Mood Changes Associated with Iyengar Yoga Practices: A Pilot Study

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Abstract

The main objectives of this study were 1) to examine changes in self-reported moods and emotional states from before to after Iyengar Yoga classes and how they are affected by the practice of different types of Yoga poses and (2) to determine whether observed changes in mood depend on one's personality traits. The participants were 11 healthy Yoga students in a nine-session Yoga course in which three different types of Yoga poses were compared: back bends, forward bends, and standing poses. Each 90-minute class focused on one of the three types of poses with three repetitions of each type of class. Self-ratings of 15 moods dealing with positive, negative, and energy-related emotional states were obtained before and after each class. Personality traits of depression, anxiety, and hostility were assessed at an initial orientation. Independently of the specific pose, positive moods increased, negative moods decreased, and energy-related moods increased from before to after classes with most changes lasting for two hours. Specific poses resulted in differences in how moods were affected, with back bends associated with greater increases in positive moods. Some mood changes were dependent on one's characteristic personality traits. The positive mood effects of back bends were greater for participants who were relatively hostile or depressed. The specific and nonspecific effects of different bodily postures and movements on psychological processes in Yoga and other forms of physical activity deserve further study. Yoga practices should be investigated for their potential clinical application in mood disorders and depression.

Introduction

It is almost universal for people to take part in individual and organized activities for purposes of exercise, physical conditioning, recreation, social contact, remediation of physical and mental problems, or general self improvement and health. The World Health Organization estimates that 65–80% of the world's population rely on traditional or alternative forms of health care. A recent survey reported on their increased use for back pain and musculo-skeletal problems, headache, insomnia, stress/anxiety, cardiovascular problems, and other ailments.[1] Yoga, Tai Chi, and Pilates have become increasingly popular activities in the United States in recent years with estimates of 10 to 15 million people participating in Yoga classes (see *Time Magazine* cover story, April 23, 2001). In a recent informal survey of students enrolling in Iyengar Yoga classes, the most common health problems reported were lower back pain, allergies, neck, shoulder, knee, and ankle/foot problems, depression, headache, and anxiety (personal communication, Iyengar Yoga National Association of the United States).

As emotional disorders are major health problems, and as Yoga is relatively inexpensive and readily available, evidence about emotional processes in Yoga merits further attention. Yoga practices have features considered by sport psychologists to be associated with stress reduction. Although Yoga is generally not aerobic, it is typically noncompetitive, predictable, and rhythmical.[2] As there are links between physical movements and postures on the one hand and emotional states and traits on the other, we hypothesized that specific Yoga practices

may have consequences for emotional states.[3] In this exploratory study, the main objectives were to examine mood changes associated with participation in Yoga classes and to determine whether certain Yoga practices differed from one another in their effects on mood.

Although Yoga is generally not aerobic, it is typically noncompetitive, predictable, and rhythmical.

Yoga instruction is usually organized around the teaching and principles of a particular tradition or master teacher (*guru*). The present study derives from the teaching and writings of B. K. S. Iyengar.[4] The Iyengar organization is international and claims that about 30% of all Yoga participants follow that tradition. The classes typically involve the practice of floor, sitting, and standing poses, inversions (headstand, shoulder stand), breathing exercises (*prânâyâma*), and meditation. Stretches, twists, and extensions or expansions of parts of the body are common features. The practice of meditation is considered appropriate mainly for advanced Iyengar Yoga students and practitioners. A unique feature of Iyengar Yoga is the highly developed use of props (mats, blocks, blankets, straps, ropes, chairs, benches) as aids in doing the poses, a method that allows gradual achievement of the desired practice and that is consistent with the principle of successive approximation in the psychology of learning.

Typically, Iyengar teachers take intensive three-year educational and training programs for certification by the organization and attend workshops for continuing education. Iyengar classes are structured and involve sequences of poses and actions designed to facilitate learning how to master the poses as well as overcome strains that may be brought about by the process. Instructions given by teachers are detailed and continuous during classes with a focus on awareness of the activity of muscles and joints and their coordination in conjunction with appropriate breathing patterns. Yoga involves maintaining postures for minutes at a time. Over time the training appears to result in increased muscle strength and flexibility and a greater awareness of one's movements and posture.

