

ANLYSIS OF MENTAL SKILLS IN RELATION TO THE PERFORMANCE OF ELITE AND NON ELITE ATHLETES OF KERALA

A Thesis
submitted to the University of Calicut through the
Department of Physical Education for the fulfillment of the
requirement for the
DOCTOR OF PHILOSOPHY IN PHYSICAL EDUCATION

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CERTIFICATE

This is to certify that the thesis entitled “**ANALYSIS OF MENTAL SKILLS IN RELATION TO THE PERFORMANCE OF ELITE AND NON ELITE ATHLETES OF KERALA**” submitted to the University of Calicut, in fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Physical Education is record of original research work done by **Mr. Baby Shijansha K.P.** during the period of 2015 – 2019 of his study in the Department of Physical Education, University of Calicut, Thenjipalam, under my supervision and guidance and the thesis has not been previously submitted elsewhere for the award of any Degree/Diploma/Associate ship/Fellowship or any other similar title and it represents entirely an independent work on the part of the candidate.

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Dedication

I dedicate this project to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on his wings only I have soared. I also dedicate this work to my beloved parents (Musthafa Pallikkalakath and Beefathima K.P.) for their whole hearted support and prayers. I also dedicate this to my brother Baby Shehinsha and my wife Ms. Rayisa K. who have encouraged me all the way and whose encouragement has made sure that I furnish the work which I have started. I also dedicate this new born daughter, who has been affected in every way possible by this quest. Thank you. My love for you all can never be quantified. God bless you.

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It would be an obvious fact of my ignorance if I fail to spread my sincere and heartfelt thanks to my dearest friend's help, assistance, encouragement and guidance for the thesis without them it would not have been a form of what it is now. No amount of thanks will repay my debts to my friends.

Above all, I thank God Almighty for giving me the strength and wisdom to complete my Research.

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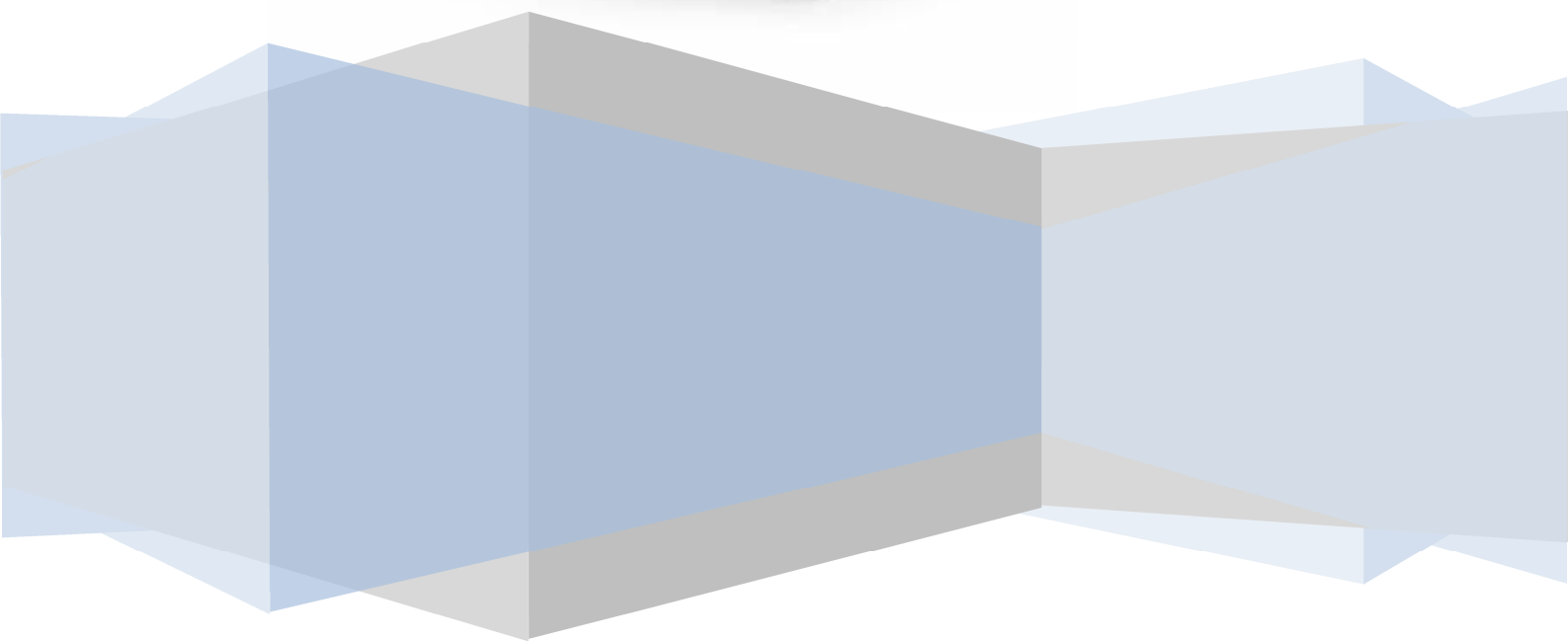
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A 3D rendered white figure stands in the center, holding a tall stack of approximately ten books. The books have various colored spines, including brown, yellow, and blue. The figure is positioned behind the main text.

CHAPTER- I

INTRODUCTION



Chapter I

INTRODUCTION

“I am the greatest. I said that even before I knew I was.”

Muhammed Ali, Boxing Legend

Sports

Sport is an activity that is ruled by a set of rules or customs and most of the times engaged in competitively. Sports normally associate with activities where the physical capabilities of the contestant are the only or primary determinant of the result (winning or losing), However the term is additionally used to embody activities like mind sports (a common name for few card games and board games with very little to no element of chance) and motor sports where mental alertness and equipment quality are major components. Sport is referred as an organized, competitive and skillful physical activity requiring commitment and fair play. Some point out sports as differing from games on the ground that are measure some times higher levels of organization and profit (not monetary always) engaged in sports. Accurate records are safely kept and updated for most sports at the very best levels, whereas failures and accomplishments are once declared in sport news. Sports are usually played only for fun or for recreation that individuals want exercise to remain in good physical condition. Although it can't be always true. Sports participants are expected to show good sportsmanship, standards of conduct like being respectful of opponents and officials, and congratulating the winners when they lose (rvsacademy.com, 2016)

Sport includes every type of competitive physical activity or games that, through casual or organized participation, aim to use, maintain or improve physical ability and skills are also providing enjoyment to participants, and in some cases, entertainment for spectators. A lot of sports exist, from those between single contestants, through to those with a lot of simultaneous participants, either in groups or competing as individuals. In some sports like racing, several contestants could participate, simultaneously or consecutively, with one winner; in others, the

competition (a match) is between two sides, everyone making an attempt to exceed the other. Some sports allow a tie game; others give tie-breaking strategies to confirm one winner and one loser. A lot of contests may be arrayed in a tournament producing a champion. Many sports leagues often created an annual champion by conducting games in a regular sports season, followed in some cases by playoffs. (Sport Accord, 2011)

