

**KEY WORDS**

Complementary and alternative medicine, Yoga, Nutraceuticals

**INTRODUCTION**

Health is a state of complete physical, mental, social and spiritual well being, not merely absence of disease. Quality health is the right of every human being but it relies on individual, social and environmental factors. Health is a positive concept and does not just mean freedom from disease. Unfortunately, the current system of Medicine worldwide, concentrates on treating symptoms and diseases, leaving the mission of health unaccomplished and giving scope for alternate means for restoration of health. Despite many scientific and technological advances in modern medicine, there are many number of illnesses which remain incurable, or not completely treatable, Fortunately, alternative medicinal systems are readily available from ages, and are now being reinvented and rediscovered to fill those gaps and all of them need a critical appraisal, scientific evaluation and test of time. The search for health includes many beliefs and practices that are outside conventional medicine, sources being family, role of family priests, culture and traditions. Current day physicians should be aware of patient's attitude for self treating using alternatives and warn the potential harm involved in such activities.

**CLASSIFICATION OF HEALTH CARE SYSTEMS**

1. Conventional Medicine: Synonyms include dominant, orthodox, western, allopathic, modern, scientific or technologic medicine. Conventional medicine is the medicine prescribed with the use of diagnostic techniques and pharmaceutical/surgical interventions. It is the major health-care system adopted across the globe which has got strengthened since a few decades by clinical research trials and evidence based medicine.
2. Alternative medicine: Synonyms include traditional, unconventional, uncommon, natural or native medicine. Alternative medicine is the main stream medicinal system characteristic to societies, cultures and nations. It has been practiced in their respective areas to fill the gap or to replace the modern medicine. Examples include:
  - Indian Ayurvedic Medicine with use of herbs, yoga, meditation etc.

- Traditional Chinese medicine with the use of Acupuncture, Qi gong, Tai Chi etc.
  - Alternative medicine of USA with the use of chiropractic, osteopathy for manipulation of spine, joints using hand pressing.
  - Alternative medicine of Europe with Diet, Homeopathy, Naturopathy and exercise.
3. Complementary or adjunctive medicine: Independent from the above two major health-care systems, complementary medicine synergizes benefit and outcome of an individual health. Mind-body practices like physiotherapy, massage therapy, reflexology, hypnosis, meditation, yoga are few examples.
  4. Adjuvant therapy: Adjuvant therapy is an addition to the primary (initial) medicine designed to help reach the ultimate goal. In cancer, adjuvant therapy usually refers to surgery followed by chemotherapy or radiotherapy to help reduce the risk of the recurring cancer. Other examples include nutraceuticals/pharmaceuticals or dietary integrators.
  5. Integrative or holistic medicine: This is a new trend to respect belief and reject harm of any of the above systems to focus more on patient and less on technology [Figure 1]. This approach seems attractive as it is less interventional and more natural but lack of evidence is a cause of concern and controversy. Example 1. Veterans Administration and Department of Defence (VA-DD) & American Pain Society of USA utilizing integration of chiropractic osteopathy to treat low backache & other musculoskeletal disorders and 2. Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) of India.

**II. BACKGROUND**

Complementary and Alternative Medicine (CAM) has been used in various countries like India, China, Latin America, Europe and USA much before the development of present day medical science which became global in chronological order. In India, Ayurveda and yoga are two major CAM systems. In Sanskrit, Ayurveda means "knowledge of life". Ayurvedic knowledge was born from the wisdom of the ancient rishis (sages and healers) and yogis (ascetics practicing yoga) of India, and was first passed on from healer to healer as an oral tradition

