



YOGA IN PHYSICAL EDUCATION

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Introduction

Yoga has a hoary past. Its importance for the spiritual attainment has been recognised throughout the ages by all the systems of Indian Philosophy. There is no doubt that the essence of Yoga has been considered in the spiritual upliftment of man.

One may question as to how then Yoga is related to the Physical Education and whether Yoga will not be pulled down from its highest pedestal in doing this. It is necessary, therefore, to clear our concepts of Yoga and Physical Education, first.

The Concept of Yoga

Although the word 'Yoga' has many connotations, etymologically it means 'Integration'. The term '*Samatva*' of Bhagwad-Gita conveys the same meaning. Other terms like homeostasis, equilibrium, balance, harmonious development etc. more or less suggest the same thing. The aim of Yoga itself is integration of personality in its all aspects.

In order to help the development of such an integration various techniques are employed. These techniques or practices enjoined in Yogic literature and handed down in different traditions also go under the name of Yoga.

The various yogic practices may be classified into (a) *Āsanās*, (b) *Prāṇāyāmas*, (c) *Bandhas* and *Mudrās*, (d) *Kriyās*, and (e) Meditation.

(a) *Āsanās*—These are certain special patterns of postures that stabilise the mind and body. They aim at establishing proper rhythm in the neuromuscular tonic impulses and improving the general tone of the muscles.

(b) *Prāṇāyāmas*—These are the practices for the control of respiratory impulses which form one of the main channels of the flow of autonomic nerve currents.

(c) *Bandhas* and *Mudrās*—These are special features of *Hatthayoga*. These consist of practices wherein one tries to consciously control more and more certain semi-voluntary and involuntary muscles in the body. In these muscles there is an integration of central and autonomic nerve supply. By bringing these muscles more and more under volition one could influence thereby the activity of the autonomous nervous system which functions as a whole. *Bandhas* and *Mudrās* help to tone up the internal organs, decongest them and stimulate their healthy functioning.

(d) *Kriyās*—These are cleansing processes usually classified into six divisions and therefore they are often called *Saṅkarmas* or *Saṅkriyās*. Each one of these consists of many sub-sections.

(e) *Meditation*—This is a continuum of mental practice involving from initial withdrawal of senses to the complete oblivion of the external environment. Literally, there are innumerable stages and practices which could be included under this head.

For undergoing yogic practices an adequate substratum is formed by resorting to a mode of self-imposed code of conduct technically known as *Yāmās* and *Niyāmās*. They form the very basis of Yoga and is considered to be essential part of yogic routine, howsoever on a mild scale.

The nature of all yogic practices is psycho-physiological. Some practices emphasizing control of mental processes directly are more psychological. Other practices are more physical or physiological. It is the latter part of the yogic practices that has become more popular and is being extensively used for the maintenance of health.

The Concept of Physical Education

Confusions, contradictions and misunderstandings have always existed concerning physical education and these persist even to-day. But more effective interpretation of the purposes and substance of physical education is being carried on to-day than in the past. Nixon and Jewett (1969) state that the aim of organized physical education is “to make the maximal contribution to the optimal development of the individual’s potentialities in all phases of life, by placing him in an environment which will promote the movement and related responses or activities that will best contribute to this purpose”. In the light of this statement physical education may be defined as an integral part of the total education process which endeavours at the development of physically, mentally, emotionally and socially fit citizens through the medium of physical activities. Thus physical activities are the means, while optimal development of the individual’s potentialities in all phases of life is the aim of physical education.

Keeping this aim in view several objectives have been formulated and revised literally thousands of times over the years. From a long list of general objectives from a variety of sources we could isolate two most important objectives—(1) Health and Physical fitness and (2) Emotional stability.

Common Objectives of Yoga and Physical Education

Health and Physical Fitness and Emotional Stability are the two objectives which bring Yoga and Physical Education on a common platform for the benefit of human individuals. Health is a more general and comprehensive term conveying the ‘feeling of well-being’, while physical fitness is a more specific term. Physical fitness is an organic fitness. It may be defined as ‘the capacity of an individual to perform a given task at a particular time.’ There are several factors of physical fitness. The important ones may be enumerated as—(a) Speed, (b) Strength, (c) Stamina (endurance), (d) Suppleness, (e) Stability, (f) Skill (neuro-muscular co-ordination).