In the case of competition, there are different views on the necessity of competition as a defining element of a sport, with almost all professional sport involving competition, and governing bodies requiring competition as a primary requirement of recognition by the International Olympic Committee (IOC) or Sport Accord. Others are of the view to expand the definition of sport to incorporate all physical activity. For instance, the Council of Europe includes all forms of physical exercise, including those competing just for fun. (Scrimgeour, Heidi, 2011)

In order to increase participation, and lessen the impact of losing on less able participants, there has been an effort to introduce non-competitive physical activity to traditionally competitive events like school sports days, although efforts like this receive said back. . In competitive events, participants are ranked or classified on the basis of "result" and sometimes divided into teams of comparable performance, (e.g. gender, weight and age). The measurement of the result can be objective or subjective, and corrected with "handicaps" or penalties. In a race, for instants, the time to complete the course is an objective measurement. In gymnastics or diving the result is set by a panel of judges, and so subjective. There are several shades of judging between boxing and mixed martial arts, where winning is assigned by judges if no competitor has lost at the end of the match time. (Scrimgeour, Heidi, 2011)

The area of game challenge is building up each day so the participants usually have equal physical capacities, and have distinctive mental aptitudes. Hence it is impossible expect to overlook the job of mental abilities to achieve the greatest execution. (Van Den Heever. Z., H. Grobbelaar and J. Potgieter. 2007)

This subject point out the importance of involving in psychological aspects of sport. As it was found in recent Olympic Games, some athletes who were expected to win medals couldn't in the competitions and they pointed out the lack of mental preparedness as one of the major reasons for their failure. Recent studies in the field of sport psychology have made it clear that mental skills play a vital role in achieving success in sport. (6. Morris. T. and S. Koehn. 2004)

Cox and Yoo (1995) opined that success in professional sport not only depends on the physique of players and technical aspects but also on psychological skill.

Individual Sports

Individual sports are some sports, like golf, bowling, track and field that, for the usual part, are regarded as individual sports, that means sports played alone. A sample of the thousands of individual sports includes: Bowling, Cycling, Figure skating, Golf, Skiing, Snowboarding, Surfing, Swimming, Track and field and martial arts. There are many of individual sports, and the skill requirement for each differs a lot. However, there are certain skills that common to most individual athletes. Almost most of the individual sports have high levels of cardio respiratory fitness to enable long time of practice and play. Above all they have well-toned muscles and are flexible. (study.com, 2016)

One major advantage of participating in an individual sport is that the athlete can development their own pace to widen their skills. The skills athletes require are more mental related than physical. Athlete is supposed to have self-sufficiency, self-discipline, focused thinking, and passion. Athlete must try on a specific skill over and over to master in it. Athlete can practice during early hours or late as athlete wants. Once they win, athlete gets all the credit for winning, but athlete can blame no one other than himself for any monotonous performances. (study.com, 2016)

One of the major advantages of this type of sports is that it permits an athletes to aim for personal goals without disturbing the team. For instance in distance running, an athlete will usually aim for individual best number of times per

year. As matter of a fact, individual athletes are often characterized as competing against themselves. They obviously have competitors to beat, but at the same time they also attempt to develop on their previous best performances as well. (study.com, 2016)

Commonly there are two basic types of motivation. They are external motivation and intrinsic motivation. External motivation usually comes from outside or from someone else or involves gaining a reward. Examples of external motivation include a coach shouting at participants to do pushups, winning a medal, or a parent asking us to clean our room. At the same time intrinsic motivation comes from within. This is a quality that many individual sport's athletes possess. Examples include self determination to run a personal best in a 10000 km race for a big competition. In individual sports, there won't be any co-players to put peer pressure upon them, but the pressure comes from self. (study.com, 2016)

Team sports

A team sport is often referred as any sport that involves two or more players aiming together for a shared objective. A team sport is a task during which participants are organized into opposing teams which take part to win. Examples are basketball, volleyball, rugby, water polo, handball, lacrosse, cricket, baseball, and the different kinds of football and hockey.

Team sports are practiced between opposing teams, where in the players interact directly and at the same time between them to attain an objective. The objective usually involves teammates clearing way for the movement of a ball or similar object in accordance with a set of rules, so as to score points.

The meaning of "team sport" has been widely discussed in recent years. Some kinds of sports have different objectives or rules comparing to "traditional" team sports. These kinds of team sports do not involve teammates clearing for the movement of a ball or similar item as per the rules so as to, get points. For example, swimming, rowing, sailing, dragon boat racing, and track and field among others can also be categorized team sports. (Baofu 2014)

In some types of team sports, there won't be an opposing team or point scoring, for example, mountaineering. Instead of points scored against an opposing team, the relative impediment of the climb or walk is the measure of the achievement. In some sports where participants are entered by a team, they not only compete against members of other teams but also against each other in their own team for points towards championship standings. (Baofu 2014)

As the years pass by the prominence team sports has continued to grow, influencing not only athletes, but also fans, local and national economies. All over the world, the influence of team sport is seen as professional athletes live out their dreams as role models. Youth athletes develop life skills and follow the path of their role models. Fans bond over the love of their teams while supporting their economies with their support. (Baofu 2014)

Racquet Sports

The Racquet games usually played either on a divided court area played over a net or on a shared court area played against wall. Tennis and badminton are the most popular game played over a net while squash and racquet ball are examples of game played against a wall. The games vary in depending on the size of the playing area, type of racquet used and the type of missile and each has its own set of rules for competition. One of the common factor in these games is that each entails inter mitten exercise with vigorous involvement of both lower and upper body. Musculature during bouts of activity and engagement of upper limb muscle groups is largely unilateral, except when the two handed back hand stroke is used in tennis. All most all sports require fast reactions, quick accelerations, fast arm, leg, and whole body movements and capacity to change direction quickly.

The major racket sports are badminton, squash, table tennis and tennis. The advancement of sports science and the devolvement of racket sports in recent years have demanded attention on improved performance and this has led to a more elaborated study and understanding of all aspects of racket sports.

The reviews indicate that a great deal of scientific Endeavour has been applied to racket sports, but this is variable across both the racket sports and the scientific disciplines.

A scientific approach has towards game has helped to impart training program to boost players' fitness; guide players in nutritional and psychological preparation for play; inform players of the strategy and ways used by themselves and their opponents; offer insight into the technical performance of skills; figure out the effect of equipment on play; and accelerate the recovery from racket-arm injuries. Racket sports have also posed a distinctive challenge to scientists and have provided channel for developing scientific methodology.