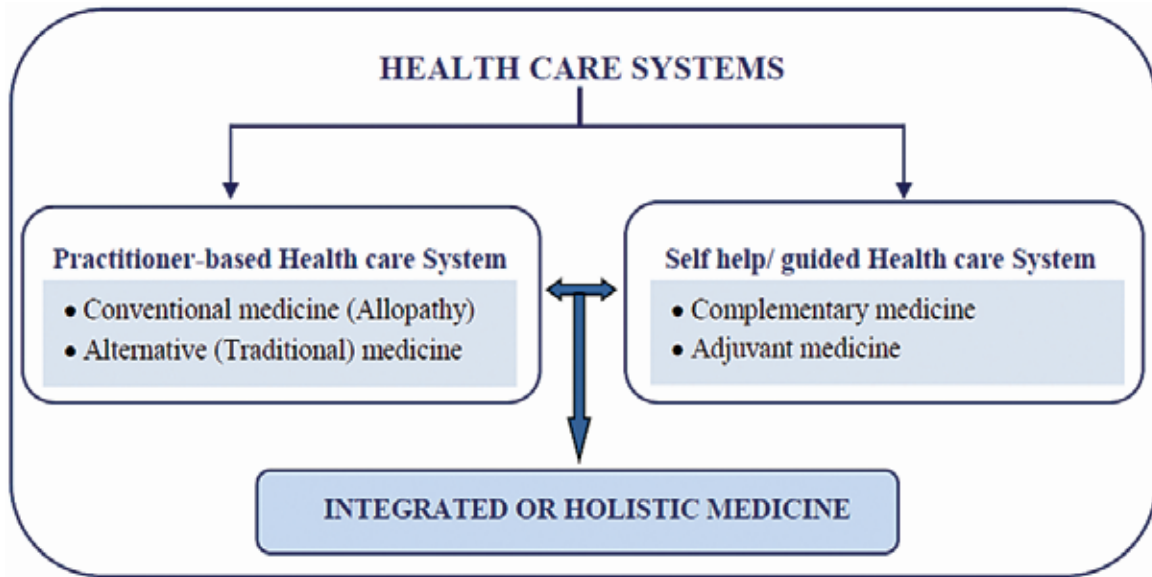


Fig. 1: Health Care System

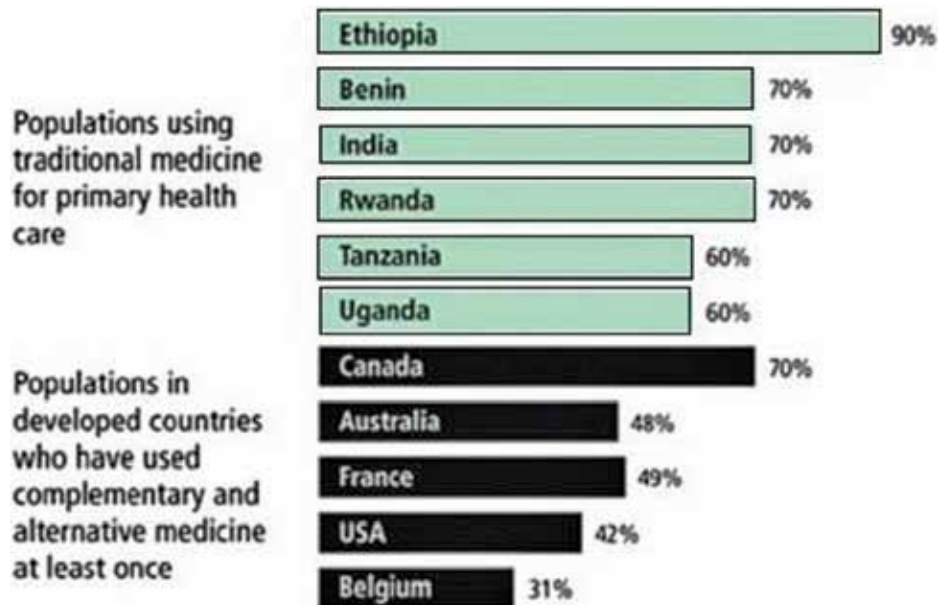
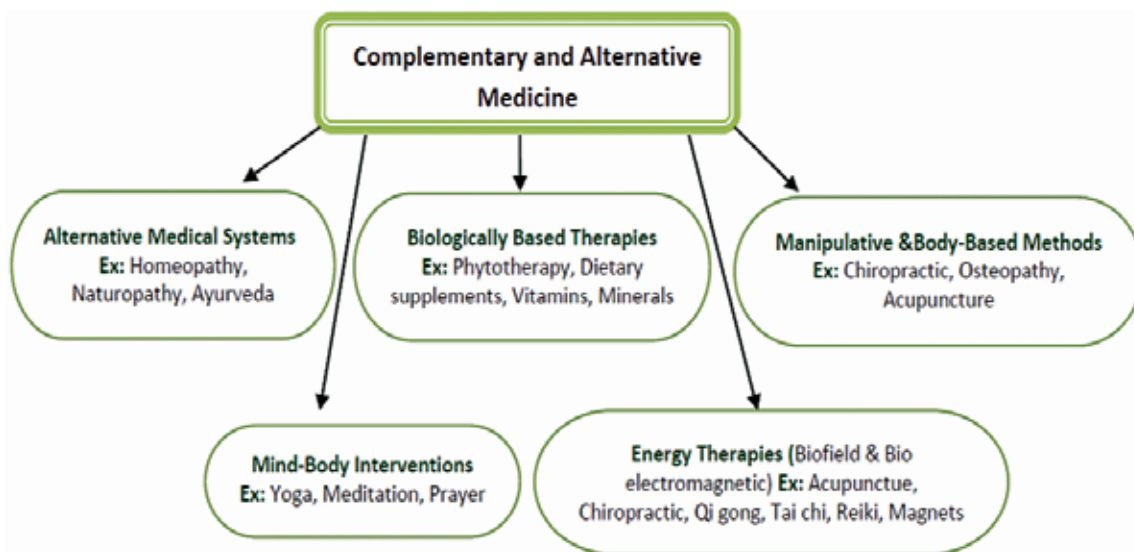


