oil of tulsi also showed antifungal activity against dermatophytic fungi, such as *Trichophyton mentagrophytes*, *Microsporum canis*, and *Epidermophyton floccosum* (Balakumar et al., 2011).

Tulsi has antioxidant effects and helps the body to prevent and fight damage caused by toxins. The black or purple variety of tulsi, known as Krishna tulsi, is the most effective due to its high phenolic content (Cohen, 2014). Other constituents that offer an antioxidant effect are glutathione, superoxide dismutase, and catalase. Tulsi helps the body get rid of toxins by enhancing the effect of cytochrome P450 enzymes, which support the liver and kidneys in deactivating toxic chemicals and excreting them from the body (Cohen, 2014). Tulsi's constituents reduce damage from heavy metals, industrial chemicals, pesticides, pharmaceuticals, and radiation (Cohen, 2014).

Natural Medicines, formerly known as Natural Standard, gave a grade C to evidence that tulsi is effective in reducing blood sugar levels and treating diabetes mellitus (Ulbricht, 2010). A grade C indicates that the evidence is unclear or conflictive. A study over a 30 day period on diabetes patients showed a 26.4% reduction in plasma glucose after administering a 200 mg / kg of tulsi extract on a daily basis (Petersen, 2014).

All these studies indicate why tulsi was known as the elixir of life.

Website Links

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Explaining Antioxidants & Their Benefits

Antioxidants are components that scavenge free radicals in the body to fight oxidative stress (Nasri, Baradaran, Shirzad, & Rafieian-Kopaei, 2014). Free radicals have negative effects in the body by reacting with other molecules and causing damage to cell membranes, DNA, and proteins (Gale, 2014). Antioxidants are considered neutraceuticals because they are used for both nutrition and medicine due to their beneficial effects on health.

Antioxidants can generally be classified as antioxidant vitamins, such as vitamins A, C, and E; phytochemicals, bioactive plant components with health benefits, that have antioxidant properties including flavonoids and carotenoids such as beta-carotene and lycopene; minerals that play antioxidant functions, such as manganese, copper, selenium, and zinc; and antioxidant compounds and enzymes made in the body, like coenzyme Q10 or ubiquinone, superoxide dismutase, and glutathione (Gale, 2014; Mahan, Escott-Stump, & Raymond, 2012; Nasri et al., 2014; Pizzorno & Murray, 2013; Schlenker & Roth, 2011). Other examples of antioxidants include curcumin, lutein, and turmerin (Gale, 2014; Mahan et al., 2012; Nasri et al., 2014). Antioxidants can be made in the body, can be found naturally in fruits, vegetables, grains, nuts, meats, and seafood, or can be taken as supplements (Gale, 2014; Mahan et al., 2012; Nasri et al., 2014; Schlenker & Roth, 2011).

Figure 1. Variety of Produce. *Image courtesy of http://pixabay.com*

Oxidative Stress & Free Radicals

The most important beneficial effect antioxidants have is reducing damage from oxidative stress. Oxidative stress is the result of metabolic processes caused by an increase in oxidants from cellular reactions, a decrease in antioxidants protecting the body, or a failure in the cellular processes in the body to repair damage caused by oxidative reactions (Mahan et al., 2012). Oxidants that cause this damage are known as reactive oxygen species (ROS), which consist of "free radicals, reactive anions containing oxygen atoms, or molecules containing oxygen atoms that can either produce free radicals or are chemically activated by them" (Mahan et al., 2012, p. 203). ROS are formed as part of

normal metabolic processes that involve oxygen, and can also be caused when the body is exposed to chemicals, radiation, and toxins (Gale, 2014). Another example of a ROS is the hydroxyl radical $^{-}$OH, which is one of the most reactive. Reactive nitrogen species include peroxynitrite and other molecules including NO_2 (Pizzorno & Murray, 2013).

Free radicals are molecules with unpaired electrons, and are unstable until they are able to steal from, or give up, an electron to another molecule (Gale, 2014). Free radicals include molecules such as nitric oxide NO^{-}, superoxide O_2^{-}, and hydrogen peroxide H_2O_2 (Pizzorno & Murray, 2013). They are believed to contribute to causing or worsening diseases, and because free radicals have an unpaired electron, they cause damage when they seek to balance this negative charge with DNA, proteins, and lipid molecules. Antioxidants bind to free radicals, stabilizing them, and thus reducing the damage they may cause (Gale, 2014).