Racket sports offer a good model for probing the interplay between aerobic and anaerobic metabolism and the effect of nutrition, heat and fatigue on performance. This has resulted in the development of mathematical solutions for multi-segment interactions within the racket and arm during the performance of shots, which have accorded to our understanding of the mechanisms of both performance and injury. They have provided a distinct to challenge to sports engineers in relation to equipment performance and interaction with the player. Racket sports have contributed to developments in notational analysis both in terms of analytical procedures and also the conceptualization of strategy and ways. Racket sports have provided a channel for probing in to quick interceptive actions, hand-eye coordination and perception-action coupling in the field of motor control. In conclusion, science has contributed significantly to our knowledge and understanding of racket sports.

Combat Sports

A combative sport means a sport where athlete fights or combats each other, usually one-on-one situation. In a competitive combat sport is two combatants fight against each other using certain rules of engagement, Examples are Kalaripayattu, Karate, Boxing, amateur wrestling, mixed martial arts and fencing etc. The

following techniques are usually used in compact sports; striking, holding, grappling and weapon usage. (muni.cz, podzim, 2012)

Combat sports skills have become a part of human culture for thousands of years. The Ancient Olympic Games were mostly composed of sports that tested skills related to combat, such as Boxing, Wrestling, chariot racing etc. This ritual of Combat sports was taken to the next step by the Romans with fighters who fight with weapons, which even ended in death. (muni.cz, podzim, 2012)

Through the central ages and Renaissance this sport became popular, with the Joust (a sport and an amusement for the rich and polite. It comprises of martial competition between two equestrian knights using a variety of weapons. Traditional wrestling was also prominent in many forms and in most cultures. (muni.cz, podzim, 2012)

Martial arts have varying degrees of sporting application. Martial arts vary widely, and may focus on strikes, holding, grappling, or weapons training. Some sports that focus on specific aspect; Striking- Kickboxing, Taekwondo, Karate; Grappling- JiuJitsu, Judo, Wrestling (various types) and Weaponry-Fencing, Kendo. (muni.cz, podzim, 2012)

Sports Psychology

Psychology is often termed as a science of behavior and mind, including conscious and unconscious phenomena, together with feeling and thought. It is an academic discipline with a lot of scope of and diverse interests that, once taken together; require an understanding of the emergent properties of brains, and all the variety of epiphenomena they display. As a social science it endeavors to understand individuals and groups by establishing general principles and researching specific cases. (Fernald LD, 2008)

Sports psychology, which is often referred as a sub discipline within the larger field of psychology, is termed as an applied psychology or as a field of study in which the principles of psychology are applied within particular context.

Although sports psychology was earlier not been recognized as a sub discipline with in the field of academic psychology, Smith (1983) suggested that sports psychology was ready to be included in mainstream psychology.

The including sports psychology as a sub discipline of sports comes mostly from researchers in physical education, or Kinesiology. Henry (1981), for example, argued that the academic discipline of physical education comprises the study of certain aspects of fields such as psychology, physiology, anatomy and sociology rather than the application of those disciplines to the practice of attempting to increase performance levels by altering pre competition anxiety which seem to be a questionable practice. Hence, such attempt must be made cautiously and on an individualized basis. Anxiety levels of winning and losing teams do not seem to differ either before or after competition. The study reveals that Physical activity has a direct influence on reducing anxiety, and therefore successful attempts to elevate anxiety before competition would benefit once vigorous physical activity is initiated.

Sport psychology is a science that uses the techniques and principles of psychology in the stream of physical activity settings (Cox, 1998). The area of sports psychology improves from the research and knowledge of several areas of psychology, including social psychology and psychophysiology, to help coaches and athletes realize the elements of themselves and those around them pertaining to sport, performance, and exercise.

Participation in sport has always been displayed as the most significant forms of human expression. For thousands of years, men and women displayed their power through feats of speed and strength. Ancient athletes underwent months of strict training as a part preparing for the early athletic games (Csikszentmihalyi, 1990). Following their part modern athletes also undergo such strict training. Even the today's Olympians and high school and college athletes spend their time and money preparing for an upcoming competition. Athletes strain their bodies and their health daily for preparing themselves to be the best in their area of concentration. They undergo daily pain and sacrifices hoping that this would benefit it in one major competition. But it is hard fact that even though most athletes sacrifice their minds

and their bodies for the victory in competition, most of their effort will be in vain and will never experience a world renowned win or celebrity status.

The grueling nature of sport demands the question of its purpose. If sport is demanding a lot of sacrifices for often little gain, why do humans still seek participation? The question is one that requires sport psychology research in the area of flow. Csikszentmihalyi (1990) concluded that all humans seek optimal experience in life, which means that somehow, sport must offer some sort of optimal experience. He later developed a theory that referred to this optimal experience as flow. His theory suggests the reason most athletes continue in participation in sport is because of the flow experience.

Csikszentmihalyi (1990) opined that in order for flow to occur there must be present two conditions. The first condition is that the athlete's perceived skill must be equal to the perceived challenge. The second condition is that the perceived challenge and perceived skill required for the challenge must be greater than average (Csikszentmihalyi, 1990). It would mean that when an athlete's perceived skill is less than the perceived challenge, it would create a high amount of arousal within an athlete. The arousal would display itself in the form of apprehension or anxiety. Also, if an athlete's perceived skill level is greater than the perceived challenge, there would be a lack of enough arousal. This lack of arousal would most likely display itself in the form of boredom or apathy (Weinberg & Gould, 2003).

Le Roux and Pienaar (2001) are of the opinion that game brain research assumes an importance job in focused games. The importance of game brain research is increasingly highlighted when it tends to express that by contemplating a competitor's conduct inside a donning domain, we can clarify, anticipate and change conduct (Andrew. M. H.W. Grobbelaar and J.C. Potgieter. 2007)

Moreover, some researchers are of the opinion that mental training is the most effective way to improve sport performance. However, Weinberg and Williams (2007) opined that it is necessary to study the affective variables such as gender, skill level and age groups more. Therefore, recognition and development of mental

skills consequently makes competitors, coaches, officials and researchers interested in sport psychology (Weinberg. R S. and D. Gould. 2007).