Fig. 2: Popularity of traditional medicines and complementary alternative medicines worldwide

for untold generations before the earliest known texts were written around 5000 BC. Yoga, a system envisaged by Maharshi Patanjali also exists in India since ages but is now recognised worldwide and being absorbed into main stream of medicine and World health organization (WHO) observed International Yoga Day on June, 21<sup>st</sup> of every year. Unani, another old methodology of East Indian medicinal system originated from Persian medicine, is practiced primarily in the Muslim community along with 'Tibbe'; it is also called as 'hikmat', a science which deals with prevention and treatment of health problems. Siddha is also an oldest system of medicine in India, prevalent among Tamil speaking people<sup>1</sup>. Homeopathy, discovered by Samuel Hahnemann, a German physician treats illness by going with, rather than against symptoms that are seen as the body's natural defence. Other older traditional practices of India include Dhara (Oil massage therapy/

Kerala Ayurveda), Mud therapy, Magnetic therapy, Agnikarma, Magic/Mantra therapy etc. Figure 2 shows the popularity of traditional and CAM worldwide<sup>2</sup>.

In the Western countries, there are many existing traditional practices struggling with dominant system. At present only six fields are educationally accredited, they are osteopathy, chiropractic, acupressure, massage, naturopathy & homeopathy. Though widely practiced, Indian yoga and ayurveda are neither accredited nor licensed in US. In Latin America and Africa many primitive practices are existing but few are mentioned theoretically in currently available literature. In the Far East, Tibetan medicine and Traditional Chinese Medicine are existing from ages. In US, chiropractic is offered as two year UG course followed by 4years of internship in many accredited medical schools, offering PG courses in osteopathy. It is estimated that in US 52000 licensed



**Fig. 3: Domain of Complementary and Alternative Medicine**

chiropractors<sup>3</sup>, 3000 naturopaths, 155000 massage therapists and 70% family practitioners are being carried out by osteopathy. In India, courses like BAMS, BHMS, BNYS & BUMS and their respective PG courses are taught in many government & private medical colleges recognized by many health universities & UGC.

