CHAPTER 1

INTRODUCTION
The use of tobacco, as cigarettes, cigars, snuff, or chewing tobacco, is a form of recreational drug abuse. Use of recreational drugs by athletes closely follows trends established in society. Hallucinogens in the sixties, marijuana in the seventies, and cocaine in the eighties represent the primary focus of drug abusers in recent years. Drug use and experimentation primarily occurs in late adolescents and young adults. These age groups are also those primarily involved in amateur and professional sports. The recreational use of drugs by athletes, however, is magnified by the close media coverage given to those individuals in sports.

"The trainers would bring your medication to your hotel room the night before the game. Empirin compound for men in pain, amphetamine for men expecting pain, specialty drugs for players with chronic injuries, experimental drugs for those who had little body left to sacrifice, including butazolidin for joint pain (a drug also used to treat horses) and of course, sleeping pills."

The above quote certainly was not the first written evidence of man's attempts to modify performance using drugs. An apple for Adam and Eve, mushrooms in the third century B.C, sesame seeds in ancient Greece, bufotein of the legendary Berserkers in Norwegian mythology, coca leaves in South America, pituri of Australian aborigines, and large amounts of coffee for the Army of the Potomac during the Civil War all represent man using current

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day knowledge of drugs to increase his ability to perform. Men in general, not just athletes, have always tried to use drugs to elevate the quality of life and the performance of the body.

Modern drugs moved out of the area of health care and into the realm of recreation and self medication during the sixties. Dr. Timothy O'Leary, with the help of the press, publicized the recreational use of drugs.

WHY DO ATHLETES ABUSE DRUGS?

The competitive nature of sports is a powerful driving force for athletes to utilize the advances of modern-day science to improve performance and gain a competitive edge. Modern-day athletes have lucrative salaries or scholarships at stake or carry the honor of their school or country when competing. These factors only enhance the competitive nature of man. All types of advances, from batting gloves to fiberglass poles for pole vaulting, have become accepted in order to improve sports performance. The use of pharmacological agents by modern athletes to improve performance is an expected outcome of the availability of powerful new drugs and the social acceptance of self-medication. To the athlete, the benefits of drug abuse outweigh the perceived risks.

Athletes have used a variety of erogenic aids. The erogenic effects can take many forms. Mechanical, pharmacological and psychological aids have been developed over many years to maximize performance. Man may be approaching his natural limit of

performance. World class competitors achieve a world record or become world champions with very small changes in performance. There is a great deal of concern among athletic groups that competitors will develop a new manner in which to have a competitive edge. This causes an ever-strengthening circle of events involving the trial use of new and more powerful pharmacological agents.

Intense competition often creates a lack of self-confidence and insecurity in athletes. The chemical boost, whether psychological or ergogenic, becomes an important part of some athlete's ability to continue competing and to deal with competition in spite of self-perceived deficiencies. The use of recreational drugs in athletes may also be a stress-related problem, such as is common for any mental or physical performance oriented profession.

Athletic competition frequently results in overexertion or injuries. These can have a major impact on performance levels. The availability of drugs that can mask injuries and allow the athlete to continue to perform will provide a short-term solution to the problem of overcoming an injury. Unfortunately, this also frequently leads to increased damage to the tissue and a shortening of a sports career. The chewing of tobacco among young teenagers has become a major concern of the medical community. Many sports figures chew tobacco and several have recently been

highlighted in commercials. Because sports figures serve as role models, there is concern about their use of chewing tobacco in the light of the increasing numbers of young adolescents chewing tobacco.

"Tobacco drieth the brain, dimmeth the sight, vitiateth the smell, hurteth the stomach, destroyeth the concoction, disturbeth the humours and spirits, corrupteth the breath, induceth a trembling of the limbs, exsicateth the windpipe, lungs, and liver, annoyeth the milt, scorchoth the heart, and causeth the blood to be adjusted".

Tobias Venner
Via recta ad vitam Longam, 1638.

This very night I am going to leave off tobacco! Surely there must be some other world in which this unconquerable purpose shall be realized.

Charles Lamb, 1815.

The custom of smoking dried tobacco leaves spread from America to the rest of the world after European colonization began in the sixteenth century. Given the deleterious effects of tobacco on cardiovascular, respiratory, and other body systems, coupled with its addictive properties and widespread use, it is perhaps the most dangerous of all psychoactive drugs. Its effects are soothing and tranquilizing, and under appropriate circumstances there is also a stimulant action. Physiological and psychological dependence occur, and there are severe withdrawal symptoms, a
craving for tobacco, that makes this among the most refractory of all addictions.

