

## EFFECT OF YOGA BASED LIFESTYLE INTERVENTION ON SUBJECTIVE WELL-BEING

RATNA SHARMA\*, NIDHI GUPTA AND R. L. BIJLANI

*Integral Health Clinic,  
Department of Physiology,  
All India Institute of Medical Sciences,  
New Delhi – 110 029*

( Received on March 1, 2008 )

**Abstract :** Yoga is assuming importance in improving mental health and quality of life in the treatment of a number of psychiatric and psychosomatic disorders. The present study was a prospective controlled study to explore the short-term impact of a comprehensive but brief lifestyle intervention, based on yoga, on subjective well being levels in normal and diseased subjects. Normal healthy individuals and subjects having hypertension, coronary artery disease, diabetes mellitus or a variety of other illnesses were included in the study. The outcome measures were 'subjective well being inventory' (SUBI) scores, taken on the first and last day of the course. The inventory consists of questions related to one's feelings and attitude about various areas of life, such as happiness, achievement and interpersonal relationship. There was significant improvement in the subjective well being scores of the 77 subjects within a period of 10 days as compared to controls. These observations suggest that a short lifestyle modification and stress management educational program leads to remarkable improvement in the subjective well being scores of the subjects and can therefore make an appreciable contribution to primary prevention as well as management of lifestyle diseases.

**Key words :** subjective well being                      Yoga                      meditation

### INTRODUCTION

Most people evaluate what is happening to them as either good or bad, and similarly they are normally able to offer judgments about their lives. People virtually always experience moods and emotions, which have a hedonic component that is pleasant, signaling a positive reaction, or unpleasant, signaling a negative reaction. Thus,

subjective well being is emerging as a major diagnostic and outcome variable in psychology and in medicine. People subjectively assess their well being on a continuous basis even if they do not often consciously think about it. Subjective well-being (SWB) refers to how people evaluate their lives, and includes variables such as life satisfaction and marital satisfaction, depression and anxiety, and moods and

---

\*Corresponding Author :

emotions. The idea of SWB or happiness has intrigued thinkers for millennia, although it is only in recent years that it has been measured and studied in a systematic way. Denier (1) and Larson (2) have prepared extensive review on the work done in this area. A significant improvement in the quality of life can be brought about only by knowing how different persons feel with regard to their day to day concerns like health or family. Among the approaches to improve the quality of life, there has been the search for healthy lifestyles and better strategies for handling stress, and thereby improving the subjective well being. These explorations have led us to ancient disciplines such as yoga, which combine the physical elements of a healthy lifestyle with potent prescriptions for abiding mental peace (3). Further, the growth of psychoneuroimmunology has strengthened the scientific foundations of mindbody medicine (4). Now that tools for influencing the mind positively have assumed extensive application in a wide variety of illnesses (5), it is important to examine their efficacy. The present study evaluates the changes seen in the subjective well being while completing a comprehensive but brief lifestyle modification educational program based on the principles of yoga.

## MATERIAL AND METHODS

### Subjects

The study is based on the data collected on 77 subjects (50 males, 22 females), age ranging from 19–76 years, who attended one of our integrated lifestyle programs conducted in the Integral Health Clinic (IHC) at All India Institute of Medical Sciences.

Although initially 89 subjects were recruited for the study due to various reasons 12 subjects could not complete the study. Fifty two (33 males, 19 females) healthy subjects with age ranging from 21–77 years, who did not undergo the program were included as controls. The study was approved by the ethics committee of All India Institute of Medical Sciences and consent was taken from the subjects and controls for inclusion in the study. The subjects were a heterogeneous group, having hypertension, coronary artery disease, diabetes mellitus, obesity, mild psychiatric disorders (depression, anxiety) or were apparently healthy but wanted to join the program for prevention of disease. No strict inclusion and exclusion criteria were used except that the subjects were interested in attending the integral health clinic to learn yoga and other aspects of a healthy lifestyle and the controls in spite of being aware of the intervention were not interested in attending the yoga course.

### Study design

The subjective well being of the experimental subjects was assessed on the first (day 1) and last day (day 10) of the lifestyle modification program. The same assessment was also made on control subjects twice at the same interval, i.e. 10 days but they did not attend the lifestyle modification program. At the end of the study the results obtained were further analyzed between groups formed on the basis of age (Table V) and disease (Table IV).