Mental skills

Mental skills are defined as the set of trainable mental abilities and methods that are held to underpin successful learning and performance. The basic mental skills embrace concentration, goal-setting, imagery and mental rehearsal, relaxation and self talk. That can also be call cognitive skills and psychological skills. (thefreedictionary.com, 2016)

Mental Skills in Sport

By analyzing the nature of sport we will be able to identify the times when mental skills are crucial. Depending on the nature of sports (whether it is individual sports or team sports) there will be different demands for sports. One common factor will be the time when they decide to take break from their performance. This may be due to injuries or may be part of the game (time in between the game such as half time), individual breaks (consulting umpires, referees or breaks between execution of skills (example is trap shooting golf etc.) (Hodge, K, Slievert G and Mekenzie, 1996)

Unlike individual game sports team sport will demand different mental skills from each individual due to the different demands of their specific role they require to perform within their team. For example needs of goal keeper will be different from those who take penalty corners. Likewise the required needs for the role that is responsible for restarting a particular phase (example hooker in rugby) will be different. It is the responsibility of coach to identify their needs through careful observations and assessment. This assessment usually done through mental skills profiling .This could be done through many ways and it is the duty of the coach to help the individual to be self-aware of the performance of the mental demands required of him or her

On identifying their skills it will be possible to encourage an athlete to examine where he or she is in terms of his or her mental strength and weakness. After this process should be put in place to improve those areas that need improvement) (Hodge, K, Slievert G and Mekenzie1996)

Goal setting

Goal setting is very important in sports performance. Successful goal setting is not just setting goals; it's also implementing them, learning from them, creating conclusions and building new bigger and better goals. Tom Brady was never the big, or even fastest guy on the field, but he aspires to improve himself everyday by goal setting!

Dr. Locke made an attempt to study the benefits of goal setting in 1981. His finding revealed that the valuable effects of goal setting on sports performance seem to be the greatest robust and replicable findings in the psychological literature. 90% show positive effects. Burton and Weiss in 2008 reviewed 88 studies and found 80% showed moderate to strong positive effects out of goal setting. Dr. Locke went on to develop a theory known as the Mechanistic Theory, with a man by the name of Latham in 2002. They opined that goals influence performance in 4 ways. 1) Goals draw your attention and action to important tasks, 2) Goals help mobilize effort,3) Goals increase immediate effort as well as prolong effort or increase persistence and 4) As an athlete setting goals help you to learn new strategies

Self-confidence

Self-confidence is one among the essential mental skills for achievement in sports and life. It is how strong athletes believe in their abilities to execute a physical skill or perform a task. Athletes batten confidence from many sources: past performance, great week of practice, preparation, and feeling positive about themselves. For some athletes, confidence is weak and can waver depending on their performance. Many athletes let a mistake take over, which can be temporary, and in turn cause self-doubt. Hence it is the duty of coaches and other team leaders to help athletes and teammates keep a stable level of confidence (Evan Hilbert, 2018).

Commitment

Commitment is often referred as a psychological state representing the need or resolve to continue sport participation. The Sport Commitment Model developed by Scanlon and her colleagues (2003) suggests that enjoyment, personal investments, involvement opportunities, attractive alternatives, social constraints, and social support all influence an athlete's level of sport participation and commitment. Out of these factors, enjoyment is said to be the strongest predictor of sport commitment among youth athletes. They further contented that sport enjoyment and involvement opportunities were the strongest predictors of sport commitment in elite rugby and collegiate soccer players.

It is accepted fact that motivation is a contributing factor to commitment. Motivation can be defined as the psychological energy, or the force that initiates, or directs, and even sustains our behaviors over a period of time. It is the force driving you to decide on certain types of behaviors over others.

Stress reaction

In psychology, stress is a feeling of strain and pressure (Mental Health America. 2013). Stress can also be called as type of psychological pain. Small amounts of stress could be desired, beneficial, and even healthy. Positive stress in turn helps to improve athletic performance. It boosts motivation, adaptation, and reaction to the environment. Excess amounts of stress, however, could result to bodily harm. Stress can increase the risk of strokes, heart attacks, ulcers, and mental illnesses such as depression (Sapolsky, Robert M., 2004)

Stress may be external and associated with the environment, but may also be caused by internal perceptions that cause an individual to experience anxiety or other negative emotions surrounding a situation like pressure, discomfort, etc., which they then deem stressful.

Studies have revealed that that exercise reduces stress. Exercise effectively reduces fatigue, improves sleep, enhances overall cognitive function such as

alertness and concentration, decreases overall levels of tension, and improves self-esteem (Anxiety and Depression Association of America, 2018)

Fear Control

Fear is considered to be one of the most powerful emotions. It has a very strong effect on our mind and body. Fear can create strong signals of response when we're in emergencies – for instance, if we are caught in a fire or are being attacked (Steimer, T. 2002)

Öhman, A. (2000) is of the opinion that it can also play a crucial role when we're faced with non-dangerous events, like exams, public speaking, a new job, a date, or even a party. It's a natural response to a threat which can be either perceived or real. And he contended that anxiety is a word that is associated with some types of fear that are usually about the thought of a threat or something going wrong in the future, rather than right now.

Fear and anxiety can exist for a short time and then pass, but they can also last much longer and we can get stuck with them. In some cases they jeopardize our life, affecting our ability to eat, sleep, concentrate, travel, enjoy life, or even leave the house or go to work or school. These in turn hold us back from doing things we are supposed to do, and it also affects our health. Some people become shaken by fear and need to avoid things that might make them frightened or anxious. It is hard to overcome this situation, but there are ample of ways to do it. We can learn to feel less fearful and overcome fear so that it doesn't stop you from living (Lazarus, R.S. & Averill, J.R., 1972).

Relaxation

Stephen Walker, PhD (2007) opined that relaxation is of very important to any athlete who is striving for peak performance. Relaxation skills help athletes reduce mental anxiety (self-doubts, worry, etc.) and physical anxiety (nausea, shaking, etc.), and also increase concentration and performance. Relaxation techniques is used before competition or, if practiced enough, during competition.

There are a lot of techniques for feeling relaxed before and during competition. Breath controlled relaxation, mantra meditation, and blank meditation are the common tools used for controlling nervousness/anxiety. Breath controlled relaxation is a technique that demand a lot of practice to learn properly. It can help reduce both mental and physical anxiety. Begin by practicing once a day for 15-20 minutes at a time. Assume a lying or sitting position in a very quiet place that is free from disturbance. Practice consists of four steps and more or less 17-20 minutes to finish the complete technique.

Energizing

Energizing strategies, often referred as activation strategies, are primarily designed to increase the task-specific level of performer's mental and physical activity. They are of interest to applied sport psychologists, coaches, and athletes alike as on competition players require strategies that help stimulate levels of physical and mental activity. As it is often used interchangeably by applied sport psychologists, it is important to distinguish between the concepts of arousal and activation. The major distinguishing factor is the unplanned (automatic) versus planned (prepared) nature of the two responses. Arousal is the mental and physiological response to activity experience in relation to an unexpected (or unplanned) input into the system similar to an unexpected shout from the crowd. Athletes will be required to increase their state of mental and physical activation. The methods used in this entry provide some insight into new performers and may induce such increased activated or energized states. These strategies are usually introduced to the athlete on becoming proficient at using strategies designed to lower their activation state, such as relaxation strategies (Hanton, S., Thomas, O., & Mellalieu, S. D., 2009).

