

# ***RESEARCH AT A GLANCE***



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# ***Research at a Glance***

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**BY:**

**Meenakshi Bhatia  
Librarian Incharge**

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e-mail: [ccrhlbrary@gmail.com](mailto:ccrhlbrary@gmail.com)**

# **PREFACE**

## **Introduction**

The library of the Central Council for Research in Homoeopathy has been circulating "Research at a Glance". The main objective is to disseminate precise information/citation about scientific articles published in various journals/magazine other than the journals subscribed by this Council.

## **Scope**

This volume covers articles on Homeopathy, Ayurveda, Unani, Yoga.

## **Arrangement of Entries**

The articles are indexed under the name of the authors, arranged in alphabetical order. The entries have been made in the following order:

Author  
Title  
Name of Journal  
year of publication; Volume (issue no.): pagination  
Abstract

## **Acknowledgement**

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**(Meenakshi Bhatia)**  
**Librarian Incharge**

## HOMOEOPATHY

**Croyal M, Billon-Crossouard S, Goulitquer S et al. Stable Isotope Kinetic Study of ApoM (Apolipoprotein M). *Arterioscler Thromb Vasc Biol.* 2018; 38(1):255-261.**

### **Abstract:**

**Objective:** ApoM (apolipoprotein M) binds primarily to high-density lipoprotein before to be exchanged with apoB (apolipoprotein B)-containing lipoproteins. Low-density lipoprotein (LDL) receptor-mediated clearance of apoB-containing particles could influence plasma apoM kinetics and decrease its antiatherogenic properties. In humans, we aimed to describe the interaction of apoM kinetics with other components of lipid metabolism to better define its potential benefit on atherosclerosis.

**Approach and Results:** Fourteen male subjects received a primed infusion of  $2H_3$ -leucine for 14 hours, and analyses were performed by liquid chromatography-tandem mass spectrometry from the hourly plasma samples. Fractional catabolic rates and production rates within lipoproteins were calculated using compartmental models. ApoM was found not only in high-density lipoprotein (59%) and LDL (4%) but also in a non-lipoprotein-related compartment (37%). The apoM distribution was heterogeneous within LDL and non-lipoprotein-related compartments according to plasma triglycerides ( $r=0.86$ ;  $P<0.001$ ). The relationships between sphingosine-1-phosphate and apoM were confirmed in all compartments ( $r$  range, 0.55-0.89;  $P<0.05$ ). ApoM fractional catabolic rates and production rates were  $0.16\pm 0.07$  pool/d and  $0.14\pm 0.06$  mg/kg per day in high-density lipoprotein and  $0.56\pm 0.10$  pool/d and  $0.03\pm 0.01$  mg/kg per day in LDL, respectively. Fractional catabolic rates of LDL-apoM and LDL-apoB100 were correlated ( $r=0.55$ ;  $P=0.042$ ). Significant correlations were found between triglycerides and production rates of LDL-apoM ( $r=0.73$ ;  $P<0.004$ ).

**Conclusions:** In humans, LDL kinetics play a key role in apoM turnover. Plasma triglycerides act on both apoM and sphingosine-1-phosphate distributions between lipoproteins. These results confirmed that apoM could be bound to high-density lipoprotein after secretion and then quickly exchanged with a non-lipoprotein-related compartment and to LDL to be slowly catabolized.

**Culpin P. RCVS stand on homeopathy. *Vet Rec.* 2017 Nov 18;181(20):542p.**

**Davidson JR. Wesselhoefts: A medical dynasty from the age of Goethe to the era of nuclear medicine. *J Med Biogr.* 2017; 25(4): 214-22p.**

### **Abstract:**

For six generations, members of the Wesselhoeft family have practiced medicine in Germany, Denmark, Switzerland, Canada and/or the USA. In the early decades of the 19th century, two Wesselhoeft brothers left Europe to eventually settle in New England, where they and their progeny gave rise to a regional medical dynasty. The Wesselhoeft doctors became well-known practitioners of homeopathy, hydropathy, conventional medicine and surgery,

in academic and general clinical settings. An additional connection was established to the literary worlds of Germany and the USA, either through friendships or as personal physicians.

**Dei A. Hormesis and Homeopathy: Toward a New Self-Consciousness. *Dose Response*. 2017;15(4):1559325817744451.**

**Marston S. RCVS stand on homeopathy. *Vet Rec*. 2017 Nov 25;181(21):571-572p.**

**Nascimento KF, de Santana FR, da Costa CRV et al. M1 homeopathic complex trigger effective responses against *Leishmania (L) amazonensis* in vivo and in vitro. *Cytokine*. 2017; 99: 80-90p.**

**Abstract:**

Leishmaniasis is a term referring to a range of clinical conditions caused by protozoan parasites of the genus *Leishmania*, Trypanosomatidae family, Kinetoplastida order that is transmitted by the bite of certain species of mosquitoes Phlebotominae subfamily. These parasites infect hosts wild and domestic mammals, considered as natural reservoirs and can also infect humans. *Leishmania* are obligate intramacrophage protozoa that have exclusively intracellular life style. This suggests that the amastigotes possess mechanisms to avoid killing by host cells. Cutaneous leishmaniasis, the most common form of the disease, causes ulcers on exposed parts of the body, leading to disfigurement, permanent scars, and stigma and in some cases disability. Many studies concluded that the cytokines profile and immune system of host have fundamental role in humans and animals natural self-healing. Conventional treatments are far from ideals and the search for new therapeutic alternatives is considered a strategic priority line of research by the World Health Organization. A promising approach in the field of basic research in homeopathy is the treatment of experimental infections with homeopathic drugs prepared from natural substances associations highly diluted, which comprise a combination of several different compounds considered as useful for a symptom or disease. Therefore, this study aimed to evaluate the effect of M1, a complex homeopathic product, in macrophage-*Leishmania* interaction in vitro and in vivo. It was used RAW cells lineage and BALB/c mice as a host for the promastigotes of *L. amazonensis* (WHOM/BR/75/Josefa). Several biochemical and morphological parameters were determined. Together, the harmonic results obtained in this study indicate that, in general, the highly diluted products trigger rapid and effective responses by living organisms, cells and mice, against *Leishmania*, by altering cytokines profile, by NO increasing ( $p < 0.05$ ), by decreasing parasitic load ( $p < 0.001$ ), and modifying classical maturation and biogenesis of parasitophorous vacuoles ( $p < 0.001$ ). M1 complex decreased endocytic index ( $p < 0.001$ ), and the % of infected macrophages ( $p < 0.05$ ), preventing the development of lesions ( $p < 0.05$ ) caused by *L. amazonensis* by increasing Th1 response ( $p < 0.05$ ). Therefore the M1 complex can be a good candidate for a complementary therapy to conventional treatments, since all the parameters observed in vitro and in vivo improved. It could be an interesting clinical tool in association to a classical anti-parasitic treatment, maybe resulting in better quality of life to the patients, with less toxicity.

**Noureddine H, Hage Sleiman R, Wehbi B et al. Chemical characterization and cytotoxic activity evaluation of Lebanese propolis. *Biomed Pharmacother.* 2017; 95: 298-307p.**

**Abstract:**

Chemical composition, anti-proliferative and proapoptotic activity as well as the effect of various fractions of Lebanese propolis on the cell cycle distribution were evaluated on Jurkat leukemic T-cells, glioblastoma U251 cells, and breast adenocarcinoma MDA-MB-231 cells using cytotoxic assays, flow cytometry as well as western blot analysis. Liquid chromatography-tandem mass spectrometry (LC-MS/MS) analysis revealed that ferulic acid, chrysin, pinocembrin, galangin are major constituents of the ethanolic crude extract of the Lebanese propolis, while the hexane fraction mostly contains chrysin, pinocembrin, galangin but at similar levels. Furthermore chemical analysis was performed using gas chromatography-mass spectrometry (GC-MS) to identify major compounds in the hexane fraction. Reduction of cell viability was observed in Jurkat cells exposed to the ethanolic crude extract and the hexane fraction, while viability of U251 and MDA-MB-231 cells was only affected upon exposure to the hexane fraction; the other fractions (aqueous phase, methylene chloride, and ethyl acetate) were without effect. Maximum toxic effect was obtained when Jurkat cells were cultivated with 90µg/ml of both the crude extract and hexane fraction. Toxicity started early after 24h of incubation and remained till 72h. Interestingly, the decrease in cell viability was accompanied by a significant increase in p53 protein expression levels and PARP cleavage. Cell cycle distribution showed an increase in the SubG0 fraction in Jurkat, U251 and MDA-MB-231 cells after 24h incubation with the hexane fraction. This increase in SubG0 was further investigated in Jurkat cells by annexinV/PI and showed an increase in the percentage of cells in early and late apoptosis as well as necrosis. In conclusion, Lebanese propolis exhibited significant cytotoxicity and anti-proliferative activity promising enough that warrant further investigations on the molecular targets and mechanisms of action of Lebanese propolis.

**Schmaltz R, Lilienfeld SO. Corrigendum: Hauntings, homeopathy, and the Hopkinsville Goblins: using pseudoscience to teach scientific thinking. *Front Psychol.* 2017; 8: 1982p.**

## AYURVEDA

**Bee Jung E, An Trinh T, Kyoung Lee T et al. Curcuzedoalide contributes to the cytotoxicity of Curcuma zedoaria rhizomes against human gastric cancer AGS cells through induction of apoptosis. *J Ethnopharmacol.* 2017; pii: S0378-8741(17)32030-5.**

### **Abstract:**

**Ethnopharmacological relevance:** Curcuma zedoaria Roscoe (Zingiberaceae), also known as white turmeric or zedoaria, has been used in Ayurveda and traditional Chinese medicine to treat various cancers, and it possesses several sesquiterpenoid compounds.

**Objective:** This study aimed to evaluate the therapeutic effects of a methanolic (MeOH) extract of C. zedoaria rhizomes, as well as its active constituents, against gastric cancer, which is a frequently diagnosed cancer in South Korea.

**Materials and methods:** Repeated column chromatography, together with semi-preparative HPLC purification, was used to separate the bioactive constituents from the C. zedoaria MeOH extract. The cytotoxic effects of the C. zedoaria MeOH extract and its active compounds were measured in human gastric cancer AGS cells. Expression of proteins related to apoptosis was evaluated using Western blotting analysis.

**Results:** The MeOH extract of C. zedoaria rhizomes exerted a cytotoxic effect on AGS cells (IC<sub>50</sub>: 96.60±4.87 µg/mL). Based on the bioactivity-guided fractionation for antiproliferative activity, a chemical investigation of the MeOH extract led to the isolation of five sesquiterpenes including isoprocurcumenol (1), germacrone (2), curzerenone (3), curcumenol (4), and curcuzedoalide (5). Among these, curcuzedoalide demonstrated the strongest effect in suppressing gastric cancer cell proliferation in a dose-dependent manner with an IC<sub>50</sub> value of 125.11±2.77 µM. Western blotting analysis showed that curcuzedoalide inhibited AGS human gastric cancer cell viability by activating caspase-8, caspase-9, caspase-3, and PARP, which contributed to apoptotic cell death in AGS human gastric cancer cells.

**Conclusion:** These data indicate that curcuzedoalide contributed to the cytotoxicity of C. zedoaria by activating the cleavage of caspases and PARP, which are representative markers for apoptosis. Therefore, curcuzedoalide is a positive candidate for the development of novel chemotherapeutics.

