INTRODUCTION

Although swordsmanship can be traced back to ancient civilizations, the inclusion of fencing in the first modern Olympic games (Athens 1896) secured its status as a major sport. The art of epee fencing is based on the principle 'hit opponents without being hit or self'. The resulting spectacle may be described as a game of chess played at high speed. Epee is fenced on a piste 18 m in length and 2 m wide, and competitions can last for 2 days with the fencer often being active for 8-12h on each competition day. Unlike many major spectator sports such as soccer, athletics and swimming, there has only been limited research into fencing. Moreover, attempts to correlate success in fencing with certain motor and perceptual skills, such as reaction time, accuracy and balance, have been far from conclusive.

Fencing is an elegant, prestigious and traditional sport which reflects the success qualities that are important to contemporary people who seek a challenge to both body and mind through a competitive blend of patience and determination, discipline and competitiveness. In fact, fencing is also referred to as physical chess by many proponents. While there may be a relevant comparison here, the physical aspect of fencing is underestimated more often than not in this analogy. Fencing is a game of the mind but it does require immense forethought, precise execution and great focus. Nonetheless, fencing is a game that demands physical power, agility and flexibility.

Professional fencers spend a lot of time being physically fit. The training routine involves exercises, weight training and stretches. Over the years, the importance of physical fitness has not been given as much importance by the athletes as it should be given. Individually, fencers do their regular runs, weight lifting and follow various other exercise routines while they should ideally be following a more specific routine to improve their fencing skills.

With fencing, a fencer needs to hone his basic responses, have a certain level of physical fitness and mental strength. The main muscles that allow balance, agility and coordination are the ones to be focused on in a sport such as fencing. These are independent of cardio-endurance, standard muscularity and body-fat ratio.
Fencing has many features and skills. Fencer should have to be distinguished by from other sports because it requires a great efforts in specific time with ability to do his best continually at uneven periods for one or two days. Therefore, there is need to develop special training program for fencers to attain the basic physical fitness and concentration which is a key for success in fencing competitions. In this context it was thought to introduce yogic exercise program as a training part for elite fencing players, because numerous studies demonstrated that Yoga has many physiological and psychological benefits (Cowen & Adams, 2005; Schure, Christopher & Christopher, 2008). In fact, Yoga is a significant part of worldly philosophy. It is an ancient Indian system which helps to keep person physically and mentally fit. It has been scientifically proved that yoga helps to improve concentration which is a key factor for achieving success in competitions like fencing. In this investigation, therefore, an attempt has been planned to see the efficacy of yoga training on performance related fitness, concentration skills, personality and concentration of state level fencing players.

**Statement of the Problem**

In many branches of sport there are some similar traits, tasks, abilities etc. And yet there are many differences. In some branches of sport there are many closed (intrinsic) sensory-motor skills and most important is perfect execution of different movements (e.g. gymnastics, figure skating etc.). In other branches of sport there is only one closed motor skill and the task is to achieve best results (field and track events, weight lifting, swimming etc.). In these disciplines of sport there is no body contact (direct fight against) with an opponent. However, fencing and other combat sport and team games are known as body contact events (direct fight against opponent) and thus very important role of psychological and physical abilities seems to be very important to win. Nonetheless, in fencing the correct and fast execution of movement is not enough but fencer in a bout must know, when and how to apply a given action. The fencer must choose the appropriate action and reaction in most suitable situation and this requires physical fitness, skills, concentration and reaction time within a calm and quite mental set up.

Moreover, constant attention/concentration is one of the main requirements for good performance in any sports. In fact, fencing needs high level of attention that becomes an important trait that
characterizes each skill of attack and parry. Although there are number of research reports available exploring various training strategies for improving performance and tactical skills in fencing but studies in relation to yoga in this direction is so far meager. In fact, traditional yoga practices consist of asanas and relaxation techniques which can be helpful to improve the performance abilities of fencers. Hence, the researcher has planned this study entitled “Effect of yoga exercises on performance related physical fitness, reaction time and concentration of elite fencing players”.