The best studies of mood changes associated with Yoga were done by Berger and Owen. In a form of Yoga that has a strong exercise dimension (Hatha-Yoga) involving stretching, balancing, and breathing routines, after classes subjects reported being less anxious, tense, angry, fatigued, and confused.[2] In a second study,[3] Yoga and swimming showed comparable effects on moods, and the authors concluded that aerobic exercise may not be necessary for mood alteration or stress reduction. No published data are available on changes in mood as related to the practice of specific poses or on whether mood changes associated with Yoga differ as a function of personality traits.

The main objective of the present study was to test the hypothesis derived from Iyengar Yoga teaching and theory that the practice of back bends results in increases in positive emotional states (feeling happy or elated) and decreases in negative emotional states (feeling sad or depressed).[4] In designing the study, we had to consider that mere participation in any type of self-help program may affect moods and lead to a sense of personal achievement and well-being. Psychological and physiological benefits of participating in programs involving physical activity and exercise training are well documented.[6–9] To control for nonspecific factors, the effects of back bends were compared with the effects of two other typical Yoga practices (forward bends and standing poses). In this way, we could determine whether the expected changes in moods would be more pronounced in or specific to the practice of back bends. Examples of each pose type are as follows: back bends—camel, upward bow, upward dog; forward bends—downward dog, head on knees, intense west stretch; standing poses—extended triangle, extended angle, warrior I.

The study utilized a within-subject experimental design. By comparing the effects of the different class types within the same subjects, we could determine whether changes in self-reported moods from before to after a session would vary as a function of the specific focus on a given Yoga practice. It was hypothesized that back-bend classes would be associated with greater increases in positive moods and greater decreases in negative moods from before to after class as compared with forward bends or standing poses. A second aim was to test the hypothesis that mood changes associated with the different Yoga practices would be related to personality traits. For this purpose, individual differences in anxiety, depression, and hostility were examined. These traits are related to emotional behavior and experience and may predict how a person's mood changes with the practice of the different poses. No specific predictions were made about the direction of the associations. A third aim was to examine the changes in mood occurring independently of the specific Yoga prac-

tice engaged in. Based on prior research, we expected increases in positive moods and decreases in negative moods. We also determined whether these changes were related to the personality traits.

Methods

The participants were 8 women and 3 men, 23 to 59 years old, recruited mainly from beginning Yoga classes. Years of education ranged from 12 to 20. They reported being in good health and free of problems that would limit participation, and they stated that they regularly exercised from 0 to 14 hours a week (median = 4). Six participants had taken part in other health-related programs. In an initial orientation session, the procedures were explained, and subjects filled out the personality questionnaires, which took 30 minutes. Mood scales (see below) took one minute for each set of ratings. All together, little time (less than an hour in total) was required of the participants. In exchange, participants were able to attend the nine Yoga classes free of charge. The nine classes contained the same kinds of practices of a typical introductory Iyengar Yoga course, organized in different sequences. Participants were asked to make every effort to attend every session; attendance rate for all classes and participants combined was 89% (11 missed classes out of 99). All participants completed the course.

It was hypothesized that back-bend classes would be associated with greater increases in positive moods and greater decreases in negative moods.

Nine Yoga classes were held on weekdays, during early evening hours, two evenings a week, each class about 90 minutes in duration, as part of a regular introductory Yoga course. Each class focused on one of the three types of poses: standing poses, forward bends or back bends. These were rotated in

Table 1

Mood Ratings Pre- and Post-Yoga Classes

Mood	Pre	Post	Post 1	Post 2	P[a]	P[b]
Negative						
Angry	1.38	1.09	1.23	1.27	0.13	0.04
Anxious	2.41	1.68	1.71	1.59	0.05	0.01
Depressed	1.42	1.16	1.26	1.26	0.08	0.01
Frustrated	2.03	1.40	1.44	1.54	0.04	0.01
Irritated	1.72	1.33	1.41	1.46	0.09	0.02
Pessimistic	1.81	1.31	1.44	1.56	0.08	0.01
Sad	1.37	1.23	1.27	1.29	0.45	0.27
Stressed	2.76	1.56	1.72	1.61	0.01	0.01
Positive						
Confident	3.29	3.73	3.64	3.60	0.25	0.04
Content	3.15	3.60	3.70	3.60	0.02	0.01
Happy	3.43	3.68	3.76	3.70	0.05	0.02
Optimistic	3.26	3.80	3.70	3.60	0.01	0.01
Relaxed	2.56	3.46	3.56	3.52	0.05	0.02
Energy						
Fatigued	2.33	1.71	1.73	1.96	0.04	0.01
Tired	2.51	1.97	2.28	2.80	0.02	0.04