**Behera SK, Rajasekaran C, Payas S et al. In vitro flowering in Oldenlandia umbellata L. *J Ayurveda Integr Med.* 2017 Nov 24. pii: S0975-9476(16)30414-4p.**

## **Abstract:**

**Background:** Oldenlandia umbellata L. (Indian madder) is an antique Ayurvedic Indian herb and a source of various anthraquinone derivatives. The red dye from its roots has been used in diverse applications since ancient times.

**Objectives:** To establish reliable and effective protocols for in vitro flowering of O. umbellata.

**Materials and methods:** For in vitro flowering, organogenic calli were subcultured onto Murashige and Skoog (MS) medium supplemented with various concentrations of Naphthalene acetic acid (NAA) (0.15-1.0 mg/l) and Benzyladenine(BA) (0.5-1.5 mg/l) with and without 0.4% of coconut milk (CM).

**Results:** The highest number of in vitro flowers (22.8%) and best response (92.73%) was achieved on MS medium supplemented with 0.7 mg/l NAA + 1.5 mg/l BA with 0.4% CM. It was found that MS medium devoid of BA promoted best root development (47.3 per calli) as well as response (100%). It was also observed that when embryogenic calli grown in depletion of required nutrition transferred to fresh media induced more flowering. In vivo and in vitro floral comparative analysis revealed that in vitro flower induction was required for short time duration (20.67 days) than in vivo flower.

**Conclusion:** To the best of our knowledge, this is the first report on in vitro flowering and this study will help to overcome problems associated with flower development and seed production. As a result, this study may be a potent conservation tool to restore innate population size in its natural habitat.

**Chen YP, Ying SS, Zheng HH et al. Novel serotonin transporter regulators: Natural aristolane- and nardosinane- types of sesquiterpenoids from Nardostachys chinensis Batal. Sci Rep. 2017; 7(1):15114p.**

## **Abstract:**

Serotonin transporter (SERT) is a classic target of drug discovery for neuropsychiatric and digestive disorders, and against those disorders, plants of Nardostachys genus have been valued for centuries in the systems of Traditional Chinese Medicine, Ayurvedic and Unani. Herein, chemical investigation on the roots and rhizomes of Nardostachys chinensis Batal. led to the isolation of forty sesquiterpenoids including six new aristolane-type sesquiterpenoids and six new nardosinane-type sesquiterpenoids. Their structures were elucidated by extensive spectroscopic methods, combined with analyses of circular dichroism and single-crystal X-ray diffraction data. To explore natural product scaffolds with SERT regulating activity, a high-content assay for measurement of SERT function in vitro was conducted to evaluate the SERT regulating properties of these isolates. In conclusion, eleven

compounds could be potential natural product scaffolds for developing drug candidates targeting SERT. Among which, kanshone C of aristolane-type sesquiterpenoid inhibited SERT most strongly, while desoxo-nachinol A of nardosinane-type sesquiterpenoid instead enhanced SERT potently.

**Dalal KK, Holdbrook T, Peikin SR. Ayurvedic drug induced liver injury. World J Hepatol. 2017 Nov 8;9(31):1205-1209p.**

**Abstract:**

Drug induced liver injury is responsible for 50% of acute liver failure in developed countries. Ayurvedic and homeopathic medicine have been linked to liver injury. This case describes the first documented case of Punarnava mandur and Kanchnar guggulu causing drug induced liver injury. Drug induced liver injury may be difficult to diagnosis, but use of multi-modalities tools including the ACG algorithms, causative assessment scales, histological findings, and imaging, is recommended. Advanced imaging, such as magnetic resonance cholangiopancreatography, may possibly have a greater role than previously reported in literature.

**Dinakaran SK, Sujiya B, Avasarala H. Profiling and determination of phenolic compounds in Indian marketed hepatoprotective polyherbal formulations and their comparative evaluation. J Ayurveda Integr Med. 2017 Nov 29. pii: S0975-9476(16)30419-3.**

**Abstract:**

**Background:** Nowadays, plants have been considered as powerful agents for treatment of disorders due to their traditional use. Plants have a special role in the treatment of various diseases in Ayurveda. Liver disorders with their devastating outcomes have been discussed in Ayurveda as well.

**Objectives:** In the present study, polyherbal products (L52 and L38) were retrieved from Ayurveda and its pharmacognostic standardization was performed.

**Materials and methods:** Quality control test for the Ayurveda tablets were performed as per Indian Pharmacopoeia. Dissolution studies of polyherbal Ayurveda marketed formulations were assessed based on the phenolic content. Fingerprinting of phytochemical constituents of L52 and L38 was performed using spectroscopical (like IR and UV) and chromatographic techniques like HPLC, HPTLC and TLC.

**Results:** The results showed that L52 and L38 successfully passed quality control tests. Moreover, L52 and L38 exhibited different pharmacognostic behavior of all herbs present in the product. In addition, TLC, IR, HPTLC and

HPLC fingerprinting of L52 and L38 demonstrated the presence of several phenolic constituents corresponding to the polyherbs.

**Conclusion:** Regarding the role of phenolic compounds in the treatment of hepatitis, L52 and L38 could be appropriate candidates for hepatitis with respect to their traditional use in Ayurveda formulation. Moreover, HPTLC and HPLC fingerprinting could be utilized as an applicable method for quality control of the prepared formulation.

**Kania N, Widowati W, Dewi FRP et al. Cinnamomum burmanini Blume increases bone turnover marker and induces tibia's granule formation in ovariectomized rats. J Ayurveda Integr Med. 2017 Nov 30. pii: S0975-9476(16)30257-1.**

#### **Abstract:**

**Background:** Bone fragility and an increase in susceptibility to fracture osteoporosis is characterized by a reduction in bone mass and the micro-architectural deterioration of bone tissue. There is no previous study regarding the effect of Cinnamomum burmanini Blume on osteoporosis.

**Objective:** This study was aimed to investigate the effect of C. burmanini Blume on bone turnover marker, mineral elements, and mesostructure of ovariectomized rats.

**Materials and methods:** Thirty female Wistar rats were randomly divided into five groups, which included a control group (sham surgery), ovariectomy group (OVX), and ovariectomy groups in the presence of ethanolic extract of C. burmanini Blume (EECB) at doses of 12.5; 25; 50 mg/kg body weight (BW). Analysis of serum C-telopeptide collagen type I (CTX) and osteocalcin (OC) were done by enzyme-linked immunosorbent assay (ELISA). Tibia mineral elements and mesostructure were analyzed by X-ray Fluorescence and Scanning Electron Microscopy, respectively. In silico study was performed by modeling protein structure using SWISS-MODEL server and Ramachandran plot analysis.

**Results:** The increase in OC and CTX were significantly attenuated by treatments of EECB. Ovariectomy significantly decreased Cu/Zn ratio compared to sham-operated rats ( $p < 0.05$ ). Mesostructure of ovariectomized rats was significantly different compared with the control group.

**Conclusion:** Cinnamon was able to normalize bone turnover markers, but, the mesostructure of hydroxyapatite crystal growth was achieved at the highest dose extract. In silico study showed that the active compound of EECB could not only support osteoclastogenesis process by decreasing the binding energy

between RANKL and RANK, but also by inhibiting the interaction between OPG and RANK.

**Kean JD, Downey LA, Stough C. Systematic Overview of *Bacopa monnieri* (L.) Wettst. Dominant Poly-Herbal Formulas in Children and Adolescents. Medicines (Basel). 2017 Nov 22;4(4). pii: E86.**

**Abstract:**

**Background:** The Ayurvedic medicinal system employs a holistic approach to health, utilising the synergistic properties of organic resources. Research into the Ayurvedic herb *Bacopa monnieri* (L.) Wettst. (*B.monneri*) has reported improvements in cognitive outcomes in child and adult populations. The aim of current review is to systematically assess and critically summarize clinical trials investigating *B.monneri*-dominant poly-herbal formulas and their effects on the cognition, memory, learning, and behaviour in children and adolescents.

**Methods:**Key word searches were performed using PubMed, Scopus, Cochrane Library, DHARA, and CINAHL for publications meeting inclusion criteria up to November 2017. There were no restrictions in study design. Effect sizes were calculated for all significant findings to allow for direct comparisons, and each study was evaluated on design quality. Cognitive and behavioural outcomes were grouped into validated constructs for cross-study comparison.

**Results:** Nine trials met inclusion criteria. Five studies reported sufficient data for effect size analysis with most improvements reported in behavioural outcomes. True cognitive abilities and behavioural constructs were reviewed in six studies, with visual perception, impulsivity, and attention demonstrating the greatest improvements. The veracity of the evidence for the formulations reviewed is weakened by inconsistent statistical design and under-reporting of safety and tolerability data (44%).

**Conclusions:** The current review extends research supporting *B.monneri* as a cognitive enhancer and provides modest evidence for the use of *B.monneri* in poly-herbal preparations for improving cognitive and behavioural outcomes in child and adolescent populations. Greater emphasis on statistical vigour and the reporting of tolerability data are essential for future trials to adequately document poly-herbal treatment efficacy.

**Manokar J, Balasubramani SP, Venkatasubramanian P. Nuclear ribosomal DNA - ITS region based molecular marker to distinguish the medicinal plant *Gmelina arborea* Roxb. Ex Sm. from its substitutes and adulterants. J Ayurveda Integr Med. 2017; pii: S0975-9476(17)30136-5.**

**Abstract:**

Roots of *Gmelina arborea* (Gambhari) is a medicinally important raw drug traded in India. However, *Gmelina asiatica* and *Mallotus nudiflorus* are also found in the raw drug markets as Gambhari. The current study aims to identify molecular markers based on the nuclear ribosomal DNA - ITS1 region to distinguish the authentic species from substitute/adulterants. The nuclear ribosomal internal transcribed spacer 1 (ITS1) was amplified to identify species-specific markers using universal primers. Based on the sequence of the ITS region, specific primers were designed for *G. arborea*, *G. asiatica* and *M. nudiflorus* which efficiently amplified 142 bp, 93 bp and 150 bp of the ITS1 region of the respective species. The notable feature of this molecular method is that it is technically accurate, practically convenient and suitable for analyzing large numbers of samples. This study demonstrates that the ITS1 region can be used for reliable authentication of medicinal plants and detection of adulterants and substitutes of Gambhari.

**Menon M, Shukla A. Understanding hypertension in the light of Ayurveda. *J Ayurveda Integr Med.* 2017; Nov 16. pii: S0975-9476(17)30295-4.**

**Abstract:**

Different theories have been proposed to explain hypertension from an Ayurvedic perspective, but there is no consensus amongst the experts. A better understanding of the applied physiology and etio-pathogenesis of hypertension in the light of Ayurvedic principles is being attempted to fill this gap. A detailed review of available Ayurvedic literature was carried out to understand the physiology of blood pressure and etio-pathogenesis of hypertension from the perspective of Ayurveda. Many parallels were drawn from the concepts such as Shad Kriyakala (six stages of Dosha imbalance) and Avarana of Doshas (occlusion in the normal functioning of the Doshas) to the modern pathogenesis of hypertension to gain a deeper understanding of it. Hypertension without specific symptoms in its mild and moderate stages cannot be considered as a disease in Ayurveda. It appears to be an early stage of pathogenesis and a risk factor for development of diseases affecting the heart, brain, kidneys and eyes etc. Improper food habits and modern sedentary lifestyle with or without genetic predisposition provokes and vitiates all the Tridoshas to trigger the pathogenesis of hypertension. It is proposed that hypertension is to be understood as the Prasara-Avastha which means spread of vitiated Doshas from their specific sites, specifically of Vyana Vata, Prana Vata, Sadhaka Pitta and Avalambaka Kapha along with Rakta in their disturbed states. The Avarana (occlusion of normal functioning) of Vata Dosha by Pitta and Kapha can be seen in the Rasa-Rakta Dhathus, which in turn hampers the functioning of the respective Srotas (micro-channels) of circulation.