In 1993, David Eisenberg and colleagues surprised by showing the utilization of complementary or alternative health approach is more than 30% of Americans. According to Centres for Disease Control and Prevention's National Centre for Health Statistics National survey in 2007, 42% of hospices in USA had integrated CAMs in mainstream medicine. In Veterans Administration and Department of Defence, utilising of complementary approaches for management of various pain syndromes (headache, low back ache etc.) and post-traumatic stress disorder is common. A survey on complementary and alternative health approaches estimated that approximately 18% of overall population used non-vitamin, non-mineral dietary supplements in 2002, 2007 and 2012 respective studies. This states that Americans are willing to pay about \$34 billion out-of-pocket expenditure amounting 1.5% of total USA health expenditures<sup>3</sup>. Globally, herbal-based products accounts for \$120 billion annual market of which half of the share is by Ayurvedic products<sup>4</sup>.

In India, by 1998 there are 2,860 hospitals with 45720 beds, 22100 dispensaries with estimated 587536 registered traditional medicine practitioners<sup>4</sup>, both institutionally and non-institutionally qualified, to provide traditional medicine particularly in rural areas which accounts 70% of total population. More than 75% of beds are occupied by patients receiving ayurvedic treatment.

Allopathic resident doctors have little knowledge about ayurveda and ayurvedic medicine use but engaged in prescribing ayurvedic medicine compared to other alternative medicine<sup>5</sup>.

## IV. ALTERNATIVE MEDICINE

### A. Definition

"Alternative medicine" or "complementary medicine" is interchangeable terms with traditional medicine in some countries. National Centre for Complementary and Alternative Medicine (NCCAM) defines Complementary and Alternative Medicine as a group of diverse medical and health care systems, products and practices that are not presently considered part of conventional medical care<sup>6</sup>.

### B. Types of Alternative medicine

Alternative medicines mainly fall into five major domains<sup>6</sup> [Figure 3]

The common alternative medicines used globally are listed in table 1.

### C. Significance of Alternative medicine

Alternative medicine has been in vogue for a long time, but it was discarded in pursuance of the energetic science of allopathy. Decades later, ancient alternative medicine has again come to light. Reasons for this is two-fold; 1. Drawbacks of modern medicine like increasing side effects, dramatic rise in the cost of allopathic medicine despite failure in achieving desired cures of their ailment, 2. Inherent advantages of alternative medicine like its simplicity & cost-effectiveness, its cultural links to tradition and religion, hatred to certain western practices.

### D. Indian Alternative Medicine:

There are many Indian traditional therapies [Table 2] practiced by many Indian tribes and rural people<sup>4</sup>, some of them are proved beneficial in many incurable diseases like migraine, insomnia, sinusitis, asthma, spondylitis, sciatica, indigestion,