### The Program

The program consisted of an integrated package comprising theory and practice

sessions. It was administered in the form of an outpatient course, 3–4 hours each day for 8 days, and was spread over 10 days, being interrupted by a weekend break for two days. They were advised to practice the same on their own on the two off days and a good compliance of the same was reported on the subsequent day. The course was given to a group of 6-8 patients at a time. A typical day in the course started with a set of simple asanas (physical postures) and pranayama (breathing exercises) for approximately one hour followed by a break. During the break subjects listened to instrumental music and had breakfast. After this short interval the next activity was a lecture or a video film. Besides providing elementary facts about nutrition and the specific diseases, which the patients had, these sessions introduced the patients to principles of yoga and yogic techniques. Although group as well as individual nutrition education was imparted, providing meals was not a part of the program. One full session was devoted to principles and practice of meditation, and two to stress management. Questions and unstructured discussions were encouraged. Each day's program ended with relaxation through either shavasana (a relaxation technique) or meditation. Autosuggestion and imagery were encouraged during relaxation to promote self-healing. The patients were given a few booklets to reinforce what was discussed in the lectures. On one of the days, the patient received individualized advice in a one to one session. This session included advice on diet, physical activity, smoking, drinking, mental relaxation, and also provided a good listener to the patient for his or her personal problems. The spouse and other members of the patient's family were encouraged to attend the course to facilitate compliance. Attending the course

costed the patient a nominal registration fee of 200 rupees. The protocol of the course is given in Table I, and the set of asanas and pranayama included in the course in Table II.

TABLE I: Protocol of the Course.

<i>Day 0</i>	<i>History</i>
Day 1: Wednesday	Filling up questionnaire Introduction to one another Lecture: Introduction to yoga Practice: Shavasana
Day 2: Thursday	Practice: Asanas & Pranayama* Break <sup>†</sup> Lecture: Meditation Practice: Meditation Individualized advice (2 patients)
Day 3: Friday	Practice: Asanas & Pranayama Break Lecture: Fundamentals in nutrition Practice: Meditation Individualized advice (2 patients)
Day 4: Saturday Day 5: Sunday	Off Off
Day 6: Monday	Practice: Asanas & Pranayama Break Film: Samattvam (Equanimity) Practice: Meditation/Shavasana
Day 7: Tuesday	Practice: Asanas & Pranayama Break Film: Stress management Practice: Meditation/Shavasana
Day 8: Wednesday	Practice: Asanas & Pranayama Break Lecture: About your illness Practice: Meditation/Shavasana Individualized advice (2 patients)
Day 9: Thursday	Practice: Asanas & Pranayama Break Lecture: Yogic attitude in daily life Practice: Meditation/Shavasana Individualized advice (2 patients)
Day 10: Friday	Filling up questionnaire Practice: Asanas & Pranayama Break Lecture: Stress management Practice: Meditation/Shavasana Closing session

\*Details in Table II.

<sup>†</sup>Instrumental Music during breaks.

TABLE II: The set of asanas and pranayama included in the course.

i	Humming in meditative posture – Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/Sukhasana (Easy Pose)
ii	<b>BREATHING TECHNIQUES</b> Dog breathing, Tiger breathing, Hands in and out breathing, Hands interlocked, kept on chest, stretching, in three positions, Ankle stretch breathing.
iii	<b>LOOSENING EXERCISES</b> Warm ups: starting from the head, working towards the toes. Neck rolls, Shoulder rotation, Arm rotation, Elbow movements, Wrist movements, Finger movements, Waist movements, Knee rotation, Ankle rotation, Toe movements.
iv	<b>QUICK RELAXATION IN SHAVASANA (CORPSE POSE)</b>
v	<b>ASANAS</b> (a) <u>Standing</u> 1. Ardhakatichakrasana (lateral arc pose) 2. Padahasthasana (forward bend pose) 3. Ardhabhakrasana (backward bend pose) 4. Vrikshasana (tree pose) (b) <u>Sitting</u> 1. Ardhamatsyendrasana (half-spinal twist pose) 2. Paschimatanasana (back stretch pose) 3. Konasana (angular pose) (c) <u>Lying on stomach</u> (prone) 1. Makarasana (crocodile pose) 2. Bhujangasana (cobra pose) 3. Dhanurasana (bow pose) (d) <u>Lying on back</u> (supine) 1. Uttitapadasana (straight leg raising) 2. Sarvangasana (shoulder stand pose) 3. Matsyasana (fish pose) 4. Pavanmuktasana (wind relieving pose) 5. Setubandhasana (bridge pose)
vi	<b>DEEP RELAXATION IN SHAVASANA (CORPSE POSE)</b>
vii	<b>PRANAYAMA (BREATHING PRACTICES)</b> 1. Bhastrika (rapid breathing) 2. Nadi shuddhi (alternate nostril breathing) 3. Bhramari (honeybee sound during expiration)
viii	<b>QUICK RELAXATION IN SHAVASANA (CORPSE POSE)</b>
ix	Humming in meditative posture – Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/Sukhasana (Easy Pose)