Clinical Evidence

Ginger contains different antioxidant properties, which have been found to help fight hypertension (Nasri et al., 2014). Many antioxidants are helpful in cancer prevention. For instance, lycopene decreases oxidative stress and damage to DNA, and works mostly in the adrenals, prostates, skin, and testes, where it protects against cancer (Nasri et al., 2014). Beta-carotene has one of the highest antioxidant activities of all types of carotenes. Lipoic acid is an antioxidant that protects against the complications from diabetes, and treats diabetic naturopathy (Nasri et al., 2014). Macular degeneration due to age has been treated with antioxidants, such as beta-carotene, coenzyme Q10, garlic, green tea, lycopene, polyphenols, and vitamins C and E (Nasri et al., 2014).

Some clinical studies have yielded results against the benefits of antioxidants. A study reviewing 68 clinical trials found that the risk of dying on the 232,600 patients who took antioxidants supplements may have increased by 5% (Gale, 2014). In addition, supplementation of beta-carotene was tested on 29,000 men who smoked and resulted in an 18% higher rate of developing lung cancer (Gale, 2014). These studies tested antioxidant supplements, however this may not be the recommended form of intake.

Recommended Consumption

It is best to consume antioxidants from natural sources rather than from supplements. Supplements contain much higher levels of antioxidants than those naturally found in food, and although ill effects are not expected from antioxidants in food, there is a possibility of contraindications from supplements due the higher doses in these (Gale, 2014). Antioxidant supplementation can be deleterious to health (Pizzorno & Murray, 2013). There is no single

nutrient, supplement, or food that can fight all oxidative stress that occurs in the body, because there are too many oxidants that need to be neutralized. To get the best source of antioxidants, it is encouraged to follow a varied diet with high amounts of colored fruits, vegetables, and whole grains, and adequate intake of nuts, meats, poultry, and seafood; and to lead a healthy lifestyle with regular exercise, proper stress management, and no smoking (Pizzorno & Murray, 2013).

Website Links

National Cancer Institute: http://www.cancer.gov

National Institutes of Health: http://www.nih.gov

Supplement Watch: http://www.supplementwatch.com

United States Food and Drug Administration: http://www.fda.gov

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Benefits of Water Consumption

Water is necessary to sustain life and maintain health. Chemically, water has the formula of H_2O, and is known as hydrogen oxide. Water comprises most of the human body, although the proportion of water varies by age, body fat, body mass, and gender (Marieb & Hoehn, 2013). Infants have 73% or more water (Marieb & Hoehn, 2013). Healthy male adults have 60% of their body mass as water, and healthy female adults have 50% water (Marieb & Hoehn, 2013). Water content declines with age to about 45% in older adults (Marieb & Hoehn, 2013). It comprises 90% of most cells in the body, except in adipose cells, which are up to 20% water (Marieb & Hoehn, 2013; Pizzorno & Murray, 2013). Skeletal muscle is around 75% water, indicating that those who have more muscle mass have a higher proportion of water in their body (Marieb & Hoehn, 2013).

Figure 1. Glass of Water

Benefits of Consumption

Water is essential as building material in DNA, extracellular components, intracellular components, and proteins; it acts as a solvent for ionic compounds and other solutes; it provides a medium for chemical reactions within the body, often participating in the reactions; it carries nutrients and oxygen to cells; it carries waste products out of the cells and body; it aids in maintaining a constant body temperature; it lubricates and moistens tissues in the eyes, joints, mouth, mucus membranes, nose, and skin; and it acts as a shock absorber to help keep the structural integrity of cells and connective tissues (Gale, 2014; Pizzorno & Murray, 2013).

Many body structures require large amounts of fluid. For instance, it is estimated that we swallow around 1 L of saliva daily, and produce 200 mL of colon fluid secretions, 1 L of bile, 1.5 L of gastric fluids, and 2 L of intestinal juices (Campbell, 2003). Urine, produced in the kidneys, is a result of filtering around 1.2 L of blood per minute to remove toxic wastes from metabolic processes, such as urea and creatine, as well as certain drugs, potassium, sodium, water, and water-soluble vitamins like B vitamins and vitamin C (Campbell, 2003). Urine is 95% water and 5% solutes, and healthy adults produce 1 to 2 L of urine per day (Campbell, 2003).

Water intake is driven by the thirst mechanism, which uses osmoreceptors in the extracellular fluid to detect a gain or loss in water (Marieb & Hoehn, 2013). This in turn causes dry mouth, or a decrease in production of saliva, and a decrease in blood pressure, both of which trigger the body to feel thirst (Marieb & Hoehn, 2013). When thirst is quenched by drinking water, a signal is sent to the osmoreceptors that there is enough water in the body (Marieb & Hoehn, 2013). Thirst is not always a reliable indicator, particularly in athletes, older adults, or people suffering from renal or cardiac conditions, where the thirst mechanisms are not as sensitive, and may not activate the triggers of thirst even when they body is dehydrated (Marieb & Hoehn, 2013). When thirst is not quenched, it can lead to dehydration.