Smokers continue to smoke for several reasons. Some smoke for enjoyment or social reinforcement, and some to alleviate stress. Many young people perceive smoking as an attribute of maturity or sexual desirability. Pharmacological factors interact with stimuli in the social environment—social reinforcers—so that after many thousands of repetitions of inhaling tobacco fumes, confirmed smokers are inseparable from their cigarettes.

Heavy smokers who abruptly cease smoking, experience a withdrawal syndrome of irritability, aggressiveness, hostility, depression and difficulty in concentrating. These symptoms may last several days or even weeks and are accompanied by electroencephalographic changes. Many smokers who have such symptoms relapse when they try to quit.

Prevalence of the Tobacco habit

Some 50% or more of adult men are dependent on some form of tobacco use. Smoking is the preferred habit in men. In most groups, less than 5% of women are smokers, except, for example, in certain areas of Bangladesh, India, Nepal and Thailand, where a much higher proportion of women indulge in the traditional forms of smoking characteristic of the region. In some of the countries mentioned above chewing of tobacco is also prevalent, particularly among women.

In China about 25% of the men are addicted to tobacco smoking before they reach the age of 18 years and in India roughly a third are addicted before reaching the age of 20 years, though there is a considerable regional variation. Egypt reports less than 1% of smokers in both males and females under 14 years of age, but the proportion increases with age, stabilizing at 14% in urban males and 31% in rural males over the age of 40 years. The frequency of smoking varies widely from country to country.

A study in India has shown that between 1969-1989 6-10% of the study populations (10,1830 rural inhabitants) acquired the tobacco habit. More males began smoking tobacco than chewing it. Most of those who acquired the tobacco habit were in the younger age group. Reports from several countries show that smoking is prevalent among school children, though more among boys than girls. In the past few years in Asia alone per capita consumption of Tobacco among adults has increased by 22%.

In the United States, over 59 million people smoke, and each year nearly 400,000 people die prematurely from tobacco-related diseases. About 40% of the United States' population


smoked; in 1987, it was 29%. Smoking is higher among men (32% smoke) than among women (27%); it is also higher among African Americans (34%) than among whites (29%). Smoking is inversely related to level of education. 36% of those with less than a high school education smoke compared to 33% with a high school education, 26% with some college and 16% who graduated from college. There also is a similar pattern of higher smoking rates among blue-collar and service workers compared to white-collar workers. Tobacco use is influenced heavily by the tobacco industry's $2 billion annual advertising and marketing campaigns. Women, minorities, blue-collar workers, adolescents and even children are bombarded by clever, often insidious, marketing and advertising gimmicks.

The profile of smokers is changing. Today, smokers are more likely to come from minority groups and from women. They are likely to have at most a high school education and to be blue-collar workers. First approximately 50 million American adults, or about one in three, still smoke, and 2 to 3 million young people aged 12 to 17 are currently cigarette smokers.


Second, African Americans represent the nation's largest minority group. They have the highest smoking rates and lowest quit rates of any ethnic/racial group; 35% of African Americans smoke. African Americans also suffer the highest rates of morbidity and mortality in the United States from smoking-related diseases, including lung cancer and cardiovascular disease. Although African Americans smoke fewer cigarettes, they are more likely to smoke brands with higher tar/nicotine yields. The higher smoking prevalence among African Americans probably can be explained by the fact that they are more likely than white smokers to be low in income and low in education. It appears that African Americans and whites are equally likely to have ever smoked, but African Americans are less likely to have quit, regardless of socio-demographic factors.

Third, there is special concern for the heavy smoker, that is, someone who smokes 25 or more cigarettes a day. There are more heavy smokers today than ever before. A heavy smoker is 15 to 25 times more likely to die of lung cancer than a nonsmoker.

Fourth, numerous surveys and studies have shown that smoking is most often initiated during the junior and senior high school years.

Fifth, one of the most disturbing trends in tobacco use by young people is the increasing use of smokeless tobacco—snuff and chewing tobacco. Smokeless tobacco users are the fastest growing group of tobacco users, and the pattern of use is steadily shifting from older to younger users. Currently 16% of males between the ages of 12 and 25—over one million people—have used smokeless tobacco in the preceding year, 5% to 8% or about 6.13 million, are regular users (at least once a week). Use varies widely across the country. Boyd and co-workers, in a recent review reported that less than 7% of sixth-grade boys in New York City but more than 68% of sixth-grade boys in rural Montana were users.