**Table 1: List of various Alternative Medicines**

## Alternative medicine

- 1 Acupuncture & acupressure: Stimulation on defined anatomic points with insertion & manipulation with thin metallic needles.
- 2 Alexander technique: Movement of body therapy to improve posture & efficient use of muscles for improvement of overall body function.
- 3 Anthroposophic: A spiritual based medicine involving herbs, homeopathy, and movement therapy called 'eurhythmy'.
- 4 Aromatherapy: Treatment with extracted natural oil to enhance psychological and physical well-being
- 5 Ayurveda: Treatment regimen include diet, exercise, complex herbs
- 6 Chiropractic: Spine & joints adjustment to reduce pain & improve backache, headache, musculo skeletal disorders.
- 7 Curanderismo: Spiritual healing of Latin America with ritual cleansing, herbs, incantations, smudging (cleaning room with smoke of sacred plant)
- 8 Electric Therapy: Use of electric devices like deep brain stimulator, muscle stimulation
- 9 Energy medicine: Energetic or informational interaction with a biological system to bring back homeostasis in the organism is energy medicine
- 10 Faith healing: Ritualistic practice of prayer and gestures for spiritual and physical healing.
- 11 Guided imagery: Use of relaxation technique followed by visualization of images, usually calm & peaceful in nature, to invoke specific images to alter neurological function & physiological state.
- 12 Greeva Basil Soaking the neck in pool of herbal oils to alleviate pain, stiffness and cervical compression
- 13 Herbal medicine: Also called Phytomedicine/Botanical, use of plants for medicinal purpose
- 14 Homeopathy: Originated in German, based on the belief in the theory of 'like cures likes', compounds that produce symptoms in very dilute solution will be curative.
- 15 Heat Therapy: Use of hot cloth, container/heating pad etc for pain relief
- 16 Hypnosis: Induction of altered state of consciousness characterized by increased responsiveness to suggestions.
- 17 Magic Therapy: Religious worships as therapy for diseases assumed as a result of wrath of God
- 18 Magnetic Therapy: Use of magnetic devices for treating diseases.
- 19 Massage: Manual therapies that manipulate muscles & connective tissues to promote muscle relaxation, healing & sense of well being.
- 20 Meditation Practices based on spiritual traditions intended to focus I control attention & obtain greater awareness/mindfulness of present moment
- 21 Mud Therapy: Use of mud (rich in minerals) on body as well as houses to prevent germs and related diseases
- 22 Music Therapy: Use of music as therapeutic intervention to reduce anxiety, improve cognitive functioning, promote physical rehabilitation
- 23 Native American medicine: Treatment with awareness of self spirit, rest, connection with nature, herbs, social support and spiritual healing
- 24 Naturopathy Clinical medicine with holistic approach involving herbs, exercises, diet.
- 25 Netradhara: Special cleansing technique of pouring herbal decoction over the eyes for 20 min in a continuous stream
- 26 Oil massage Kerala Ayurveda: Use of vegetable oil, essential oils etc for mental and physical health
- 27 Osteopathy: Spinal manipulative methods to reduce pains.
- 28 Physical medicine & rehabilitation: Treating physical impairments or disabilities by counselling
- 29 Qi gong: Traditional Chinese gentle and slow exercise for health maintenance, healing and increasing vitality

*Contd.*

**Table 1: List of various Alternative Medicines**

30	Reflexology: Manual stimulation of point- on hands feet that are believed to affect organ function
31	Reiki Japanese technique for stress reduction and relaxation that also promotes healing
32	Rolfing: Manual therapy attempting to realign the body by manipulating deep tissue & fascia.
33	Sekkotsu: Traditional Japanese technique of bone setting.
34	Siddha: Medicinal system prevalent in Tamil speaking people.
35	Spinal Manipulation: Manual techniques by chiropractic/osteopaths for adjusting spine lo affect neuromuscular functions
36	Tai Chi: A mind body practice achieving slow, gentle movements, a kind of moving meditation.
37	Tau-dam Agnikarma Treatment using burn red hot iron rod touching the affected area of skin.
38	Touch therapy: A version of lying on hands, a kind of healing meditation.
39	Tibetan medicine: Diagnose by examining pulse & urine, treatment by diet, herbs & massage.
40	Traditional Chinese Medicine: Involving acupuncture, herbal mixtures, massages, exercise & diet.
41	Unani: Medicine originated from Persian, prevalent in Muslim community, also called as 'hikmat'.
42	Yoga: An exercise based practice, combines physical postures, breathing exercises & meditation.