Signs of dehydration include dark and concentrated urine, dry mucous membranes, dry skin, constipation, fatigue, headache, irritability, low blood pressure, nausea, nosebleed, shallow, rapid breathing, and weakness, among others (Pizzorno & Murray, 2013). Water is lost from the body through perspiration, in urine, through respiration, and through feces (Pizzorno & Murray, 2013).

Athletes and older adults are particularly susceptible to dehydration. When dehydrated, "athletes may experience problems such as cramps, delirium, vomiting, hypothermia, and hyperthermia" (Schlenker & Roth, 2011, p. 323). To prevent this, athletes should be properly hydrated before exercising, and replace fluids during and after exercise (Schlenker & Roth, 2011). It is important to watch the water consumption in older adults. Often, the elderly do not drink enough water because they are not sensitive to having dry mouth, and they want to avoid incontinence problems, which can lead to "dehydration, constipation, cardiovascular disease, and deep-vein thrombosis/pulmonary embolism" (Tsuboyama-Kasaoka & Purba, 2014, p. 505).

Clinical Evidence

Not only is water vital for maintaining life and health, but appropriate consumption of water can be therapeutic in treating arthritis, chronic fatigue syndrome, colitis, constipation, coronary heart disease, edema, fibromyalgia, hangover headaches, hypertension, intermittent claudication, low back pain, migraines, obesity, and peptic ulcers (Pizzorno & Murray, 2013). Water consumption helps to minimize the risk of developing kidney stones (Gale, 2014).

Research showed that not drinking enough water was as harmful to heart health as smoking. Drinking more water reduced the risk of heart attack deaths by 50% (Pizzorno & Murray, 2013). A study found that men who drank five or more glasses of pure water daily, only had 46% risk of fatal heart attack when compared to men who drank two or less glasses of pure water daily. In women, the risk was 59%. Conversely, women who drank five or more glasses of fluids other than pure

water, including juices, soft drinks, tea, and others, had 147% greater risk of a heart attack than those who consumed two or less glasses of other fluids. In men, the risk was greater by 46% (Pizzorno & Murray, 2013).

Other evidence indicated that exercise-induced asthma is caused from dehydration of mucous membranes occurring even before exercise begins (Pizzorno & Murray, 2013). Thus, it is important for those with exercise-induced asthma to be properly hydrated prior to starting an exercise routine (Pizzorno & Murray, 2013).

Recommended Consumption

The absolute minimum requirement of water for a person is 7.5 to 15 L of water per day to cover their needs for consumption (2.5 to 3 L), basic hygiene (2 to 6 L), and cooking (3 to 6 L) (Tsuboyama-Kasaoka & Purba, 2014). The minimal consumption of water for a normal adult is 700 to 800 mL to make up for water losses and maintain water balance (Gale, 2014). However, to ensure proper health, it is advised to consume 1.4 to 2.0 L of water per day (Gale, 2014). The specific amount of water varies by a person's age, environment, exertion, and size. Water intake needs to increase with exercise, in hotter and more humid climates, in higher altitudes, when taking prescription drugs, to aid in dieting, when traveling, in an environment where air is recirculated, and when there is illness (Gale, 2014). Infants require 0.7 L of water, children require 1.3 to 1.7 L, teenage males require 2.4 to 3.3 L, teenage females require 2.1 to 2.3 L, adult men require around 3.7 L, adult women around 2.7 L, pregnant women around 3 L, and lactating women around 3.8 L of water daily (Pizzorno & Murray, 2013). However, adjustments are needed for those suffering from disorders, people consuming high amounts of protein, and people taking diuretics (Pizzorno & Murray, 2013).

Excessive water intake can occur when an adult consumes more than 7.6 L of water per day, as this can lead to hyper-hydration, where the body is unable to excrete excess water (Gale, 2014). Symptoms include confusion, disorientation, muscle cramps, nausea, and slurred speech, and can lead to death (Gale, 2014).

Typically 70 to 80% of water intake can come from water, juices, teas, and other drinks, and 20 to 30% of water can come from foods with high water content, such as fruits and vegetables (Pizzorno & Murray, 2013).