*Measurement of subjective well-being*

The subjective well being was assessed using a 'The Subjective Well - Being Inventory' devised and validated by Sell and Nagpal (6) in 1992. This is a self-report assessment device, which measures the

degree of subjective well being of an individual in various day to day life concerns. The positive factors, namely general well being (factor 1), expectation achievement congruence (factor 2), confidence in coping (factor 3), transcendence (factor 4), family group support (factor 5) and social support

(factor 6) are assessed. The negative factors considered are primary group concern (factor 7), inadequate mental mastery (factor 8), deficiency in social contacts (factor 9) and general well being negative effect (factor 10). For each of these items the individual is expected to make a choice from one of the three options – a) Not so much, b) to some extent or c) very much. The inventory was scored by attributing the scores of 1, 2 or 3 to response categories to each response in each question. The mean score on the normal adult Indian samples is 90.8 with a standard deviation of 9.2. The mean score on normal adult Indian samples on positive item is 42.9 with a standard deviation of 4.6 and on the negative items is 47.9 with a standard deviation of 5.1. When working out scores on each factorial dimension the profile of an individual is interpreted by comparing the score with the middle values of each score in each factor. If most of the scores fall above the middle value the probability is that the person enjoys a good sense of well-being. If most scores are below the middle values, the individual is experiencing difficulties in terms of a happy living. Subjects were assessed at the beginning (day 1) and at the end (day10) of the intervention.

**Statistical analysis**

The day 1 scores of the two groups of subjects were compared using unpaired t-test. The SUBI scores on day 1 and day 10 were compared by Student’s t-test for paired observations. Differences were considered significant with  $P < 0.05$ .

**RESULTS**

The scores of subjective well - being measured at the beginning (day 1) and end

(day 10) of the IHC course for the intervention group and for controls at an identical interval are given in the Fig. 1. At the end of the course, subjective wellbeing scores were significantly higher than at the beginning in the intervention group. There was no significant change in the subjective well-being scores of the controls after an interval of ten days. When considered factor wise (Table III) the baseline scores for factors

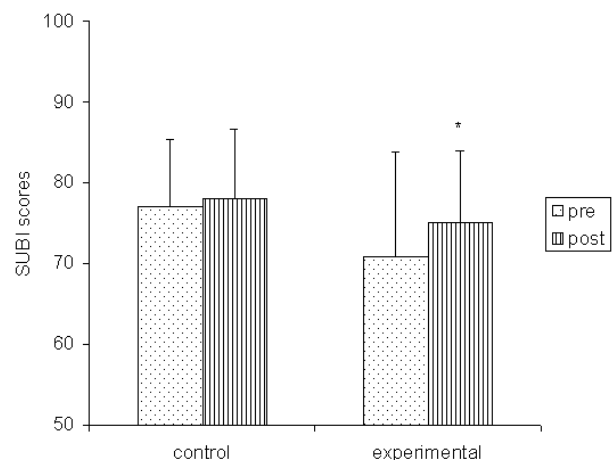


Fig. 1: Comparison of SUBI Scores in Experimental and control group. All values are mean±SD, \* $P < 0.05$ .

TABLE III: Baseline (day1) SUBI Scores for Experimental as compared to Controls subjects.