**Menon M, Shukla A. Understanding hypertension in the light of Ayurveda. *J Ayurveda Integr Med.* 2017 Nov 17. pii: S0975-9476(17)30295-4.**

**Abstract:**

Different theories have been proposed to explain hypertension from an Ayurvedic perspective, but there is no consensus amongst the experts. A better understanding of the applied physiology and etio-pathogenesis of hypertension in the light of Ayurvedic principles is being attempted to fill this gap. A detailed review of available Ayurvedic literature was carried out to understand the physiology of blood pressure and etio-pathogenesis of hypertension from the perspective of Ayurveda. Many parallels were drawn from the concepts such as Shad Kriyakala (six stages of Dosha imbalance) and Avarana of Doshas (occlusion in the normal functioning of the Doshas) to the modern pathogenesis of hypertension to gain a deeper understanding of it. Hypertension without specific symptoms in its mild and moderate stages cannot be considered as a disease in Ayurveda. It appears to be an early stage of pathogenesis and a risk factor for development of diseases affecting the heart, brain, kidneys and eyes etc. Improper food habits and modern sedentary lifestyle with or without genetic predisposition provokes and vitiates all the Tridoshas to trigger the pathogenesis of hypertension. It is proposed that hypertension is to be understood as the Prasara-Avastha which means spread of vitiated Doshas from their specific sites, specifically of Vyana Vata, Prana Vata, Sadhaka Pitta and Avalambaka Kapha along with Rakta in their disturbed states. The Avarana (occlusion of normal functioning) of Vata Dosha by Pitta and Kapha can be seen in the Rasa-Rakta Dhathus, which in turn hampers the functioning of the respective Srotas (micro-channels) of circulation.

**Misra S. Action research on education in Ayurveda. *J Ayurveda Integr Med.* 2017; pii: S0975-9476(17)30494-1.**

**Mitra A, Sur TK, Upadhyay S et al. Effect of swarna jibanti (coelogyne cristata lindley) in alleviation of chronic fatigue syndrome in aged wistar rats. J Ayurveda Integr Med. 2017; pii: S0975-9476(17)30217-6.**

**Abstract:**

**Objectives:** Cognitive decline is often associated with the aging process. Ashwagandha (*Withania somnifera* (L.) Dunal) has long been used in the traditional Ayurvedic system of medicine to enhance memory and improve cognition.

**Aim:** This pilot study was designed to evaluate the efficacy and safety of ashwagandha (*Withania somnifera* (L.) Dunal) in improving memory and cognitive functioning in adults with mild cognitive impairment (MCI).

**Methods:** A prospective, randomized, double-blind, placebo-controlled study was conducted in 50 adults. Subjects were treated with either ashwagandha-root extract (300 mg twice daily) or placebo for eight weeks.

**Results:** After eight weeks of study, the ashwagandha treatment group demonstrated significant improvements compared with the placebo group in both immediate and general memory, as evidenced by Wechsler Memory Scale III subtest scores for logical memory I ( $p = 0.007$ ), verbal paired associates I ( $p = 0.042$ ), faces I ( $p = 0.020$ ), family pictures I ( $p = 0.006$ ), logical memory II ( $p = 0.006$ ), verbal paired associates II ( $p = 0.031$ ), faces II ( $p = 0.014$ ), and family pictures II ( $p = 0.006$ ). The treatment group also demonstrated significantly greater improvement in executive function, sustained attention, and information-processing speed as indicated by scores on the Eriksen Flanker task ( $p = 0.002$ ), Wisconsin Card Sort test ( $p = 0.014$ ), Trail-Making test part A ( $p = 0.006$ ), and the Mackworth Clock test ( $p = 0.009$ ).

**Conclusions:** Ashwagandha may be effective in enhancing both immediate and general memory in people with MCI as well as improving executive function, attention, and information processing speed.

**Pandey G, Khatoon S, Pandey MM et al. Altitudinal variation of berberine, total phenolics and flavonoid content in *Thalictrum foliolosum* and their correlation with antimicrobial and antioxidant activities. J Ayurveda Integr Med. 2017; pii: S0975-9476(16)30443-0.**

**Abstract:**

**Background:** The quality of herbal medicine is determined by its secondary metabolites, which may vary according to growth, season and altitude etc.

**Objective:** We studied the variation in phytochemistry and biological activities of *Thalictrum foliolosum* (TF) roots collected from four sites at different altitudes.

**Material and methods:** The berberine content in different extracts of *T. foliolosum* roots collected from various altitudes was estimated using HPTLC. Total phenolic and flavonoid contents were determined using Folin-Ciocalteu reagent and aluminum chloride method respectively. The sensitivity of microbes for the extracts was studied using disc diffusion and the MIC was estimated using broth dilution method. Antioxidant capacity of the plant was studied using  $\beta$ -carotene bleaching assay, lipid peroxidation assay using goat liver, reducing power assay and DPPH free radical scavenging activity.

**Results:** Berberine content varied inversely with altitude; while phenol and flavonoid content of TF increased at higher altitudes. All the TF extracts showed moderate to high activity against *Candida albicans*, *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*. Extracts with high berberine content were most effective against *C. albicans* and *S. aureus* and also showed relatively significant anti-lipid peroxidation,  $\beta$ -carotene bleaching and reducing power. TF extracts with higher phenol and flavonoid content showed better scavenging of DPPH free radicals. Berberine was used as a standard in all the antioxidant and antimicrobial experiments performed.

**Conclusion:** *Thalictrum* from lower elevations can be explored as an alternate source of berberine and the plant has high antioxidant and antimicrobial properties owing to its berberine content.

**Parvathi K, Krishnan AG, Anitha A et al. Poly(L-lactic acid) nanofibers containing *Cissus quadrangularis* induced osteogenic differentiation in vitro. Int J Biol Macromol. 2017 Nov 15. pii: S0141-8130(17)33601-2.**

**Abstract:**

*Cissus quadrangularis* (CQ) is known as "bone setter" in Ayurvedic Medicine because of its ability to promote fracture healing. Polymers incorporated with CQ at lower concentration have shown to enhance osteogenic differentiation of mesenchymal stem cells (MSCs) in vitro. However, for the healing of clinically relevant critical sized bone defects, large amount of CQ would be required. Based on this perception, a herbal fibrous sheet containing high weight percentage of CQ [20,40 and 60wt/wt% in poly (L-lactic acid) (PLLA)] was fabricated through electrospinning. The solution concentration, flow rate, voltage and tip-target distance was optimized to obtain nanofibers. The hydrophobicity of PLLA fibers was reduced through CQ incorporation. There was considerable increase in the adhesion, proliferation and osteogenic differentiation of MSCs on herbal fibers than normal fibers, mainly on P-Q20 and P-CQ40. MSCs were differentiated into osteoblasts without providing any osteogenic supplements in the medium, indicating its osteoinductive capability. The herbal sheet also could promote mineralization when immersed in simulated body fluid for 14days. These

studies specify that PLLA nanofibers loaded with 20 and 40wt% of CQ could serve as a potential candidate for bone tissue engineering applications.

**Patwardhan K, Pathak J, Acharya R. Ayurveda formulations: A roadmap to address the safety concerns. *J Ayurveda Integr Med.* 2017; pii: S0975-9476(17) 30215-2.**

**Abstract:**

It is a matter of serious concern that the number of case reports pointing at a possible association between the clinical toxicity and the use of Ayurveda formulations is increasing significantly over the years in scientific medical literature. Though most of these cases are connected with the presence of heavy metals such as lead, mercury and arsenic in these formulations, there are also reports suggesting toxicity due to the presence of toxic chemicals of herbal origin. In the year 2008, the Government of India took an initiative of establishing the National Pharmacovigilance Programme for Ayurveda, Siddha and Unani drugs in a structured way. However, due to lack of sustained support, this program has now become defunct. This issue is of vital importance and needs to be addressed effectively on a priority basis. In this communication, we propose the following crucial policy interventions to be introduced at different levels: a. Amendments to Drug and Cosmetic Act, b. Issuing consumer guidelines, c. Issuing prescription guidelines, d. Issuing clinical monitoring guidelines, e. Implementation of good manufacturing guidelines, f. Promoting documentation of clinical safety, g. Identifying the sources of contamination, and, h. Provision for stringent punishment. If these policy interventions are taken up and implemented, a significant positive change in the scenario can be expected in the near future.

**Rai SN, Birla H, Zahra W et al. Immunomodulation of Parkinson's disease using *Mucuna pruriens* (Mp). *J Chem Neuroanat.* 2017; 85: 27-35p.**

**Abstract:**

Immune control is associated with nigrostriatal neuroprotection for Parkinson's disease (PD); though its direct cause and effect relationships have not yet been realized and modulating the immune system for therapeutic gain has been openly discussed. While the pathobiology of PD remains in study, neuroinflammation is thought to speed nigrostriatal degeneration. The neuroinflammatory cascade associated with PD begins with aggregation of misfolded or post-translationally modified  $\alpha$ -synuclein ( $\alpha$ -syn). Such aggregation results in neuronal cell death and the presence of chronically activated glia (microglia and astroglia), leading to the production of proinflammatory cytokines like tumor necrosis factor alpha (TNF- $\alpha$ ), interleukin-1 beta (IL-1 $\beta$ ), IL-6, and enzymes such as nicotinamide adenine dinucleotide phosphate (NADPH) oxidase and cyclooxygenase-2 (COX-2). These changes in the glial phenotype can affect the central nervous system (CNS) microenvironment by producing a pro-inflammatory milieu that

speeds PD pathogenesis. *Mucuna pruriens* (Mp) is the most popular drug in Ayurveda, the Indian system of medicine. Several reports have suggested that it possesses analgesic, anti-inflammatory, anti-neoplastic, anti-epileptic and anti-microbial activities. Mp contain L-DOPA and ursolic acid which has an anti-inflammatory property. There are very few literatures which show the immunomodulatory activity of Mp in PD, several researchers have tried to work on the immunomodulatory activity of Mp in some other diseases. The results of several studies show that Mp modulate the immune components like TNF- $\alpha$ , IL-6, IFN- $\lambda$ , IL-1 $\beta$ , iNOS and IL-2 in the CNS. It also modulates the activity of the transcription factor NF-kB which plays an important role in the progression of the PD. Thus, by altering these cytokines or transcription factors, Mp protects or prevents the progression of PD. Thus in this review we try to explore the immunomodulatory activity of Mp in PD.

**Rajaram A, Vanaja GR, Vyakaranam P et al. Anti-inflammatory profile of *Aegle marmelos* (L) *Correa* (Bilva) with special reference to young roots grown in different parts of India. J Ayurveda Integr Med. 2017 Nov 24. pii: S0975-9476(16)30408-9.**

**Abstract:**

**Background:** *Aegle marmelos* (Bilva) is being used in Ayurveda for the treatment of several inflammatory disorders. The plant is a member of a fixed dose combination of Dashamoola in Ayurveda. However, the usage of roots/root bark or stems is associated with sustainability concerns.

**Objectives:** The present study is aimed to compare the anti-inflammatory properties of different extracts of young roots (year wise) and mature parts of Bilva plants collected from different geographical locations in India, so as to identify a sustainable source for Ayurvedic formulation.