Website Links

American Heart Association: http://www.heart.org/HEARTORG/

Charity: Water: http://www.charitywater.org

United States Environmental Protection Agency: http://www.epa.gov

Water: http://water.org

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Consuming Apples Improves Health

Figure 1. Apples in Basket

Apples are known scientifically as *Malus domestica*. They belong to the Rosacea family or the Rose family, which also contain apricots, plums, peaches, and almonds. The most commonly available varieties of apples include Fuji, Gala, Golden Delicious, Granny Smith, McIntosh, Pink Lady, and Red Delicious, among others. Apples are an important contribution to the diet by providing fiber, potassium, vitamins A and C, and other nutrients (Savatovic et al., 2008). They can be eaten raw, cooked, or dried, or in a processed form like compote, jam, juice, marmalade, or sauce. In 2012, around 70 million tons of apples were consumed globally (Szakiel, Paczkowski, Pensec, & Bertsch, 2012).

Origins

There are over 7,000 varieties of apples, all believed to have originated from the wild apple *Malus silvestri*, found in Central Asia. The apple was domesticated and grown in Asia and Europe, and brought to the American and Australian continents by European colonists. The Granny Smith apple originated in Australia in 1868 when a lady named Maria Smith propagated the seedling (Savatovic et al., 2008).

Benefits

Apples and apple products, such as juices and apple extracts, have a high content of phytochemicals. Phytochemicals are plant-derived compounds or biologically active components in plants believed to offer protection from diseases (Heneman & Zidenberg-Cherr, 2008). Some of the most commonly found phytochemicals in apples are flavonoids, including the flavonol quercetin (Heneman & Zidenber-Cherr, 2008), and phenolic acids (Boyer & Liu, 2004). In the standard diet in the United States (US), apples are the source of 22% of phenolics consumed (Boyer & Liu, 2004).

Apple consumption has increased antioxidant enzyme levels, and plasma antioxidant activity (Hyson, 2011). They affect health by reducing rates of cancer, asthma, cardiovascular disease, hypercholesteremia, and type 2 diabetes (Boyer & Liu, 2004).

In *in vitro* studies, apple extracts reduced the size of colon cancer cells. Some of the cancer cells were inhibited with an apple extract at a concentration of 70 mg / mL (Jaganathan et al., 2014). Rats that were fed apple juice experienced a decrease in proliferation of colon cancer, and had a 50% lower occurrence of cancer cells, despite being injected with a carcinogenic substance (Jaganathan et al., 2014).

Apples are thought to increase lifespan and quality of health. A study conducted on nematodes, *Caenorhabditis elegans*, indicated that nematodes that were administered apple extracts lived up to 39% longer, had increased motility, produced fewer byproducts of the aging process, and were more resistant to stress (extreme heat and UV radiation) than nematodes that did not get apple extracts (Vayndorf, Lee, & Liu, 2013).

Studies conducted on humans demonstrated that apples have a significant impact on health. In a study conducted in Italy in 2005, over 6,000 patients consuming one apple a day saw reduced risk of several types of cancers, including breast, colorectal, esophageal, larynx, oral, ovary, pharynx, and prostate cancers (Hyson, 2011). A study conducted in 2007 included 478,590 participants in 10 European countries, and found that those who consumed at least one apple or pear a day had a lower incidence of lung cancer among smokers and non-smokers (Hyson, 2011). In addition, a group of Finnish women who consumed an apple per day saw 43% reduction of mortality rates due to coronary disease, and men saw a 19% reduction of mortality rates from coronary disease (Hyson, 2011). Apple consumers saw a reduced risk of type 2 diabetes and higher weight loss than those who did not consume apples regularly (Hyson, 2011).

It is believed that apple peels offer more bioactive phytochemicals than the flesh of the apple. Studies have found that peels contain a higher amount of triterpenoids, such as ursolic acid, when compared to apple flesh. Triterpenoids have shown antitumor activity and are beneficial in the treatment of many types of cancers. Although it is unlikely that apple peel will be consumed on its own, evidence shows that consuming the whole apple, including flesh and peel, gives the maximum nutritious value (Szakiel et al., 2012).

Apple juice is also beneficial. In a study including 2,600 children in the United Kingdom, those who drank one serving of apple juice per day had reduced wheezing. Also, mothers who drank apple juice during pregnancy had children with reduced incidences of asthma (Hyson, 2011).

Recommended Consumption

Several studies indicated that consuming one or more medium sized apples per day (weighing roughly 150 grams) has marked health benefits (Boyer & Liu, 2004). The suggested consumption of apple juice is around 160 ml per day (Hyson, 2011).

Apples can be stored for a relatively long period, particularly if they are kept in cold storage or refrigeration. An apple can last for up to 6-months (Tarozzi, Marchesi, Cantelli-Forti, & Hrelia, 2004). However, some of the nutritional value of the apple decreases with time. A study showed that the maximum phenolic and antioxidant activity occured when the apple were freshly picked. After three months, phenolic compounds and antioxidant activity decreased in the apple peel, but not in the apple flesh. After six months, phenolic compounds and antioxidant activity further decreased in peel, and also decreased in the flesh (Tarozzi et al., 2004).

