

Research article

Role of Yoga in Empowerment and Strengthening of Elderly

Rajendra Harnagle^{1*}, Sapna Maheshram², Kamal Varma²

¹Department of Community Medicine, Sakshi Medical College, Madhya Pradesh, India

²Department of Community Medicine, Modern Medical College, Madhya Pradesh, India

***Corresponding author:** Rajendra Harnagle, Sakshi Medical College, Madhya Pradesh, India, Tel: +91 07542247803; E-mail: rajendra.harnagle@gmail.com

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Abstract

Background: Older people in India have to look after themselves due to the nuclear family system and also as children are not staying with them due to reasons such as acquiring higher education or employment at distant places. These factors coupled with deteriorating health due advancement of age & change in value system & the attitude amongst children who give more importance to materialism, it was felt necessary to find modalities to empower & strengthen ex-servicemen by Yoga.

Methods: An interventional “Before & After study” was planned for a period of three months for in-patient a hospital for common lifestyle diseases namely Stroke, Diabetes, Senile Depression, Acute Myocardial Infarction & Hypertension. Data on anthropometry, laboratory investigations & Hamilton Depression Score was taken before the study. The 58 elderly subjects aged between 47 to 94 yrs who were already/ freshly admitted & other set of 58 subjects (A total of 116) who reported on daily outdoor basis during the period of study, were having mild to moderate complications due to Life style diseases were enrolled in a Military Hospital at the time of study, were selected. These cases were then subjected to interventions by Yoga for three months followed by measurement of anthropometry, laboratory investigations and Hamilton Depression Score again.

Results: Statistically significant differences were observed before & after study with respect to pulse, respiratory rate, blood pressure, blood glucose, total cholesterol, LDL, VLDL & Hamilton Depression Score (p 0.05). The sleep pattern, sense of well being, posture while sitting to standing and walking with degree of support (stick/ other person’s help) improved considerably after the Yoga.

Conclusion: Elderly are recommended to be trained on yoga in by employing part time trainers of yoga. The effect of yoga results in better capability to deal with old age without much support.

Keywords: Elderly; Yoga; Older People

Introduction

Ageing is associated with a number of physiological changes that can contribute to increased disability, frailty & accidental falls. The contributing factors are the loss of muscle mass & strength due to sarcopenia. Current research has demonstrated that strength training exercises have the ability to combat weakness, frailty & their Debilitating consequences by building muscle strength & muscle mass preserve bone density so as to reduce signs & symptoms of

numerous chronic diseases such as Heart Diseases, Arthritis, Type 2 Diabetes Mellitus and also improving sleep & Depression. [1,2].

Yoga exercises entail breathing, asana as well as meditation [3]. Many studies had revealed significant positive effects of yoga on physical outcomes including perceptual and motor skills [4], cardiopulmonary function [5] fitness [6], muscle strength, flexibility, stiffness, and joint pain [7-9]. Asanas has shown effectiveness as exercise for diabetes and multiple sclerosis [10].

Uncontrolled hypertension is presently prevalent globally

and Yoga is coming out to be a cheaper alternate to this problem [11-13]. Yoga described as an ancient tradition (originating 8000 years ago) [14-16] incorporates postures, breath control, and meditation [17,18]. The yoga practitioners continues to rise, with current estimates indicating at least 15.8 million people in the United States (6.9% of Americans) practice yoga [19]. American health care providers suggest yoga as a means of enhancing health. Of the many benefits ascribed to yoga practice, blood pressure control is among the most studied [13]. While several reviews regarding the potential benefits of yoga for reducing blood pressure and other cardiovascular disease risk factors have been published [11-13,20-23].

The Origins of the Yoga Sutras of Patanjali: The Yoga Sutras of Patanjali (YS) were compiled somewhere between 50 BCE and 300. The Yoga Sutras were compiled around 400 CE by Sage Patanjali, taking materials about yoga from older traditions. Commonly is called the Pātañjalayogaśāstra. [24] It took nearly 700 years from the 12th century to 19th century, for a yogic renaissance, due to the efforts of Swami Vivekananda [25].

Eight components of yoga

Swami Vivekananda translates, “Yoga consists of meditative practices attaining a state where consciousness is unaware of any object external to itself, is only aware of its own nature as consciousness unmixed with any other object [25,26].

Yamas

Yamas are moral rules and can be essential as moral imperatives prior to the five yamas listed by Patañjali [21]

- Non-harming other living beings [27]
- Truthfulness [28]
- Non-stealing [29]
- Chastity [30] marital fidelity or sexual restraint [30]
- Non-avarice, non-possessiveness [31]

Patanjali states that the virtue of nonviolence and non-injury to others the yoga is at peace with self and with other i.e. externally or internally [32].

Niyama

The Niyama component of Patanjali’s Yoga includes good habits, interaction with other [32].

