

3.0 REVIEW OF SCIENTIFIC LITERATURE

Review of scientific literature has been presented in the Table 3.0.

Table 3.0

Review of Scientific Literature

Sl. No	Author year	Study Design	Sample size	Variables	Participants	Conclusion
1	Simard, 2009	Pre-post experimental (pilot) study	14	Overall health Perceived stress and Depressive symptoms	1 st year medical students	Sixteen-week yoga intervention was effective in improving overall health and decreasing perceived stress among 1 st year medical students.

2	Szabo, 2016	Pre-post experimental study	53	Negative-affect State-anxiety and Perceived stress	Bikram yoga participants	Immediate effect of 90-minutes yoga practice significantly improved negative-affect and state-anxiety, and perceived stress among the participants.
3	Goldstein, 2016	Non-randomized open-trial pilot study	74	Depression, Perceived stress Life satisfaction, Social connectedness and Gratitude	College students and young adults Mean age 25.4 ± 6.6 years; 55% female	A yogic breathing-based life skills workshop (YES+ workshop) significantly improved life satisfaction, social connectedness, gratitude, and decreased depression, and perceived stress.
4	Prasad, 2016	Prospective case-control study	27	Perceived stress and	1 st through 3 rd year medical students	Six-week yoga and meditation intervention significantly improved

				Sense of wellbeing	(male students= 14 and female students=13, with the range of age group 24 yrs–32 yrs)	personal wellbeing and decreased perceived stress among medical students.
5	West, 2004	Pre-post experimental study (three group study) African dance (n=21), hatha yoga (n=18) and biology lecture session as control (n=30)	69	Perceived Stress Positive Affect and Negative Affect and Salivary cortisol	Healthy college students	There was a significant reduction in perceived stress and negative affect among participants of hatha yoga and African dance. Also, a significant decrease in salivary cortisol was reported after hatha yoga practice.

6	Bond, 2013	Pre-post experimental study	27	Empathy Perceived stress Self-regulation and Self-compassion	Medical students 1 st (15 students) and 2 nd (12 students) year.	Eleven-week yoga intervention along with neuroscience didactics (one hour per week) among medical students significantly increased self-compassion but, improvement in empathy and perceived stress were not statistically significant.
7	Ward, 2012	Longitudinal study (at the beginning and at the end of 2006-2007 academic year)	214	Empathy	Undergraduate nursing students (84% were women)	There was a decline in empathy among nursing students
8	Wilson, 2012	Survey study	282	Empathy	1 st and 3 rd year Pharmacy, Nursing and Law students	First year nursing students reported high level of empathy than 3 rd year students, also there was a decline in empathy during their course. Contrast

					(females were 76% and male were 24% with majority of them aged between 19-27 years)	results were true among pharmacy students
9	Hartfiel, 2011	Randomized wait-list controlled study	48	Emotional well-being and Resilience	University employees	In a RCT, 6-week Dru yoga intervention (one hour/week) improved life satisfaction and resilience to stress among university staff.
10	Kim, 2014	Randomized controlled trial Yoga group (n=12) and control group (n=15)	27	Life stress and Blood glucose levels	Female undergraduate nursing students	Yoga practice (surya namaskara, relaxation and meditation) for 12-weeks (one hour/week) significantly reduced stress and postprandial blood glucose levels.

					(Students aged between 20-23 years)	
11	Shelov, 2009	Randomized wait-list controlled trial	46	Mindfulness	Healthy population	An eight-week yoga intervention was significantly effective in increasing overall mindfulness, and in mindfulness subscales (Attention to the present moment, Accepting and open attitudes toward experience, and Insightful understanding) and in control group also there was a significant increase in overall mindfulness and in insightful understanding.

12	López-Miñarro, 2009	Comparative study	143	Sit-and-reach test Back-saver sit-and-reach test Straight leg raise right and left	University students (mean age of men (n=76) 23.45 ± 3.96 years and that of women (n=67) 23.85 ± 5.36 years)	The sit-and-reach test is an ideal test to measure hamstring muscle extensibility
13	Amin, 2014	Pre-post experimental study (pilot)	16	Lumbar and hamstring flexibility	Low to moderately active females (52.37 ± 7.79 years)	A pilot study has reported a 6-week Iyengar yoga practice (90 min session per week) significantly improved hamstring flexibility.
14	Lau, 2015	Randomized wait-list controlled study Two groups; yoga group (n = 87) and	173	Cardiorespirator y endurance	Chinese adults (aged 52.0 ± 7.5 years)	There was a significant increase in cardiorespiratory endurance, muscular strength and lower back and hamstring

		waitlist control group (n = 86).		Muscular strength and Lower back and hamstring flexibility		flexibility after a 12-week hatha yoga practice.
15	Tekur, 2008	Randomized wait-list controlled study	80	Oswestry Disability Index (ODI) and spinal flexibility	Participants with chronic low-back pain (37 females)	Seven days of a residential intensive yoga-based lifestyle program significantly improved spine flexibility of patients with chronic low-back pain. The yoga program comprised of asanas designed for back pain, pranayamas, meditation, and didactic and interactive sessions on philosophical concepts of yoga