**Materials and methods:** A total of 191 extracts (petroleum ether, ethyl acetate, ethanol and aqueous) of roots, stems and leaves of *A. marmelos* (collected from Gujarat, Maharashtra, Odisha, Chhattisgarh, Karnataka and Andhra Pradesh region) were tested for anti-inflammatory effects in vitro on isolated target enzymes cyclooxygenase-1 (COX-1), cyclooxygenase-2 (COX-2) and 5-lipoxygenase (5-LOX), lymphocyte proliferation assay (LPA), cytokine profiling in LPS induced mouse macrophage (RAW 264.7) cell line and in vivo carrageenan induced paw edema in mice.

**Results:** Of 191 extracts, 44 extracts showed COX-2 inhibition and 38 extracts showed COX-1 inhibition, while none showed 5-LOX inhibition. Cytokine analysis of the 44 extracts showing inhibition of COX-2 suggested that only 17 extracts modulated the cytokines by increasing the anti-inflammatory cytokine IL-2 and reducing the pro-inflammatory cytokines like IL-1 $\beta$ , MIP1- $\alpha$  and IL-6. The young (2 and 3 years) roots of Bilva plants from Gujarat and young (1 yr) roots from Odisha showed the most potent anti-inflammatory activity by suppressing the pro-inflammatory cytokines and

inducing anti-inflammatory cytokines. These three extracts have also shown in vivo anti-inflammatory activity comparable to that in adult stem and root barks.

**Conclusion:** The present study reveals that young roots of Bilva plants from Gujarat and Odisha region could form a sustainable source for use in Ayurvedic formulations with anti-inflammatory activities. The present study also indicates that the region in which the plants are grown and the age of the plants play an important role in exhibiting the anti-inflammatory effect.

**Rastogi S. Assessing the ayurvedic prescribing trends on the basis of who drug use indicators. *J Ayurveda Integr Med.* 2017; pii: S0975-9476(17)30194-8.**

**Abstract:**

**Background:** Ayurvedic prescriptions are often challenged for their rationality. Excessive use of proprietary medicines, rasa preparations, and samshodhana without any justification and deliverable benefits outweighing the other forms of safer, cheaper and less time consuming therapies is putting the Ayurvedic prescribing trends into question. In Ayurvedic practice, prescriptions are often individualized with substantial variability between the choices of drugs. Although being welcomed as an advanced approach of prescription writing by making it tailor made, this method also allows for lapses to creep in thus making it necessary to check common trends of prescribing in Ayurveda and to see whether it raises any caution.

**Objectives:** The objective of this study was to create a check for common trends of prescribing in Ayurveda and to see if such checks raise any caution.

**Materials and methods:** Present study utilizes the WHO drug use indicators as a preliminary tool for analyzing Ayurvedic prescriptions.

**Results:** It was found that with a small modification, this tool can help immensely in screening of Ayurvedic prescriptions.

**Conclusion:** Based on the results obtained through this study, it can be concluded that the WHO drug use indicators, with a small modification, can help in identifying the prescribing trends in Ayurveda and can also help in suggesting remedial measures in case certain anomalies are found.

**Rastogi S. Looking at prescription quality in Ayurveda: Developing, validating and pilot testing a prescription quality index for Ayurveda. *J Ayurveda Integr Med.* 2017; pii: S0975-9476(17) 30003-7.**

**Abstract:**

**Background:** Prescription quality can be a direct predictor of the net outcome of a health care delivery effort. Quality of prescription may be considered as a cumulative matrix of multiple components of a prescription

on the basis of their relative importance. Prescription quality index is a recognized tool in clinical medicine for multiple purposes including the prediction of health care intervention outcome.

**Objectives:** Considering the importance of prescription quality among every system of medicine, an attempt was made to design a prescription quality index for Ayurveda.

**Materials and methods:** The Prescription Quality Index for Ayurveda was designed through item selection following a thorough literature search and was validated through multiple peer group discussions. Final draft of index containing 38 individual items carrying different scores as per their importance in the prescription was subjected to a pilot test upon 1576 indoor prescriptions generated in 2015 at State Ayurvedic College Hospital, Lucknow.

**Results:** The study revealed large information gaps in the components of the prescription where it was supposed to be noted by the prescribers. These gaps in the Ayurvedic prescriptions were most significant in the areas pertaining to Ayurvedic fundamentals of clinical examination, disease diagnosis and Ayurvedic drug intake methods.

**Conclusion:** Prescription Quality Index for Ayurveda was found useful in underlining the gaps between the ideal and generated prescriptions. This can be utilized as a useful tool to evaluate the quality of Ayurvedic prescriptions by seeing their adherence to the standard prescription template.

**Samanta SK, Kandimalla R, Gogoi B et al. Phytochemical portfolio and anticancer activity of *Murraya koenigii* and its primary active component, mahanine. Pharmacol Res. 2017 Nov 23. pii: S1043-6618(17)31120-9.**

**Abstract:**

*Murraya koenigii*, a plant belonging to the Rutaceae family is widely distributed in Eastern-Asia and its medicinal properties are well documented in Ayurveda, the traditional Indian system of medicine. Through systematic research and pharmacological evaluation of different parts of the plant extracts has been shown to possess antiviral, anti-inflammatory, antioxidant, antidiabetic, antidiarrhoeal, antileishmanial, and antitumor activity. In the plant extracts, carbazole alkaloid, mahanine has been identified as the principle bioactive component among several other chemical constituents. Scientific evidence derived not only from in vitro cellular experiments but also from in vivo studies in various cancer models is accumulating for the pronounced anticancer effects of mahanine. The primary objective of this review is to summarize research data on cytotoxic chemical constituents present in different parts of *Murraya koenigii* and the anticancer activity of mahanine along with the recent understanding on the

mechanism of its action in diverse cancer models. The information on its bioavailability and the toxicity generated from the recent studies have also been incorporated in the review.

**Scontre VA, Martins JC, de Melo Sette CV et al. Curcuma longa (turmeric) for prevention of capecitabine-induced hand-foot syndrome: A pilot study. *J Diet Suppl.* 2017; doi: 10.1080/19390211.2017.1366387.**

**Abstract:**

Hand-foot syndrome (HFS) is common and frequently occurs in the first cycle of treatment in approximately 40% to 50% of patients who receive capecitabine. Turmeric (*Curcuma longa*) is a plant used in Ayurvedic medicine with clinical activity in various inflammatory conditions. Our objective was to evaluate whether turmeric was active for the prevention of capecitabine-induced HFS. We included patients older than 18 years of age without previous exposure to capecitabine who were scheduled to receive this medication. Before starting treatment, after three weeks and at the end of six weeks, we evaluated dermatologic toxicity, conducted quality-of-life questionnaires (EORTC-QLQC30 and DLQI) and collected serum inflammatory biomarkers (interleukin-6 (IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), C-reactive protein (CRP), and albumin). We administered turmeric at a dose of 4 g/day (2 pills 12 hours apart) starting at the beginning of capecitabine treatment and lasting six weeks. We included 40 patients whose mean age was 62 years. Most were female (80%), 52% had breast cancer, and 47.5% had GI tumors. After the first cycle of capecitabine treatment, we observed that 11 of 40 patients developed HFS (27.5%; 95% CI [15, 42]), whereas four patients developed HFS equal or superior to grade 2 (10%; 95% CI [3.3, 23]). We did not find any correlations between the inflammatory markers tested and HFS. We show that turmeric combined with capecitabine seems to produce a lower rate of HFS, especially grade 2 or higher. These findings need to be reproduced in larger controlled studies.

**Shamsi TN, Parveen R, Fatima S. Panchakola Reduces Oxidative Stress in MCF-7 Breast Cancer and HEK293 Cells. *J Diet Suppl.* 2017; Nov 16:1-11.**

**Abstract:**

A large number of studies have proven the efficacy of ayurveda in the field of health and wellness. Panchakola, an ayurvedic formulation, is a general health tonic primarily used to cure fever, inflammation, pain, indigestion, and so on. We investigated effects of panchakola on oxidative stress in MCF-7 breast cancer and human embryonic kidney 293 (HEK293) cells. This work was performed to assess the antineoplastic and free radical-scavenging potential of aqueous extract of panchakola, a polyherbal formulation, in normal and breast cancer cell lines (i.e., HEK and MCF-7, respectively) using

MTT assay. Activities of antioxidant enzyme, nitric oxide scavenger, superoxide dismutase, glutathione S-transferase, and glutathione peroxidase were assessed in cell lines incubated with and without panchakola. The outcome was analyzed by spectrophotometer. The results demonstrated increased cytotoxicity in MCF-7 (IC<sub>50</sub> 16.446 µg/ml) comparable to the results obtained with standard anticancer control (curcumin) with IC<sub>50</sub> 10.265 µg/ml in MCF-7 cell line. Further, the results obtained from antioxidant assays suggested increased antioxidant activity in MCF-7 cells as compared to normal HEK cells. The results derived from this study suggested panchakola is a strong contender in the field of phytomedicines to fight cancer and free radical-related diseases.

**Shirolkar A, Chakraborty S, Mandal T et al. Unbiased plasma metabolomics reveal the correlation of metabolic pathways and Prakritis of humans. J Ayurveda Integr Med. 2017 Nov 25. pii: S0975-9476(16)30355-2.**

**Abstract:**

**Background:** Ayurveda, an ancient Indian medicinal system, has categorized human body constitutions in three broad constitutional types (prakritis) i.e. Vata, Pitta and Kapha.

**Objective:** Analysis of plasma metabolites and related pathways to classify Prakriti specific dominant marker metabolites and metabolic pathways.

**Materials and methods:** 38 healthy male individuals were assessed for dominant Prakritis and their fasting blood samples were collected. The processed plasma samples were subjected to rapid resolution liquid chromatography-electrospray ionization-quadrupole time of flight mass spectrometry (RRLC-ESI-QTOFMS). Mass profiles were aligned and subjected to multivariate analysis.

**Results:** Partial least square discriminant analysis (PLS-DA) model showed 97.87% recognition capability. List of PLS-DA metabolites was subjected to permutative Benjamini-Hochberg false discovery rate (FDR) correction and final list of 76 metabolites with  $p < 0.05$  and fold-change  $> 2.0$  was identified. Pathway analysis using metascape and JEPETTO plugins in Cytoscape revealed that steroidal hormone biosynthesis, amino acid, and arachidonic acid metabolism are major pathways varying with different constitution. Biological Go processes analysis showed that aromatic amino acids, sphingolipids, and pyrimidine nucleotides metabolic processes were dominant in kapha type of body constitution. Fat soluble vitamins, cellular amino acid, and androgen biosynthesis process along with branched chain amino acid and glycerolipid catabolic processes were dominant in pitta type individuals. Vata Prakriti was found to have dominant catecholamine, arachidonic acid and hydrogen peroxide metabolomics processes.

**Conclusion:** The neurotransmission and oxidative stress in vata, BCAA catabolic, androgen, xenobiotics metabolic processes in pitta, and aromatic amino acids, sphingolipid, and pyrimidine metabolic process in kaphaPrakriti were the dominant marker pathways.

**Thu HE, Mohamed IN, Hussain Z. Exploring molecular mechanism of bone-forming capacity of Eurycoma longifolia: Evidence of enhanced expression of bone-related biomarkers. *J Ayurveda Integr Med.* 2017; Nov 13. pii: S0975-9476(17)30007-4**

**Abstract:**

**Background:** Among the numerous well-documented medicinal herbs, Eurycoma longifolia (EL) has gained remarkable recognition due to its promising efficacy of stimulating bone formation in androgen-deficient osteoporosis. Though numerous animal studies have explored the bone-forming capacity of EL, the exact mechanism was yet to be explored.

**Objectives:** The present study was aimed to investigate the mechanism of bone-forming capacity of EL using MC3T3-E1 as an in vitro osteoblastic model.

