RESEARCH AT A GLANCE

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Research at a Glance

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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

We are grateful to Dr. R.K. Manchanda, Director General, CCRH for his encouragement and valuable suggestions from time to time. We sincere acknowledge the cooperation of Mrs. Nisha Adhikari, DEO in compiling this bulletin.

(Meenakshi Bhatia)
Librarian

Abstract:

Background Belladonna and Pyrogenium are commonly used to treat fever in homeopathy. But in vivo antipyretic activity of these medicines is not reported yet. The study was conducted to evaluate the effectiveness of ultrahigh dilutions of Belladonna (Bell) and Pyrogenium (Pyro) in fever model of rabbits induced by Baker's yeast. Methods Healthy, local strain rabbits (♂ and ♀) were divided into seven groups (n=42): Normal control, negative control, standard control, pyro 1000c, pyro 200c, Bell 1000c and Bell 200c. Fever was induced by intra peritoneal injection of 135 mg/kg Baker's yeast suspension. Rectal temperature was measured hourly. All the medicines were administered once a day. The results were expressed as mean ± SEM. ANOVA and least significant difference post hoc test were applied for checking the level of significance, p-value of ≤0.05 was considered significant statistically. Results Pyro in both potencies significantly reduced fever in rabbits compared to negative control group, while both potencies of Bell were ineffective. Paracetamol and Pyro 1000c reduced by 1.2 °C (39.7 ± 0.1 to 38.5 ± 0.1), while Pyro 200c reduced by 1 °C temperature (39.7 ± 0.5 to 38.7 ± 0.2). Conclusions Pyro possesses marked antipyretic activity in rabbit's Baker's yeast fever model. It would embolden its clinical use in fever with more guarantee of its efficacy. However, caveat of small sample size necessitates replication of experiment in large sample size.


Abstract:

Background: In recent years, there has been an increase in the utilization of complementary and integrative health (CIH) care, and an increase in information-seeking behavior focused on CIH. Thus, understanding the quality of CIH information that is available on the internet is imperative. Although
there have been a limited number of studies evaluating the quality of websites providing information about specific CIH-related topics, a broad evaluation of CIH websites has not been conducted.

**Objective:** This study was designed to fill that gap. We set out to assess website quality in 5 CIH domains: (1) acupuncture, (2) homeopathy, (3) massage, (4) reiki, and (5) yoga. This study aimed to 1) characterize the websites by type and quality; 2) evaluate website characteristics which may affect readers' perceptions, specifically message content, structural features, and presentation style, and 3) investigate the extent to which harms, benefits and purposes of use are stated on websites.

**Methods:** This study employed a systematic search strategy to identify websites in each of the target domains to be evaluated. The websites were then classified by type, and a set of checklists focusing on quality, message content, structural features, and presentation style was used to evaluate the websites. Lastly, we performed content analysis to identify harms, benefits, and perceived purposes of use.

**Results:** There were similarities across domains regarding their overall quality and their message content. Across all domains, a high proportion of websites received strong scores in terms of ownership, currency, interactivity and navigability. Scores were more variable concerning authorship, balanced presentation of information and the use of sources of information. However, there were differences regarding their structural features and presentation style. Acupuncture and reiki sites tended to include more external links, and yoga, fewer. There was variation across domains in the extent to which the websites contained domain-specific terminology. Websites tended to provide an extensive list of potential benefits, while reporting of harms was scarce.

**Conclusions:** This is the first study to perform a multidimensional assessment of websites in multiple CIH domains. This review showed that while there are similarities among websites of different CIH domains, there are also differences. The diverse distribution of website types suggests that, regardless of CIH domain, the public encounters information through many different types of media, and it would be useful to consider how the presentation of this content may differ depending on the medium. The characteristics for which variability exist are areas that warrant greater attention from researchers, policy makers, clinicians and patients. There is also a need to better understand how individuals may interact with CIH websites, and to develop
tools to assist people to interpret the CIH-related information that they encounter.


Abstract:

The principal outcome was to identify which hypnotics substances, medicated (Benzodiazepines, antihistamine, antidepressant…) or not medicated (herbal medicine, homeopathy, melatonin…), were consumed by community pharmacy patients who reported taking something for sleep disorder, and which factors can influence the consumption of medicated substance rather than non-medicated substance. Data was collected via a network of 73 partner pharmacies around Nantes, France. Patients who reported taking a substance to sleep completed a questionnaire that collected data relative to the different substances consumed by that person for sleep, and the desired effect. Substances were classified in Hypnotic Drug Substances and Non-Medicated Hypnotic Substances. A logistical regression was done in order to highlight the factors associated with the consumption of Hypnotic Drug Substance rather than Non-Medicated Hypnotic Substances. Six hundred and forty-seven patients were included, with an average age of 58 years and 74% female. The principal strategy employed to combat sleep disorder was the consumption of Hypnotic Drug Substance (54%), followed by herbal medicine (32%) and homeopathy (19%). The factors positively associated with the consumption of a Hypnotic Drug Substance are age, living alone, being out of work or in the process of looking for a job and being a parent. In our survey, the use of Hypnotic Drug Substance to help patients with sleep is far from systematic. On the other hand, amongst patients who consume HDS, misuse is still significant, particularly in terms of the duration of consumption.


Abstract:
**Background:** Part of the scientific community states that implausible methods cannot have a true effect and that epidemiological proof can only lead to false positives.

**Discussion:** Homeopathy is regarded as an example of an implausible method with false positive evidence. However, epidemiological proof is necessary to falsify the placebo hypothesis. Implausibility is now supposed to rectify selection of a part of all trials, but the applied selection criteria are diverse and not common in conventional medicine. Applying Bayes' theorem only once to demonstrate that a low prior chance does not lead to reasonable probability is flawed application of this theorem.

**Conclusion:** Demanding scientific evidence and then rejecting the same with post-hoc selection of trials and flawed statistics shows unwillingness to falsify the completeness of existing paradigms.

**Gregory P. No scientific basis to homeopathy? Vet Rec. 2018 Oct 13;183(14):453.**
AYURVEDA


Abstract:

**Background:** Cadmium (Cd) pollution is of serious concern due to its toxic effects in both humans and animals. The study investigates the protective effect of Tinospora cordifolia stem methanolic extract (TCME) on Cd induced hepatotoxicity.

**Objective:** The aim of the study was to explore the hepatoprotective effects of T. cordifolia extract.

**Materials and Methods:** Rats were administered orally with Cd (5 mg/kg) and TCME (100 mg/kg) for 28 days. At the end of the treatment period, serum and liver tissues homogenates were subjected to biochemical analysis.