Problem and its Relevance

Fencing is an open-skilled combat sport that was admitted to the first modern Olympic games in Athens 1896. Modern fencing competition consists of three different weapons: the foil, the sabre and the épée, each contested with different rules. The actual matches represent only 18% of total competition time, with effective action time being 17 and 48 minutes. The physical demands of competitive fencing require a high level of aerobic and anaerobic conditioning. Further, the research reports indicate that body composition is an important aspect in relation to an athlete's performance (Clarke et al., 2003). The ideal body composition varies by sport, but in general, the less fat mass, the greater the performance potential. Previous studies (Vender et al., 1984; Goldberg and Elliot 1985) have demonstrated that success in fencing depends more on technique, speed, and agility as opposed to a high aerobic capacity and low percent body fat percentage. Although the findings of the study may be true, numerous studies (Guizani 2006; Satoru et al., 2007; Durstine 2008) confirmed that aerobic training increases the fencers’ reaction times, their attention capacities.

Further, in fencing purposeful and efficient application of technical and tactical capabilities depends upon the specific energy and co-ordination abilities, technical skills and degree of psychological preparedness. In fact, undue nervousness, over-excitation, lack of confidence, overestimation of the opponent’s strength, apathy, insufficient warming up, prevalence of inhibitory processes – all these factors may hamper the fencer in conducting a tactical bout, realisation of tactical solutions, and display of his technical abilities. Generally it is accepted that when a fencer catches his opponent by surprise, when the opponent is off balance
and not fully concentrated, that fencer has chosen the right “tempo”. Everybody knows that it is extremely difficult to sustain the highest concentration of attention for a very long time, and invariably lapses of attention occur in a bout: a fencer, concentrating on his own attack, may forget about his defence; a competitor, manoeuvring on the strip, may expose himself dangerously to his opponent’s action; a fencer, executing blade movements, may open certain lines of his target – such and similar situations may be taken advantage of for surprise action. The ability to recognise, and instantly take advantage of, such situation is usually inborn, but it may be further developed by special exercises.

Hence, the researcher of this study thought to introduce yoga training for fencers because yoga is a mind-body medicine which encompasses a range of methodologies that may be beneficial to the health of practitioners. Yoga is commonly practiced mind-body approach that has components centering around meditation, breathing, and activity or postures. In recent US surveys of adults, 7.5% reported having used yoga at least once in their lifetime and 3.8%–5.1% reported having used it in the previous 12 months (Saper et al., 2007 and Barnes et al., 2004).

Hatha, yoga techniques, is a system for developing physical and mental well-being through stretching of all muscle groups for strength, flexibility, and physical balance. A person assumes a series of stationary positions that use isometric contraction and relaxation of different muscle groups to create specific body alignments. There is also a deep relaxation component.

There are at least 2 mechanisms by which the practice of yoga or exercise may improve cognitive ability. Both may serve to improve mood and reduce stress. Lowered mood is associated with declines in cognitive function and hatha yoga has been reported to produce improvements in mood comparable to aerobic exercise (Berger and Owen, 1992 and Berger and Owen, 1988), so this is one potential mechanism. Additionally, the practice of yoga emphasizes body awareness and involves focusing one’s attention on breathing or specific muscles or parts of body, so it is possible that yoga may improve more general attention abilities. It is not a far leap from Yoga Sutra (1.2), which says that “Yoga is the control of the whirls of the mind (citta), to consider attentional focus as a major aspect of yoga practice. It is unknown whether the attentional practice in yoga would generalize to conventionally assessed attentional function. Furthermore, potential effects of yoga for physical health are numerous; including improved
physical fitness (Armstrong & Smedley, 2003; Gharote, 1976; Mandanmohan et al., 2003; Raub, 2002; Ray et al., 2001; Telles et al., 1993), and improved cardiovascular health (Jayasinghe, 2004; Shannahoff-Khalsa et al., 2004). Scientific evidence indicates that yoga may be useful for musculoskeletal health, (Garfinkel & Schumacher, 2000) Psychologically, yoga may reduce hostility (Bhushan & Sinha 2001), improve mood (Lavey et al., 2005; Netz & Lidor, 2003), and reduce stress (Bower et al., 2005; Carlson et al., 2004; Gura, 2002; Shapiro et al., 2005). Traditional yoga theory indicates that the effects of yoga are due to its combined impact on the mind and body. Yoga practice teaches an individual new behaviors – physical activities (exercises and breathing practices), which can be implemented in order to manage responses and reactions. These altered responses and reactions facilitate improved outcomes. Moreover, yoga practice teaches an individual new cognitions – new ways of perceiving, judging, and assessing their circumstances. The alteration of thoughts and actions helps the yoga practitioner to achieve psychological balance in the present moment, which leads to health and well-being.