**Materials and methods:** The cell differentiation capacity of EL was investigated by evaluating cell growth, alkaline phosphatase (ALP) activity, collagen deposition and mineralization. Taken together, time-mannered expression of bone-related mediators which include bone morphogenic protein-2 (BMP-2), ALP, runt-related transcription factor-2 (Runx-2), osteocalcin (OCN), type I collagen, osteopontin (OPN), transforming growth factor- $\beta$ 1 (TGF- $\beta$ 1) and androgen receptor (AR) were measured to comprehend bone-forming mechanism of EL.

**Results:** Results demonstrated a superior cell differentiation efficacy of EL (particularly at a dose of 25  $\mu$ g/mL) that was evidenced by dramatically increased cell growth, higher ALP activity, collagen deposition and mineralization compared to the testosterone. Results analysis of the bone-related protein biomarkers indicated that the expression of these mediators was well-regulated in EL-treated cell cultures compared to the control groups. These findings revealed potential molecular mechanism of EL for the prevention and treatment of male osteoporosis.

**Conclusion:** The resulting data suggested that EL exhibited superior efficacy in stimulating bone formation via up-regulating the expression of various mitogenic proteins and thus can be considered as a potential natural alternative therapy for the treatment of osteoporosis.

**Vatsavai LK, Kilari EK. Interaction of p-Synephrine on the pharmacodynamic and harmacokinetics of gliclazide in animal models. *J Ayurveda Integr Med.* 2017; pii: S0975-9476(16)30487-9.**

**Abstract:**

**Background:** Type 2 diabetes is frequently seen in patients suffering from obesity. p-Synephrine and gliclazide are widely used medicines for the treatment of obesity and diabetes, respectively. Based on the relationship between obesity and diabetes, the present study was undertaken to determine the potential for herb-drug interactions between p-Synephrine and gliclazide.

**Methods:** Influence of p-Synephrine on the activity of gliclazide was determined by conducting single and multiple dose interaction studies in animal models. Blood samples collected at pre-determined time intervals from experimental animals were used for the estimation of glucose and insulin levels. The insulin resistance and  $\beta$ -cell function were determined by homeostasis model assessment. Additionally, serum gliclazide levels in rabbits were analyzed by high-performance liquid chromatography (HPLC).

**Results:** Gliclazide alone showed peak reduction in blood glucose levels at 2 and 8 h after administration in rats and after 3 h in rabbits. The activity of gliclazide was not altered by a single dose treatment with p-Synephrine. However, in multiple dose interaction studies, samples from all the time points analyzed showed significant changes in percent blood glucose reduction ranging from 19.73 to 44.18% in normal rats, 23.76-46.43% in diabetic rats and 16.36-38.34% in normal rabbits. The homeostasis model assessment parameters were also significantly altered in multiple dose interaction studies. The pharmacokinetics of gliclazide was not altered by either single or multiple dose p-synephrine treatments in rabbits.

**Conclusion:** The effect of multiple dose p-synephrine treatments upon gliclazide appeared to be pharmacodynamic in nature, indicating the need for periodic monitoring of glucose levels and dose adjustment as necessary when this combination is prescribed to obese patients.

**Venkata Giri Kumar P, Deshpande S, Joshi A et al. Significance of arterial stiffness in Tridosha analysis: A pilot study. *J Ayurveda Integr Med.* 2017: pii: S0975-9476(16)30394-1**

**Abstract:**

**Background:** The variations in Tridoshas are the basis for disease diagnosis and treatment in Ayurveda. The doshas are assessed by sensing the pulse manually with fingers which depends on skill of the physician. There is a need to measure doshas using instruments and study them objectively.

**Objective:** Arterial stiffness is well established pulse parameter in modern medicine and is closely associated to kathinya in the context of Ayurveda. The aim of our study was to measure arterial stiffness using Nadi Tarangini,

a pulse acquisition system, and investigate the significant variations of stiffness across Tridosha locations.

**Materials and methods:** A total of 42 samples of vata, pitta and kapha pulses with proper systolic and diastolic peaks were included in the study. The arterial stiffness parameters namely stiffness index (SI) and reflection index (RI) were considered for the study. The data was analyzed using one-way ANOVA followed by Tamhane's T2 test. The changes in SI and RI between males and females were assessed using independent samples t test.

**Results:** SI at vata ( $5.669 \pm 1.165$ ) was significantly low compared to pitta ( $8.910 \pm 3.509$ ) and kapha ( $8.021 \pm 2.814$ ); RI at vata ( $0.846 \pm 0.071$ ) was significantly low compared to pitta ( $0.945 \pm 0.043$ ) and kapha ( $0.952 \pm 0.033$ ). SI at kapha was significantly low in females compared to males.

**Conclusion:** The SI and RI acquired using Nadi Tarangini have shown significant variations across Tridosha locations. The framework developed to measure the arterial stiffness across Tridosha locations can be used for the interventional studies in Ayurveda which in turn can help in disease diagnosis and treatment.

**Yadav S, Jain S, Chaudhary J et al. Role of Ayurveda management in preventing surgical site infections instead of surgical antibiotic prophylaxis. J Ayurveda Integr Med. 2017 Oct - Dec;8(4):263-265.**

**Abstract:**

It is probably for the first time in the history of modern surgery that Benign Prostate Hyperplasia (BPH) surgery which belongs to 'clean contaminated' class and requires at least 3 doses of prophylactic antibiotic as per recommendations by American Urology Association, was done without the use of any as the patient had a history of severe intolerance to them. The case was an 83 year old male patient presenting with acute urinary retention. He was a known case of BPH being managed continuously on Ayurvedic therapy for many years. It was a challenge to conduct the inevitable surgery without any antibiotic prophylaxis. Holmium laser enucleation of prostate (HOLEP) was done with Ayurvedic medicine support only without the use of any antibiotic. The post-operative recovery was uneventful. The long term recovery was unusually faster and remarkable. In view of rising antibiotic resistance and World Health Organisation (WHO) declaration of arrival of post-antibiotic era, the successful outcome of this case could open new channels of research into Ayurveda, to find out the solution to the worst ever antibiotic crisis of the present time.

## UNANI MEDICINE

**Chen YP, Ying SS, Zheng HH et al. Novel serotonin transporter regulators: Natural aristolane- and nardosinane- types of sesquiterpenoids from *Nardostachys chinensis* Batal. *Sci Rep.* 2017; 7(1):15114p.**

### **Abstract:**

Serotonin transporter (SERT) is a classic target of drug discovery for neuropsychiatric and digestive disorders, and against those disorders, plants of *Nardostachys* genus have been valued for centuries in the systems of Traditional Chinese Medicine, Ayurvedic and Unani. Herein, chemical investigation on the roots and rhizomes of *Nardostachys chinensis* Batal. led to the isolation of forty sesquiterpenoids including six new aristolane-type sesquiterpenoids and six new nardosinane-type sesquiterpenoids. Their structures were elucidated by extensive spectroscopic methods, combined with analyses of circular dichroism and single-crystal X-ray diffraction data. To explore natural product scaffolds with SERT regulating activity, a high-content assay for measurement of SERT function in vitro was conducted to evaluate the SERT regulating properties of these isolates. In conclusion, eleven compounds could be potential natural product scaffolds for developing drug candidates targeting SERT. Among which, kanshone C of aristolane-type sesquiterpenoid inhibited SERT most strongly, while desoxo-nachinol A of nardosinane-type sesquiterpenoid instead enhanced SERT potently.

## YOGA

**Akyuz G, Kenis-Coskun O. Efficacy of tai chi and yoga in rheumatoid arthritis and spondyloarthropathies: A narrative biomedical review. *Rheumatol Int.* 2017; doi: 10.1007/s00296-017-3867-2.**

### **Abstract:**

Rheumatoid arthritis (RA) and spondyloarthropathies (SpA) are among the most common inflammatory rheumatic diseases, which might induce chronic pain for their sufferers. Mind-body interventions like Tai Chi and yoga are among the many alternative therapies for combatting chronic pain. This review aims to overview the articles about their effectiveness in RA and SpA. We searched PubMed/MEDLINE, Scopus, and Web of Science for English-language sources from their inception through September 2017. Case-control studies, interventional studies, and case series that included more than three cases and randomized crossover studies were included. The literature search retrieved 133 non-duplicate records, and 15 of them were eligible and were included in this review. The influence of Tai Chi remains debatable in RA, while there is only one study that investigated its efficacy in SpA. Yoga seems effective in decreasing pain and inflammation while increasing quality of life. There are no data available about its effect on SpA. Even after a thorough research, the number of articles is quite limited on the effectiveness of Tai Chi and yoga in RA and SpA. While these complementary approaches still show some promise as alternative therapies in RA and SpA, the literature lacks long-term studies with larger patient groups.

**Babbar S, Porter BW, Williams KB. The Impact of Prenatal Yoga on Exercise Attitudes and Behavior: Teachable moments from a Randomized Controlled Trial. *Int J Yoga Therap.* 2017 Nov;27(1):37-48.**

### **Abstract:**

**Objective:** Pregnancy serves as an opportune time for "teachable moments" to elicit positive behavior change. We evaluated change in exercise perception, behavior and gestational weight gain in participants engaged in a one-hour educational experience.

**Methods:** Women between 28 0/7 to 36 6/7 weeks with no prior yoga experience carrying a non-anomalous singleton fetus participated in a randomized controlled trial on prenatal yoga. The yoga group engaged in a one-hour yoga class; the attention control educational group, in a one-hour presentation on exercise, nutrition and obesity in pregnancy. Maternal perception of yoga, exercise effects and current health status was conducted before and after the intervention. Gestational weight gain (GWG) and body mass index (BMI) were assessed. A postpartum survey was performed to determine self-reported behavioral changes during and after pregnancy.

**Results:** Over 6 months, 52 women were randomized and 46 (88%) completed the study. Women reported a more positive attitude towards exercise and yoga after the yoga intervention. Total GWG was similar (yoga 32.9 versus education 32.8 pounds,  $p = 0.98$ ). Stratified by pre-pregnancy BMI, 13% gained within and 61% gained above the Institute of Medicine guidelines in each group. Of 29

inactive women prior to the intervention, 60% of the yoga group and 75% of the education group began prenatal exercises after the intervention and 50% of each group continued to exercise after delivery. There were no significant differences between groups.

**Conclusion:** A one-time, one-hour intervention teaching a new exercise or educating women during pregnancy can positively impact pregnancy behaviors and perception with the potential to improve maternal and neonatal outcomes.

**Barrett CJ. Mindfulness and rehabilitation: Teaching yoga and meditation to young men in an alternative to incarceration program. *Int J Offender Ther Comp Criminol.* 2017; 61(15):1719-38p.**

**Abstract:**

This study used participant/observation and open-ended interviews to understand how male participants (age 18-24 years) benefited from yoga and mindfulness training within an Alternative to Incarceration (ATI) program. Findings suggest that the male participants (age 18-24 years) benefited from the intervention through reductions in stress and improvements in emotion regulation. Several participants noted the importance of the development of an embodied practice for assisting them in managing anger and impulse control. The young men's narratives suggest that mindfulness-based interventions can contribute positively to rehabilitative outcomes within alternative to incarcerations settings, providing complementary benefit to existing ATI programs, especially for clients amenable to mindfulness training. With many jurisdictions expanding rehabilitation-focused interventions for young offenders, service providers should consider the potential positive contributions that mindfulness-based interventions can have for fostering desistance and reducing recidivism among justice system-involved populations.