16	Telles, 2009	Randomized wait-list controlled study	291	Musculoskeletal discomfort Hand grip strength Tapping speed Low back and hamstring flexibility	Professional computer users	After 60-days of yoga intervention (60 minutes daily for 5 days in a week) there was a significant decrease in the musculoskeletal discomfort, an increase in hand grip strength of both hands, right hand tapping speed, and low back and hamstring flexibility among yoga group participants
17	Gaur, 2015	Randomized controlled trial, Three groups: slow pranayama (n=29), fast	91	Pulmonary function test	Healthy volunteers	Twelve-week practice of slow and fast pranayama practice (30 min/day, thrice/week) significantly improved peak expiratory flow rate among healthy volunteers.

		pranayama (n=32) and control (n=30)				
18	Yadav, 2001	Pre-post experimental study	60	FVC FEV-1 and PEFR	Healthy female participants (age group 17-28 yrs)	Twelve-week yoga practice (daily one hour) among healthy young female participants significantly improved FVC, FEV-1 and PEFr.
19	Mandanmohan, 2003	Randomized controlled trial (20 students in each group)	40	Hand grip strength Hand grip endurance Maximum expiratory pressure	12-15 years school children (8 th class)	There was a significant increase in handgrip strength and peak expiratory flow rate among school children aged between 12-15 years after 6-months yoga practice. Even though, there was an increase in handgrip strength and peak expiratory flow rate in control group, but results were not significant. Yoga was practiced 45 minutes per day

				<p>Maximum inspiratory pressure</p> <p>Forced expiratory volume</p> <p>Forced expiratory volume in first second and</p> <p>Peak expiratory flow rate</p>		<p>Monday to Saturday for 6 months duration after 2-weeks yoga training.</p>
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20	Telles, 2012	<p>Randomized trial</p> <p>Two groups; one who practiced kapalabhathi (n=47) and other group practiced breath awareness (n=47)</p>	94	<p>O'Connor finger dexterity task and Shape and size discrimination task</p>	<p>Participants enrolled for stress management program. In kapalabhathi group there were 28 females and 19 males with group average age±S.D., 39.3 ± 10.5 years. In breath awareness group, 26 females and 21 males with group average</p>	<p>Seven days practice of kapalabhathi and breath awareness significantly improved fine hand dexterity as measured on O'Connor finger dexterity task and visual discrimination.</p>
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					age±S.D., 39.8 ± 10.7.	
21	Telles, 2013	<p>Randomized controlled trial</p> <p>Three group study with 30 members in each group; One group practiced alternate nostril yoga breathing, the second group practiced breath awareness and the third group was given a control intervention (i.e., reading a</p>	90	<p>Manual dexterity and</p> <p>Eye-hand coordination using Purdue pegboard test</p>	<p>Essential hypertension participants aged 20 to 59 years (group average age ±S.D., 49.7±9.5 years).</p> <p>There were sixty males</p>	<p>In a randomized controlled three-group study, performance on the Purdue pegboard (especially right hand) improved in both the groups one who practiced anuloma-viloma pranayama and who were reading magazine, here intervention was given for 10 minutes</p>

		magazine with neutral content).				
22	Merchaoui, 2016	A cross-sectional study	293	Eight-item work capacity evaluation (WAI) Body mass index Handgrip strength	Nurses	Gender, workability index, duration of household work, BMI, perceived physical load and work schedule significantly predicted 52.6% of variance on hand grip strength among nurses
23	Arvandi, 2016	Cooperative Health Research in the Region of Augsburg (KORA)-	1,066	Handgrip strength	Older adults (mean age 76 ± 11 SD years)	It is essential to improve hand grip strength, especially for the one who have low hand grip strength as this is inversely related to the risk of mortality

		Age Study (follow-up over 3 years)				
24	Hewett, 2011	Pre-post experimental study	51	Mindfulness Perceived stress Physical fitness	Healthy participants, females were 41 and males were 10 aged between 20–54 years (mean age \pm SD 31.57 \pm 9.29 years)	An eight-week Bikram yoga (3 sessions per week) significantly improved mindfulness, hamstring flexibility and reduced perceived stress.
25	Chan, 2013	Randomized controlled trial Two groups;	34	Depression, Anxiety and Stress (DASS-21) -Patient	First year nursing and midwifery students	Ten-week qigong (a traditional Chinese exercise) practice (each session for 45 minutes, practiced twice a week)

		Qigong group (n=18) and control group (n=16)		Health Questionnaires (PHQ) Salivary biomarkers	Qigong group male n=5, female n=13, with the age ranged between 19-28 years and in Control group male n=2, female n=14, with the age ranged between 18-21 years.	significantly reduced stress among nursing students. Each Self-Healing Qigong session consisted of three stages: warm-up, Qigong exercise (first tensing and relaxing of the hands; then standing still; scanning front part of the body with palms; and gentle bending and stretching of the spine) and cooling- down stage.
26	Sharma, 2014	Randomized controlled trial Three groups;	91	Hand grip strength and endurance	Among Healthy volunteers, 72 were females and 19 were males with	Fast pranayama (Kapalabhati, Bhastrika and Kukkuriya pranayama) practice (30 minutes/session, thrice a week for 12 weeks) significantly

		slow pranayama (SPG) (n=29), fast pranayama (FPG) (n=32) and control groups (CG) (n=30).			average age of 18.58 ±2.27 (mean ± SD)	improved handgrip strength among healthy volunteers
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