Note: P[a] = Probability of test of differences between all four mood ratings.
P[b] = Probability of test of differences between Pre and Post.

Table 2

Changes in Mood Ratings (Post-Pre) in Different Yoga Practices

Mood	Standing Poses	Forward Bends	Back Bends	P[a]
Angry	-0.32	-0.36	-0.20	0.35
Anxious	-0.97	-0.71	-0.53	0.24
Depressed	-0.29	-0.18	-0.32	0.70
Frustrated	-0.58	-0.62	-0.67	0.92
Irritated	-0.33	-0.49	-0.35	0.70
Pessimistic	-0.49	-0.47	-0.43	0.97
Sad	-0.03	-0.06	-0.32	0.44
Stressed	-1.18	-1.23	-1.21	0.97
Positive				
Confident	0.24	0.55	0.53	0.05
Content	0.41	0.39	0.53	0.75
Happy	0.12	0.15	0.46	0.09
Optimistic	0.46	0.50	0.67	0.28
Relaxed	0.71	0.80	1.18	0.30
Energy[b]				
Fatigued	-0.50	-0.59	-0.77	0.49
Tired	-0.52	-0.67	-0.44	0.72

[a]Probability of test of differences between mood ratings.
[b]Negative value for energy means a decrease for fatigued and tired.

FIRST SERIES

REGULAR	MENSTRUAL VARIATION
Standing Poses	
Tâdâsana	
Trikonâsana	*Pârshvakonâsana*
Vîrabhadrâsana II	
Pârshvakonâsana	
Vîrâsana	
Sarvângâsana in chair	*Setubandha*
Forward Bends	
Adhomukha-shvanâsana	
Trikonâsana	
Pârshvottânâsana	
Prasârita-pâdottânâsana	
Vîrâsana	
Triang-muksikapada-pascimotttânâsana	
Pascimotttânâsana	
Upavishta twist	
Supta-baddhakonâsana	
Back Bends	
Adhomukha-shvanâsana	
Trikonâsana	
Vîrabhadrâsana I	
Ûrdhva-mukha-shvanâsana— hands on chair seat	
Ushtrâsana	
Ûrdhva-dhanurâsana— blocks okay	Back bend over a chair
Adhomukha-svanâsana	
Chair *bharadvâjâsana* to side	
Chair *pasâsana*	
Sarvângâsana on chair	*Setubandha*

SECOND SERIES

REGULAR	MENSTRUAL VARIATION
Standing Poses	
Tâdâsana	
Vrikshâsana	
Trikonâsana	
Tâdâsana	
Pârshvakonâsana	
Tâdâsana	
Utkatâsana	*Tâdâsana*
Baddhakonâsana	
Ûrdhva-prasarita-padâsana	*Supta-baddhakonâsana*
Classic *Sarvângâsana*	*Setubandha*
Forward Bends	
Baddhakonâsana	
Upavishtakonâsana	
Dandâsana	
Jânu-shîrshâsana	
Pascimotttânâsana	
Supta-pâdângusthâsana	Against wall to side
Bharadvâjâsana on bolster	
Bharadvâjâsana on chair to side	
Bharadvâjâsana on chair with bolster	
Shavâsana with feet on chair	
Back Bends	
Rope I (10 times twice)	
Rope II	
Rope III	
Ûrdhva-mukha-shvanâsana— hands on chair seat	
Dvi-pada-viparîta-dandâsana on chair - half blanket on upper back - roll catching shoulder blades - half roll at lumbar moving down	
Ûrdhva-dhanurâsana	
Adhomukha-shvanâsana	
Sarvângâsana on chair	