Health and physical fitness are not static. They are always changing. They follow ‘the law of use and disuse’. Health and physical fitness can be maintained only by carefully selected physical activities which are called ‘exercise.’ The utility of a particular exercise programme can be evaluated only in terms of the effects that are obtained in promoting a particular factor or factors of physical fitness.

Evaluating Various Programmes of Physical Activities and Yogic Practices

There have been literally thousands of scientific investigations carried out uptill now for finding out the utility of various individual activities, systems of exercises, and several exercise programmes in developing different factors of physical fitness. Scientific books and periodicals are full of reports on the effects of these physical activities on the various systems of the human organism leading to health and physical fitness. However, we do not find many studies conducted on the yogic practices with a view to find their utility in promoting health and physical fitness. This seems to have reflected in an apathy toward Yoga and yogic practices by the workers in the field of physical education.

Yogic Practices in Physical Education Programme

Until five decades ago Yoga was shrouded in a mystery and some yogic practices were undergone by individuals here and there for spiritual purposes only. Swami Kuvalayananda



was the first person and the Kaivalyadhāma founded by him is the first institution who brought scientific evidence about the utility of yogic practices for the promotion of health and physical fitness.

Yogic practices were for the first time officially included in the syllabus of physical activities by the Physical Education Committee appointed by the then Bombay Provincial Government and headed by Swami Kuvalayānanda in 1937. Even before that attempts were made by the Uttar Pradesh Government to train physical education teachers in yogic practices for which help of Swami Kuvalayānanda was sought in 1932. Yogic practices are now being recognized as a part of physical education programme by all the States as well as by the Central Government in India. We know of some countries like Brazil, Argentine and Poland where interest in yogic practices has been shown by the Departments of Physical Education and taken steps to train physical education teachers in yogic practices. Though Yoga has become popular all over the world, physical education workers in many countries do not feel, Yoga to be accommodated in their regimen.

Although the field of yogic practices has not been sufficiently explored yet, whatever little work has been done brings home the fact that these practices could make an important contribution to the field of physical education.

It would be our endeavour to take a brief resume of the scientific investigations conducted on yogic exercises with a view to evaluate their utility in the field of physical education.

A Brief Resume of the Scientific Research Related to Yoga

The first pioneering attempt along the scientific lines to study the physiological effects of yogic practices was made by Swami Kuvalayānanda (1924 a and b). His studies published in *Yoga Mimasma Journal* occupy very important and unique position among the scientific works in Yoga done so far in the field. Later other workers like Therese Brosse (1964), Bagchi and Wenger (1959) Anand et al (1961) took interest and studied electrical activity of the brain during yogic meditation. Autonomic Nervous System activity among yogic practitioners was studied by Wenger and Bagchi (1961).

Individual yogic practices have been studied by Kuvalayānanda and Karambelkar (1956 a and b, 1957 a, b, c, d and e), Bhole and Karambelkar (1971 a and b), Rao (1962, 1963, 1968), Gharote (1971 a and b), Karambelkar et al (1969), Wallace (1970), Udupa et al (1975 a, b, c).

Therapeutical aspect of yogic practices has been very well brought forward by Kuvalayānanda and Vinekar (1963), Datey et al (1969), Tulpule et al (1973), Bhole and Karambelkar (1971 c, 1972), Gharote (1973 b), Gharote and Karmbelkar (1975).

Limited research seems to have been carried out regarding the effects of a selected routine of yogic practices on the improvement of physical fitness. It is now accepted by the authorities in physical education that yogic procedures are best to contribute to flexibility (De Vries, 1967, Smithells and Cameron 1962). The experimental evidence comes from the studies of Herbert de Vries (1961 a and b, 1962), Dhanaraj (1974), Gharote (1973). But that other aspects of physical fitness are also equally favourably influenced are rarely known. From our own investigations we present herewith some interesting results.