- Purity, clearness of mind, speech and body [33].
- Contentment, acceptance of others and acceptance of one’s circumstances [34].

- Austerity and persistence [35].
- Study of Vedas in order to study of self [36].
- Contemplation of the God [37].

Patanjali states the above mentioned niyama overcome the external sources of pleasure substances [38].

Āsana

Patanjali definition of Āsana (posture) [39].

An asana is steady, pleasant, motionless and agreeable form (of staying). Posture one can hold With comfort and motionlessness [40] and head erect (proper spinal posture) [41]. Vyasa, in his Bhasya (commentary) on Patanjali’s treatise suggests twelve postures: lotus, heroic, decent, like the mystical sign, staff, supported, bedstead, seated heron, seated elephant, seated camel, evenly balanced and any motionless posture that is in accordance [42].

The Hatha Yoga Pradipika describes the technique of 84 asanas, stating four of these as most important: Lotus, decent, lion and accomplished [43].

Praṇayama

Prāṇ āyāma is made out of two Sanskrit words prāṇa (breath) and āyāma (restraining, extending, stretching) [44]. It means consciously regulating breath (inhalation and exhalation). This is done in several ways, inhaling and then suspending exhalation for a period, exhaling and then suspending inhalation for a period, slowing the inhalation and exhalation, consciously changing the time and length of breath (deep, short breathing) [45].

Pratyāhāra

Pratyāhāra is a mix of two Sanskrit words prati- (“towards”) and ahāra (“bring near, fetch”) [46]. Fetching and bringing near one’s awareness and one’s thoughts to within. Process of withdrawing one’s thoughts from external objects, things, person and situation. It is turning one’s attention to one’s true Self, one’s inner world, experiencing and examining self. It is consciously closing one’s mind processes to the sensory world, fetch one’s attention to seek self-knowledge and experience the freedom innate in one’s inner world [47].

Dhāraṇā

Dharana: means concentration, introspective focus and one-pointedness of mind. The root of word is dhr, has a meaning of “to hold, maintain, keep” [48]. The mind is fixed on a mantra or one’s breath/navel/tip of tongue/any place or an object one wants to observe or a concept/idea in one’s mind, without drifting or jumping from one topic to another [49].

Dhyāna

Dhyana literally means “contemplation, reflection” and “profound, abstract meditation”. If the concentration was on one object, Dhyana is non-judgmental, non-presumptuous observation of that object. If the focus was on a concept/idea, Dhyana is contemplating that concept/idea in all its aspects, forms and consequences with uninterrupted train of thought, current of cognition, flow of awareness [50]. Dharana is a state of mind, Dhyana the process of mind [51].

Samādhi

Means “putting together, joining, combining with, union, harmonious whole, trance” [52]. Samadhi is that spiritual state when one’s mind is so absorbed in whatever it is contemplating on, that the mind loses the sense of its own identity. The thinker, the thought process and the thought fuse with the subject of thought as oneness, Samadhi [53,54, 56].

American Heart Association and American College of Sports Medicine recommends regular exercise as it improves functions of heart & lung, enhances glucose metabolism, reduces coronary disease risk & boosts well being [56]. Elderly patients who have had a hip fracture can perform moderate to high intensity yoga training at home [57]. Ex-servicemen are left to look after themselves due to widely prevalent nuclear family norm. Furthermore, children are not staying with parents mostly due to reasons like education & employment.

Objectives of the Study

To determine the feasibility of strengthening the health of elderly by Yoga in view of non availability of the children or relatives to assist in old age & also to prevent life style diseases.

Material & Methods

The 58 elderly aged between 47 to 94 yrs who were already or freshly admitted in addition to 58 subjects (A total of 116) who also reported on daily outdoor basis during the period of study, having mild to moderate complications due to Life style diseases were enrolled in a Military Hospital at the time of study, were selected. Some of them despite being in relatively young age were unemployed and were dependent on their children for psychological, physical and financial support. Ex-servicemen as young as 47 yrs old were also included to delineate early changes due to ageing as well as because an ex-serviceman PBOR retires relatively at an early age.

The study was an interventional “Before” & “After” prospective hospital based study. A total of 58 (out of 116) subjects were selected amongst freshly admitted and already admitted patients in a Military Hospital and in addition 58 subjects were

enrolled on outdoor basis who were suffering with any or multiple complications of Diabetes Mellitus, Ischemic Heart Diseases, Stroke, Hypertension & Senile Depression. Out of 136 subjects, only 116 subjects could complete the study. The study was conducted on all volunteers ESM subjects without calculating sample size because of operational /logistical difficulties. However, when retrospectively sample size was calculated for variables such as Hemoglobin, blood sugar, total cholesterol, and blood pressure with 10% level of significance, 80% power and two tailed tests, the sample size ranged lowest 40 & highest 104. In our study, 116 could complete the study and thus sample was adequate.