Factor	Experimental subjects	Control subjects	Significance, NS or S*
Total	70.92±9.83 <sup>†</sup>	77.08±8.35	S <sup>‡</sup>
F1	5.94±1.44	7.06±1.24	S <sup>‡</sup>
F2	6.43±1.42	7.00±1.31	S <sup>§</sup>
F3	6.97±1.61	7.6±1.9	S <sup>§</sup>
F4	6.57±1.5	6.52±1.39	NS
F5	7.39±1.6	7.87±1.33	NS
F6	6.86±1.73	7.04±1.74	NS
F7	5.43±2.81	6.06±3.29	NS
F8	13.78±3.23	15.63±3.17	S <sup>□</sup>
F9	4.19±1.38	4.63±1.19	NS
F10	7.36±1.46	7.67±1.31	NS

\*NS-Non-Significant, S-Significant  
<sup>†</sup>All values are mean±SD  
<sup>‡</sup> $P < 0.0005$   
<sup>§</sup> $P < 0.05$   
<sup>□</sup> $P < .005$

TABLE IV: SUBI Scores for Experimental subjects day 1 as compared to day 10.

Factor	Experimental			Control		
	Day1	Day10	NS or S*	Day1	Day10	NS or S*
Total	70.92±9.83 <sup>†</sup>	75.06±8.97	S <sup>‡</sup>	77.08±8.35	78.02±8.56	NS
F1	5.94±1.44	6.94±1.23	S <sup>‡</sup>	7.06±1.24	7.06±1.41	NS
F2	6.43±1.42	6.92±1.27	S <sup>§</sup>	7.00±1.31	6.90±1.42	NS
F3	6.97±1.61	7.36±1.39	S <sup>e</sup>	7.60±1.19	7.33±1.25	NS
F4	6.57±1.5	7.05±1.26	S <sup>§</sup>	6.52±1.39	6.62±1.19	NS
F5	7.39±1.6	7.44±1.46	NS	7.87±1.33	7.79±1.45	NS
F6	6.86±1.73	7.01±1.73	NS	7.04±1.74	7.21±1.56	NS
F7	5.43±2.81	5.95±2.84	S <sup>□</sup>	6.06±3.29	6.23±3.56	NS
F8	13.78±3.23	14.78±3.59	S <sup>§</sup>	15.63±3.17	16.37±3.07	NS
F9	4.19±1.38	4.06±1.40	NS	4.63±1.19	4.56±1.14	NS
F10	7.36±1.46	7.55±1.40	NS	7.67±1.31	7.96±1.25	NS

\*NS-Nonsignificant, S-significant

\*NS-Nonsignificant, S-significant

<sup>†</sup>All values are mean±SD<sup>‡</sup>P<.001<sup>§</sup>P<.005<sup>□</sup>P<.05

1, 2, 3, 4 and 8 were significantly lower for the experimental group as compared to the control group. The IHC course significantly affected all factors assessed except for the scores for factor 5, 6, 9 and 10 that did not show any significant change in the experimental group (Table IV). Among the controls ten days of interval did not change significantly either of the factor scores. Further IHC course did not affect the SUBI scores for the subjects in 30–39, 40–49 and 70–79 years age group (Table V) whereas significant improvement was seen in age groups 20–29, 50–59 and 60–69. Of the 12 dropouts 10 belonged to age groups 30–49 mainly due to work related commitments. The intervention has increased significantly the scores for Coronary disease patients and also has markedly affected the scores of subjects who had attended the course as a part of general prophylaxis (Table VI) whereas no statistically significant changes were observed in patients with diabetes, hypertension and chronic pain.

TABLE V: Comparison of SUBI scores for experimental subjects on day 1 and day 10, age wise.

Age (years)	n	Day 1	Day 10	Significance*
20–29	13	60.45±9.63 <sup>†</sup>	70.45±9.66	S <sup>‡</sup>
30–39	17	70.38±8.00	73±10.53	NS
40–49	19	74.75±8.74	78.08±6.08	NS
50–59	13	71.3±8.85	75.05±9.03	S <sup>‡</sup>
60–69	11	74.27±10.10	80.09±08.3	S <sup>§</sup>
70–79	4	75.25±3.30	71.25±7.9	NS

\*NS-Nonsignificant, S-significant

<sup>†</sup>All values are mean±SD<sup>‡</sup>P<.05<sup>§</sup>P<.005

TABLE VI: Comparison of SUBI scores for experimental subjects on day 1 and day 10, disease wise.