The adage that an apple a day keeps the doctor away has some truth to it. Consuming apples and apple products has health benefits.

Website Links

International Food Information Council: http://www.foodinsight.org

Organic Trade Association: http://www.ota.com

Partnership for Food Safety Educations: http://www.fightbac.org

Produce Marketing Association: http://www.pma.com

United States Department of Agriculture: http://www.usda.gov/wps/portal/usda/usdahome

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Importance of Exercise

Exercise is an important part of any health and wellness practice. Exercises are "structured bouts of physical activity beyond those of normal daily activities (Schlenker & Roth, 2011, p. 318). The *Gale Encyclopedia of Alternative Medicine* (2014) defines exercise as "any activity requiring physical exertion done for the sake of health" (p. 874). Exercise can take many forms. Aerobic exercise involves moving large muscles repeatedly such that energy used is from aerobic metabolic reactions that use oxygen (Freeman, 2009). This includes cycling, jogging, rowing, running, skiing, swimming, tennis, and walking. Anaerobic exercise requires anaerobic metabolic reactions without oxygen (Freeman, 2009). This includes resistance training and weight lifting. In addition, there are martial arts, qi gong, stretching, tai chi, and yoga, among others. Exercise varies on personal choice, but it is important to engage in some form of exercise.

Figure 1. Exercise Equipment

Origins of Exercise

For millions of years, humans had to walk every day as their main or only way of movement (Pizzorno & Murray, 2013). Movement as a form of exercise and not a necessity can be dated back to the inception of yoga around 5,000 years ago in India. Around 2,500 years ago, the Chinese got involved in kung fu, qi gong, and tai chi. The Greek started exercise programs and launched the first Olympic games in 776 B.C. (Gale, 2014).

Although other forms of physical exercise were practiced, it was not until the 1800s that exercise machines were documented in journals (Gale, 2014). Even then, exercise programs became mainstream in the Western world over 100 years later, in the 1960s, with the advent of gymnasiums (Gale, 2014). Today, exercise and movement are crucial, given the obesity epidemic, overly sedentary lifestyles, and the rising incidence of serious health conditions (Pizzorno & Murray, 2013).

Clinical Evidence of the Effects of Exercise on the Body

Regular exercise is considered a vital practice for health. A study with 13,000 people over an eight-year period found that 30 minutes of exercise a day reduced the risk of premature death when compared to those who did not exercise (Gale, 2014). Another study showed that 10 minutes of exercise a day could improve mental outlook (Gale, 2014).

A mortality study on over 3,000 railroad workers during a 17 to 20 year period found that coronary heart disease was the cause of death 40% more often in those who led sedentary lives than in those who were active. Over 1,400 men were tracked for five years and those who were most active had 60% fewer heart attacks than those who were inactive (Freeman, 2009). Several clinical studies found that high-intensity interval training or HIIT is beneficial to vascular and heart health (Pizzorno & Murray, 2013). In a study on 11 elderly men with a mean age of 74, HIIT improved heart rate variability and cardiac baroreflex. A study on 47 patients on a HIIT program showed it could help rehabilitate those with peripheral vascular disease and cardiovascular disease suffering from intermittent claudication. Another study found that HIIT was better than traditional aerobic training in reversing left ventricular remodeling, and improving aerobic capacity, endothelial function, and quality of life (Pizzorno & Murray, 2013).

Studies indicated that exercise programs were effective in pulmonary rehabilitation resulting from chronic obstructive pulmonary disease (COPD), chronic bronchitis, and other forms of pulmonary disease (Freeman, 2009). Studies have also shown that exercise has a positive effect in reducing anger, anxiety, and stress, and in healthy aging, treating depression, and supporting treatment for cancer, diabetes, fibromyalgia, HIV/AIDS, impotence, menopause, and urinary incontinence (Freeman, 2009).

Yoga has been correlated with positive outcomes from breast, head, and neck cancer patients (Pizzorno & Murray, 2013). Yoga helps to reduce anxiety and stress from cancer treatments, and has been incorporated into 56% of cancer clinics. Resistance training was effective in treating those suffering from cachexia (Pizzorno & Murray, 2013).

Aerobic exercise of 30 minutes three times a week for a 10-week period helped improve depressed moods on a group of patients, where 62% reached a normal range score on the Profile of Mood States-Short Form Depression Scale (POMS). In the control group only 29% reached a normal score (Pizzorno & Murray, 2013). Another study saw participants suffering from major depression improve significantly after walking daily for at least 30 minutes after 12 days (Pizzorno & Murray, 2013). A study compared exercise with Zoloft, a commonly prescribed medication to treat depression. Over a 12-month period the group who exercised on a treadmill at least three times per

week had significantly better outcome than the group who received Zoloft alone or the group who received Zoloft and exercise (Pizzorno & Murray, 2013). A 10-week study showed that aerobic exercise was effective in reducing anxiety amongst patients suffering from panic disorder (Pizzorno & Murray, 2013).