The training modalities included weekly program for all 116 study subjects together, comprising of Yoga training on a daily basis for 6 days in a week on for 90 minutes under the guidance of a recognized a yoga teacher, hired for a period of three months. Yoga & Pranayama training was conducted under the guidance of a yoga teacher. All eight aspects of Patanjali Yoga were covered concurrently. In addition, apart from specific medications & physiotherapy and so on, appropriate specialist consultation and treatment required for specific ailment was also given. . All subjects, were given spiritual enhancement by instructor from TejGuru Tej Parkhi’s “Happy Thoughts” organization, who covered topic such as, aspects of being a good human being, methods of self-realization by meditation without reference to any particular religion. All subjects were imparted Yoga training at Yoga hall of the Military Hospital. . Efforts were done to reduce bias by detailing same Medical & paramedical staff on same equipments for evaluation of ‘after’ parameters.

The study was conducted for a period of three months. All patients were either admitted in indoor department or enrolled on the outdoor basis till end of the study or more depending on their medical condition.

The observer’s bias was removed by including group of observers who examined and evaluated all the study subjects before starting the intervention and at follow-up three months later. The same observers except for one, again evaluated same subjects without knowing the baseline data. The observers assessments was totally independent and without prejudice as they were not co-authors.

Results

A total of 116 subjects (out of 136 initial subjects) were followed up from start to end as 20 subjects discontinued the study due to domestic reasons. The age of 116 subjects range from 47yrs to 94 yrs with maximum concentration between 55 yrs & 70 yrs.

A statistically significant decrease was observed with respect to pulse, respiratory rate, blood pressure (Both systolic & Diastolic), fasting glucose, post-prandial glucose, total cholesterol LDL cholesterol & VLDL cholesterol (Table-1).

| | Mean value Before interventions | SD Before interventions | Mean Value After interventions | SD After interventions | Mean Change | T Test value | 'p' value |
|-----------------------|---------------------------------|-------------------------|--------------------------------|------------------------|-------------|--------------|-----------|
| Hemoglobin | 12.46 | 2.09 | 13.129 | 1.7479 | -0.671 | -5.631 | 0.001 |
| Weight | 59.3 | 13.574 | 59.35 | 13.369 | -0.01 | -0.135 | 0.89 |
| BMI | 24.13 | 4.92 | 24.01 | 5.32 | 0.124 | 0.386 | 0.7 |
| Waist measurement | 82.19 | 13.53 | 82.45 | 12.71 | -0.26 | -0.645 | 0.52 |
| Pulse | 79.57 | 5.42 | 76.36 | 4.7 | 3.21 | 5.172 | 0.001 |
| Resp Rate | 19.75 | 0.99 | 19.37 | 1.07 | 0.39 | 2.654 | 0.01 |
| BP Systolic | 131.51 | 12.59 | 125.75 | 7.838 | 5.75 | 3.438 | 0.001 |
| | | | | | | | |
| BP Diastolic | 84.04 | 8.57 | 78.91 | 10.3 | 5.12 | 3.223 | 0.01 |
| Fasting glucose | 87.71 | 20.58 | 81.76 | 12.68 | 5.95 | 4.793 | 0.001 |
| Post prandial glucose | 122.62 | 71.86 | 109.69 | 42.46 | 12.93 | 3.236 | 0.01 |
| Total Cholesterol | 185.84 | 19.52 | 178.03 | 19.23 | 7.81 | 6.207 | 0.001 |
| Triglycerides | 147.69 | 103.89 | 153.22 | 137.7 | -5.53 | -0.385 | 0.7 |
| HDL | 50.34 | 5.65 | 49.84 | 6.43 | 2.52 | 3.535 | 0.001 |
| LDL | 105.59 | 19.31 | 101.9 | 18.21 | 3.69 | 9.503 | 0.001 |
| VLDL | 33.34 | 26.92 | 28.78 | 21.69 | 4.57 | 3.375 | 0.001 |

Table 1: Changes in anthropometry, biochemical and depression score - after the interventions.

All cases had score ranging from six to ten & their score improved to normal i.e. to less than five after three months of interventions (Table-3).

| DSS | N | STD | DEVIATION | Minimum | Maximum |
|--------|-----|------|-----------|---------|---------|
| Before | 116 | 5.19 | 1.53 | 3 | 9 |
| Afer | 116 | 1.58 | 1.07 | 0 | 3 |

Table 3: Changes in Hamilton Depression Score after the Intervention.

1. Before intervention 78 (67.26%)subject had Hamilton Depression score of less than five ,which is considered to be normal

- 93.96% had six to ten score improved to normal ie to less than five in 109/116 patients had subjective improvement as per Hamilton
- Depression score after yoga intervention
- The Hamilton’s Depression score was found to be statistically significant following intervention after three month.