**Results:** Cd treated rats showed increased activities of the serum marker enzymes of liver damage such as AST and ALT along with increased levels of LPO and protein carbonyl content in liver tissues. Cd treatment also leads to decreased activities of endogenous antioxidants (SOD, CAT, GSH, GPx and GST), membrane ATPases (Na+K+ATPase, Ca2+ATPase and Mg2+K+ATPase) and the tissue glycoprotein levels (hexose, fucose, hexosamine and sialic acid). Histological analysis revealed vacuolar degeneration of hepatocytes with focal necrosis upon Cd administration. TCME co-treatment restored the biochemical and histological alterations caused by Cd intoxication to near normal levels.

**Conclusion:** The results of the present investigation reveal the hepatoprotective nature of T.cordifolia against Cd induced hepatotoxicity.


Abstract:

The maximum number of germ cells is present during the fetal life in mammals. Follicular atresia results in rapid depletion of germ cells from the
cohort of the ovary. At the time of puberty, only a few hundred (<1%) germ cells are either culminated into oocytes or further get eliminated during the reproductive life. Although apoptosis plays a major role, necrosis as well as necroptosis, might also be involved in germ cell elimination from the mammalian ovary. Both necrosis and necroptosis show similar morphological features and are characterized by an increase in cell volume, cell membrane permeabilization, and rupture that lead to cellular demise. Necroptosis is initiated by tumor necrosis factor and operated through receptor interacting protein kinase as well as mixed lineage kinase domain-like protein. The acetylcholinesterase, cytokines, starvation, and oxidative stress play important roles in necroptosis-mediated granulosa cell death. The granulosa cell necroptosis directly or indirectly induces susceptibility toward necroptotic or apoptotic cell death in oocytes. Indeed, prevention of necrosis and necroptosis pathways using their specific inhibitors could enhance growth/differentiation factor-9 expression, improve survivability as well as the meiotic competency of oocytes, and prevent decline of reproductive potential in several mammalian species and early onset of menopause in women. This study updates the information and focuses on the possible involvement of necrosis and necroptosis in germ cell depletion from the mammalian ovary.


Abstract:

**Ethnopharmacological Relevance:** Clitoria ternatea L. (CT), commonly known as Butterfly pea, is used in Indian Ayurvedic medicine to promote brain function and treat mental disorders. Root of CT has been proven to enhance memory, but its role in an animal model of chronic cerebral hypoperfusion (CCH), which has been considered as a major cause of brain disorders, has yet to be explored.

**Aim of the Study:** To assess the motor and cognitive effects of acute oral administration of CT root methanolic extract and hippocampal long-term plasticity in the CA1 region of the CCH rat model.

**Materials and Methods:** Male Sprague Dawley rats (200-300 g) were subjected to permanent bilateral occlusion of common carotid arteries (PBOCCA) or sham operation. Then, these rats were given oral administration of CT root
extract at doses of 100, 200 or 300 mg/kg on day 28 post-surgery and tested using behavioural tests (open-field test, passive avoidance task, and Morris water maze) and electrophysiological recordings (under urethane anaesthe

**Results:** Treatment with CT root extract at the doses of 200 and 300 mg/kg resulted in a significant enhancement in memory performance in CCH rats induced by PBOCCA. Furthermore, CCH resulted in inhibition of long-term potentiation (LTP) formation in the hippocampus, and CT root extract rescued the LTP impairment. The CT root extract was confirmed to improve the glutamate-induced calcium increase via calcium imaging using primary cultured rat neurons. No significance difference was found in the CaMKII expression. These results demonstrated that CT root extract ameliorates synaptic function, which may contribute to its improving effect on cognitive behaviour.

**Conclusions:** Our findings demonstrated an improving effect of CT root extract on memory in the CCH rat model suggesting that CT root extract could be a potential therapeutic strategy to prevent the progression of cognitive deterioration in vascular dementia (VaD) and Alzheimer’s disease (AD) patients.


**Abstract:**

Oroxyllum indicum (L.) Kurz is a medicinally important and rare tree species of the family Bignoniaceae. It is rich in flavonoid content and its mature roots are extensively used in Ayurvedic formulations. O. indicum specific flavonoids like oroxylin B, prunetin and oroxindin possess antibacterial, antiproliferative, antioxidant and anticancerous properties, signifying its importance in modern medicine. In the present study, de novo transcriptome analysis of O. indicum root was performed to elucidate the genes involved in flavonoid metabolism. A total of 24,625,398 high quality reads were assembled into 121,286 transcripts with N50 value 1783. The BLASTx search of 81,002 clustered transcripts against Viridiplantae Uniprot database led to annotation of 46,517 transcripts. Furthermore, Gene ontology (GO) revealed that 34,231 transcripts mapped to 3049 GO terms and KEGG analysis demonstrated that 4570 transcripts plausibly involved in 132 biosynthetic pathways. The transcriptome data
indicated that cinnamyl-alcohol dehydrogenase (OinCAD) was abundant in phenylpropanoid pathway genes while; naringenin chalcone synthase (OinCHS), flavone synthase (OinFNS) and flavonoid 3’, 5’-methyltransferase (OinF35 MT) were abundant in flavonoid, isoflavonoid, flavone and flavonol biosynthesis pathways, respectively. Transcription factor analysis demonstrated the abundance of MYB, bHLH and WD40 transcription factor families, which regulate the flavonoid biosynthesis. Flavonoid pathway genes displayed differential expression in young and old roots of O. indicum. The transcriptome led to the identification of 31 diverse full length Cytochrome P450 (CYP450) genes which may be involved in biosynthesis of specialized metabolites and flavonoids like baicalein and baicalin. Thus, the information obtained in this study will be a valuable tool for identifying genes and developing system biology approaches for in vitro synthesis of specialized O. indicum metabolites.

**Dogra NK, Kumar S, Thakur K et al. Antipsoriatic effect of fatty acid enriched fraction of Vernonia anthelmintica Willd. fruits. J Ethnopharmacol. 2018 Oct 5;224:85-90.**

**Abstract:**

**Ethnopharmacological relevance:** Vernonia anthelmintica has been utilized conventionally as an ingredient in Ayurveda and traditional Uighur medicine for management of various skin ailments, and scientific data’s have substantiated its use in treating vitiligo, dermatosis and leucoderma. The present investigation was focused to evaluate the antipsoriatic activity of V. anthelmintica fruit extracts and fractions.

**Materials and methods:** Ointment containing dichloromethane (DCM) and methanol (MeOH) extracts at topical dose of 2.5% and 5% (w/w) was evaluated using mouse tail model of psoriasis. Bioactivity-guided fractionation (F1-F7) of most active extract was carried out and fractions were again subjected to mouse tail model. Further the activity of bioactive fraction was confirmed in HaCaT (human keratinocyte) cell line using MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay and its chemical characterization was done via gas chromatography mass spectrometry (GC-MS).