**Bock BC, Thind H, Dunsiger S et al. Who enrolls in a quit smoking program with yoga therapy? *Am J Health Behav.* 2017; 41(6):740-49p.**

**Abstract:**

**Objectives:** Yoga may improve stress, affect, and weight control, all of which are commonly cited barriers to quitting smoking. However, the importance of these concerns may vary by sex, race, ethnicity, and age. We examined smoking-relevant characteristics of individuals enrolling in an 8-week randomized controlled trial testing yoga as a complementary treatment to standard smoking cessation.

**Methods:** Of 958 callers, 227 were eligible and enrolled.

**Results:** The sample was 55% female, 86% non-Hispanic white, with a mean age of 46 years (SD = 12). Males smoked more cigarettes/ day than females and had lower motivation to quit smoking. Females were more likely to smoke for weight control, social and mood-related reasons, and had higher expectations for the efficacy of yoga. Age was negatively associated with the presence of other smokers in the household, and smoking in response to negative moods, and was positively associated with smoking rate, and confidence in quitting.

**Conclusions:** This study demonstrated that both males and females were interested in a program offering yoga as a complementary therapy for smoking cessation. However, there were both sex and age-related differences with respect to smoking-related variables that may suggest a need to adapt the intervention for sub-populations.

**Boyd CN, Lannan SM, Zuhl MN et al. Objective and subjective measures of exercise intensity during thermo-neutral and hot yoga. *Appl Physiol Nutr Metab.* 2017 Nov 23. doi: 10.1139/apnm-2017-0495.**

**Cramer H, Kloese P, Brinkhaus B et al. Effects of yoga on chronic neck pain: A systematic review and meta-analysis. *Clin Rehabil.* 2017; 31(11):1457-65p.**

**Abstract:**

**Objective:** The aim of this review was to systematically assess and meta-analyze the effectiveness of yoga in relieving chronic neck pain.

**Methods:** PubMed/MEDLINE, the Cochrane Library, Scopus, and IndMED were screened through January 2017 for randomized controlled trials assessing neck pain intensity and/or neck pain-related disability in chronic neck pain patients. Secondary outcome measures included quality of life, mood, and safety. Risk of bias was assessed using the Cochrane tool.

**Results:** Three studies on 188 patients with chronic non-specific neck pain comparing yoga to usual care were included. Two studies had overall low risk of bias; and one had high or unclear risk of bias for several domains. Evidence for short-term effects was found for neck pain intensity (standardized mean difference (SMD) = -1.28; 95% confidence interval (CI) = -1.18, -0.75;  $P < 0.001$ ), neck pain-related disability (SMD = -0.97; 95% CI = -1.44, -0.50;  $P < 0.001$ ), quality of life (SMD = 0.57; 95% CI = 0.17, 0.97;  $P = 0.005$ ), and mood (SMD = -1.02; 95% CI = -1.38, -0.65;  $P < 0.001$ ). Effects were robust against potential methodological bias and did not differ between different intervention subgroups. In the two studies that included safety data, no serious adverse events occurred.

**Conclusion:** Yoga has short-term effects on chronic neck pain, its related disability, quality of life, and mood suggesting that yoga might be a good treatment option.

**Darbandi S, Darbandi M, Khorram Khorshid HR et al. Yoga can improve assisted reproduction technology outcomes in couples with infertility. *Altern Ther Health Med.* 2017; pii: AT5482.**

**Abstract:**

**Context:** Depending on the cause of the infertility, nonsurgical or surgical treatments may be used to treat men and women with infertility. Despite improved outcomes due to medical advances, assisted reproductive technology (ART) for couples with infertility is sometimes unsuccessful. Success may be affected by the patient's social, psychological, and physical status.

**Objective:** The study examined the effects of yoga-including asanas (yoga poses), pranayama (proper breathing), shavasana, and meditation-on male and female fertility and ART outcomes.

**Design:** The research team performed a literature review, electronically searching for articles published between January 1978 and January 2016 in the PubMed, Scopus, ScienceDirect, and Google Scholar databases.

**Setting:** The study took place at the Reproductive Biotechnology Research Center at the Avicenna Research Institute at the Academic Center for Education, Culture, and Research (Tehran, Iran).

**Participants:** Participants were couples with infertility taking part in 87 reviewed studies.

**Intervention:** Yoga was the intervention.

**Outcome Measures:** The outcome measures comprised fertility factors in males and females, fertility rate, and ART success rate.

**Results:** The reviewed studies showed that yoga can provide stress management for patients with infertility, with beneficial effects on fertility, helping couples give birth. They found that yoga also could reduce pain; decrease depression, anxiety, and stress; reduce the rate of assisted vaginal delivery; and improve fetal outcomes.

**Conclusions:** Yoga can help couples overcome infertility and increase the ART success rate by improving the physiological and psychological states of both men and women.

**Duncan M, Moschopoulou E, Herrington E et al. Review of systematic reviews of non-pharmacological interventions to improve quality of life in cancer survivors. BMJ Open. 2017 Nov 28;7(11):e015860.**

**Abstract:**

**Objectives:** Over two million people in the UK are living with and beyond cancer. A third report diminished quality of life.

**Design:** A review of published systematic reviews to identify effective non-pharmacological interventions to improve the quality of life of cancer survivors.

**Data sources:** Databases searched until May 2017 included PubMed, Cochrane Central, EMBASE, MEDLINE, Web of Science, the Cumulative Index to Nursing and Allied Health Literature, and PsycINFO.

**Study selection:** Published systematic reviews of randomised trials of non-pharmacological interventions for people living with and beyond cancer were included; included reviews targeted patients aged over 18. All participants had already received a cancer diagnosis. Interventions located in any healthcare setting, home or online were included. Reviews of alternative therapies or those non-English reports were excluded. Two researchers independently assessed titles, abstracts and the full text of papers, and independently extracted the data.

**Outcomes:** The primary outcome of interest was any measure of global (overall) quality of life.

**Analytical methods:** Quality assessment assessing methodological quality of systematic reviews (AMSTAR) and narrative synthesis, evaluating effectiveness of non-pharmacological interventions and their components.

**Results:** Of 14 430 unique titles, 21 were included in the review of reviews. There was little overlap in the primary papers across these reviews. Thirteen reviews covered mixed tumour groups, seven focused on breast cancer and one focused on prostate cancer. Face-to-face interventions were often combined with online, telephone and paper-based reading materials. Interventions included physical, psychological or behavioural, multidimensional rehabilitation and online approaches. Yoga specifically, physical exercise more generally, cognitive behavioural therapy (CBT) and mindfulness-based stress reduction (MBSR) programmes showed benefit in terms of quality of life.

**Conclusions:** Exercise-based interventions were effective in the short (less than 3-8 months) and long term. CBT and MBSR also showed benefits, especially in the short term. The evidence for multidisciplinary, online and educational interventions was equivocal.

**Ebede CC, Jang Y, Escalante CP. Cancer-related fatigue in cancer survivorship. *Med Clin North Am.* 2017; 101(6): 1085-97p.**

**Abstract:**

Cancer-related fatigue (CRF) significantly interferes with usual functioning because of the distressing sense of physical, emotional, and cognitive exhaustion. Assessment of CRF is important and should be performed during the initial cancer diagnosis, throughout cancer treatment, and after treatment using a fatigue scoring scale (mild-severe). The general approach to CRF management applies to cancer survivors at all fatigue levels and includes education, counseling, and other strategies. Nonpharmacologic interventions include psychosocial interventions, exercise, yoga, physically based therapy, dietary management, and sleep therapy. Pharmacologic interventions include psychostimulants. Antidepressants may also benefit when CRF is accompanied by depression.

**Graham CR, Larstone R, Griffiths B et al. Development and evaluation of innovative peer-led physical activity programs for mental health service users. *J Nerv Ment Dis.* 2017; 205(11):840-47p.**

**Abstract:**

Mental health service users (MHSUs) have elevated rates of cardiometabolic disturbance. Improvements occur with physical activity (PA) programs. We report the development and evaluation of three innovative peer-developed and peer-led PA programs: 1) walking; 2) fitness; and 3) yoga. Qualitative evaluation with 33 MHSUs in British Columbia, Canada, occurred. These programs yielded improvements for participants, highlighted by powerful narratives of health improvement, and improved social connections. The feasibility and acceptability of innovative peer-developed and peer-led programs were shown. Analyses

revealed concepts related to engagement and change. Relating core categories, we theorize effective engagement of MHSUs requires accessibility on three levels (geographic, cost, and program flexibility) and health behavior change occurs within co-constituent relationships (to self, to peers, and to the wider community). This study highlights the benefits of peer involvement in developing and implementing PA programs and provides a theoretical framework of understanding engagement and behavior change in health programs for MHSUs.

**Groessl EJ, Liu L, Chang DG et al. Yoga for military veterans with chronic low back pain: A randomized clinical trial. *Am J Prev Med.* 2017; 53(5): 599-608p.**

**Abstract:**

**Introduction:** Chronic low back pain (cLBP) is prevalent, especially among military veterans. Many cLBP treatment options have limited benefits and are accompanied by side effects. Major efforts to reduce opioid use and embrace nonpharmacological pain treatments have resulted. Research with community cLBP patients indicates that yoga can improve health outcomes and has few side effects. The benefits of yoga among military veterans were examined.

**Design:** Participants were randomized to either yoga or delayed yoga treatment in 2013-2015. Outcomes were assessed at baseline, 6 weeks, 12 weeks, and 6 months. Intention-to-treat analyses occurred in 2016.

**Setting/participants:** One hundred and fifty military veterans with cLBP were recruited from a major Veterans Affairs Medical Center in California.

**Intervention:** Yoga classes (with home practice) were led by a certified instructor twice weekly for 12 weeks, and consisted primarily of physical postures, movement, and breathing techniques.

**Main outcome measures:** The primary outcome was Roland-Morris Disability Questionnaire scores after 12 weeks. Pain intensity was identified as an important secondary outcome.

**Results:** Participant characteristics were mean age 53 years, 26% were female, 35% were unemployed or disabled, and mean back pain duration was 15 years. Improvements in Roland-Morris Disability Questionnaire scores did not differ between the two groups at 12 weeks, but yoga participants had greater reductions in Roland-Morris Disability Questionnaire scores than delayed treatment participants at 6 months -2.48 (95% CI= -4.08, -0.87). Yoga participants improved more on pain intensity at 12 weeks and at 6 months. Opioid medication use declined among all participants, but group differences were not found.

**Conclusions:** Yoga improved health outcomes among veterans despite evidence they had fewer resources, worse health, and more challenges attending yoga sessions than community samples studied previously. The magnitude of pain intensity decline was small, but occurred in the context of reduced opioid use. The findings support wider implementation of yoga programs for veterans.

**Ikai S, Uchida H, Mizuno Y et al. Effects of chair yoga therapy on physical fitness in patients with psychiatric disorders: A 12-week single-blind randomized controlled trial. *J Psychiatr Res.* 2017; 94:194-201p.**

**Abstract:**

**Introduction:** Since falls may lead to fractures and have serious, potentially fatal outcomes, prevention of falls is an urgent public health issue. We examined the effects of chair yoga therapy on physical fitness among psychiatric patients in order to reduce the risk of falls, which has not been previously reported in the literature.

**Methods:** In this 12-week single-blind randomized controlled trial with a 6-week follow-up, inpatients with mixed psychiatric diagnoses were randomly assigned to either chair yoga therapy in addition to ongoing treatment, or treatment-as-usual. Chair yoga therapy was conducted as twice-weekly 20-min sessions over 12 weeks. Assessments included anteflexion in sitting, degree of muscle strength, and Modified Falls Efficacy Scale (MFES) as well as QOL, psychopathology and functioning.