THIRD SERIES

REGULAR	MENSTRUAL VARIATION
Standing Poses	
Ardhacandrâsana	*Trikonâsana*
Adhomukha-shvanâsana	
Trikonâsana	
Pârshvottânâsana	
Parivritta-pâdottânâsana	
Classic *Sarvângâsana*	*Setubandha*
Forward Bends	
Adhomukha-shvanâsana	
Uttanâsana	
Adhomukha-shvanâsana	
Jânu-shîrshâsana—working	
Jânu-shîrshâsana—supported	
Pascimotttânâsana—supported	
Pavana-muktâsana	
Viparîta-karanî-mudrâ	*Supta-baddhakonâsana*
Shavâsana— bolster under the knees	
Back Bends	
Adhomukha-shvanâsana	
Adhomukha-vrikshâsana	*Adhomuka-shvanâsana*
Adhomukha-shvanâsana	
Adhomukha-vrikshâsana	
Rope I (10 times)	
Ûrdhva-dhanuârsana— hands turned out on roll	Back bend over a chair
Ûrdhva-dhanurâsana— hands on blocks	Back bend over a chair
Ûrdhva-dhanurâsana— hands on floor	Back bend over a chair
Adhomukha-shvanâsana	
Pasâsana at wall	
Bharadvâjâsana at wall	
Setubandha	
Adhomukha-svastikâsana	

sequence three times. The classes were taught by two experienced Iyengar Yoga teachers who alternated from class to class. Each class was preplanned, and the particular sequence of postures of each class type varied from session to session. Other poses not falling into a given pose type (e.g., shoulder stand, corpse pose) were included in all classes, but the main focus of a given class was one of the three pose types. The teachers focused on the poses and did not discuss potential emotional or other psychological changes associated with the practices. See the sidebar for a list of the sequence of poses used in each class.

At the beginning (PRE) and end (POST) of each class, subjects rated their moods using 5-point numerical scales (none to very much). They also were given two additional rating sheets and asked to rate the same moods one hour (POST1) and two hours (POST2) after class and to return these two sets of ratings at the next class. Mood terms were selected to tap positive and negative emotional states plus energy level (moods shown in Table 1). In previous research, these three dimensions of mood were found to be independent of one another as determined by a principal components analysis.[10]

The following personality tests were administered at the initial orientation. The Cook-Medley Hostility Scale (HOS) is a measure of indirect hostility, a cynical and mistrusting attitude toward others.[11] The Spielberger Trait Anxiety Inventory (ANX) measures the general disposition to experience anxiety frequently.[12] The Center for Epidemiological Studies of Depression Scale (DEP) measures a disposition to experience depressed affect.[13] This scale is designed for use in the general population.

The main data consisted of mood ratings obtained before and after classes, with repeated measures over the nine sessions. As initial analyses of the data indicated that pre-post class mood differences did not change significantly over the three repetitions within each pose type, mood ratings were averaged over the three repetitions. The data were analyzed with repeated measures analysis of variance (SYSTAT 9, General Linear Models). Wilks' Lambda was used to test effects with more than two repeated measures. Initial analysis focused on the changes in mood ratings over the four repeated rating occasions (PRE, POST, POST1, POST2) independent of pose style. Subsequent analyses focused on the change in mood ratings from PRE to POST, first independently of pose type and then comparing the three pose types. The latter analyses were then repeated adding in each personality measure as an independent factor. In the case of a significant interaction between mood change and personality test score, independent of the specific pose, Pearson r correlations were used to show the nature of the interaction. These correlations are based on the difference for a given mood (POST minus PRE) vs. scores on the given personality scale, ordered from low to high. Thus, a positive correlation means that the higher the personality test score the greater the increase in the particular mood from PRE to POST and a negative correlation means the opposite. For the analyses involving both pose style and personality test scores as independent factors, a significant 2-way interaction means that the change in mood from pre- to post-class varied as a function of both pose style and personality trait. Again, correlations were used to show the nature of the interaction. Given the exploratory nature of the study and the relatively small sample, all effects with p values less than .10 are discussed.