**Results:** The dichloromethane extract (5%, w/w) showed statistically significant (*p < 0.05) antipsoriatic activity (66.97 ± 2.68%) with respect to control (25.45 ± 1.80%) and equivalent to that of the standard drug, retino-A 0.05%, (72.47 ± 2.14%) in terms of degree of orthokeratosis, whereas methanol
extract (5%, w/w) showed significant (*p < 0.05) differentiation (45.86 ± 2.02%) in comparison to the control group. Out of all fractions, F6 showed statistically significant (*p < 0.05) antipsoriatic activity (69.27 ± 2.76%) with respect to control and equivalent to that of the standard. F6 (15.6-1000 µg/ml) showed dose-dependent inhibition of HaCaT cell lines proliferation which suggests keratinocyte modulating activity of V. anthelmintica. Chemical characterization of F6 revealed that essential fatty acids (i.e., linoleic acid, palmitic acid, oleic acid and stearic acid) formed the bulk of bioactive fraction.

**Conclusion:** Ameliorative effect of V. anthelmintica in psoriasis might be attributed to the presence of essential fatty acids and thus corroborates its traditional use in the treatment of skin ailments.


**Abstract:**

**Background:** Roots of Withania somnifera (WS) are a celebrated medicinal ingredient in Ayurvedic and many other indigenous systems of medicine. The present study investigates the effect of the phytochemical composition of the extracts on their antioxidant and reducing activities.

**Methods:** WS roots were extracted with water, acetone, aqueous methanol (1:1), and methanol: chloroform: water (1:1:1) to obtain aqueous, acetone, hydro-methanolic, and methanol-chloroform-water extracts. Thereafter, phytochemical constitution and antioxidant and reducing activities of the extracts were compared using different qualitative and quantitative tests.

**Results:** Maximum extraction recovery was obtained with 50% aqueous methanol whereas extraction with acetone yielded the poorest recovery. Methanol-chloroform-water extract had the highest content of phytochemical constituents, except tannins, and also exhibited the highest antioxidant and reducing activities.

**Conclusion:** Phytochemical composition and antioxidant and reducing activities of the extracts were positively associated with the use of organic solvents during the extraction process. Alkaloids and flavonoids were the most important contributors in the antioxidant and reducing activities of the extracts.

Abstract:

Background: Trikatu, Sitopaladi, Hingavastaka, Avipattikara, Sringyadi and Talisadya are very popular Ayurvedic (churna) medicines practiced in India; however, unfortunately, they possess several quality control issues.

Objective: The aim of this study was to find out a simple, accurate and sensitive HPTLC method for the detection and quantification of marker molecule, piperine (alkaloid) on these Ayurvedic formulations for standardization.

Materials and methods: Methanolic extraction (reflux) was performed from the above six churnas as well as three single ingredients Piper longum (pipul), Piper nigrum (marich) and Piper chaba (chai). HPTLC was done using piperine as a standard. The mobile phase was a mixture of toluene-ethyl acetate (7:3, v/v) and detection at 342λ.

Results: The Rf was detected at 0.39. Piperine was quantified in all samples. P. nigrum showed higher piperine than P. longum and P. chaba. The maximum piperine was noted in Hingavastaka churna and followed by Sringyadi churna, Sitopaladi churna, Talisadya churna, Trikatu churna and Avipattikara churna.

Conclusion: This method can be successfully employed for standardization and quantitative analysis of piperine in Ayurvedic formulations (churnas) and also be helpful to clinicians and pharmacists to draw significant role of piperine present in all these samples.


Abstract:

We report a case of accidental ocular chemical injury by self-medication with a single application of a topical ayurvedic medication containing salicylic acid, phenol, and tincture iodine, which is being used in developing countries for treatment of various dermatological conditions.

**Abstract:**

**Background:** Aluminum a known neuro and cholinotoxin has been implicated in the pathogenesis of Alzheimer's disease. Its exposure is associated with impairment of the memory and cognition.

**Objective:** The present study was undertaken to evaluate the anti-Alzheimer's activity of Vitis vinifera in aluminum induced Alzheimer's disease.

**Materials and Methods:** In this study, we investigated the behavioral and biochemical effects of aluminum in Sprague-Dawley rats. Animals were exposed to aluminum chloride (100 mg/kg/day) orally for a period of 8 weeks. Vitis was given in doses of 250 mg/kg and 500 mg/kg for 16 weeks and the possible effects of Vitis vinifera on the expression of Tau and amyloid precursor protein were evaluated by PCR analysis and the possible activities of lipid peroxidation, inflammation and anti-cholinesterase activity were evaluated.

**Results:** Aluminum intoxication was associated with significant impairment in learning and memory in Morris water maze test. A significant improvement was observed with Vitis vinifera in a dose dependent manner.

**Conclusion:** The findings of the present study revealed the significant neuroprotective actions of Vitis vinifera by modifying the biochemical parameters and inhibited the mRNA expression of Amyloid Precursor Protein and Tau, which are the key pathological hallmarks of Alzheimer's disease, which was further confirmed by histopathological observations.

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**Abstract:**

**Background:** Heart failure reversal therapy (HFRT) is designed to enhance cardiorespiratory fitness of chronic heart failure (CHF) patients.
Objectives: The present study was designed to evaluate efficacy of HFRT that uses herbal procedure (panchakarma) and allied therapies, in CHF patients with low ejection fraction.

Methods: This efficacy study was conducted in CHF patients (aged: 25-65 years, ejection fraction (EF) 10-30%) wherein HFRT (60-75 min) consisting of snehana (external oleation), swedana (passive heat therapy), hrudaydhara (concoction dripping treatment) and basti (enema) was administered twice daily for 7 days. During this therapy and next 30 days, patients followed the study dinarcharya and were prescribed ARJ kadha in addition to their conventional treatment. The primary endpoint of this study was evaluation of maximum aerobic capacity uptake (MAC) as assessed by 6 min walk distance (6MWD) using Cahalins equation from baseline, at the end of 7 day treatment, follow-up after 30 days and 90 days. EF was assessed by 2D Echo at baseline and after 30 days of follow-up.

Results: Fifty-two CHF patients with 10-30% EF (mean [SD] age: 58.8 [10.8], 85% men) were enrolled in the study. There was a 100% compliance to study therapy. A significant improvement was observed in MAC levels (7.11%, p = 0.029), at the end of 7 day therapy as compared to baseline. This improvement was maintained at two follow-up visits. Moreover ejection fraction was observed to be increased by 6.38%, p = 0.012 as compared to baseline at day 7 of the therapy.

Conclusion: This 90 day follow up study highlights the benefit of HFRT, as a part of maintenance treatment for CHF patients with reduced ejection fraction.