Tobacco is the greatest preventable cause of death in American women, and is responsible for 125,000 deaths per year. Women began smoking during World War-II and have been more resistant to quitting than men. Lung cancer now has overtaken breast cancer as the number one cancer killer of women.

Overall, 26.8% of women smoke, but that disguises considerable subgroup differences. As education rises, women are more likely to be 'never smokers' or 'former smokers' than 'current smokers'. Smoking among college graduates has dropped by half since 1966, while smoking among those with less than high school education has hardly changed.

Women seem to have special problems in quitting (although this is not well documented). This may be due to lack of social support for quitting, fear of weight gain and greater reliance on cigarettes for stress control. It is not yet known to what extent this reflects gender differences in the physiologic mechanism of addiction, social or behavioral factors or a combination thereof. Except for adolescent females, since 1979, smoking cessation trends among women have approached those of men.

Until recently, older smokers were all but ignored. Yet, there are thirteen million smokers aged 50 and over and eight million smokers aged 60 and over. A nation wide survey of American Association of Retired Persons (AARP) members showed that 26% of the older respondents had never tried to quit smoking.

Total deaths from tobacco-related causes will continue to rise especially in Asia, Africa and South America where cigarettes are heavily advertised and marketed. For example, in Thailand, 65% of men over the age of 20 now smoke, and one out of every five male cancer patients is afflicted with lung cancer. In China, 61% of males over age 15 are smokers; it is estimated that by 2025, two million Chinese will die annually from smoking.


Morbidity and the shortening of life

Death rates are uniformly higher among smokers than among non-smokers, in both sexes and whatever the age at death. The excess mortality of cigarette smokers is proportionately greater at ages 45-54 years than at younger or older ages. Some studies have shown that excess deaths are higher in smokers of plain cigarettes than in smokers of filter cigarettes. Cigarettes with a high yield of tar and nicotine have also been shown to be more dangerous than those with a low content of these substances. However, even smokers of cigarettes low in tar and nicotine have higher death rates than do non-smokers.

Pipe and cigar smokers, who do not usually inhale, are exposed to lower health risks than cigarette smokers, who usually do, and it has been suggested in some countries that cigarette smokers who are unable to stop should change to smoking pipes or cigars. It has, however, been found that some cigarette smokers continue to inhale when they switch to pipes or cigars. Thus the risk of their developing lung cancer, ischaemic heart disease, or chronic obstructive lung disease is not diminished but probably increased.


A smoker doubles his risk of dying before the age of 65. The higher death rate in smokers is related to the number of cigarettes smoked, the age of starting, and the degree of inhalation.

The diseases most commonly associated with cigarette smoking are lung cancer, bronchitis and emphysema, and ischaemic heart diseases and other diseases of the vascular system. Between them they account for 80% of the excess mortality. Other diseases that are significantly commoner in smokers are cancer of the lip, tongue, mouth, larynx, pharynx, oesophagus and bladder. Gastroduodenal ulcer occurs twice as frequently in smokers as in non-smokers. Cigarette smoking has been shown to accelerate gastric emptying which could be important in the pathogenesis of duodenal ulcer and for the well-recognized delay in the healing of peptic ulcers.

It has been calculated that in countries where smoking has been a widespread habit, it is responsible for 90% of lung cancer deaths, for 75% of bronchitis deaths, and for 25% of ischaemic heart disease deaths under 65 years of age in men. In women the proportions may be somewhat less. In Britain this has led to the calculation that about 25,000 deaths a year under the age of 65 are directly due to cigarette smoking. Without


cigarette smoking it is likely that the total cancer death rate could be reduced by a quarter.

Apart from its effects on the mortality rate, smoking results in a considerably increased morbidity rate, with its consequent loss of working days, absenteeism and excessive demands on medical services, both for primary and for hospital care. The cost to the community of premature death, increased illness, and loss of productive capacity resulting from cigarette smoking is very high in countries where the habit has been common for a long time.

THE DYNAMICS OF THE SMOKING EPIDEMIC

The spread of the smoking habit has occurred like an epidemic. The habit has spread from country to country, from continent to continent, and even between different population groups within the same country. While tuberculosis has been decreasing in most countries, there has been a rapid increase in smoking-related diseases, of which lung cancer is the most striking example. These trends vary from country to country.