The University of Washington tested 115 women in 2006, where half of the participants stretched for 45 minutes every week for 12 months, and the other half did 45 minutes of moderate exercise five times a week for the same 12-month period. They found that the women who exercised regularly had significantly fewer colds than the women who stretched (Hirt, 2013).

There are health benefits of walking in urban parks. A study in Japan on 17 male students aged around 21 years looked at the difference between walking in an urban park and walking in a city area (Song et al., 2014). Participants walked a 15-minute course in each area, and the study showed that heart rate and sympathetic nervous activity was lower, and parasympathetic nervous activity was higher after the walk in the urban area than in the city. In addition, tension, fatigue, and anxiety were lower, and positive moods were higher after the walk in the urban park than after the walk in the city (Song et al., 2014). Not only walking, but nature plays an important role in promoting health and wellness.

Additional Recommendations

A physically active person needs to increase carbohydrate intake, as this is the primary fuel for the body. A highly active person should consume 6 to 10 g / kg of body weight per day in carbohydrates (Schlenker & Roth, 2011), although carbohydrate needs vary on the person's "total daily energy expenditure, type of sport, gender, and environmental conditions" (Mahan, Escott-Stump, & Raymond, 2012, p. 512).

Protein intake should vary based on the type of physical exertion, as well as "age, gender, mass, fitness level, regiment, and phase of training" (Mahan et al., 2012, p. 514). In general, a physically active person should consume 1.2 to 2 g of protein / kg of body weight daily. Endurance athletes require 1.2 to 1.4 g / kg of body weight in protein per day, and resistance and strength trainers need 1.6 to 1.7 g / kg of body weight in protein per day (Mahan et al., 2012).

People who exercise regularly need to ensure they consume sufficient water before engaging in physical activity, that they replace fluids during exercise, and they replace fluids after exercise (Schlenker & Roth, 2011). Although increase consumption of vitamins and minerals is not required for those physically active, it is important to consume adequate vitamins and minerals (Schlenker & Roth, 2011). They also do not need increased fat intake, and should consume 20 to 35% of their

daily calorie intake from fat. Certain physical training programs require reduced fat intake to 15 to 25% of daily calorie intake (Schlenker & Roth, 2011).

Website Links

American College of Sports Medicine: http://www.acsm.org

American Council on Exercise: http://www.acefitness.org

American Running Association: http://www.americanrunning.org

Drug Free Sport: http://www.drugfreesport.com/index.asp

Gatorade Sports Science Institute: http://www.gssiweb.org/en

Informed Choice: http://www.informed-choice.org

International Society of Sports Nutrition: http://www.sportsnutritionsociety.org

Sports and Cardiovascular and Wellness Dieticians Dietetic Practice Group of the American Dietetic Association: http://www.scandpg.org

Sports Science: http://www.sportsci.org

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Bach Flower Remedies

Bach flower remedies (BFR) are a range of flower concentrates. The original range has 38 remedies, each corresponding to treatment of a negative emotional state (Thaler, Kaminski, Chapman, Langley, & Gartlehner, 2009). Naturally grown, wild flowers are collected to make the remedies (Thaler et al., 2009), and with the exception of Rescue remedy, each remedy is based on one flower (Ernst, 2010). Rescue remedy is a blend of five essences.

Figure 1. Bach Flower Remedies. *Image courtesy of http://pixabay.com*

The premise of BFRs is that most human illnesses can be linked to emotions or negative states of mind, and by treating these emotions the diseases are alleviated. They are prescribed according to the individual condition of a person, and two people suffering from similar ailments could receive different treatments (Ernst, 2010).

Flower essences are similar to homeopathic remedies in that they contain incredibly small quantities of the healing substance, and derive their therapeutic value from the vibrational and energetic qualities of the remedy (Gerber, 2001). The effectiveness comes from a subtle energy or life force imparted by the flower onto the remedy (Ernst, 2010). When consumed, the life force from the remedies is believed to have action on the body, acting on the subtle energy in a person "to rebalance the conscious and unconscious, and dissolve old patterns of behavior" (Thaler et al., 2009, p. 3). They treat negative feelings, although patients often feel worse before they see an improvement (Thaler et al., 2009). However, because the remedies are diluted, they do not produce toxic effects on the body (Ernst, 2010).

