

IMPROVEMENT IN STATIC MOTOR PERFORMANCE FOLLOWING YOGIC TRAINING OF SCHOOL CHILDREN

Shirley Telles, B. Hanumanthaih, R. Nagarathna, and H. R. Nagendra

Vivekananda Kendra Yoga Research Foundation, Bangalore, India. (Accepted March 22, 1993)

Summary - Two groups of 45 children each, whose ages ranged from 9 to 13 years, were assessed on a steadiness test, at the beginning and again at the end of a 10-day period during which one group received training in yoga, while the other group not. The steadiness test required insertion of and holding for 15 sec. A metal stylus without touching the sides of holes of decreasing sizes in a metal plate. The contacts were counted as errors during the 10-day period, one group (the 'Yoga' group) received training in special physical postures (asanas), voluntary regulation of breathing (Pranayama), maintenance of silence, as well as visual focusing exercises (tratakas) and games to improve the attention span and memory. The other group (control) carried out their usual routine. After 10 days, the 'yoga' group showed a significant (Wilcoxon's paired signed-ranks test) decrease in errors, whereas the 'Control' group showed no change. Certain postures such as that of a diver poised on the high board, immobile just before he springs into the air, require considerable muscular coordination even though the person is not actually mobile. The ability to maintain one's hand extended, yet steady is essential for a wide range of tasks.

Yoga is an ancient Indian tradition which through diverse physical and mental practices the practitioner strives to achieve a state of all around health. The practice of yoga has already been shown to be of therapeutic benefit in cases with psychosomatic ailments such as bronchial asthma (Nagarathna & Nagendra, 1985; Nagendra & Nagarathna, 1986). After 9 months of yogic practice, mentally retarded children also showed improvement in general mental ability, psychomotor coordination, and intelligent and social behaviour (Uma, Nagarathna, Nagendra, Vaidehi, & Seethalakshmi, 1989).

The present study was carried out with the aim of assessing whether Yogic training (for 10 days) would change the static motor performance in 45 school children as compared with an equal number of 'control' subjects, who did not practice Yoga but were also assessed after 10 days.

**Request reprints from Dr. Shirley Telles, Vivekananda Kendra Yoga Research Foundation, No. 9, Appajappa Agrahara, Chamarajpet Bangalore-560018, India.*

METHOD

Subjects

There were two groups, with 45 subjects in each, i.e., the 'Yoga' and the 'control' group. The 'Yoga' group had come to our research foundation in Bangalore to receive intensive training in Yoga for 10 days. Among the 45 there were 34 boys, and the group mean age was 11.3 (SD = 1.6 yr.). The 'control' group of students from a nearby school did not practice Yoga. In this group were 21 boys; the group's mean age was 12.0 (SD = 1.0 yr.). The design was explained to the subjects, and signed informed consent was taken

from their guardians in accord with the ethical principles of the Indian Council of Medical Research, New, Delhi, India.

Testing procedure

Hand steadiness was tested using the simple apparatus conventionally employed (Hunt, 1936; Munn, 1946), which was fabricated by Anand Agencies, Pune, India. This apparatus consists of a metal plate in which are nine holes of graded diameters (the largest diameter being 8 mm and the smallest 2 mm). A metal stylus is connected to the plate in series, with a counter which is activated whenever the stylus makes contact with the metal plate. The subject is instructed to insert about 2 cm of the metal stylus in each hole, keeping his arm extended without support, and then maintain the stylus in the hole for 15 sec. without allowing the stylus to make contact with the side of the hole. Then the stylus is withdrawn also without making contact with the sides. Subjects began the testing procedure with the largest hole first and then proceeded to the smallest one. The number of accidental contacts which the metal stylus made with the metal plate were registered on the electronic counter as the number of errors.

Design

Both groups ('Yoga' and 'control') were assessed initially on the test and again after 10 days. The groups' means were statistically compared using Wilcoxon's paired signed-ranks test. During the 10-day period the 'Yoga' group received training in Yoga whereas the 'control' group received no such training. This comparison was essential to ascertain whether merely repeating the exercise after 10 days would be enough to reduce the number of errors.

Training in Yoga

The 'Yoga' group received Yogic training for approximately 8 hours a day, which was aimed at all around (physical, mental, intellectual, and spiritual) development. The 10-day programme consisted of (1) Yogasanas, specialised physical postures which are meant to increase physical stamina and both physical and mental balance; (2) Pranayama or voluntary regulation and slowing of the breathing which is carried out to achieve a relaxed state of mind and to increase inner awareness; and (3) Kriyas, techniques which bring about cleansing of the internal organs (e.g., respiratory tract, abdominal muscles, and viscera). Among these, what was especially relevant to school children were eye-cleaning techniques (tratakas). The practice of tratakas involves concentration. For example, in some of the practices, the subject sits in a relaxed position, keeping the head straight. The arms are extended in different directions, with the gaze focussed on the tip of the index finger without moving the head. The periods of focussing are interrupted by periods of relaxation so that no visual strain is experienced. In addition to these specialised practices, the training also included games to improve the attention span and memory as well as the telling of meaningful stories to foster a sense of values and feelings of responsibility.

RESULTS

The number of errors made at Test 1 were approximately similar for both groups. The group mean (\pm SEM) for the 'Yoga' group was 221.2 ± 10.0 (errors) and for the 'control'

group 221.0 ± 8.1 (errors). At the end of 10 days, the 'Yoga group' had 183.3 ± 7.1 (errors), and the difference between this and the initial value was statistically significant ($p < .01$, Wilcoxon paired signedranks test, two-tailed). The mean of the 'control' group on Test 2 was 217.8 ± 8.3 ; this difference was not significant on a similar test. These results suggest that 10 days training in Yoga can on immediate retest significantly show improved static motor performance. Our speculation is that learning and practising the different physical postures (asanas) could have improved voluntary control and eye-hand coordination. The special visual concentration exercise (tratakas) might have improved concentration so attention would vary less during the task. Since all Yogic practices have the ultimate goal of calming the mind, the over-all relaxation might have been beneficial. A subsequent follow-up would have been desirable, and other types of control groups could be explored.

REFERENCES

- 1 Hunt, T. (1936): Measurement in psychology. New York: Prentice-Hall
- 2 Munn, N. L. (1946): Psychology. Boston, M.A. Houghton Mifflin
- 3 Nagarathna, R.. & Nagendra, H. R. (1985): Yoga for bronchial asthma: a controlled study. British Journal of Medical Research 291, 1077-1099
- 4 Nagendra, H.R. & Nagarathna, R (1986): An integrated approach of Yoga therapy for bronchial asthma: a 3-54 month prospective study. Journal of Asthma, 23, 123-137.
- 5 Uma, K. Nagarathna, R., Nagendra, H. R., Vaidehi. S. & Seethalakshmi. R. (1989): The integrated approach of Yoga: a therapeutic tool for mentally retarded children: a one-year controlled study. Journal of Mental Deficiency. Research, 33, 415-421

----- END OF 2nd RESEARCH DOC -----