Imagery

Mental imagery is technique where the athlete imagining themselves in an environment performing a specific activity using all of their senses (sight, hear, feel

and smell). The images should be of the athlete performing successfully and feeling satisfied with their performance (Roberts, S. M. 2011).

Mental imagery (varieties of which are often referred to as “visualizing,” “seeing in the mind's eye,” “hearing in the head,” “imagining the feel of,” etc.) is a *quasi-perceptual experience*; it resembles perceptual experience, but occurs in the absence of the appropriate external stimuli. It is usually understood to bear *intentionality* (i.e., mental images are always images *of* something or other), and thereby to function as a form of mental representation. Traditionally, *visual* mental imagery, the most discussed variety, was thought to be caused by the presence of picture-like representations (*mental images*) in the mind, soul, or brain, but this is not accepted by everyone. Most of the times, imagery experiences are understood by their subjects as echoes, copies, or reconstructions of actual perceptual experiences from their past; at other times they seem to expect often desired or feared, future experiences. Thus imagery has very often played a very large, even important, role in both memories (Yates, 1966; Paivio, 1986).

Mental Practice

Mental practice is often said to be the cognitive (thinking) rehearsal of a physical skill without movement. It is considered to be effective both for skill learning and preparing for competition. Sport psychologist generally use visualizations and rehearsal to assist in motivation, self-confidence, and to reduce competitive anxiety. Regardless of its application, everyone knows that training the mind is key to successful sport performance. Hence more attention is to be given on skill acquisition.

Athletes can benefit from the method in two ways. Internal imaging implies that the athlete is imagining a real-life scenario that he or she might expect in competition. At the same time External imaging implies viewing themselves as the observer.

As per motor learning literature, studies has revealed that thinking about how to perform a skill together with physical performing works better than just physical

exercise for learning and remembering skills. It can be said that rehearsing in the mind only is better than not rehearsing at all (Sports Training Adviser, 2018).

Focusing

Focus is said to be the most vital mental skills in sports. Athletes, for whom focusing is hard, are easily distracted by doubts, negative thoughts, mistakes or other factors like parents and coaches yelling during a game. Many athletes face the problem of losing focus during competition. One has to be aware that even though you can improve your concentration, it is not possible to do that all the time. Following three tips can use by the kids to improve their focus such as; identify the relevant cues to our sport, Recognize when we lose focus and create a strategy to help you refocus (activekids.com, 2018)

Refocusing

Athletes are always advised that they have to refocus, let go of mistakes and move on. But they are not taught on how to actually do it. The intention is good, but athletes don't know a way to refocus.

To enable one to re-focus after an error or mistake does not have a One-size-fits-all solution. There are some usual ways athletes and coaches can apply their strategies. First, each athlete uses his or her natural learning style how they best attains and recalls information. There are three main learning styles visual, kinesthetic and auditory (Dr. Rob Bell, 2016).

Competition Planning

Most often athletes struggle with applying mental skill to competition. They are well aware of the mental game strategies, but fail to use what they learn once they perform. Hence it is obligatory that Mental skills, just like physical skills must be practiced to make them part of us. Once we learn and understand mental game strategies, we should use them in practice. For example, if an athlete is working on coping with distractions, he must practice refocusing or using the Three Rs in

practice. Once he becomes expert in practice with refocusing, he'll be able to use it in competition easily. Patrick Cohn advised their students that they should practice their mental strategies often. For this what athlete have to do is they must read their refocus statements each day to learn them and to remind himself (Patrick Cohn, 2018)

Basic Mental Skills to assist Athlete Performance

As we know coach is not a professional mental skill trainer. Hence it will be used for them the knowledge and understanding of what is required from their athletes in this area. Coaches can assist their athletes to use basic mental skill effectively. Some of the fundamental skills used in psychological skills training (PST).is explained below (Hodge, K., Sleivert, G. & McKenzie A., 1996)

As explained by Hodge, Sleivert and Mackenzie (1996, p. 58) a PST aptitude is a “competency, capacity or capacity level”, at the same time a strategy use to build up ability is a “method, procedure or drill.” These narrators are of the opinion that the major mental abilities are inspiration (for ideal physical initiation), mindfulness and confidence (for ideal mental enactment), and fearlessness (for ideal focus). The real methods they urge competitors to use are objective setting, mental readiness, self-talk, focusing and unwinding and symbolism.

Mental preparation has a very important role at the time of three plans for performance. They are:-

- Pre-performance
- During performance
- Coping plan

Pre performance

The pre performance plan focus attention on the preparation of the athletes for the day of competition. For this method likes self-talk imagery and centering can be used.

During the performance

The performance plan is all about guiding an athlete to focus attention on what is important during the performance. The coaches have to arrange situations in the training session which will help the athletes to use the mental skill required in performance

The coping plan

This plan is different from the other two plans. The coping plan is for assisting athletes to face any hassles or distractions pre during or post the event. Setting up discussion with the athletes and preparing the athletes for potential what if situation during preparation for competition will enable the athletes to cope with both the situations discoursed and also unexpected situations (Hodge, K., Sleivert, G. & McKenzie A., 1996)

Mahoney and Gabriel (1987) identified that skills such as stress management, concentration, arousal, mental preparation and self-confidence are key components of mental skills which make the psychology profile of elite athletes. O'sullivan, Zuckerman et al found out that (1998) Positive confidence is a consider ease added advantage in sports. At the same time excessive sensitivity to criticism lessen player's performance during the match. Many researchers had made and efforts to study in detail the relationship between stress, anxiety, self-confidence and performing motor skills. Some of the theories and experiences have in fact strongly supported their positive relationship (Martens. R, 1977).

The personality of sports persons is also considered as the determining factors in the performance of an event. It is found that personality variations take place depending on nature of the sports events. Psychological factors such as aggression, anxiety, self-confidence, achievement motivation etc. is also found to be affecting performance. The best consistent and most confident performers are able to control or channel their emotions, to focus their concentration and to bounce back from setback in an emotionally mature or constructive way. The present study focuses on an area that has not come in the purview of many previous studies and

analyses of mental skills in relation to the performance of elite and non-elite athletes of Kerala and also compares these factors between male and female and elite and non-elite athletes from the state of Kerala.

Statement of the problem

The purpose of the study was to analyse the mental skills in relation to the performance of elite and non-elite athletes from the state of Kerala.