Table A exhibits the results of the improvement among the failures of Kraus-Weber Tests after yogic training. Kraus-Weber Tests are minimum muscular fitness tests in which six items are included to measure strength of (1) abdominal plus psoas muscles, (2) abdominal muscles without the help of psoas, (3) psoas and lower abdominal muscles, (4) upper back muscles, (5) lower back muscles, and (6) the length of back and hamstring muscles. These are pass or fail tests and person failing in one item of the test is scored a failure on the test. No allowances are made for partial scores. In a survey of minimum muscular fitness on Indian school children it was reported by Gharote and Ganguly (1975) that 40.3% students failed in Kraus-Weber tests. Since the particular key muscular groups used in Kraus-Weber Tests are better attended to in yogic exercises, it was thought of conducting a pilot experiment. This

experiment was conducted on 9 students who failed in a survey of 70 boarding students from the local high school when tested for their fitness by Kraus-Weber Tests. A comparison of experimental group of 4, undergoing yogic training for three weeks, with the control group of 5 on the basis of chi-square showed significant improvement in the experimental group suggesting some utility of yogic exercises in improving the status of these failures (Gharote, 1976 b).

TABLE A

Classification of control and experimental groups from the Failures of K-W Test according to 'Improved' and 'Not-improved' conditions due to yogic exercises.

	Improved	Not improved	Total
Control Group	0 (2)	5 (3)	5
Experimental Group	3 (1)	1 (3)	4
Total	3	6	9

(Note—Bracketed figures show expected values on the basis of the independency of two classes).

chi-square=8.66

$p < .05$

TABLE B

Effect of yogic training programme on the Achievement in Physical Fitness Index derived from the Fleishman Battery of Basic Fitness Tests.

	Control Group			Experimental Group			Diff.	t value
	N	Mean Achievement.	S.D.	N	Mean Achievement.	S.D.		
Physical Fitness Index	19	+1.78	4.78	19	+6.21	3.46	+4.43	2.326 $p < .05$

In Table B the effects of a short term yogic training programme of three weeks (18 sessions of 30 minutes each) on the general physical fitness level of the boys students of a secondary school are shown. General physical fitness is expressed by the physical fitness index derived from the Fleishman Battery of Basic Fitness tests (Fleishman 1964). The test items of the battery and the fitness aspect measured by each test are as follows :

Test Item	Fitness aspect measured
(1) Extent Flexibility.	Extent flexibility.
(2) Dynamic Flexibility.	Dynamic flexibility.
(3) Shuttle Run.	Explosive strength. (leg emphasis)
(4) Softball Throw.	Explosive strength. (arm emphasis)
(5) Hand Grip.	Static strength.
(6) Pull-ups.	Dynamic strength.
(7) Leg lifts.	Trunk strength.
(8) Cable Jump.	Gross body co-ordination.
(9) Balance.	Gross body equilibrium.
(10) 600-Yard run.	Stamina or Cardio-vascular efficiency.

As will be seen physical fitness level improved significantly in the group undergoing yogic training. This shows that yogic training contributes to the development of different basic factors of fitness besides flexibility. Further experimentation showed delayed effects on various other measures, after discontinuation of the yogic training for the same period of practice.



TABLE C

Comparison of Fitness Index derived from Harvard Step Test Before and After Long Term Yogic Training.

Test	N	Initial Mean	Final Mean	Mean Diff.	SEM Diff.	t value	Sig. level
Harvard Step Test	11	78.636	86.272	+7.636	2.439	3.131	p<.05

Table C depicts the picture of cardio-vascular efficiency influenced by a long term yogic training (Ganguly & Gharote, 1974). These results were obtained on the male students of the G. S. College of Yoga, Lonavla who underwent yogic training for 9 months during which period they did not engage in any other vigorous physical exercises except yogic routine. Programmes of vigorous and resistance exercises are usually advocated for the improvement of cardio-vascular efficiency. But yogic training programme which is not a vigorous one, also helps to improve the cardio-vascular efficiency is a new finding. This seems to be a great contribution of yogic practices. These results were also confirmed in another study conducted by us with short term yogic training programme.

This study was conducted on the trainees of the Regional Police Training School, Khandala. Yogic training was imparted to the experimental group for 9 weeks keeping a control group for comparison who did not undergo yogic training. The routine physical activities in the School were commonly engaged in by both the groups. The results presented in Table D will show the significant improvement in the experimental group undergoing yogic training.