Deaths from all causes, including accidents and poisoning, were estimated as being more numerous among smokers than among ex-smokers and non-smokers. Higher mortality and incidence rates for coronary heart disease have been found among


smokers in general even among women smokers, especially those also
using oral contraceptives. Smoking is regarded as a high-risk
factor for intermittent claudication and a possible risk factor
for cerebral stroke and for cerebrovascular complications in
both men and women. Previous smoking has been linked with
atherosclerotic and early atherosclerotic changes in the aorta,
coronary arteries, and myocardial arterioles. The leading role
of smoking as a causative factor in the development of lung
cancer and cancer of other sites has also been confirmed and not
only for men, but also for women.

The most noxious components of tobacco smoke are tar,
carbon monoxide and nicotine. The carcinogenic role of tar is well
established. Nicotine and carbon monoxide, particularly,
contribute to increased risk of cardiovascular disorders through
the enhancement of blood coagulation in the vessels, interference
with myocardial oxygen delivery, and reduction of the threshold
for ventricular fibrillation.

1980.
28. Bell, B.A. & Symon, L. British Medical Journal, 1:577,
1979.
1979.
The role of smoking as a factor causally related to chronic bronchitis has also been clearly demonstrated. Among smokers, prevalence of regular cough and sputum production was significantly higher than among ex-smokers and life-long non-smokers. A noticeable impairment of lung function and physical performance occurs in smokers, and improvements are seen after cessation of smoking.

The considerable risk of lung and respiratory diseases (chronic bronchities) developing in children who are obliged to breathe air polluted with tobacco smoke has been reported, the degree of risk depending on the number of smokers in the family. Passive smoking is regarded by some authors as a possible risk factor for the development of lung cancer in non-smokers and as an additional risk factor—in combination with some environmental conditions, e.g., cooking in a small enclosed space by kerosene stove and occupational hazards for the development of other cancers.

The effect of smoking on nervous, digestive, respiratory and cardiovascular systems is a well known fact. It is common knowledge that smoking, when resorted to over a long period, may decrease the airway conductance, lung diffusing capacity, efficiency of the heart and may increase the blood pressure. These

in turn will reflect on a person's ability and efficiency in performing the tasks assigned, even though such impacts on the persons of general category may be considered as subnormal work. The task still can be completed with some delay. However, this is not the case in a competitive sports event or a team event, in which a chance lost is lost.

NEED FOR THE STUDY

The foregoing discussions on cigarette smoking clearly brings out the fact that cigarette smoking reduces the health and efficiency of a person. However, in the absence of any specific study pertaining to Indian conditions, actions cannot be initiated which require quantification and physical reflections of the ill-effects due to smoking. Therefore, it is thought fit to take up this study that brings out the effect of tobacco smoking on athletes with special reference to motor fitness and allied physiological components only.

OBJECTIVES OF THE STUDY

1. To define scientifically, the state of perfect physical fitness and health, among athletes, and to see whether it is endangered by the habit of smoking resulting in poor performance.

2. To minutely probe into various physical and motor fitness components and to study how far are they affected by tobacco smoking.

3. To educate the coaches to support the non-smoking rule for athletic teams, to ensure success if established that smoking is the main cause for anybody's poor performance.
LIMITATIONS
1. The cultural and environmental factors of the subjects were not be taken into consideration.
2. The atmospheric temperature was not taken into account while collecting the data.
3. Involvement of subjects in their Physical Education College training programmes and in their daily routine was not taken into consideration.

DELIMITATIONS
The study will be limited in the following aspects.
1. For the convenience of the investigator, the present study is restricted to men athletes who are undergoing their training in 6 different Physical Education Colleges in Andhra Pradesh and their age ranging from 19 to 30 years.
2. Healthy athletes who are non-alcoholic, non-drug addicts, who consistently oblige for conducting some physical and motor fitness tests were chosen for this study after careful personal enquiry.
3. For this study, 122 athletes who are smokers and 185 athletes who are non-smokers were selected as subjects at random.
4. The study is delimited to the following selected motor fitness components.
   1. Strength  2. Flexibility  3. Agility
   7. Circulatory respiratory endurance
National relevance

The above research is highly relevant and very important from the National point of view. It has been observed in recent years that in the Olympics the performance of India was poor and among several approaches to improve the performance, the present investigation results might contribute a lot and might help athletes and concerned National bodies to take cognisance of the present work.

Besides it would be of great relevance to know whether an athlete's peak performance is subtly undermined or marred by tobacco smoking.

The following papers have been presented in the National and International Seminars prepared from this thesis.