Disease	n	Day 1	Day 10	Significance*
Diabetes	13	69.62±8.69 <sup>†</sup>	73.77±8.64	NS
Hypertension	14	69.4±8.97	74.2±9.90	NS
CAD	14	75.55±9.83	80.64±7.83	S <sup>‡</sup>
Chronic Pain	18	74.11±9.22	74.6±8.10	NS
General prophylaxis	18	68.32±10.50	73.89±7.21	S <sup>‡</sup>

\*NS-Nonsignificant, S-significant

<sup>†</sup>All values are mean±SD<sup>‡</sup>P<.05

## DISCUSSION

The present study shows that measurable improvement in the subjective well being scores occurs within ten days as the result of an intervention that combines daily practice of asanas, pranayama, relaxation techniques (shavasana and meditation) and advice about stress management, diet and other aspects of lifestyle. Although each of these measures individually can also influence the subjective well being levels favorably, the present study aimed to find out the combined effect of a healthy lifestyle. Although the experimental group consisted of patients suffering from various kinds of diseases along with the healthy subjects the control group consisted of age matched subjects who were not interested in attending the life style modification course. Although waitlisted subjects could have been the ideal control, compliance in such a group could not be achieved.

The intervention began each day with a set of asanas. Yogic relaxation can check sympathetic over activity (7). Prior studies (8, 9) have also reported beneficial effects of yogasanas on various physiological and psychological parameters. At the end of the programme in five out of the seven positive factors, significant improvement was observed. A significant improvement on general well being was observed suggesting that the participants felt more interested in their lives and perceived it as functioning more smoothly and joyfully. The significant improvement in the expectation achievement congruence shows that there was an increase in feeling of success and satisfaction in the subjects about their achievements in life. A tremendous increase in coping up with crisis

situation among the subjects was observed. The increase in transcendence scores suggests that subjects had life experiences that are beyond day-to-day and rational existence, such as feeling of oneness with the surrounding. There was a significant change in the scores for questions related to the negative factors. There was a decrease in the worry and concern about the relationship of the subjects with their respective spouse and children. There was reduction in subjects' insufficient control over or inability to deal efficiently with certain aspects of daily life, which are likely to disturb the mental equilibrium. No significant change in the scores for family group support and social group support is not surprising as these factors reflect supportive, cohesive and emotional attachment to and from family, relatives and friends who did not receive the benefits of the intervention. The baseline scores for these two factors were relatively higher (factor 5- $7.39 \pm 1.6$ ; factor 6- $6.86 \pm 1.73$ ) and showed a further increase as a result of the intervention. Since subjective well being is culturally sensitive (10) we have compared our results with studies in the Indian population only. In a previous (11) study on the normal subjects even four months of yogic practices could not bring significant changes in the scores for these two factors. Scores on the deficiency in social contacts were relatively lower ( $4.19 \pm 1.38$ ) to start with and might require an intervention lasting longer than ten days. In a previous study four months of yogic intervention significantly reduced the scores for this factor. Regarding general well being - negative affect the baseline scores were higher ( $7.36 \pm 1.46$ ) and there was no significant change with ten days

intervention. The scores for most of the factors which had shown improvement were lower at the baseline as compared to the controls clearly indicating that there was much more scope for improvement. Also the major difference between the subjects in the intervention and the control group was that the subjects in the intervention group were suffering from the chronic diseases while those in the control group were objectively healthy. The lower scores in the intervention group can be attributed to the physical health contrary to a study showing no correlation between objective physical health and subjective well being (12). When the effect of intervention on subjects in different age groups was compared, subjects in the range of 30–49 years were found to benefit the least. Since this was the same age group which had maximum number of drop outs, these might be the people who are least adaptable to any change. Among the diseased subjects coronary artery disease patients were benefited the most. Further significant improvement of SUBI scores in the subjects who had joined the course for general prophylaxis emphasizes the importance of yogic intervention in otherwise normal healthy individuals. In an earlier study (13) similar yogic intervention has brought about significant reduction in the state and trait anxiety scores. A similar lifestyle intervention had favorably changed the biochemical parameters - the serum lipids and fasting plasma glucose in ninety-eight subjects (14). Since lifestyle is an integrated entity, an intervention, which aims at influencing the total lifestyle, has much in its favour as compared to changing only one aspect of lifestyle at a time. First, the effect of individual changes may be additive or