**Table 2: Indian Alternative Medicine**

1	Kerala Ayurveda	3000 years old, originated in Kerala, spread world wide Also called as Dhara/Panchkarma Fivefold purification revives equilibrium of Tridosha
2	Mud therapy	1000 years old, practiced in rural / tribal communities Mud paste smeared on walls of house to maintain temperature & keeps germs away Mild from north is good for nervous system disorders
3	Herbal therapy	Prehistoric, tree worship of Indus Valley civilization Herbs in the form of powder, decoction, tonic & mixtures Rigveda mentioned plants like Semal, Pithvam, Palash, Pippal Kalpasutra of Atharvaveda explain 579 plants list.
4	Megnetic therapy	Sand and stone are spelled as SIKATA & ASHMAN in Atharvaveda Used to treat bleeding disorders and infertility in woman because iron is an important ingredient in blood. Low powered magnets used to treat sensitive organs
5	Agnikarma (Tau-Dam)	Traditional Himalayan Therapy Tau is an iron rod, burned till red hot and touches the affected skin for few seconds and massaged with oil. Dam, burnt seeds of Terminalia chebulta or Anaphalis araneso used as same as Tau Mostly used for liver and gastrointestinal disorders
6	Magic therapy	Also called as Zadu, Tantra, Mantra Practiced in Central Himalaya, elsewhere in rural India Diseases are result of wrath of God, to invoke the God of ceremonial worship during night performed and sacrifice of goat, pig, cock or coconut is offered. 50% are cured, psychosomatic in nature.

substance abuse and general ill health. Some of them are very barbarous, unscientific, self harming than curative.

#### E. Ayurveda:

Principles of ayurveda are made up of 5 basic

elements viz., Akasa (ether), Vayu (air), Tejas (fire, minerals, acids, alkalis), Jala (water) and Prithvi (organic substances & earthy matter). Combination of all these elements classifies into 3 types of basic diagnoses viz., Vata (ether & air); responsible for movement in the body & mind, Pittha (fire



**Fig. 4: Principles of Ayurveda**

& water); functions associated with digestive processes, metabolic activity & body temperature, Kapha (earth & water); corresponds to anabolism of body tissues & stored substances. Final diagnosis can be defects in any one or more of these defects in different permutations, e.g. *Tridosha* is defect in all three principle which are not balanced, may be excess (hyper function) or deficiency (hypo function) of each component which needs to be corrected by adopting ayurvedic principles of treatment. Figure 4 depicts principles of Ayurveda.

### SIGNIFICANCE OF AYURVEDIC MEDICINE

Ayurvedic methods can be applied to any disease of present day human life; few scientifically proven examples are outlined below:

1. Guidelines of Swasthavritta in ayurveda are remedies for obesity, which addresses & advocates that
  - a. the obsession & compulsion for food intake should be strictly controlled; avoid sweet, salt & oily food in regular diet; avoid curd and take butter milk; boil and drink warm water;
  - b. avoid day time sleep,
  - c. walking, swimming, cycling etc;
  - d. ayurvedic medicines like Triphala churna or guduchi churna at bedtime with honey/ Brihat Pancha Moola or amla powder can be used.
2. According to ayurveda, sleep disorders are caused by tridosha, which result in impaired psychological tendencies. Lifestyle changes in accordance with nature cause enthusiastic, vivacious, regular, excitable & quick-change in individual mood, hence mind body practices have to be adopted for good sleep, like regular exercise, yoga & meditation; limiting toxins containing tobacco, alcohol, tea & coffee; and taking right food at right time in right amount.
3. Generalized Anxiety Disorder (GAD) is because of

hyper function of Vata elements in the body which cause various forms of anxiety, phobias, neurotic & psychotic ailments. Any changes in circadian rhythm, a biological cycle of 24 hours duration, and results in physiological changes because of excess or under production of bodily secretions is the fundamental cause. Ayurvedic remedies to cure this malady include

- a. Massage therapy: abhyanga with sesame oil daily, warm oil for feet & marma therapy (vital junction point's treatment),
  - b. Aroma therapy with mixture of warm, sweet & sour aromatic oils of basil, orange & rose for Vata purification,
  - c. Regular exercise, yoga & meditation for at least 30 minutes daily between 6 am to 7 am,
  - d. Consume all 6 types of tasting foods (sweet, sour, salt, bitter, pungent & astringent) and
  - e. Facilitate well ventilated bed room without direct blow of the air.
4. Ayurvedic medicine with its natural & traditional base has the potential to provide remedies to the many challenging health issues like drug withdrawals<sup>2</sup>, adverse drug reactions and economic disparities without many side effects. Traditional, Complementary and Alternative Medicine (TCAM) delays in seeking help from the allopathic practitioners and related health facilities by healing or slowing the progression of disease<sup>7</sup>.