Objectives of the study

1. To compare the mental skills of elite and non-elite athletes from the state of Kerala.
2. To compare the mental skills of male and female athletes from the state of Kerala.
3. To compare the mental skills of elite athletes from different sports disciplines (individual sports, team sports, racket sports and combative sports) from the state of Kerala.
4. To compare the mental skills of non-elite athletes from different sports disciplines (individual sports, team sports, racket sports and combative sports) from the state of Kerala.
5. To compare the mental skills among male athletes of different sports disciplines (individual sports, team sports, racket sports and combative sports) from the state of Kerala.
6. To compare the mental skills among female athletes of different sports disciplines (individual sports, team sports, racket sports and combative sports) from the state of Kerala.
7. To assess the relationship of mental skills to performance of elite and non-elite athletes from the state of Kerala.
8. To assess the relationship of mental skills to performance of male and male athletes from the state of Kerala.

Hypotheses

On the basis of literature, research findings, expert opinions and the scholar's own understanding of the problem, the following hypotheses are formulated.

1. There would be a significant difference in selected mental skills between elite and non-elite athletes of Kerala.
2. There would be a significant difference in selected mental skills between male and female athletes of Kerala.
3. There would be found no significant difference in selected mental skills between elite category athletes of different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala.
4. There would be no significant difference in mental skills between on elite category athletes from the different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala.
5. There would be no significant difference in selected mental skills between male athletes of different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala.
6. There would be no significant difference in mental skills between female athletes of different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala.
7. There would be no significant relationship of mental skills to performance of elite and non-elite athletes of Kerala.
8. There would be no significant relationship of mental skills to performance of male and female athletes of Kerala.

Delimitations

The study was delimited to the following aspects:

1. The study was delimited to a total of two hundred and forty (N = 240) athletes from different sports discipline. They were equally selected (n=120) from both sexes.
2. The study was again delimited to the selected mental skill variables and their performance in the selected sports disciplines.
3. The average age group of the selected subjects was 21 (± 3) years.

Limitations

1. As such any bias that had crept into the responses of the subjects on this account may be considered as a limitation of the study.
2. Individual differences among the subjects such as life style, daily routine and other factors that may have influenced the subjects was remain as a limitation of the study.
3. The affect of uncontrollable factors such as sudden emotional disturbance of the selected subjects due to factors other than related to sports may be considered as the limitation of the study.

Significance of the Study

1. This study will help the aspiring sports persons to identify the mental abilities that influence the performance in their field.
2. The result of the study will help to identify the mental skills of male and female athletes of Kerala.
3. The result of the study will also help to identify the mental skills of elite and non-elite athletes of Kerala.

4. The result of the study will also help to identify the relationship of mental skills to performance of athletes from the state of Kerala.
5. This study will help the coaches, trainers and physical educationists in the psychological preparation of the athletes.

Working definition and explanation of terms

Sport

According to Lumpkin sport is “Physical activities governed by formal or informal rules that involve competition against an opponent or oneself and are engaged in for fun, recreation or reward”

Lumpkin, 2009

Elite athlete

Elite athlete is often refers as a person who is currently or has previously competed as a varsity player. (Individual or team), a professional player or a national or international level player. Elite athletes are more prone to an injury

Segen's Medical Dictionary.2012

In this study, Elite athlete means those who have participated or medal winner in the International and National championships and medal winners in the Inter University championships.

Non Elite athlete

In this study, Non elite athlete means those who had participated in the University, State and Intercollegiate championship)

Psychology

Psychology can be termed as the study of the mind and mental processes, especially in relation to behavior. There are a number of fields of psychology such as sports psychology.

William C. Shiel Jr., 2018

Sport Psychology

The sports psychology is an interdisciplinary science that pulls on knowledge from numerous fields including physiology, kinesiology, biomechanics and psychology. It ensures the study of how psychological factors affect performance and, how participation in sport and exercise affect physical and psychological factors.

Weinberg, R.S. & Gould, D., 2010

Mental Skill

The mental skill is the set of trainable mental abilities and methods that are held to underpin successful learning and performance. The basic mental skills are concentration, goal-setting, imagery and mental rehearsal, relaxation and self-talk, which is also known as cognitive skills and psychological skills.

thefreedictionary.com, 2016

Foundation skills

Foundation skills are perceived to be fundamental and essential for consistent high-level performance in sport; they are can be called the building blocks for the development of other mental skills.

Bota, 1993

Psychosomatic skills

Psychosomatic skills variations in physiological arousal as well as mental and physical intensity and can be used for their regulation.

Landers & Boutcher, 1998

Cognitive skills

According to Mayer, Cognitive skills are dependent upon cognitive processes and activities that include sensation, perception, learning, memory, thinking, and reasoning.

Mayer, 1983

Goal setting

Goal setting is deliberate process by which individuals establish objectives or goals that provide them with a direction and the motivation to achieve an end result.

Burton, 1993; Locke & Latham, 1985

Self confidence

Self-confidence is often termed as to a feeling or belief in one's own abilities and personal goals.

Orlick, 1992; Vealey, 1986

Commitment

According to Orlick, Commitment reflects one's intensity and dedication toward achieving de-sired goals

Orlick, 1992

Stress reaction

According to Selye stress reactions are nonspecific responses of the body to different demands placed upon it.

Selye, 1974

Fear control

Fear control is the ability to cope with situations or elements of a performance that cause fear or apprehension.

Rotella& Lerner, 1993

Relaxation

Relaxation enables individuals to decrease physiological arousal, muscle tension, heart rate, and anxiety, as well as control attention.

Williams & Harris, 1998

Activation

Activation is the process by which individuals heighten their physiological and mental states in situations where they need to increase their energy, motivation, or focus.

Zaichkowsky & Takenaka, 1993

Energizing

Energizing is one of the mental skill we use when we are tired.

N., Pam M.S., 2013

Focusing

Focusing is started to be the ability to direct and maintain one's attention on task-relevant cues.

Nideffer & Sagal, 1998; Orlick, 1992

Refocusing

According to Orlick refocusing is the ability to regain an effective focus in the face of distractions.

Orlick, 1992

Imagery

According to Murphy & Jowdy, Imagery comprises the use of images and sensations to imagine different situations.

Murphy & Jowdy, 1992,

Mental practice

Mental practice is stated to be the process by which athletes mentally rehearse physical skills, plays, or segments of a performance without overt movement of the limbs and body.

Murphy & Jowdy, 1992

Competition planning

Competition planning involves reflecting upon and developing plans to guide thoughts, emotions, and actions before, during, and after competitions.

Orlick & Partington, 1988

Chapter II

REVIEW OF RELATED LITERATURE



Chapter II

REVIEW OF RELATED LITERATURE

The review of related literature is for better understanding of the problem and to interpret the results. The researcher has taken all efforts to go through the available literature, which are relevant to the studies, findings and facts including interpretations and explanations from the published literature and have been included in this chapter. The researcher also collected the latest literature relating to his study through the website.