**Results:** Fifty-six inpatients participated in this study (36 men; mean  $\pm$  SD age, 55.3  $\pm$  13.7 years; schizophrenia 87.5%). In the chair yoga group, significant improvements were observed in flexibility, hand-grip, lower limb muscle endurance, and MFES at week 12 (mean  $\pm$  SD: 55.1  $\pm$  16.6 to 67.2  $\pm$  14.0 cm, 23.6  $\pm$  10.6 to 26.8  $\pm$  9.7 kg, 4.9  $\pm$  4.0 to 7.0  $\pm$  3.9 kg, and 114.9  $\pm$  29.2 to 134.1  $\pm$  11.6, respectively). Additionally, these improvements were observable six weeks after the intervention was over. The QOL-VAS improved in the intervention group while no differences were noted in psychopathology and functioning between the groups. The intervention appeared to be highly tolerable without any notable adverse effects.

**Conclusions:** The results indicated sustainable effects of 20-min, 12-week, 24-session chair yoga therapy on physical fitness. Chair yoga therapy may contribute to reduce the risk of falls and their unwanted consequences in psychiatric patients.

**Jones JA. Oxidative stress in bicuspid aortic valve-related aortopathy: Hand-me-downs and yoga pants. *J Thorac Cardiovasc Surg.* 2017; 154(5):1764-65p.**

**Koch AK, Rabsilber S, Lauche R et al. Effects of yoga and self-esteem on menopausal symptoms and quality of life in breast cancer survivors-A secondary analysis of a randomized controlled trial. *Maturitas.* 2017; 105: 95-99p.**

**Abstract:**

**Objectives:** Previous research has found that yoga can enhance quality of life and ease menopausal symptoms of breast cancer survivors. The study examined whether self-esteem mediated the effects of yoga on quality of life, fatigue and menopausal symptoms, utilizing validated outcome measures.

**Study design:** This is a secondary analysis of a randomized controlled trial comparing the effects of yoga with those of usual care in 40 breast cancer survivors who suffered from menopausal symptoms. All participants completed all 3 assessments (week 0, week 12, and week 24) and provided full data.

**Main outcome measures:** Outcomes were measured using self-rating instruments. Mediation analyses were performed using SPSS.

**Results:** Self-esteem mediated the effect of yoga on total menopausal symptoms ( $B=-2.11$ , 95% BCI [-5.40 to -0.37]), psychological menopausal symptoms ( $B=-0.94$ , 95% BCI [-2.30 to -0.01]), and urogenital menopausal symptoms ( $B=-0.66$ , 95% BCI [-1.65 to -0.15]), quality of life ( $B=8.04$ , 95% BCI [3.15-17.03]), social well-being ( $B=1.80$ , 95% BCI [0.54-4.21]), emotional well-being ( $B=1.62$ , 95% BCI [0.70-3.34]), functional well-being ( $B=1.84$ , 95% BCI [0.59-4.13]), and fatigue ( $B=4.34$ , 95% BCI [1.28-9.55]). Self-esteem had no effect on somatovegetative menopausal symptoms ( $B=-0.50$ , 95% BCI n.s.) or on physical well-being ( $B=0.79$ , 95% BCI n.s.).

**Conclusions:** Findings support the assumption that self-esteem plays a vital role in the beneficial effect of yoga and that yoga can have long-term benefits for women diagnosed with breast cancer and undergoing menopausal transition.

**Kwok JYY, Kwan JCY, Auyeung M et al. Effects of yoga versus stretching and resistance training exercises on psychological distress for people with mild-to-moderate Parkinson's disease: study protocol for a randomized controlled trial. *Trials*. 2017; 18(1):509p.**

**Abstract:**

**Background:** Psychological distress is prevalent among people with Parkinson's disease (PD) and aggravates their motor symptoms, thereby leading to increased disability, high healthcare costs, and poor health-related quality of life (HRQoL). The under-recognition and adverse effects of the pharmacological management of anxiety and depression among the PD population are considerable. Thus, adopting a Complementary and Alternative Management (CAM) approach to address this problem is important. Yoga, one of the most common "mind-body" CAM therapies, can improve the psychological wellbeing of people with chronic illnesses. However, limited research on the effects of yoga in people with PD has been conducted. This study will determine the effects of yoga on the psychological wellbeing of people with mild-to-moderate PD and will compare these effects with those of stretching and resistance training exercises.

**Methods:** A community-based, single-blind, randomized trial will be conducted. A total of 126 subjects will be recruited and randomly divided into yoga ( $n = 63$ ) or stretching and resistance exercise ( $n = 63$ ) groups. For 8 weeks, the yoga group will receive a weekly 90-min session of yoga, and the control group will receive a weekly 60-min session of stretching and resistance exercises. The primary outcome will be the level of psychological distress measured using the Hospital Anxiety and Depression Scale. The secondary outcomes will include the severity of motor symptoms measured by the Movement Disorders Society - Unified Parkinson's Disease Scale - Part III Motor Examination; mobility, balance, and fall risk measured by the Timed Up and Go test; spiritual wellbeing measured by

the Holistic Wellbeing Scale; and HRQoL measured by the Parkinson's Disease Questionnaire-8. Assessment will be conducted at baseline, 8th, and 20th weeks of follow-ups.

**Discussion:** This study will be the first randomized trial to compare the effect of yoga versus stretching and resistance training exercises in a PD population. Results will contribute to the value of yoga as a therapeutic option for managing psychological distress in PD patients. Multiple outcomes including psychological, physiological, and spiritual and HRQoL will also be measured to elucidate the potential mechanisms of yoga. The effect of yoga on people with chronic illnesses will further be elucidated. This information should contribute to future research, practice, and policy related to PD management.

**Trial registration:** WHO Primary Registry - Chinese Clinical Trials Registry (ChiCTR): CUHK\_CCRB00522 Registered on 8 October 2016; date of approval 19 August 2016.

**Maddux RE, Daukantaité D, Tellhed U. The effects of yoga on stress and psychological health among employees: an 8- and 16-week intervention study. *Anxiety Stress Coping.* 2017 Nov 23:1-14.**

**Abstract:**

**Background:** The stresses of modern work life necessitate effective coping strategies that are accessible and affordable to the general public. Yoga has been found to reduce stress in clinical samples, but studies are needed to examine standard gym yoga classes among functional individuals.

**Objectives:** This study investigated the effects of 8- and 16-week gym yoga on stress and psychological health.

**Design and method:** Ninety individuals reporting moderate-to-high stress were randomly assigned to 16 consecutive weeks of yoga, or to a waitlist crossover group who did not practice yoga for 8 weeks then practiced yoga for 8 weeks. Stress and psychological health variables were assessed at baseline, 8 weeks, and 16 weeks.

**Results:** Significant reductions in stress and all psychological health measures were found within the Yoga group over 16 weeks. When compared to the control group, yoga practitioners showed significant decreases in stress, anxiety, and general psychological health, and significant increases in well-being. The group who did not practice yoga showed significant decreases in stress, anxiety, depression, and insomnia after they crossed over and practiced yoga for 8 weeks.

**Conclusions:** Gym yoga appears to be effective for stress amelioration and promotion of psychological health among workers experiencing stress.

**Nance EM, Byun DJ, Endo Y et al. Dorsal wrist pain in the extended wrist-loading position: An MRI study. *J Wrist Surg.* 2017; 6(4):276-79p.**

**Abstract:**

**Background:** The etiology of dorsal wrist pain associated with loading of the wrist in extension has not been clearly identified in the literature.

**Purpose:** Many exercise disciplines incorporate upper extremity weight-bearing exercises in an extended wrist posture, for example push-ups, plank position, and various yoga and Pilates poses. This study evaluates patients with dorsal wrist pain in the extended wrist-loading position and identifies anatomic abnormalities in the wrist using magnetic resonance imaging (MRI).

**Methods:** A retrospective chart review was performed comparing MRI of patients who complained of dorsal wrist pain while performing weight bearing in a wrist extension position with a control group of patients who complained of ulnar-sided wrist pain. The primary MRI outcome was dorsal wrist pathology, including occult dorsal ganglion cyst, scapholunate ligament tear or degeneration, and dorsal capsulitis.

**Results:** Dorsal wrist pathology was significantly more prevalent in patients with dorsal wrist pain (84%) than in the patient cohort with ulnar-sided wrist pain (12%). Occult dorsal ganglion cysts were the most common sources of pathology (76%).

**Conclusion:** MRI demonstrated an identifiable dorsal abnormality in 84% of patients with dorsal wrist pain associated with weight bearing on the extended wrist. Occult dorsal ganglion cysts are the most common cause of dorsal wrist pain, followed by partial scapholunate tears. When patients complain of dorsal wrist pain during specific extended loading wrist positions such as push-ups, yoga, or Pilates poses, an MRI may be warranted to help identify anatomic abnormalities that may help guide treatment choices.

**Level of Evidence:** Diagnostic, Level III.

**Nivethitha L, Mooventhan A, Manjunath NK, Cerebrovascular Hemodynamics During the Practice of Bhramari Pranayama, Kapalhati and Bahir-Kumbhaka: An Exploratory Study. Appl Psychophysiol Biofeedback. 2017 Nov 29. doi: 10.1007/s10484-017-9387-8**

**Abstract:**

Various pranayama techniques are known to produce different physiological effects. We evaluated the effect of three-different pranayama techniques on cerebrovascular hemodynamics. Eighteen healthy volunteers with the mean  $\pm$  standard deviation age of  $23.78 \pm 2.96$  years were performed three-different pranayama techniques: (1) Bhramari, (2) Kapalhati and (3) Bahir-Kumbhaka in three-different orders. Continuous transcranial Doppler (TCD) monitoring was performed before, during and after the pranayama techniques. TCD parameters such as peak systolic velocity, end diastolic velocity (EDV), mean flow velocity (MFV) and pulsatility index (PI) of right middle cerebral artery were recorded. Practice of Kapalhati showed significant reductions in EDV and MFV with significant increase in PI while, Bahir-Kumbhaka showed significant increase in EDV and MFV with significant reduction in PI. However, no such significant changes were observed in Bhramari pranayama. Various types of pranayama techniques produce different cerebrovascular hemodynamic changes in healthy volunteers.

**Rivera Tavaréz CE. Alternative treatment modalities and its effect in older populations. Phys Med Rehabil Clin N Am. 2017; 28(4): 671-80p.**

**Abstract:**

Aging is an inevitable multifactorial process. Advances in health care and technology have led to an increase on expected life span that can reach an

average of 90 years in the next few decades. Lifestyle changes that include activity, nutrition, stress management, and alternatives low-impact exercises like yoga and tai chi can help us modify some of these age-related changes and lead to an increase in the health span and quality of life of the older adults.

**Romain C, Alcaraz PE, Chung LH et al. Regular consumption of HolisFiit, a polyphenol-rich extract-based food supplement, improves mind and body well-being of overweight and slightly obese volunteers: A randomized, double-blind, parallel trial. *Int J Food Sci Nutr.* 2017; 68(7): 840-48p.**

**Abstract:**

Modern lifestyles face growing demands for natural solutions to help improve general well-being. Accordingly, mind-body activities such as yoga have considerably grown. However, beneficial effects require regular workout. Besides, literature suggests that polyphenols may demonstrate positive effects on both mental and physical health. Overweight and obese volunteers, for which well-being might be perceived degraded, were included in a 16-week double-blind, randomized and parallel trial with a daily supplementation of HolisFiit®, a polyphenol-rich food supplement. Body composition was assessed by dual-energy X-ray absorptiometry (DXA) technology; well-being was evaluated with both, Athens Insomnia Scale (AIS) and components from Short Form-36 questionnaire (SF-36). Body composition significantly rebalanced by 7.7% ( $p = .019$ ) of the lean-to-fat mass ratio. Also, sleep quality significantly improved by 43% ( $p = .00015$ ) as well as both physical and mental components from SF-36, respectively by 10% ( $p = .004$ ) and 7% ( $p = .021$ ). These data altogether, suggest that regular consumption of HolisFiit®, might significantly improve mind and body well-being.