### IV. ADJUVANT THERAPY

Adjuvant therapy may involve addition of medicine or treatment to the primary therapy e.g. in cancer (surgery with radiotherapy/chemotherapy), ophthalmology (surgery with spectacles), orthopedics (surgery with physiotherapy/rehabilitation) and in psychiatry (medication with cognitive behavior therapy). It is common in treating chronic illnesses in addition to primary treatment, as many patients suffer from loss of appetite & general weakness resulting in malnutrition and/or malabsorption are vice versa, apart from drug-induced nutrient deficiency and socio-economic factors contributing to development of incurable & perpetuating diseases. Many nutraceuticals are claiming to be adjuvant therapy; hence there is a need for FDAs of every nation to look for genuine claims, as many compounds escape from clinical trials to establish therapeutic benefits but many fraudulent lies in claim "maintaining" the integrity of tissue & health.

### V. NUTRACEUTICALS

A nutraceutical is any non toxic food supplement which is scientifically proven for health benefits<sup>8</sup> and used for non-specific therapy to control symptoms and upgrade wellness. They range from nutrients; dietary supplements and special diet prepared by herbs and of late, genetic engineering technology. There are traditional



## Hatha Yoga

Fig. 5: Types of Yoga

nutraceuticals from fruits, vegetables, grains, fish and dairy products e.g.: lycopene of tomatoes, omega 3 fatty acid in Salmon, and saponins of soy; and non-traditional nutraceuticals from agriculture breeding or nutrient fortification of juices, e.g.: Calcium fortified with orange juice and folic acid in wheat flour<sup>9</sup>.

### VI. YOGA

Yoga is defined as the application of yogic principles to a person with objective of achieving a physiological, psychological & spiritual goal. Sanskrit meaning of yoga is 'union' indicating integration of body, mind & soul. It is one step ahead of WHO's definition of health by adding 4<sup>th</sup> dimension to the health i.e., concept of soul.

Yoga is divided into eight types viz., Bhakthi, Jnana, Karma, Raja, Hatha, Kundalini, Manthra & Purna yogas<sup>10</sup> with specific purpose it serves [Figure 5] and involves eight principles viz., yuktha sikshana, bheda, desha, deha, kaala, vritti, shakthi & marga and methods involved are also eight types viz., asana, pranayama, bandha, yama, niyama, prathyahara, dharana & dhyana. Many a times it's quoted as 'astanga yoga'<sup>11</sup>.

This ancient art derived its principles from 'Pathanjali' shastra, named after its founder sage; focuses on spiritual enlightenment by physiological, physical, psychological fitness of human being. Terminology of various yoga practices are shown in Table 3.

Yoga practices are found effective for development of various dimensions of personality. Its 'physical dimension' addresses many current diseases being treated from their root cause, particularly chronic ailments like obesity, metabolic syndrome, cardiac diseases and psychosomatic disorders. It improves general health, strength; rejuvenates recreational and sexual health; it alters central

pain processing by unknown mechanisms so as to cure many chronic painful syndromes like sciatica, migraine & cancer pain. 'Emotional dimension' relates to feelings, attitudes and takes care of negative emotions like fear, anger, and anxiety and improves positive emotions like peace, kindness & love. In its 'intellectual dimension' it improves mental abilities like critical thinking, judgment, decision making & memory. In 'social domain' it brings harmony in community by improving interpersonal relations between human beings. Finally it helps in developing values, morality and discovers individual's purpose of birth and ultimate enlightenment of *moksha*<sup>12</sup>.

### SIGNIFICANCE OF YOGA

Yoga not only limited to physical posture, breathing exercise or meditation but gives direction to food & eating habits; rejuvenation & recreational means; thinking & conduct. Yoga is a way of life, with its 5 components viz., Ahara (food), Vihara (relaxation), Achara (conduct), Vichara (thinking) & Vyavahara (behavior/action) should be adopted to promote overall championship of health.