TABLE D

Harvard Step Test Fitness Index in Control and Experimental Groups after a period of nine weeks.

Item	Control Mean	Group SEM	Experimental Mean	Group SEM	Diff. Mean	t value
(1) Initial score.	79.19	2.93	78.47	2.36	0.72	0.19 NS
(2) After Exptl. period.	64.56	2.31	100.66	3.03	36.10	9.47**
(3) Diff. bet. initial score and score after exptl. period.	-14.64	3.73	22.19	3.84	36.82	6.88**

(t=3.92)** (t=5.78)**

** Significant at .01 level.

Emotional Stability

This is an important aspect of personality. Mental health depends on it. Although Yoga and physical education, both, strive to attain this objective through their programmes, yogic approach seems to be more sound and effective. Apart from the practices like *Yamas* and *Niyamas*, meant for training and conditioning of attitudes, the nature of so-called physical practices like *Āsanās*, *Prāṇāyāmas*, etc., contributes to emotional training by influencing autonomic nervous system and endocrinal system. Various studies reported by Vijayendra Pratap (1968), Kocher and Pratap (1971 a and b, 1972), Kocher (1972 a and b), Palsane and Kocher (1973), Gharote (1962) showed favourable results of short term yogic training on mental health. Our own studies on school children evaluating the psycho-physiological effects of short term yogic training programme on the working of the autonomic nervous system, using a sophisticated and elaborate battery of Wenger's Autonomic Balance, brought evidence about the utility of yogic exercises towards improved emotional stability (Gharote, 1971 c). A summary of results has been presented in Table E.

TABLE E

Effect of Yogic Training on Autonomic Balance Score.

	Control Group N=22		Experimental Group N=22		Control Group v/s Exptl. Group Diff. Mean	t value	p
	Achievement		Achievement				
	Mean	SD	Mean	SD			
Autonomic Balance Score	5.92	9.91	13.44	7.62	+7.92	2.977	<.01

Wenger on the basis of factor analysis developed a method of studying autonomic balance which has a relationship with personality and other aspects of behaviour (Wenger, 1947, 1948). He called the estimates of this autonomic factor as "Scores of Autonomic Balance". Scores more than one sigma unit of 10 above the mean score of 69 were regarded as manifesting an apparent predominance in function of the para-sympathetic nervous system and scores of lower than one sigma unit were believed to demonstrate an apparent predominance in function of the sympathetic nervous system. Wenger (1956) observed that extreme children in the group of higher sympathetic activity (lower scores) were found to be easily excited to emotional behaviour, while those at the parasympathetic end were more calm. He states, "in general, good physical health and psychological adjustment will be associated with higher scores, while deterioration in psychological adjustment or some physical disorders will result in lower scores." On the basis of the above results, it would seem appropriate to assume that the yogic training tends to contribute to calmness of mind and stability of emotional behaviour.

Thus on the basis of some of the scientific investigations with yogic training programme, it would be clear that Yoga can play prominent role in achieving the objectives of physical education.

Apart from the contributions described so far, a few more special features of the yogic exercises may be summarised in passing.

(a) *Health of Spine*—Yogic practices render the spine supple and strong which is indicative of youth and vigour.

(b) *Care of Vital Organs*—There are excellent practice in Yoga like *Uddiyāna*, *Nauli*, *Kapālabhati*, *Mayūrāsana*, *Shalabhāsana* which influence directly on the vital organs of the thoraco-abdominal cavity and improve their function.

(c) *Scope and Limitations*—There are practically no limitations for the practice of Yoga.

(d) *Individualistic Nature*—Yogic practices are individualistic and can be performed without the requirement of any equipment or partner. They are suitable for all individuals of all ages and for all times.

Conclusion

Physical education is considered as an eclectic science. It tries to be benefitted from the facts and conclusions of different fields. It is hoped that on the basis of the scientific evidence presented and indicated here, physical educators will derive maximum benefit from this important discipline of Yoga, which is getting worldwide popularity, by including it in the curriculum of physical activities.

Yoga teachers with the technical know-how of the subject should also come forward to convince the utility of Yoga for the profession of physical education and help to train the teachers and workers in physical education, taking into consideration their special problems and interests. This will clear up many misunderstandings on both sides and will ultimately result in the good of the society.



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