Abstract:

Objective: Kanchnar guggulu is a compound Ayurvedic formulation used in clinical practice for the treatment of benign and malignant tumors. The present study investigates its cytotoxic and antiproliferative activities.

Methods: The hydro-alcoholic (50%) extract of kanchnar guggulu was prepared. Its antimitotic activity was assessed in an Allium cepa assay, while its antiproliferative effects were studied in a yeast proliferation model. Methotrexate was used as a standard anticancer agent.
Results: In the Allium assay, all concentrations of the extract (1, 2 and 3 mg/mL) and methotrexate (0.02 mg/mL) significantly inhibited the division of A. cepa root cells, decreasing root growth and mitotic index compared to control; this effect was concentration-dependent for kanchnar guggulu extract. In the antiproliferative studies, treatment with the hydro-alcoholic extract of kanchnar guggulu (1, 5 and 10 mg/mL) and methotrexate (0.025, 0.05 and 0.1 mg/mL) resulted in marked reduction of dividing Saccharomyces cerevisiae cells and inhibition of cell viability compared to control. The cytotoxicity of the hydro-alcoholic extract of kanchnar guggulu, shown by its antimitotic and antiproliferative effects, may be due to the presence of flavonoids and phenolics.

Conclusion: Kanchnar guggulu exhibited a cytotoxic effect by inhibiting cell division (antimitotic) and reducing cell proliferation. These results substantiate its potential for the treatment of cancer and support its traditional use in the treatment of cancer.

Abstract:

Background To compare the efficacy and safety of herbal decoction (pods of Cassia fistula Linn. and Arils of Myristica fragrans Houtt) with mefenamic acid in spasmodic dysmenorrhoea. Methods In this single-blind, prospective, parallel, standard controlled study, dysmenorrheic patients (n=64) were randomly allocated to receive herbal decoction (n=31) or mefenamic acid (n=33) for two consecutive menstrual cycles. Treatment group received 180 mL herbal decoction of post amaltas (Cassia fistula L pod’s pericarp) (21 g), bisbasah (Myristica fragrans Houtt arils) (3 g) and qand siyah (jaggery) (30 g) which were orally administered at morning for 3 days before the expected start of menstruation. The control group received mefenamic acid 500 mg orally twice daily between day 1 and day 3 of menstruation. The primary outcomes were visual analog scale (VAS) for pain intensity, pain relief scale and the safety assessment by clinical examination and biochemical parameters. The secondary outcomes included health-related quality of life (HRQoL) determined by SF-12 health survey questionnaire, duration of pain and pictorial blood assessment chart score for menstrual blood loss. The data were statistically interpreted with 5% level of significance. Results At the baseline, on day 1, pain severity for VAS score between the groups [7.09 ± 1.07 vs. 6.75 ± 1.09] had no significant difference (p>0.05). However, during the second menstrual cycle, a significant reduction [0.03 + 0.17 vs. 0.42 + 1.44] in pain severity on day 1 was noted in both groups (p<0.001). During the second menstrual cycle, improvement in HRQoL health survey [SF-12 total score: 85.88 ± 5.99 vs 74.83 ± 15.9] and reduction in pain duration were significantly higher in the treatment group compared to the control group. No side effects were reported. Conclusion Herbal decoction was effective to relieve pain and to improve HRQoL in spasmodic dysmenorrhoea.

Azad R, Babu NK, Gupta AD et al. Evaluation of anti-inflammatory and immunomodulatory effects of Premna integrifolia extracts and assay-
Abstract:

Premna integrifolia (Agnimantha brihat) is a traditional medicinal plant with a prominent place in Ayurveda, Siddha and Unani systems of medicine. In this study we have evaluated the anti-inflammatory and immunomodulatory properties of the Premna integrifolia root extracts employing cyclooxygenase-1 (COX-1), cyclooxygenase-2 (COX-2), and 5-lipoxygenase (5-LOX) enzyme-based assays, lymphocyte proliferation assay, pro-and anti-inflammatory cytokines measurement. Petroleum ether extract (PEE) of Premna integrifolia showed potent inhibition of COX-2 and 5-LOX with IC$_{50}$ values of 6.15 µg/mL and 11.33 µg/mL respectively. In in vitro studies on RAW 264.7 cell line, PEE showed inhibition in the formation of nitric oxide (NO), pro-inflammatory cytokines (IL-1β, IL-6), prostaglandin E$_2$ (PGE$_2$) production, induction of anti-inflammatory cytokine (IL-2) and down-regulation of expression of COX-2, 5-LOX, TNF-α, IL-1β and iNOS. PEE also significantly reduced carrageenan-induced paw edema in mouse model of inflammation. Further, attempts in isolating the active principle(s) involved in these anti-inflammatory effects of PEE by separation on RP-HPLC resulted in the isolation of four active peaks, H1, H2, H3 and H5, inhibiting COX-1, COX-2 and 5-LOX, out of which H3 was identified as 6-hydroxy salvinolone (6-HS). Present findings reveal that PEE of roots of Premna integrifolia exhibits potent anti-inflammatory and immunomodulatory activities, which could form a potential source for development of anti-inflammatory drugs. 6-HS, a COX-2/5-LOX dual inhibitor along with other lead molecules isolated from PEE of Premna integrifolia may form lead molecules for the development of COX-LOX dual inhibitors.
Abstract:

Background: Rest or acute exercise can decrease state anxiety, with some evidence showing exercise to prevent laboratory-induced elevations in anxiety. No study has examined whether yoga provides short-term protection against laboratory-induced anxiety. The aim of this study was to examine the effectiveness of an acute Yoga Fit session on state anxiety and measures of heart rate variability (HRV) to determine whether yoga provides short-term protection against emotional picture stimuli.

Methods: A randomized repeated-measures crossover clinical trial was performed. Forty healthy, female college students completed a 30 min session of Yoga Fit and a time-matched seated rest condition on separate days. After each condition, participants viewed 30 min of emotional picture stimuli. State anxiety, heart rate and time-domain and frequency-domain measures of HRV were assessed baseline, post-condition, and post-exposure to emotional stimuli. Data were analysed using a condition x time (2 x 3) repeated-measures ANOVA.

Results: Post-hoc comparisons indicate the following: (1) state anxiety significantly decreased from baseline to post-condition for both yoga and rest (p = 0.001) but returned to baseline values following exposure to emotional stimuli (p < 0.001) for both conditions; (2) heart rate decreased post-condition to post-exposure (p = 0.020) and baseline to post-exposure (p = 0.033) for both conditions; (3) time-domain measure of HRV showed a significant increase in HRV between baseline and post-condition (p = 0.019), post-condition and post-exposure (p = 0.007), and between baseline and post-exposure (p < 0.001).