The moods related to energy level tended to increase from before to after classes.

Results

Independently of pose type, did moods change over the course of the four ratings, averaging over sessions? The means are shown in Table 1. The pattern of change was consistent with the hypothesis, an increase in positive moods and a decrease in negative moods from PRE to POST that generally continued for the following two hours (POST1, POST2) with a tendency to revert to PRE values over time. The moods related to energy level tended to increase from before to after classes. Changes over the four ratings were significant for 9 out of the 15 moods at $p < .05$ with decreases in anxious, frustrated, stressed, fatigued, and tired, and increases in content, happy, optimistic, and relaxed. Three other moods (depressed, irritated, and pessimistic) had p values less than .10. Table 1 also gives the findings for PRE/POST differences, significant at $p < .05$ for all moods except sad, consistent with the pattern of an increase in positive and a decrease in negative moods and an increase in energy level. Subsequent analyses focused on the differences between PRE and POST.

Were the three *âsana* styles associated with different patterns of mood change from PRE to POST? In this analysis, the difference between the PRE and POST ratings for each mood was averaged separately for each class type (see Table 2). Differences between PRE and POST as a function of pose style were shown for confident ($p = .05$) and happy ($p = .09$). The increase from PRE to POST in the mood confident was greater for forward bends and back bends than for standing poses. These differences were unrelated to PRE values, which did not differ between poses for any of the moods. Inspection of the pattern of differences between poses in Table 2 indicates that in four out of the five positive moods, the increase from PRE to POST was greatest for back bends, and in the case of confident back bends vied for first place with forward bends. The likelihood that four of five positive moods would show the largest increase from PRE to POST for back bends is $p = .02$ (binomial test). Thus, the data in Table 2 suggest a relatively consistent tendency for back bends to enhance positive moods, as hypothesized. However, no support was obtained for the hypothesized greater reduction in negative moods for back bends.

As individuals may vary from one another in their usage of particular mood terms within each of the three mood dimensions, change scores were computed for all moods averaged together within each dimension (negative, positive, energy) and the PRE/POST differences between average mood change scores for each of the three dimensions compared by t-test. The increase in average positive mood from PRE to POST was significantly greater for back bends than for standing poses ($p < .05$) or for forward bends ($p < .04$). No other comparison was significant.

Independently of pose type, were the changes in moods from PRE to POST related to personality traits? HOS effects were not significant. DEP was related to changes in

frustrated (p = .08) and irritated (p = .08). The more depressed the subject the greater the decrease in these moods from PRE to POST. The correlations were -.55 and -.56. ANX was related to changes in frustrated (p = .03), irritated (p = .07), and pessimistic (p = .07). The higher the anxiety scale score the greater the decrease in these moods with correlations of -.65, -.57, and -.56, respectively.

The more hostile the subject the more confident the subject felt after doing back bends.

Comparing the three *âsana* styles, were the changes in mood from PRE to POST related to personality traits? HOS was associated with ratings of confident with greater increases for back bends than for forward bends or standing poses (p = .05). The respective correlations were .53, .35, and .07. The more hostile the subject the greater the increase in this positive mood after back bends. HOS was also related to ratings of irritated with a greater decrease in standing poses than in forward bends and no effect for back bends (p = .08). The respective correlations were -.64, -.30, and .02. Standing poses reduced the feeling of irritation in the more hostile subjects. DEP was related to ratings of confident with a greater increase in back bends than forward bends and little change in standing poses (p = .10). The respective correlations were .39, .18, and .08. DEP was also related to ratings of fatigued with the greatest decrease after back bends than after forward bends and little change in standing poses (p = .08). The respective correlations were -.52, -.32, and .00. Thus, after doing back bends, subjects who scored higher on the depression scale tended to report being more confident and less fatigued. For ANX, mood effects related to *âsana* style were not significant.

Discussion

This study tested the hypothesis that practicing Yoga back bends results in increases in positive moods and decreases in negative moods. Compared to two control poses, forward bends and standing poses, subjects reported a greater increase in the five positive moods averaged together as compared to the changes for either other pose. In the case of single moods, the effect was clearest for confident and happy. The effects for negative moods and for self-reports of energy level did not show any real advantage for any one of the three pose types.