synergistic. Second, a total change is sometimes easier to bring about than a piecemeal change. For example, giving up smoking is easier if the psychological factors, which make smoking seem necessary, disappear (15). Finally, yoga goes to the roots of a poor lifestyle, and when presented in a comprehensive manner, tends to convince the patient that a good lifestyle is not only healthier, but also more enjoyable than a poor lifestyle. If the patient introduces lifestyle changes because he wants to rather than because he has to, they are likely to be less stressful and hence more effective. The stress resulting from a change adopted in isolation, such as a daily exercise regimen or withdrawal of cherished foods in favour of green leafy vegetables, can do more harm than the good resulting from the healthy practice (16). The present study suggests that the integrated package administered in this study has a favorable effect on subjective well being and there is no additional stress resulting from the change in the lifestyle. Also this study demonstrates that a simple and inexpensive essentially educational intervention based on yoga improves subjective well being. An improvement of biochemical indices (14) and reduction of state and trait anxiety levels (13) has already been demonstrated using the same intervention. The intervention can therefore make an appreciable contribution to primary prevention as well as management of lifestyle diseases.

#### ACKNOWLEDGEMENTS

This work has been supported by the Institute Research Grant, All India Institute of Medical Sciences, New Delhi, India.



## REFERENCES

1. Diener E. Subjective well being. *Psychol Bull* 1984; 65: 631-636.
2. Larson RJ, Diener E, Emmoms RA. An evaluation of subjective well-being measures. *Social Indicators Research* 1985; 17: 1-7.
3. Bijlani RL. Scientific medicine shows signs of a paradigm shift. *New Approaches to Medicine and Health (NAMAHA)* 2003; 11(1): 28-40.
4. Kiecolt-Glaser JK, McGuire L, Robles TF, Glaser R. Emotions, morbidity, and mortality: new perspectives from psychoneuroimmunology. *Annu Rev Psychol* 2002; 53: 83-107.
5. Barrows KA, Jacobs BP. Mind-body medicine. An introduction and review of the literature. *Med Clin North Am* 2002; 86: 11-31.
6. Sell H, Nagpal R. Assessment of subjective well being. New Delhi, World Health Organization 1992.
7. Vempati RP, Telles S. Yoga-based guided relaxation reduces sympathetic activity judged from baseline levels. *Psychol Rep* 2002; 90: 487-494.
8. Udupa KN, Singh RH, Yadav RA. Certain studies on psychological and biochemical response to the practice of Hatha Yoga in young normal volunteers. *Ind J Med Res* 1973; 61(2): 237-244.
9. Wood C. Mood change and perceptions of vitality: a comparison of the effects of relaxation, visualization and Yoga. *JR Soc Med* 1993; 86(5): 254-258.
10. Cummins RA. Subjective Well being and Quality of Life—a cross cultural perspective. International Conference on Psychology in Mental Health—Journey of a Profession: Prospects and Challenges - book of abstracts. Isaac R., Raguram A editors. *Department of Mental Health and Social Psychology NIMHANS Bangalore India* 2007: 41.
11. Malathi A, Damodaran A, Shah N, Patil N, Maratha S. Effect of Yogic practices on Subjective well being. *Ind J Physiol Pharmacol* 2000; 44(2): 202-206.
12. Okun MA, George LK. Physician- and self-ratings of health, neuroticism and subjective well-being among men and women. *Personality and Individual Differences* 1984; 5: 533-539.
13. Gupta N, Khera S, Vempati RP, Sharma R, Bijlani RL. Effect of yoga based life style intervention on State Trait Anxiety. *Ind J Physiol Pharmacol* 2006; 50: 41-47.
14. Bijlani RL, Vempati RP, Yadav RK, Ray RB, Gupta V, Sharma R, Mehta N, Mahapatra SC. A Brief but comprehensive lifestyle education program based on Yoga reduces risk factors for cardiovascular disease and diabetes mellitus. *J Alt Complement Med*. 2005; 11: 267-274.
15. Ornish D. Dr. Dean Ornish's Program for reversing heart disease. New York: Ivy Books. 1996.
16. Chopra D. *Healing the Heart*. London: Random House. 1998.