The following are currently available Research Evidences on Yoga for its usefulness in health:

1. Tapas das et al from Kolkata proved that yoga therapy is beneficial in maintaining good health by regulating BMI, to overcome the complications of obesity & metabolic syndrome<sup>13</sup>.
2. Anand Balayogi et al from Pondicherry, reported that there is a healthy reduction in heart rate, blood pressure and other cardiovascular indices following a single yoga session<sup>14</sup>, magnitude of this benefit depends on pre-existing medical condition & yoga protocol adopted, benefits achieved are attributed to enhanced cardiac autonomic function

**Table 3: terminology of various yoga practices**

Yama and niyama are the principles that concern with personal conduct and social life.	
Five principles of Yama	Five principles of Niyama
1. Ahimsa (non-violence)	1. Shaucha (cleanliness)
2. Satya (truthfulness)	2. Santosha (satisfaction)
3. Asteya (non-stealing)	3. Tapas (austerity)
4. Brahmacharya (abstinence)	4. Swadhyaya (Good literature, knowing about self)
5. Aparigraha (non-collectiveness)	5. Ishwarpranidhana (dedication to supreme God)
Asana is a sitting yoga practice in a particular posture steadily to improve stability and comfort at physical and mental health	
Pranayama is a breathing exercise to control breathe or respiratory process	
Pratyahara is yogic practice which means withdrawal of senses from sense organs and withdrawal of external surrounding in order to control mind. Observation, studying good books are some practices which improves for control of mind.	
Bandha and Mudra involves manipulation of certain semi-voluntary and involuntary muscles in the body which results in voluntary control and toning up of internal organs.	
Shatkarma/Kriya is cleansing or purification process which cleanse the specific organs in the body by detoxifying them using six actions namely Neti (neither this nor that), Dhauti (purification of oesophagus and stomach), Basti (cleansing of lower abdomen, esp., colon), Trataka (fixing eyes on some object), nauli (cleansing of abdomen by turning abdominal muscles) and Kapalabhati (forehead and all other organs under skull to brighten by breathe exercise)	

as result of coordinated breath-body work & mind-body relaxation.

3. Kerstin et al proved that the relaxation by yoga is associated with significant increase in cardiac vagal modulation<sup>15</sup>.
4. Williams KA et al demonstrated that a 16-week yoga therapy<sup>13</sup> caused significance reduction in self reported disability & pain & educed use pain medication compared to a control group.
5. David Shapiro et al support the therapeutic potential of yoga in generalized anxiety disorder (GAD), with reduction in perceived stress & related anxiety/depressed symptoms<sup>13</sup>.
6. Cohen et al, in large randomized trials claims efficacy of restorative yoga for treatment of menopausal symptoms in women<sup>15</sup>.
7. Oken et al in his randomized trial showed significant improvement in fatigue but not in cognitive function in patients with multiple sclerosis versus control group<sup>16</sup>.
8. Kolansinski et al suggests that yoga may provide a feasible treatment option for yoga in obese and old patients with osteoarthritis<sup>17</sup>.

## CONCLUSION

Despite significant expenditure spent on testing alternative medicine, many studies have failed to prove its effectiveness as claimed and could not provide proper explanation regarding mechanisms of healing, which remain hypothetical. Other point of view is that, because of allopathic research bias (a defect in their study designs and scientific tools) alternative medicine

was a failure. Nonetheless, alternative medicine has survived from ages till date and is growing stronger in certain areas where dominant system failed to yield good results. Undoubtedly it improves chronic ailments, preventive aspects of health and is holistic in nature of physical, psychological, social and spiritual health of human kind. Over all health is the ultimate goal, not the way which we achieve it. Accordingly, all the systems of health care should be integrated in a synergistic manner by understanding the deficiencies of one's own and by appreciating strengths of others. In the endeavor of achieving integrating system, much more research has to be conducted with well designed and unbiased trials.

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