There has been subjective high degree of improvement in problems of posture of sitting, standing, sitting to standing, walking, wheel chair/ stretcher borne, walking with support & quality of sleep (Table-4).

| S. No | Parameters | Mild | Moderate | Severe | Mild | Moderate | Severe | Reduction |
|-------|--------------------------------------|------|----------|--------|------|----------|--------|-----------|
| 1 | Sitting Posture problems | 41 | 20 | 40 | 26 | 16 | 18 | 59.4 |
| 2 | Standing Posture problems | 36 | 32 | 26 | 18 | 16 | 14 | 51.06 |
| 3 | Sitting to Standing Posture problems | 47 | 28 | 30 | 22 | 16 | 18 | 58.8 |
| 4 | Walking Ambulatory problems | 23 | 18 | 26 | 12 | 10 | 12 | 22.78 |
| 5 | Wheel chair borne problems | 11 | 8 | 8 | 6 | 4 | 4 | 3.78 |
| 6 | Stretcher borne problems | 12 | 10 | 8 | 6 | 4 | 2 | 4.2 |
| 7 | Walking with support | 22 | 7 | 9 | 3 | 3 | 4 | 3.81 |

% Reduction Is Calculated After Adding Mild, Moderate & Severe Subjects before & After

Table 4: Subjective Changes in physical posture, mobility and sleep after the intervention.

| s.no | Parameter | Before intervention | | | After intervention | | | % Reduction |
|------|-------------------|---------------------|----------|--------|--------------------|----------|-------|-------------|
| | | Mild | Moderate | Severe | Mild | Moderate | Sever | |
| 1 | Depth | 28 | 18 | 22 | 13 | 9 | 11 | 22.48 |
| 2 | Duration | 24 | 22 | 20 | 12 | 12 | 10 | 25.92 |
| 3 | Quality | 32 | 16 | 24 | 16 | 8 | 12 | 25.92 |
| 4 | Continuity | 30 | 24 | 16 | 16 | 12 | 8 | 2.52 |
| 5 | Sleeping pills | 11 | 8 | 10 | 5 | 4 | 4 | 3.77 |
| 6 | Sense of Wellbing | 14 | 10 | 6 | 6 | 2 | - | 2.4 |

% Reduction is calculated after adding mild moderate & server subjects before & after the parameter affected in sleep quality include depth duration quality continuity sleeping pills use & sense of wellbeing

Table 4(a): Sleep Pattern.

Discussions

The present study has revealed that ex-servicemen are easily motivated (after removing doubts causing initial reluctance) for initiating them for regular physical exercise as well for continuing or stepping up of measures for spiritual healing enhancement. Once ex-servicemen were motivated than their age is not a hindrance for continuation with interventions on their own with three monthly one day refresher capsule. The benefits accruing due to progressive weight training in the study is in agreement with other studies [1-4]. A randomized controlled trial has similarly shown 50% reduction in Hamilton Depression Score along with strength gain & sleep quality [58].

A total of 19 parameters were studied including anthropometric, biochemical and Hamilton Depression Score before the onset of intervention, and then after subjecting 58 ex-servicemen to three months of intervention. There has been a significant decrease in pulse rate, respiratory rate, Systolic, Diastolic BP, Fasting and Post- prandial Glucose, Total Cholesterol, LDL & VLDL.

A study at Delhi has shown reduction in fasting glucose & decrease in total cholesterol & VLDL cholesterol [59]. Regular physical activity is important for primary & secondary prevention

of many chronic diseases & delays loss of independence [60].

The Hamilton's Depression Score was found to be statistically significant following intervention after three months. Before intervention 78 (67.26%) subjects had Hamilton Depression Score of less than five, which is considered to be normal, while 38 (32.75%), had Hamilton Depression Score in the range between 6 to 10, which is moderate Depression. After the intervention all 116(100%) subject had Hamilton Depression Score less than five i.e. normal. There has been a considerable subjective improvement in most of the parameter from severe to moderate/mild and from moderate to mild. Community based exercise program reduces risk factors for accidental falls in 65 to 75 yrs old with osteoporosis in a randomized controlled trial [61]. Therefore, the importance of regular physical activity at a community level including progressive weight training cannot be overemphasized.

Recommendations

It is recommended that ex-servicemen be provided with facilities for weight training and spiritual health enhancement by employing a physical trainer & a yoga teacher at station level. However, motivation as well as importance & benefit of regular exercise must be imparted since the time of enrolment and contin-

ued throughout at unit level till retirement. The effects of regular yoga training as well as enhancement of spiritual health will result in better coping ability and adaptation due to aging.

Limitation of study

As it was a hospital based study, more studies on a larger sample size are required for extrapolating the inference to the population

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