However, despite yoga’s wide popularity, there are limited numbers of randomized, controlled yoga studies in the field of sports especially in fencing. Hence, looking at the potential benefits of yoga researcher has planned this study for fencers.

Objectives of the study

- To measure physical fitness components of elite male state level fencers.
- To assess the reaction time and concentration ability of the fencers.
- To measure the fencing skill of the fencers.
- To design specific yoga schedule especially for the fencing players.
- To see the effect of yoga training on the said variables viz., physical fitness, fencing skill, reaction time and concentration level of the fencers.

Hypotheses

H₁: There would be significant improvement in physical fitness skill abilities of the elite fencers as a result of yoga training.
H$_3$: The yoga training may reduce reaction time level among elite fencers.

H$_3$: The yoga training may improve concentration ability of the fencers.

**Delimitation of the Study**

- This study will be delimited to the state level elite fencing players of age 14 to 18 years.
- This study will be delimited to selected variables viz., physical fitness components, fencing skills, reaction time and concentration.
- This study will be delimited to 60 elite male fencers belonging to the state of Maharashtra.

**Limitations of the study**

- Yoga training session will be limited to only one-hour daily, which may not be at par with the requirement for the fencers.
- Total duration of the experiment will be limited for six weeks only, which may not be sufficient to record improvement in the variables.

**Operational Definitions of the Terms used**

**Fencing and Elite Fencing players**

The history of fencing parallels the evolution of civilization, back from the days of ancient Egypt and Rome, to the barbaric Dark Ages, to the fast and elegant Renaissance, up to the modern, increasingly popular fencing of today. Fencing has always been regarded as more than a sport; it is an art form, an ancient symbol of power and glory, and a deeply personal, individual form of expression. Fencing is and always has been an intrinsic part of life, from the dueling and battle of yore to the widely captivating movies and facets of popular culture such as
Zorro and The Princess Bride. The earliest evidence of fencing as a sport comes from a carving in Egypt, dating back to about 1200 B.C., which shows a sport fencing bout with masks, protective weapon tips, and judges. However, elite fencing players are those who have much exposure in participation in the sport.

Yoga

This is a discipline of systematic practice of different kinds of postures (Asana), breathing (Pranayam) and meditation, which primarily aims at providing health and physical fitness at psycho-physiological level.

Concentration

It is one’s ability for sustained attention to do any work.

Reaction time

The time between a stimulus and the concerned action is known as reaction time. Reduction in reaction time implies better performance.

Performance related physical fitness

Physical fitness is an ability to perform any task without undue fatigue. Physical fitness has many components viz., strength, endurance, flexibility, agility, balance, coordination etc. Nature of task ensures the requirement of various physical fitness components. This indicates that various types of physical activities require different types of fitness components. In this study, to achieve better state of fencing performance the required level of fitness is known as performance related physical fitness.

Fencing skills
To exhibit fencing performance, the fencers perform a technique individually or in combination of many techniques is known as fencing skill.

**Significance of the Study**

- The finding of this study may benefit to all the fencing players and even to other sportsman, since they can use yogic exercise to improve their suppleness of body.
- Boys aged between 14 to 18 years can take advantage of the yoga postures and breathing exercises to improve their flexibility, endurance, lungs capacity, concentration, neuro-muscular co-ordination which are essential factors to improve their physical fitness and concentration.
- Fencer as well as athletes may be benefited with the inclusion of yoga in their training schedule.
- The newly designed training schedule of yoga as a result of this study may be beneficial exclusively for the students participating in fencing event.
- As yoga deals with the mental and emotional balance, it is expected that the result of this study may help the elite fencers to retain a state of mental and emotional balance during the difficult practical situation and even for accomplishment of task with academic load.