Conclusions: Both Yoga Fit and seated rest were effective at acutely reducing state anxiety post-condition, but not at preventing an induced anxiety response post-exposure. Following exposure to the emotionally stimulating pictures, there was a shift from the high frequency-domain to the low
frequency-domain and an increase in the time-domain measure of HRV for both the Yoga Fit and the quiet rest condition.

**Trial Registration:** Retrospectively registered 2/16/2018, clinicaltrials.gov, Identifier: NCT03458702.


**Abstract:**

**Introduction:** There is evidence that yoga may be helpful as an aid for smoking cessation. Yoga has been shown to reduce stress and negative mood and may aid weight control, all of which have proven to be barriers to quitting smoking. This study is the first rigorous, randomized clinical trial of yoga as a complementary therapy for smokers attempting to quit.

**Methods:** Adult smokers (n=227; 55% women) were randomized to an 8-week program of cognitive-behavioral smoking cessation and either twice-weekly Iyengar Yoga, or general Wellness classes (control). Assessments included cotinine verified 7-day point prevalence abstinence (7PPA) at week 8, 3-month and 6-month follow-ups.

**Results:** At baseline participants' mean age was 46.2 years (SD=12.0), smoking rate 17.3 cigarettes/day (SD=7.6). Longitudinally adjusted models of abstinence outcomes demonstrated significant group effects favoring Yoga. Yoga participants had 37% greater odds of achieving abstinence than Wellness participants at EOT. Lower baseline smoking rates (<=10 cigarettes/day) were also associated with higher likelihood of quitting if given Yoga vs. Wellness (OR=2.43, 95% CI: 1.09-6.30) at EOT. A significant dose effect was observed for yoga (OR=1.12, 95% CI: 1.09-1.26), but not Wellness, such that each yoga class attended increased quitting odds at EOT by 12%. Latent Class Modeling revealed a 4-class model of distinct quitting patterns among participants.

**Conclusions:** Yoga appears to increase the odds of successful smoking abstinence, particularly among light smokers. Additional work is needed to identify predictors of quitting patterns and inform adjustments to therapy needed to achieve cessation and prevent relapse.

Abstract:

Aim: In the present study, we aim to assess the prevalence and certain psychological and other correlates of orthorexic tendencies: health and exercise behaviors and demographic variables among gym attendees in Hungary.

Methods: Altogether, responses of 207 gym attendees who filled out an online questionnaire (03/2017-10/2017) were analyzed. The mean age was 31.9 years; most were female and college educated, and about half resided in the capital city. Frequencies and means were calculated for the sample; and univariate linear regression and ANOVA were carried out. Finally, multivariate linear regression was used to assess the relationship between the dependent variable (Orto-11-Hu) and the independent variables (Eating Disorder Inventory, Maudsley Obsessional-Compulsive Inventory, health and exercise habits, and demographics).

Results: The mean score for the Orto-11-Hu was 27.7. In the multivariate analysis, two eating disorder characteristics (drive for thinness and interpersonal distrust), age, exercising more than once a day, and yoga practice were significantly associated with higher orthorexic tendencies. There was a lack of correlation between any obsessive-compulsive traits.

Conclusions: Our data suggest and overlap between certain eating disorder traits, and a link between ON and frequent exercising and younger age. Further research is needed to investigate whether these correlates are found not only in a specific fitness-oriented population, but also in the general population.

Level of evidence: Level V, descriptive cross-sectional study.


Abstract:

This commentary explores the legal and ethical obligations of yoga programs and teachers to uphold both the principles and the spirit of secularism when teaching yoga in schools. Arguing that secularism is essential both to comply
with legal mandates and to maximize inclusivity and access, each facet of a secular approach to yoga in schools is explored through an inquiry-based model meant to help the reader gain clarity and make informed choices when developing school-based yoga programming. This article does not address the use of nonsecular yoga for children outside the school setting. It instead speaks to the complexities of topics such as spirituality, personal transformation, secular ethics, and the use of cultural and historical artifacts within school programs. While inviting continued reflection on the nuances of the topic, the article concludes that given both the legal imperatives and potential risk of exclusion, failure to offer school-based yoga using a secular approach threatens to undermine the success of the field and hinder access to practices that have positive effects on young people.


Abstract:

Objective: We studied which games and underlying game mechanics are considered motivating by older adults, so that designers and therapists make informed choices when designing or selecting virtual reality (VR)-training interventions.

Materials and Methods: We conducted a repeated measures design with 30 older participants, who played eight different VR-training games and afterward filled out the intrinsic motivation inventory (IMI). Differences in intrinsic motivation between games were analyzed using Friedman's tests. In addition, in-depth interviews were conducted according to the laddering technique, to unveil the underlying game mechanics that lead to the players preferences.

Results: IMI scores were relatively high for all games, indicating that these VR games seem effective for inducing a high intrinsic motivation. Wii yoga and Kinect Adventures were the highest scoring games on all but the negative subscale tension. Both games provided regular positive feedback. An important game mechanic was Variation, which showed a strong link to important values such as: to Stay Focused, Improve Fitness, and Health and Independency. Furthermore, the game mechanics Visual Feedback and Positive Feedback, which lead to an increased Drive to Perform, were perceived valuable. Seemingly contradicting, but both important attributes such as Speed versus
Slow Movements emphasize the importance of designing VR training that adapts to the skill level of the player.

**Conclusion:** We have shown that games with different game mechanics can induce high intrinsic motivation. When designing or selecting VR balance training games for older adults, these game mechanics should be incorporated to optimize a positive user experience and increase intrinsic motivation.


**Abstract:**

Background Hydrotherapeutic applications to the head and spine have shown to improve cardiovascular and autonomic functions. There is lack of study reporting the effect of either neutral spinal bath (NSB) or neutral spinal spray (NSS). Hence, the present study was conducted to evaluate and compare the effects of both NSB and NSS in healthy volunteers. Methods Thirty healthy subjects were recruited and randomized into either neutral spinal bath group (NSBG) or neutral spinal spray group (NSSG). A single session of NSB, NSS was given for 15 min to the NSBG and NSSG, respectively. Assessments were taken before and after the interventions. Results Results of this study showed a significant reduction in low-frequency (LF) to high-frequency (HF) (LF/HF) ratio of heart rate variability (HRV) spectrum in NSBG compared with NSSG (p=0.026). Within-group analysis of both NSBG and NSSG showed a significant increase in the mean of the intervals between adjacent QRS complexes or the instantaneous heart rate (HR) (RRI) (p=0.002; p=0.009, respectively), along with a significant reduction in HR (p=0.002; p=0.004, respectively). But, a significant reduction in systolic blood pressure (SBP) (p=0.037) and pulse pressure (PP) (p=0.017) was observed in NSSG, while a significant reduction in diastolic blood pressure (DBP) (p=0.008), mean arterial blood pressure (MAP) (p=0.008) and LF/HF ratio (p=0.041) was observed in NSBG. Conclusion Results of the study suggest that 15 min of both NSB and NSS might be effective in reducing HR and improving HRV. However, NSS is particularly effective in reducing SBP and PP, while NSB is particularly effective in reducing DBP and MAP along with improving sympathovagal balance in healthy volunteers.