Origins

Dr. Edward Bach, a British physician and microbiologist, developed BFRs in the 1930s. He studied Hahnemann's homeopathy by reading *Organon*, and was inspired to create homeopathic-like remedies (Gerber, 2001). He was dedicated to find remedies to treat emotional states after realizing that many physical complaints he treated his patients for were accompanied by negative emotional states (Gale, 2014). He did not like the homeopathic approach of using disease-producing elements

in the remedies, and instead searched for natural elements that could treat emotional aspects of disease. He discovered essences of flowers and created 38 remedies (Gerber, 2001).

Bach believed that BFRs assisted the body to heal itself by bringing about a positive emotional state. Although BFRs were created to treat stress and psychological issues, they could also be used to treat medical conditions (Thaler et al., 2009). They could be administered individually or taken in combination with up to seven other remedies. Prescription of a remedy was tailored to the individual needs of a patient, and treatment could take days, weeks, or months, depending on the patient and the condition (Thaler et al., 2009).

The Dr. Edward Bach Healing Centre in England continued to prepare flower essences after Bach's death in 1936 (Gerber, 2001). These remedies were used in naturopathic schools in Europe and the United States. In 1979, with the establishment of the Flower Essence Society (FES), knowledge and information on flower essences were exchanged amongst flower essence workers and therapists. Since then, the use of flower essences has spread beyond BFRs (Gerber, 2001).

Benefits

The few clinical studies on the effects of BFRs on anxiety, attention-deficit hyperactivity disorder, depression, pain relief, and stress have not been conclusive. They have indicated that BFRs are as effective as placebos, which means that although they produce a positive effect on the body, the effect is no different than taking no medication or than the positive psychological effect a placebo might have (Ernst, 2010; Thaler et al., 2009). Nonetheless, BFRs have a following of clients, and there is demand for them. More clinical studies are needed on BFRs.

Availability and Administration

BFRs can be purchased commercially, and Rescue Remedy is the most widely available. They can be made through the sun method, which involves collecting "fully opened flower heads still fresh with dew" that are then left to float for a few hours in a glass bowl filled with pure spring water placed in sunshine (Thaler et al., 2009, p. 2). They can also be made through the boiling method, which involves placing branches and leaves in boiled water for thirty minutes (Thaler et al., 2009). In both methods, the plant matter is removed and the remaining liquid, the mother tincture, is believed to retain the energy of the flower (Thaler et al., 2009). The mother tincture is mixed with 27% grape brandy as a preservative (Gale, 2014). Most of the essences are sold in liquid form in 20 ml dropper bottles, although there are cream forms of Rescue Remedy (Gale, 2014). The liquid remedies can be administered orally by diluting in water or by placing on pulse points in the body at a recommended dose of four drops four times daily (Gale, 2014). They are sold as food

supplements, and because of their low toxicology, they are considered safe to be consumed by pregnant women and children (Ernst, 2010).

Website Links

The Bach Center: http://www.bachcentre.com/index.php

Flower Essence Society: http://www.flowersociety.org

The Original Bach Flower Remedies: http://www.bachflower.com

The Spirit of Dr. Bach – The Back Flower Therapy: http://www.drbach.co.uk

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Thaler, K., Kaminski, A., Chapman, A., Langley, T., & Gartlehner, G. (2009). Bach flower remedies for psychological problems and pain: a systematic review. *BMC Complementary and Alternative Medicine, 9*(16), 1-12. doi:10.1186/1472-6882-9-16

Dynamic Phytotherapy or Homeobotanical Remedies

Dynamic Phytotherapy (DP) remedies are also known as Homeobotanical (Hb) remedies. There are 46 standard remedies that can individually treat a specific set of body organs and systems, or that can be combined in infinite ways to treat a range of body organs and systems (Murray, 2005). Each remedy is prepared from a mixture of herbal extracts, and may contain a blend of 20 to 40 herbs (Murray, 2005; Petersen, 2014).

Dr. Brian Murray, who created Hb remedies, was influenced by homeopathy, and quoted Dr. Samuel Hahnemann, the founder of homeopathy, in his works (Murray, 2005). Hb remedies are similar to homeopathic remedies, but with a few differences. Hb remedies only include herbs, and not minerals, metals, or energetic substances as homeopathic remedies do (Petersen, 2014). The remedies start with mother tinctures that are diluted to a low potency, similar to homeopathic remedies, but they differ in that they are all diluted to a potency of 1.5X, where homeopathic remedies have varying potencies. In addition, once prepared, Hb remedies are potentized in homeopathic manner through a process of succussion. They are different in that the remedies can be freely blended with each other. They are neither purely homeopathic nor purely herbal (Petersen, 2014).