**Smith G, Chandler M, Locke DE et al. Behavioral Interventions to Prevent or Delay Dementia: Protocol for a Randomized Comparative Effectiveness Study. *JMIR Res Protoc.* 2017 Nov 27;6(11):e223.**

**Abstract:**

**Background:** Currently, people at risk for dementia and their caregivers are confronted with confusing choices about what behavioral interventions are most effective.

**Objective:** The objective of this study is to determine which empirically supported behavioral interventions most impact the outcomes highly valued by patients with mild cognitive impairment and their partners.

**Methods:** This protocol describes a comparative effectiveness trial targeting 300 participants with mild cognitive impairment and their study partners. The trial is being conducted at the Mayo Clinic campuses in Arizona, Florida, Minnesota, and the University of Washington in Seattle. The study examines the contribution of five behavioral interventions (yoga, memory compensation training, computerized cognitive training, support groups, and wellness education) on primary outcomes of participant and partner quality of life and self-efficacy. In this unique 10-day multicomponent intervention, groups of couples were randomized to have one of the five interventions withheld while receiving the

other four. Although the longitudinal follow-up is still under way, enrollment results are available and reported.

**Results:** In total, 272 couples have been enrolled in the trial and follow-up visits continue. Outcomes will be assessed at the end-of-intervention and 6-, 12-, and 18-month follow-ups. We anticipate reporting on our primary and secondary outcomes across time points in the next 2 years.

**Conclusions:** This paper describes the protocol for a randomized comparative effectiveness study of behavioral interventions to prevent or delay dementia. We describe of the rationale, design, power analysis, and analysis plan. Also because enrollment is complete and we are in follow-up phases of the study, we have included enrollment data from the trial.

**Sullivan MB, Moonaz S, Weber K et al. Toward an explanatory framework for yoga therapy informed by philosophical and ethical perspectives. *Altern Ther Health Med.* 2017; Nov 14. pii: AT5717.**

**Abstract:**

**Context:** Yoga Therapy is an emerging complementary and integrative health practice for which there is increasing interest from both clinical and research perspectives. Currently missing, however, is an explanatory framework for the profession that provides practitioners, clients, and the public with an understanding of how various yogic traditions and principles can be understood in modern health care contexts.

**Objective:** This study proposes an explanatory framework for yoga therapy, informed by phenomenology, eudaimonia, virtue ethics, and first-person ethical inquiry.

**Conclusions:** These 4 philosophical perspectives-phenomenology, eudaimonia, virtue ethics, and first-person ethical inquiry-provide a lens through which to understand how yogic practices support the individual's transformation in the experience of illness, pain, or disability. We propose that this transformation occurs through facilitating a reharmonization of body, mind, and environment toward the experience of eudaimonic well-being.

**Sullivan MB, Moonaz S, Weber K et al. Toward an Explanatory Framework for Yoga Therapy Informed by Philosophical and Ethical Perspectives. *Altern Ther Health Med.* 2017 Nov 14. pii: AT5717.**

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Context • Yoga Therapy is an emerging complementary and integrative health practice for which there is increasing interest from both clinical and research perspectives. Currently missing, however, is an explanatory framework for the profession that provides practitioners, clients, and the public with an understanding of how various yogic traditions and principles can be understood in modern health care contexts. Objective • This study proposes an explanatory framework for yoga therapy, informed by phenomenology, eudaimonia, virtue ethics, and first-person ethical inquiry. Conclusions • These 4 philosophical perspectives-phenomenology, eudaimonia, virtue ethics, and first-person ethical inquiry-provide a lens through which to understand how yogic practices support the individual's transformation in the experience of illness, pain, or disability. We propose that this transformation occurs through facilitating a reharmonization of body, mind, and environment toward the experience of eudaimonic well-being.

**Thind H, Sillice MA, Fava JL et al. Development and validation of the outcome expectations for yoga scale.**

**Abstract:**

**Objective:** Our objective was to develop an instrument that can measure outcome expectations of yoga and to evaluate the instrument for internal consistency and initial construct validity.

**Methods:** A 20-item scale was developed to assess physical, mental, and spiritual health benefits related to yoga practice among adults. The scale was tested in a baseline survey with adults participating in a clinical trial. Principal component analysis was used to investigate the internal structure of the measure. Outcome expectations for yoga were examined for demographic differences.

**Results:** The sample (N = 185) was 54% women, 89% white and had a mean age of 46 years. The final 20-item scale had high item loadings that ranged from .57 to .88 with a Cronbach's alpha value of .96. Significant differences were found in outcome expectation score by sex.

**Conclusion:** This newly developed scale can be used to assess outcome expectations for yoga and tailor interventions to promote adherence to yoga practice.

**Trent N, Miraglia M, Dusek J et al. Improvements in psychological health following a residential yoga-based program for frontline professionals. *J Occup Environ Med.* 2017; doi: 10.1097/JOM.0000000000001216.**

**Abstract:**

**Objective:** The purpose of this pilot study was to examine the effects of a residential yoga-based program on psychological health and health behaviors in frontline professionals.

**Methods:** Frontline professionals from education, health care, human services, and corrections participated in the RISE (Resilience, Integration, Self-awareness, Engagement) program and completed questionnaires at baseline, post-program, and 2 months following RISE.

**Results:** Paired samples t tests revealed improvements in mindfulness, stress, resilience, affect, and sleep quality from baseline to post-program (all  $P$ s < 0.001,  $N$  = 55), which were sustained at the 2-month follow-up (all  $P$ s < 0.01,  $N$  = 40). Participants also reported increases in exercise, fruit, and vegetable consumption post-program (all  $P$ s < 0.001), all of which persisted at the 2-month follow-up (all  $P$ s < 0.01) except exercise.

**Conclusion:** These findings suggest that RISE improved indices of psychological health and healthy behaviors that remained 2 months following RISE.

**Ulug N, Yılmaz OT, Kara M et al. Effects of Pilates and yoga in patients with chronic neck pain: A sonographic study. J Rehabil Med. 2017 Nov 16. doi: 10.2340/16501977-2288.**

**Abstract:**

**Background:** Various studies have shown the efficacy of conventional isometric, Pilates and yoga exercises. However, data on the effects and comparison of these specific exercises on the cervical muscle morphology are insufficient or lacking.

**Objective:** To investigate the effects of different exercise treatments on neck muscles in patients with chronic neck pain.

**Design:** A randomized study.

**Methods:** Fifty-six patients with chronic neck pain were randomized into 3 groups as follows: Pilates group (n = 20), yoga group (n = 18) and isometric group (n = 18). Demographics and background information were recorded. The thickness and cross-sectional area of neck muscles were evaluated by ultrasound imaging. Cervical motions were measured with a goniometer. Pain severity was evaluated with the McGill Pain Scale, disability with the Neck Disability Index, quality of life with the Nottingham Health Profile, and emotional status with the Beck Depression Inventory. In addition to a conventional physio-therapy programme, 15 sessions of physical therapy, including hot pack, ultrasound, and transcutaneous electrical nerve stimulation (TENS), were provided to all patients. All groups performed the exercises for 6 weeks. The aforementioned assessments were performed before and 6 weeks after the treatment.

**Results:** Although pain, disability, depression and quality of life improved similarly within all groups (all  $p < 0.05$ ), muscle thickness values as regards the semispinalis capitis were increased only in the Pilates group ( $p = 0.022$ ).

**Study limitations:** The lack of complex (progressive resistive) exercise treatment protocols, short treatment duration and partial supervision.

**Conclusion:** All 3 types of exercise had favourable effects on pain and functional scores, but no differences were found among the groups, except for the Pilates group, in which the semispinalis capitis muscle increased in thickness.

**Wolff M, Brorsson A, Midlov P et al. Yoga: A laborious way to well-being: Patients' experiences of yoga as a treatment for hypertension in primary care. Scand J Prim Health Care. 2017: 1-9. doi: 10.1080/02813432.2017.1397318.**

**Abstract:**

**Objective:** The aim of the study was to describe patients' experience of yoga as a treatment for hypertension, as well as their experience of living with hypertension.

**Design:** Qualitative interview study Method and materials: In 2013-2014, in southern Sweden, patients with hypertension from three health care centres were invited to participate in a randomised controlled trial on yoga for hypertension. After completion of the study, eight women and five men (aged 35-79), who had

practiced the yoga intervention, were interviewed about their experiences. We used a semi-structured interview guide according to Kvale. Qualitative analysis was conducted by systematic text condensation inspired by Malterud.

**Results:** Two main themes emerged during the analysis process: Yoga - a laborious way to well-being and hypertension - a silent disease. The positive experiences of doing yoga were described in terms of tranquillity and increased agility. The drawbacks were mainly linked to the time required to perform the exercises. Living with high blood pressure and having to take medication can imply a stigma and cause concerns for future cardiovascular events. Most patients that we interviewed expressed a wish to find alternative ways to treat their high blood pressure. Participating in the yoga study was seen as a good possibility to try such an alternative way.

**Conclusions:** Many patients with hypertension in Swedish primary care seem to be interested in trying alternative treatments to control blood pressure. The patients in our study experienced several benefits from doing yoga, but they also pointed out difficulties in implementing yoga as a regular and permanent lifestyle change.

**Yohannes AM, Junkes Cunha M, Smith J et al. Management of dyspnea and anxiety in chronic obstructive pulmonary disease: A critical review. *J Am Med Dir Assoc.* 2017; pii: S1525-8610(17)30519-4.**

**Abstract:**

**Background:** Anxiety and dyspnea, 2 major symptoms in patients with chronic obstructive pulmonary disease (COPD), are associated with high morbidity and mortality. Thus, critically evaluating and synthesizing the existing literature employing pulmonary rehabilitation (PR) and other behavioral therapies in the treatment of anxiety and dyspnea in patients with COPD may help clinicians determine the most efficacious potential treatments. We aim to examine the efficacy of PR and behavioral therapy [eg, cognitive behavioral therapy (CBT) and counseling] and other adjunct modalities used in patients with COPD.

**Methods:** We extracted relevant studies searching the published literature using an electronic database CINAHL, Medline, PubMed, Science Direct, and the Web of Science was conducted (spanning January 1, 2006 to November 15, 2016). Studies were included if they conducted PR and behavioral therapy (CBT, self-management, yoga) to treat anxiety and/or dyspnea in patients with COPD with or without randomized controlled trial.

**Results:** The 47 studies selected included 4595 participants (PR = 3756 and behavioral therapy = 839), ranging in age from 58 to 75 years. The total number of participants receiving a treatment was 3928, and 667 participants served in control groups. In the majority of studies, PR and CBT are effective in the treatment of anxiety and dyspnea in the short term, but the long-term benefit is limited. In addition, self-management, yoga therapy, and CBT plus PR were beneficial.

**Conclusions:** PR and CBT reduced both anxiety and dyspnea symptoms in patients with COPD in the short term. However, maintenance programs and the

long-term benefits of PR and CBT remain inconclusive. Generally, the studies were relatively small and uncontrolled. Thus, prospective and randomized controlled trials with larger sample sizes are needed.