Abstract:

Home practice is a major component of mind-body programs, yet little is known about how to optimize the amount of prescribed home practice in order to achieve an effective "dose" of practice while minimizing participant burden. This study tested how varying the amount of home practice in a mind-body program impacts compliance and stress reduction, and whether prescribing a flexible home practice schedule increases compliance. Eighty-four stressed participants undergoing a 12-week yoga program were randomized to low, medium, and high home practice conditions. The medium condition allowed participants the flexibility to choose one of two amounts of practice each day. The low practice group exhibited the highest compliance (91%) compared to the medium and low practice groups (~60%), but exhibited the lowest total practice time, and did not significantly reduce stress. The high practice group was the only group to achieve significant stress-reduction, which was maintained 12 weeks post program. Prescribing a flexible home practice schedule did not increase compliance. Results suggest that prescribing higher practice doses may maximize practice time and symptom reduction despite lower compliance.


Abstract:

Objective: Assess impact of multimodality weight gain prevention intervention.

Methods: Randomized clinical trial among 39 overweight young Puerto Rico college students using 10 weekly peer-support sessions promoting dietary, physical activity, and other lifestyle changes enhanced by stress-reduction and mindfulness approaches. Body mass index (BMI) and self-reported behaviors were measured at baseline and at 10 weeks and 6 months after baseline.

Results: At the completion of the intervention, BMIs in the experimental arm were 0.8 units lower than at baseline (z = -3.0; P = .008) and 1.2 lower at 6
months after baseline ($z = -4.1; P < .001$); BMIs in the control arm were 0.7 higher ($z = 2.7; P = .02$) at 10 weeks and 0.8 higher at 6 months ($z = 3.1; P = .005$). Group × time interaction confirmed that BMI differed significantly over time between arms ($\chi^2 = 26.9$; degrees of freedom = 2; $P < .001$). Analysis of behavioral changes was mostly inconclusive although the experimental arm reported a considerable increase in walking at 10 weeks. Qualitative data suggested that yoga and mindfulness components were particularly useful for motivating participants to maintain healthier lifestyle patterns.

**Conclusions:** Body mass index in the experimental arm decreased at the end of intervention and was maintained at 6 months' follow-up.


**Abstract:**

The ability to come back from challenges such as the many factors predisposing to burnout is resilience. Individual strategies to prevent and recover from burnout can be learned and practiced. This includes mindfulness, meditation, yoga, various stress reduction techniques, coaching, counseling, mentoring, discussions in small groups, workshops, and better work life balance. Other approaches include building a support network, taking care of one's personal health, pursuing narrative medicine, engaging in reflection, emphasizing positive psychology approaches including learned optimism, encouraging a growth mindset, and volunteering. This article will focus on the topic of resilience as it is related to burnout, and subsequent articles will discuss some of the strategies for prevention and recovery in detail.


**Abstract:**

**Objective:** The purpose of the current study was to (1) assess healthcare providers' beliefs about and referral patterns to yoga and meditation services, and (2) evaluate the effectiveness of a brief yoga/meditation educational presentation to increase providers' intent to recommend these programs.
**Method:** A brief 5-min presentation regarding the benefits of yoga and meditation for cancer patients and instruction about referring and enrolling patients was delivered in four different oncology settings: breast, gynecologic, radiation, and surgical. Healthcare provider participants filled out pre- and post-surveys assessing knowledge and attitudes surrounding yoga and meditation classes.

**Results:** A total of 40 healthcare providers were surveyed, consisting of 18 physicians, 12 nurses, six nurse practitioners, two physician assistants, one pharmacist, and one clinical researcher. Of these 40 healthcare providers, 43% were unaware at baseline that yoga and meditation classes were offered through the cancer center and 55% responded that they rarely or never recommend yoga or meditation for patients. Following a brief presentation about the benefits of yoga and meditation for cancer patients, 90% of providers stated they would be more likely to recommend these services to patients in the future. There was a significant (p < 0.01) increase in providers from pre- to post-presentation (65 to 85%) stating they strongly believe yoga and meditation can provide physical or emotional benefits for their patients.

**Significance of results:** These data demonstrate that a brief educational intervention about yoga and meditation for cancer patients is effective at significantly increasing provider knowledge about the benefits of these therapeutic modalities, with a majority indicating they are more likely to recommend these services in the future. Increasing provider awareness regarding the health-promoting benefits of such supportive services for cancer patients could result in greater service utilization as well as physical and emotional benefits for patients.


**Abstract:**

**Objective:** To identify potentially effective complementary approaches for musculoskeletal (MSK)-mental health (MH) comorbidity, by synthesising evidence on effectiveness, cost-effectiveness and safety from systematic reviews (SRs).

**Design:** Scoping review of SRs.
**Methods:** We searched literature databases, registries and reference lists, and contacted key authors and professional organisations to identify SRs of randomised controlled trials for complementary medicine for MSK or MH. Inclusion criteria were: published after 2004, studying adults, in English and scoring >50% on Assessing the Methodological Quality of Systematic Reviews (AMSTAR); quality appraisal checklist. SRs were synthesised to identify research priorities, based on moderate/good quality evidence, sample size and indication of cost-effectiveness and safety.

**Results:** We included 84 MSK SRs and 27 MH SRs. Only one focused on MSK-MH comorbidity. Meditative approaches and yoga may improve MH outcomes in MSK populations. Yoga and tai chi had moderate/good evidence for MSK and MH conditions. SRs reported moderate/good quality evidence (any comparator) in a moderate/large population for: low back pain (LBP) (yoga, acupuncture, spinal manipulation/mobilisation, osteopathy), osteoarthritis (OA) (acupuncture, tai chi), neck pain (acupuncture, manipulation/manual therapy), myofascial trigger point pain (acupuncture), depression (mindfulness-based stress reduction (MBSR), meditation, tai chi, relaxation), anxiety (meditation/MBSR, moving meditation, yoga), sleep disorders (meditative/mind-body movement) and stress/distress (mindfulness). The majority of these complementary approaches had some evidence of safety-only three had evidence of harm. There was some evidence of cost-effectiveness for spinal manipulation/mobilisation and acupuncture for LBP, and manual therapy/manipulation for neck pain, but few SRs reviewed cost-effectiveness and many found no data.