Figure 1. Hb Remedies

Origin of Hb Remedies

Dr. Murray created these remedies in 1984 in Auckland, New Zealand (Petersen, 2014). He had two clinics that provided natural therapies and often saw patients from low-income backgrounds. Dr. Murray was motivated to produce affordable and effective herbal supplements. He started with mother tinctures prepared to potency of 3X, and later adjusted the mixture to a potency of 1.5X, realizing that this was the potency at which the herbal mixtures displayed their maximum healing benefit (Petersen, 2014). He originally created 30 primary remedies, and eventually developed 16 more (Murray, 2005; Petersen, 2014). After seeing positive results at his clinic, the use of Hb remedies spread to other clinics in New Zealand and Australia, and other parts of the world.

Benefits

The first 26 remedies are named according to each letter in the alphabet. Each treats a set of symptoms and organs. For instance, Hb A is for allergies, Hb D is for digestion, Hb K is for kidneys, Hb M is for migraines, and Hb V is for varicose veins. The following 16 remedies are numbered, and each remedy still treats a set of symptoms or organs. For example, Hb 1 is cerebra and treats mental conditions, Hb 4 is a male tonic, and Hb 9 is detoxa to encourage detoxification. The remaining four remedies treat eczema, psoriasi, warts, and degenerative conditions (Murray, 2005). Before a patient is given a Hb remedy they undergo an extensive case-taking to determine the appropriate blend of remedies for them. The blend given to the patient is customized to their specific needs, and the possibilities for herbal and remedy combinations are endless.

There are four main actions in the body from Hb remedies. The first is assimilation, which means the remedies support the absorption of nutrients at a cellular level, as well as the absorption of the beneficial components of the remedy into the body (Murray, 2005; Petersen, 2014). The second is depuration, which involves drainage or the elimination of toxins through the organs of elimination, such as the bowels, kidneys, liver, and skin. The third is stimulation, and that involves stimulating or reinforcing homeostasis to support the body to heal (Murray, 2005; Petersen, 2014). Finally, restoration encourages overall healthy function (Petersen, 2014). Emotions play a role in Hb remedies, and emotional stress, calmness, and energy are the conditions most treated (Murray, 2005).

Hb remedies are diphasic or bipolar because they produce physical and energetic responses in the body (Petersen, 2014). The action occurs in phases, where the first phase is physical and produces effects on the body, and the second is energetic and produces effects on the etheric body (Petersen, 2014). When the Hb remedies are potentized through succussion, or repeatedly pounding the herbal remedy a minimum of 40 times, it causes the hydrogen bonds in the water to vibrate and alter in structure. When ingested, this vibration is transferred to the patient, where it has a mental and emotional effect. Physically, they support the body in bringing homeostasis. Collectively, both phases work synergistically to bring about a holistic healing in the patient (Petersen, 2014).

Other than experimental evidence, there is no scientific evidence yet collected on the effects of DP. Studies on Hb remedies are needed.

Availability and Administration

Hb remedies can treat both acute and chronic conditions, although the approach in treatment varies for each. Acute conditions are usually accompanied with vigorous or violent reactions from the body, such as fever or vomiting (Petersen, 2014). The Hb remedy has to be

administered to match the symptoms, and can be administered frequently, even every five minutes, but in small amounts. As the symptoms decrease, the remedy is administered less often, even once or twice a day, until the symptoms disappear (Petersen, 2014).

Chronic conditions take longer to treat, because the body has to slowly to get rid of the accumulated symptoms and toxins in the body (Petersen, 2014). The focus is on the gradual repair and healing, which can take a few weeks to even a few years to heal, depending on how long the patient has been suffering from the chronic condition. Results vary, but in general, the Rule of Seven is considered, in which a scale of seven is applied the length of time a person has suffered from the condition (Petersen, 2014). In other words, the condition would take one seventh of the time to heal. A chronic condition that lasted seven months, will take one month to heal; a condition that lasted one year, will take 1.5 to 2 months to heal; and a condition that lasted seven years will take one year to heal. Hb remedies for chronic conditions are generally given in smaller doses and can vary from one drop per day to up to 30 drops per day, depending on the patient's age, condition, lifestyle, and symptoms (Petersen, 2014).

Website Links

American College of Healthcare Sciences: https://www.achs.edu

The Herbal Energy Centre, Homeobotanical Concentrates Manufacturer: http://www.herbalenergy.co.nz

Holistic Health Naturopathic Clinic: http://holistichealthclinic.co.nz

The Homeobotanical Institute Incorporated: http://www.hbinstitute.org.nz

The Naturopathic College of New Zealand: https://ncnz.co.nz

References

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Petersen, D. (2014). *Homb 501 Dynamic Phytotherapy*. Portland, OR: American College of Healthcare Sciences.