The apparent benefits of back bends were further supported when we considered the role of personality characteristics, particularly hostility and depression. The more hostile the subject the more confident the subject felt after doing back bends, compared to the other poses. Similarly, subjects who scored higher on the depression scale were more likely to report feeling more confident and less fatigued after doing back bends than after the other poses. Although the personality effects were not strong, the direction of effects suggests the potential benefit of Yoga in improving mood in those individuals who are relatively hostile or depressed.

The failure to find support for the effects on negative moods specific to back bends suggests that the unique benefits of back bends are mainly to enhance positive rather than diminish negative emotions. If an effect on negative moods unique to back bends is to be found it may take a longer period of Yoga practice. Although the apparent discrepancy between the findings for positive vs. negative moods may seem counterintuitive, positive and negative emotional states are not polar opposites but rather are independent of one another.[10] Results of the latter study would also suggest that by enhancing positive emotions the consequences of negative emotions may be counteracted. Thus, we speculate that the practice of back bends may have the potential of helping an individual cope with depressed affect. This possibility should be explored in further research and in clinical populations.

In this regard, evidence has been published on the potential benefits of Yoga for depression in studies utilizing random assignment to Yoga and control conditions. Sudarshan Kriya Yoga (SKY) was compared with electroconvulsive therapy (ECT) and drug treatment (imipramine) in patients with melancholia. The rate of remission for Yoga was 67%, comparable to imipramine (73%) and less than ECT (93%).[14] In a comparison of full and partial SKY Yoga, both were found to decrease anxiety and depression scale scores in patients with major depressive disorder.[15] Another study compared a Yoga method of relaxation typically done at the end of a class (*shavâsana*/corpse pose) with a control condition in women students with severe depression.[16] *Shavâsana* was found to be an effective technique for alleviating depression. We should note that the present study involved healthy subjects. Whether the findings generalize to persons who are clinically depressed or anxious remains to be determined. Moreover, although study of the effects of Yoga on mood changes over the course of the nine classes was not an aim of this study, an analysis of the levels of mood as reported at the beginning of each class showed no significant trends over time.

The positive effects of practicing back bends came about even though in these beginning classes such effects were not discussed. Conceivably, such effects may be accounted for by prior expectations of participants in Yoga, an issue that needs further exploration. However, such demand characteristics of Yoga would likely apply to all pose types. The difficulty and effort involved in the different types of poses is also a factor needing further attention. Back bends are considered a difficult pose for beginning students, so it is not likely that pose difficulty accounted for the positive mood effects of back bends. We were concerned that three sessions might be insufficient and that it would take more training and experience to get effects. In fact, the mood effects were more or less immediate in all the classes, regardless of the pose. Presumably larger and more consistent effects may occur with continued practice. The immediacy of the effects observed in this study is consistent with the observations of Berger and Owen.[17]

Standing poses may be more somatically activating than the other poses, which may affect emotional states.

The processes whereby posture, physical activity, and other expressions involved in back bends may translate into positive emotional changes need further investigation. Emotion involves a complex of subjective feelings and cognitions, eye movements, facial expressions, vocalizations, muscular tension or relaxation, overt behaviors, and physiological changes.[18] Emotions are communicated to others by overt as well as subtler expressions that provide the basis for how we interpret the reactions and motives of others. Whether and how any one part of an emotional complex by itself, such as body movement and position, can elicit the totality of emotion, including inner feelings and cognitions, remains a topic of continuing discussion and debate in psychology. A bodily position that is typically associated with a given emotional complex may serve as a cue and elicit the other responses associated with the complex.

The back-bend pose is a posture in which the chest is open and expanded, which is a social expression in our culture often associated with confidence and positive assertion. Furthermore, the open position of the chest is opposite to the turned-in and downward bodily position and attitude usually associated with sadness and depression. We may speculate further that expansion of the chest in back bends may facilitate deeper breathing and possibly associated changes in autonomic nervous system activity such as increased vagal tone and slower heart rate, which may enhance positive emotion. Whether change in muscular tension in the chest is a factor remains to be determined. In following up the present findings, physiological changes in the different postures should be recorded.