**Conclusions:** Only one SR studied MSK-MH comorbidity. Research priorities for complementary medicine for both MSK and MH (LBP, OA, depression, anxiety and sleep problems) are yoga, mindfulness and tai chi. Despite the large number of SRs and the prevalence of comorbidity, more high-quality, large randomised controlled trials in comorbid populations are needed.


**Abstract:**

**Background:** Despite advances in treatments for endometriosis, some symptoms persist owing to the chronic inflammation observed in this disease.
Objective: To identify resources, methods, and/or complementary treatments to alleviate the pain symptoms of endometriosis, and to identify adverse effects of treatments.

Search Strategy: Lilacs, Scielo, PEDro, Scopus, Pubmed, CENTRAL Cochrane, Science Direct, and Google Scholar were searched for studies published in Portuguese, English, and Spanish to July 31, 2017, using the terms "physical therapy" OR "complementary treatment" AND "endometriosis".

Selection Criteria: Randomized controlled trials relating to complementary pelvic pain treatment and adverse effects.

Data collection and analysis: Eight studies were identified; two studies were included in the meta-analysis.

Main Results: The complementary interventions studied were acupuncture, exercise, electrotherapy, and yoga. All were inconclusive in affirming benefit, but demonstrated a positive trend in the treatment of symptoms of endometriosis. Meta-analysis of acupuncture showed a significant benefit in pain reduction as compared with placebo (P=0.007).

Conclusions: Numerous complementary treatments have been used to alleviate the symptoms of endometriosis, but only acupuncture has demonstrated a significant improvement in outcomes. Nevertheless, other approaches demonstrated positive trends toward improving symptoms; this should encourage investigators to design controlled studies to support their applicability.


Abstract:

This study explored the perceived impact of yoga on body image. Young adults (n = 34 female, 12 male; M_age = 30.6 [SD = 1.6]) practicing yoga were interviewed and data were analyzed for emerging themes across weight status. In general, participants discussed the positive impact of yoga on their body image, but some described both a positive and negative impact. Yoga was perceived as having a positive impact on body image via perceived physical changes, gratitude for one's body, a sense of accomplishment within one's yoga practice, self-confidence, and witnessing different types of bodies
practicing yoga. Yoga was perceived to have a negative impact on body image via comparative critique (e.g., upward comparisons with others) and inner critique (e.g., negative self-talk). Themes were generally similar across weight status; exceptions were that participants at higher weight status were more likely than those at lower weight status to discuss accomplishment within one's yoga practice as a positive impact on body image and comparative critique as a negative impact on body image. Yoga studios and instructors can take steps to further enhance the positive impact of yoga and to provide environments that are inclusive of participants with diverse body shapes and sizes.


Abstract:

Background Globally obesity increase is a big challenge. Obesity causes many non-communicable diseases. Options to control obesity are in search. Aim: To assess the outcome of 3 months follow-up period, after 14 weeks yoga intervention, for body composition and sleep quality parameters on obese male in urban setting. Materials and methods Design: Parallel group RCT (randomized controlled trial) on obese male. The two groups were yoga and control groups, with yoga (n = 37, age 40.03 ± 8.74), control (n = 35, age 42.20 ± 12.06). The IAYT (integrated approach of yoga therapy) training was given to yoga group for 14 weeks, and the unsupervised yoga practice was continued by the subjects at their home, for further 3 months. Training was 1.5 hour daily for 5 days in a week, which included the IAYT module of Suryanamaskara Asana Pranayama and relaxation. No yoga activity but walking etc. for the same time, was given to control group. Body composition parameters were assessed through BIA (bioelectrical impedance) method using InBody R 20 model. The sleep quality was assessed using PSQI (Pittsburgh sleep quality index). Within group and between group analysis were performed, using SPSS version 21. The correlation analysis was carried out on the difference in pre follow-up values. Results During the follow-up period within the group, the body composition parameters improved and the parameters of quality of sleep showed trends of improvement. Also some of the gain obtained during 14 weeks intervention was
lost during follow-up period. Conclusions The changes observed may indicate the long-term benefits of yoga practice for control of obesity in urban setting for males.

**Sachinvala ND, Stergiou A, Haines DE. Remitting long-standing major depression in a multiple sclerosis patient with several concurrent conditions. Neuropsychiatr Dis Treat. 2018 Oct 4;14:2545-2550.**

**Abstract:**

In this report, we discuss the case of an multiple sclerosis (MS) patient, age 62, who learned to attain and sustain euthymia despite his ailments. He has Ehlers Danlos Syndrome (EDS), asthma, MS, urticaria, and major depression (MD). Despite thriving limitations, the patient is an accomplished scientist, who struggled for > twelve years to emerge from being confined to bed and wheel chair with MS, to walking with crutches, scuba diving, writing manuscripts, and living a positive life. Through former educators, he reacquired problem-solving habits to study the literature on his illnesses; keep records; try new therapies; and use pharmaceutical, nutritional, physical, and psychological methods to attain euthymia. With this inculcation, years later, he discovered that dimethyl fumarate (DMF) suppressed inflammation, cramping, urticaria, and asthma; and the combination of bupropion, S-adenosylmethionine (SAMe), vitamin-D3 (vit-D3), yoga, and self-hypnosis relieved MD. Then, after a 14-month respite, the patient, discovered that he had adult onset craniopharyngioma: a benign, recurring, epithelial tumor that grows from vestigial embryonic tissue (Rathke’s pouch) which formed the anterior pituitary. The tumor grows aggressively and causes surrounding tissue and function losses. It caused headaches, disorientation, bitemporal vision loss, among other problems. To emerge from this conundrum, the patient employed his relearned habits; the above antidepressant cocktail (bupropion, SAMe, and vit-D3); and with 30 fractionated stereotactic radiation treatments shrank his tumor and gained relief. This is a single case, and methods we discovered serendipitously may not work for other chronically ill patients. Consequently, we want to encourage such patients and their physicians to discuss their experiences in peer-reviewed domains so readers may acquire new perspectives that help individualize their care, and have productive contented lives.

Abstract:

The practice of mindfulness has long been incorporated into psychotherapy. Research on the therapeutic benefits of mindfulness exists within adult populations, and emerging empirical evidence demonstrates the benefit of such practices in the treatment of adolescents in both clinical and non-clinical settings. However, there are extremely limited data on the practice of mindfulness with adolescents in a psychiatric hospital. The iMatter (Improve Mindful ATTention, Enhance Relaxation) group is a manualized program developed to provide adolescents on a short-term psychiatric inpatient unit with an opportunity to learn and practice relaxation strategies, mindfulness exercises, and simple yoga poses. Mindfulness skills are taught in the context of the group and include self-observation of thoughts and feelings, breathing exercises, self-validation of one’s experience, loving-kindness toward self, non-judgmental stance toward self, and acceptance and observation of change within self. Participants included 65 adolescents aged 13-17 years (M = 15.06, standard deviation (SD) = 1.34) who took part in at least one session of the iMatter intervention. Improvements in self-reported mood were evident following participation in a mindfulness group. Also, participants' heart rate significantly decreased following participation in two groups. Future directions include improved integration of mindfulness into the milieu and other unit programming. Furthermore, comparing self-reported mood and physiological measures from this sample to findings obtained for other unit groups will further clarify the impact of the iMatter intervention.