Sertaç Erciş (2018), initiated the study entitled Comparison of Mental Skills of Elite and Non-Elite Athletes. The main purpose of this research was to compare mental skills of elite and non-elite boys team athletes by Ottawa Questionnaire. The research study was a descriptive-applied one. The data collection instrument was a questionnaire based on Ottawa questionnaire that measured some mental skills factors. The subjects were 40 elite athletes and 40 non-elite athletes that they were randomly taken up of basketball, volleyball, handball and footstall sport tournaments. Independent test was applied in order to analyze the related data to compare the results at $p < 0.05$ level. The results indicated that the rate of Goal setting, self-confidence, Commitment, Stress reactions, Relaxation, Fear control, Activation, Focusing, Imagery, Completion planning, Mental practice and Refocusing skills is higher in elite athletic boy students in compare to non-elite ones.

Dr. Sheila Stephen and Dr. M Mary Glory Ponrani (2017) conducted the study named Comparative analysis of aggression as a function of age and levels of sports participation. Sports can be said to be a psycho-social activity. It is considered to have psychological and social dimensions, apart from, physical, physiological and technical aspects. The main objective of sports is to develop physical, mental health and to integrate or to bring about psycho-social aspects to promote national and international, social and cultural integration and peace. The purpose of the study was to make a comparative analysis of aggression as a function of age and levels of sports participation among age group 18 -19, 20 to 22 and 23 to 25 years and levels

of participation among district, State and National players. Statistical techniques were used to analyze the level of aggression among sportswomen of different levels and different age groups. In this study techniques used are: 3 x 3 factorial design, Scheffe's post hoc test for factor A and B. Study revealed that there was no significant much difference among sports women of different levels and of different age groups on Aggression as a function of age and levels of participation.

Faiza Mohammed Ateek Al-Ansi and et al; (2016) carried out the study on "Relationship between Psychological Skills and Sport Anxiety among University Student Athletes in the Republic of Yemen". The object of this research was to examine the relationship between psychological skills and sport anxiety among university student athletes in the Republic of Yemen. To achieve this, 397 male and female student athletes by the age between 18- 27 have been selected. In this study, demographic information, based on 64 items test of performance strategies (TOPS) and 21-items sport anxiety scale (SAS) were used to test psychological skills and sport anxiety, respectively. The modus operandi of this study was descriptive-correlation, which was done by collecting data by TOPS and SAS questionnaires. The statistical analyses were carried out using descriptive statistics, Pearson's correlation coefficient. The level of significance was set at 0.05 in order to check the significance of the calculated correlation. The results brought forth that psychological skills negatively correlated with sport anxiety($r = -.444^{**}$, $\rho < 0.01$). Psychological skills were negatively correlated with worry ($r = -.344$, $\rho < 0.01$), concentration disruption ($r = -.371^{**}$, $\rho < 0.01$), and somatic anxiety ($r = 0.429^{**}$, $\rho = < 0.01$).

Simon M. Rice (2016), made an attempt to study on mental health of elite athletes..The physical effects of elite sport [participation is well studied. It was found that there is relative less research on the psychological wellbeing and mental health of elite athletes. The purpose of the study was to examine evidence base with respect to the mental health and wellbeing of elite level athletes, including the incidents and or nature of mental ill health and substance use A systematic search of the Pub Med, EMBASE, SPORT Discus, Psych INFO, Cochrane and Google

Scholar databases, up to and including May 2015, was carried out. The result produced a total of a total of 2279 records. After double screening, 60 studies were selected. The study revealed that elite athletes experience a higher risk of mental disorders (i.e. anxiety, depression) comparing the general population. Proof for other mental health disorders (i.e. eating disorders, substance use, stress and coping) is less consistent. These results are prefaced, however, by the result of the quality assessment of the included studies, showed that only a few studies (25 %) were well studied or methodologically rigorous. Moreover, there is less intervention-based research on this topic. The proof base regarding the mental health and wellbeing of elite athletes is limited by a paucity of high-quality, systematic studies. Moreover, the research showed that this population is more prone to a range of mental health problems (including substance misuse), which may be due to both sporting factors (e.g. injury, overtraining and burnout) and non-sporting factors. More high-quality epidemiological and intervention studies are required to find out optimal strategies to identify and respond to players mental health requirements.

Jim Golby, Phillippa Wood (2016), made an attempt to study the effect of psychological skills training on mental toughness and psychological well-being of student-athletes. This research studied the effects of psychological skills intervention (PST) designed to improve the mental toughness and psychological well-being of student-athlete rowers (N = 16). Within this context, PWB was conceptualized by combining following psychological constructs; self-esteem, perceived self-efficacy, positive affect and dispositional optimism. Progress was studied at three times evenly dispersed over the course of the six-month intervention, pre-, mid- and post-intervention. The intervention was stated to be solution-focused and informed by Dweck's (2009) theory of a growth mindset and Goldberg's (1998) psychological strategies to improve mental toughness. The study design was a 2 (group) × 3 (time) two-way MANOVA with repeated measures on one factor (time). Various measures of mental toughness and positive psychological constructs were used. Over the course of the intervention, MT significantly developed, in addition to perceived self-efficacy, self-esteem and positive effect. Positive significant relationships were found between components of MT and each of the positive measures; which gives

support to the conceptualization of MT as a positive psychological construct which fosters positive psychological states (Clough & Strycharczyk, 2012). Further research is required to study the development of MT on negative psychological constructs.

TaeHee Lim and David Michael O'Sullivan (2016), carried out a case study on Mental Skills Training for a Taekwondo Olympian. The objective of this study was to identify the effect of systematic mental skills training (MST) for a taekwondo gold medalist. On basis of MST of other sports, this study was for a single subject who competed in the Olympics. The Korean test of performance strategies, Sport Attribution Style in Korean Athletes, and a few interview methods were used to examine the effect of MST. The pre and post-test mean scores of both the Korean test of performance methods and Sport Attribution Style in Korean Athletes were examined. Interviews recorded the athlete's psychological characteristics. Apart from the 'activation' variable, all of the psychological skills, e.g. self-talk (4.25–5), emotional control (3.75–4.5), automaticity (3.75–4.25), goal setting (4.5–5), imagery (4.25–5), negative thinking (3.25–4.75), anxiety management (4.5–5), and physical and mental condition (4.5–5) developed. MST is said to have facilitated the athlete to succeed.