The effects of back-bend practice on emotional states may be compared to those reported for relaxation, biofeedback training, and other methods focused directly on muscular quieting and decreases in physiological arousal in various bodily systems.[19] However, these methods are thought to reduce stress and negative emotional states and alleviate conditions such as anxiety and pain. Why associated reductions in negative emotions were generally not observed specific to back bends in the present study is uncertain. The only negative mood showing an apparent benefit unique to back bends was the mood sad, but the effect was not significant.

One of the other *âsana* styles showed an effect on moods for subjects who scored higher on hostility. After doing standing poses these subjects reported being more confident and less irritated. How these effects depend on the specific bodily positions or other aspects of standing poses requires further study. Standing poses may be more somatically activating than the other poses, which may affect emotional states.

Although we have emphasized mood differences related to specific poses, it is clear that subjects felt good after taking a Yoga class whatever the pose may have been that day. Positive moods increased, negative moods decreased, and subjects felt less fatigued and tired immediately after class and in most cases for the two succeeding hours. How these general effects of Yoga may depend on the general physical activities of Yoga cannot be determined from these data, as no comparison group was studied to evaluate the overall effects. Although Iyengar Yoga teachers do not consider Yoga as an exercise per se, it does involve coordinated movements, stretching, muscular exertion, and sustained effort. It would take a group involved in some other form of physical activity to determine what overall benefits may be unique to Yoga and the source of the benefits. The observed changes in mood may accompany other activities in which one is doing something that is presumably beneficial for one's health and well-being. As Berger and Owen[20] have shown, other kinds of physical activity result in mood changes comparable to those associated with Yoga practice.

In Iyengar Yoga, an attentional focus and emphasis is on increasing awareness through movements and the activities of muscles and joints and their coordination. The classes usually involve intense and highly focused concentration, which has been described as a form of meditation and that may facilitate emotional and energy changes. A study by Harte and Eifert[21] provides supportive evidence. They compared the effects of running in advanced runners with the effects of meditation (chanting, breathing exercises, and concentration) in highly experienced practitioners and found that both running and meditation led to increased levels of corticotropin-releasing hormone (CRH) associated with positive mood changes. They concluded that physical exercise is not an essential requirement for CRH release.

Personality traits also seem relevant to the extent one experiences mood changes after any Yoga class. In the present study, the overall reductions in negative mood, in particular the moods frustrated, irritated, and pessimistic, were correlated with the traits of depression and anxiety. In this regard, the more depressed and the more anxious subjects in this sample showed a greater benefit than those who scored lower on these traits. Such individuals may find that Yoga practice has important psychological benefits.

Aside from the enhancement of positive mood and decreases in negative mood, we observed increases in energy level for all three poses. This finding is consistent with the results of a study by Wood[22] who compared mood changes and perceptions of vitality in Yoga, relaxation, and visualization. Wood concluded that a 30-minute program of yogic stretching and breathing exercises can have a markedly invigorating effect on mental and physical energy as well as elevating mood.

Finally, the small sample size and relatively short period of Yoga training limited the power of this study to reveal strong effects within classes or over the nine classes. Firm conclusions about the nature of the effects cannot be drawn from this pilot study. The intent of the study was to probe more systematically into the processes involved in Yoga in general and specifically to develop methods of comparing different kinds of Yoga poses. The methods and preliminary findings are worthy of further investigation.

Conclusion

The practice of Yoga appears to result in increases in positive moods, decreases in negative moods, and increases in energy level regardless of the *âsana* practiced. Despite the effort and sustained physical exertion in Yoga, psychological well-being is enhanced after a Yoga class, which no doubt reinforces further participation. These effects tend to last at least for a few hours after a class. The specific poses also appear to result in differences in how moods are affected, although these results need to be replicated in a larger sample. The topic of social, psychological, and physiological mechanisms of movements is worthy of further attention. Moreover, the fact that mood changes may be in part dependent on one's characteristic coping styles deserves further investigation. Back bends appear to be effective in increasing positive moods in general and in individuals who are relatively hostile or depressed. Yoga should be investigated for its potential clinical application in mood disorders and depression and in the management of hostility.

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