Abstract:

To describe the role of breathing exercises or yoga and/or pranayama in the management of childhood asthma. We conducted an updated literature search and retrieved relevant literature on the role of breathing exercises or yoga and/or pranayama in the management of childhood asthma. We found that the breathing exercises or yoga and/or pranayama are generally multi-component packaged interventions, and are described as follows: Papworth
technique, Buteyko technique, Yoga and/or Pranayam. These techniques primarily modify the pattern of breathing to reduce hyperventilation resulting in normalisation of CO2 level, reduction of bronchospasm and resulting breathlessness. In addition they also change the behaviour, decrease anxiety, improve immunological parameters, and improve endurance of the respiratory muscles that may ultimately help asthmatic children. We found 10 clinical trials conducted in children with asthma of varying severity, and found to benefit children with chronic (mild and moderate) and uncontrolled asthma, but not acute severe asthma. Breathing exercises or yoga and/or pranayama may benefit children with chronic (mild and moderate) and uncontrolled asthma, but not acute severe asthma. Before these techniques can be incorporated into the standard care of asthmatic children, important outcomes like quality of life, medication use, and patient reported outcomes need to be evaluated in future clinical trials.


Abstract:

Background: Hatha yoga may be helpful for alleviating depression symptoms. The purpose of this analysis is to determine whether treatment program preference, credibility, or expectancy predict engagement in depression interventions (yoga or a control class) or depression symptom severity over time.

Methods: This is a secondary analysis of a randomized controlled trial (RCT) of hatha yoga vs. a health education control group for treatment of depression. Depressed participants (n = 122) attended up to 20 classes over a period of 10 weeks, and then completed additional assessments after 3 and 6 months. We assessed treatment preference prior to randomization, and treatment credibility and expectancy after participants attended their first class. Treatment "concordance" indicated that treatment preference matched assigned treatment.

Results: Treatment credibility, expectancy, and concordance were not associated with treatment engagement. Treatment expectancy moderated the association between treatment group and depression. Depression severity over
time differed by expectancy level for the yoga group but not for the health education group. Controlling for baseline depression, participants in the yoga group with an average or high expectancy for improvement showed lower depression symptoms across the acute intervention and follow-up period than those with a low expectancy for improvement. There was a trend for a similar pattern for credibility. Concordance was not associated with treatment outcome.

**Limitations:** This is a secondary, post-hoc analysis and should be considered hypothesis-generating.

**Conclusions:** Results suggest that expectancy improves the likelihood of success only for an intervention thought to actively target depression (yoga) and not a control intervention.


**Abstract:**

**Background:** The aim of this study was to systematically investigate the effectiveness of hatha yoga in treating acute, chronic and/or treatment-resistant mood and anxiety disorders.

**Methods:** Medline, Cochrane Library, Current Controlled Trials, Clinical Trials.gov, NHR Centre for Reviews and Dissemination, PsycINFO and CINAHL were searched through June 2018. Randomized controlled trials with patients with mood and anxiety disorders were included. Main outcomes were continuous measures of severity of mood and anxiety symptoms. Cohen’s d was calculated as a measure of effect size. Meta-analyses using a random effects model was applied to estimate direct comparisons between yoga and control conditions for depression and anxiety outcomes. Publication bias was visually inspected using funnel plots.

**Results:** Eighteen studies were found, fourteen in acute patients and four in chronic patients. Most studies were of low quality. For depression outcomes, hatha yoga did not show a significant effect when compared to treatment as usual, an overall effect size of Cohen’s d -0.64 (95% CI = -1.41, 0.13) or to all active control groups, Cohen’s d -0.13 (95% CI = -0.49, 0.22). A sub-analysis showed that yoga had a significant effect on the reduction of depression
compared to psychoeducation control groups, Cohen's d -0.52 (95% CI = -0.96, -0.08) but not to other active control groups, Cohen's d 0.28 (95% CI = -0.07, 0.63) For studies using a follow-up of six months or more, hatha yoga had no effect on the reduction of depression compared to active control groups, Cohen's d -0.14 (95% CI = -0.60, 0.33). Regarding anxiety, hatha yoga had no significant effect when compared to active control groups, Cohen's d -0.09 (95% CI = -0.47, 0.30). The I2 and Q-statistic revealed heterogeneity amongst comparisons. Qualitative analyses suggest some promise of hatha yoga for chronic populations.

**Conclusions:** The ability to draw firm conclusions is limited by the notable heterogeneity and low quality of most of the included studies. With this caveat in mind, the results of the current meta-analysis suggest that hatha yoga does not have effects on acute, chronic and/or treatment-resistant mood and anxiety disorders compared to treatment as usual or active control groups. However, when compared to psychoeducation, hatha yoga showed more reductions in depression. It is clear that more high-quality studies are needed to advance the field.


**Abstract:**

Background Mind sound resonance technique (MSRT) is a yoga-based relaxation technique. Previous studies on MSRT demonstrated its potential health-benefiting effects in both clinical and nonclinical population. Present study intended to assess the acute effect of MSRT intervention on blood pressure, heart rate (HR), and state anxiety in patients with essential hypertension (HTN). Methods Thirty participants (13 females) with HTN, within the age range 30-60 years (with mean±SD: 57.23±11.3 years), who visited SVYASAA University campus to attend 1-week residential yoga program for HTN treatment, were considered for this study based on inclusion and exclusion criteria. All participants received a 4-day MSRT orientation sessions prior to the study. Each participant underwent 30-min session of both MSRT and supine rest (SR) on 2 successive days. Systolic and diastolic blood pressures, pulse rate, and state anxiety were measured before and immediately after both MSRT and SR sessions. Data were analyzed using SPSS version 16. Repeated-
measure analysis of variance was applied to assess within-subjects changes. Results After MSRT session, significant decrease in systolic blood pressure (SBP), diastolic blood pressure (DBP), HR, and state anxiety was observed compared to baseline. Similarly, after SR session, significant changes were found in HR and state anxiety. No significant change was seen in SBP and DBP following SR compared to SR session; MSRT session showed significantly better improvement in SBP, DBP, HR, and state anxiety. Conclusion Present study demonstrated the usefulness of single session of MSRT in reducing blood pressure, HR, and state anxiety among individuals with HTN as compared to SR. These findings encourage the further studies with larger sample size and long-term intervention with a robust research design.