MajidKeramatimoghadam and et al; (2015) carried out the comparative study of mental skills among of blind male and female chess players in Iran'. The objective of the study was to compare the mental skills of blind male and female chess players' in Iran. The sample selected this study was all blind male and female chess players of Iran. 60 blind chess players were selected by stratified sampling (N female = 34 players, N male = 26 players). The tool for measuring was the Ottawa Mental Skills Assessment Tool (OMSAT-3) under three broader conceptual components: foundation, psychosomatic, and cognitive skills. The gathered information was categorized by descriptive statistical methods and was analyzed by MANOVA ($P \leq 0.05$). The results of this study showed that there is no vital distinction between blind male and female chess players of Iran in foundation,

psychosomatic, and cognitive skills. Hence it has to be said that the gender factor has no determining role in female and male chess players' mental skill.

PengZeng and et al; (2014), made an attempt to study the relationship between sports skills and visual image operation. 120 college athletes along with 30 gymnasts, 30 ball players, 30 athletes in track and field, and 30 swimmers with different levels of sports skills were studied for the operation speed and accuracy of visual images in this research. The results revealed that close relationship existed between sport skill level and the operation level of visual images. It was found that sport skill was, proportional to the operation level was. In the operation of visual images gymnasts were seen to be faster than the other athletes. However there was no significant difference among athletes of other sports games in visual image operation. The athletes achieved great improvement in their ability of visual image, but there was no vital distinction difference between different genders.

Mohammad Maleki, SardarMohammadi, Ali Nazarian (2014), carried out this study. The study concentrated on permitted the disparity of mental skills in superior basketball players and gymnasts with dissimilar levels of familiarity. The scholar made an attempt to compare mental skills of superior basketball players and gymnasts. Subject consisted of 202 basketballs players (101 experienced: aged 21.44± 2.27, and 101 inexperienced, aged 22.13 ± 2.1) and 120 gymnasts (65 experienced; aged 21.77 ± 2.13 and 55 inexperienced, aged 21.79 ± 2.28). The tool used for this study was OMSAT-3 that examined mental skills in three main category of foundation skills: mental skills, psychosomatic skills and cognitive skills. Results brought forth significant differences between elite and sub-elite basketball players and gymnasts in basic mental skills, psychosomatic skills and cognitive skills. These results will facilitated coaches and athletes to enhance their performance and consolidate and expand the use of mental skills they need for every competition in close, open, and sport skill.

FairouzAzaiez and et al; (2013) carried out the study named "assessment of the Mental Skills of the High Level Athletes. "Case of the Athletes of Martial expressions. The domain of sport competition is expanding day by day. Hence the

athletes mostly have the same physical abilities but they possess different mental skills. There for it is high time to realize the role of mental skills to achieve maximum performance. Most of the sports psychologists are of the view that in recent years the coaches and athletes are under the conclusion that they need mental expertise more than physical skills. So as to achieve their goals.

Behboudi (2007). The purpose of the present study was to compare some psychological skills of martial arts athletes namely, judokas, boxers, wrestlers and karate. In Tunisia 152 volunteer competitors of martial games (100 Judokas, 15 Wrestlers, 12 Boxers and 30 karate as) including 89 men and 63 women answered the Ottawa Mental Skills Assessment Tools (version 4). This questionnaire was used to assess three categories of mental skills: fundamental skills, psycho-somatic skills and cognitive skills. The results concluded that there are mean differences for all the mental skills between the various activities in the benefitting judokas but this difference was not vital. Despite this distinction in averages, the analysis of the 12 mental skills by gender is important only for the control of fear (significant at $p < 0.05$).

MandanaSangari and et al; (2012) made an attempt to study the relationship between mental skill and competitive anxiety in female national football players. The object of the study was to analyse the mental skill and competitive anxiety level and their relationship in female national football players of Iran. For the study 16 female national football players ($n=16$) who ranged in age from twenty two to twenty seven years were selected and a cross sectional study was conducted. All participants completed Ottawa and SCAT questionnaire for assessing mental skill and competitive anxiety. Information gathered was analyzed with Pearson r correlations. Results revealed that there existed a close relationship between mental skill and competitive anxiety in female national football players of Iran ($p < 0.05$). Based on the study and findings it is stated it is necessary to categorize athletes based on the type of sport, so as to determine differences between different sports and to find out ways by which they can achieve high levels of performance.

Mohammad Saber Sotoodeh and et al; (2012) carried out this study. The purpose of the study was to compare selected mental skill in elite and non-elite taekwondo athletes. For achieving this scholar select eighty eight male and fifty four feminine taekwondo athletes (elite=60, non-elite=82) they answered Ottawa Mental Skills Assessment Tools (version 3). This questionnaire assessed 3 categories of mental skills such as: foundation skills, psycho-somatic skills and cognitive skills. The results of 2×2 MANOVA brought forth major distinction between male and feminine athletes solely in activation factor. Also, elite athletes considerably used game planning, goal setting, activation, relaxation, certainty and commitment over non-elite athletes. However, it was found that non elite athletes were better than elite athletes in refocusing and stress reaction. The study came up with recommendation that taekwondo coaches should take much effort to improve game planning with, goal setting, activation, and self-confidence and commitment factors in non-elite taekwondo athletes. At the same time elite taekwondo athletes should concentrate to develop refocusing and stress reaction to maintain their skill level.

M.S. Omar-Fauzeeand et al; (2012) carried out a case study on Mental Toughness among Footballers and the objective of this study was to examine the mental toughness perceived by selected the National football players. A sample of twelve Malaysian footballers (current and explainers), aged 19 to 57 years were selected for this purpose. All of them have been playing in the Malaysia National Football League that consists of four former national footballers, four former state footballers and four currently active footballers. Among them, five individuals are active as a coach. A semi-structure interview scheduled was used in the research. All of the players have signed the informed consent letter for tape-recorded during the interviewed. The transcribed verbatim from the tapes were content analyzed by the authors to identify the themes. Results show that eight themes emerged from the interviews, which are motivation, negative energy, self-confidence, positive energy, visual and imagery control, patriotic spirit, perseverance and attention control. Some of these themes are already been recommended by previous researchers (i.e.,

Fourie&Potgieter, 2001; Jones, Hanton&Connoughton, 2002; 2007; and Loehr, 1986), apart from patriotic spirit and perseverance.

EsmaeelSaemi and et al; (2011) carried out the study on relationship between mental skills and anxiety interpretation in female volleyball players. The connection between mental skills and anxiety route in sport has been a very dominant theme of sport psychological science analysis which was found to be exhaustive over the last 2 periods. The purpose of the study was the relationship between mental skills and anxiety interpretation in female volleyball players. 120 female volleyball players were selected for the purpose and using CSAI-2 and OMSAT-3 questionnaires. The results brought forth that many subscales of mental skills had a big influence on the success of volleyball players in relation to interpretation of anxiety and self-confidence as helpful to their performance. Also, participants discerned anxiety intensity and self-confidence differently from anxiety direction and self-confidence. The study revealed that mental skills are vital to reinforcement of confidence of volleyball players. The conclusion is that coaches and sports psychologists ought to seriously take into account athletes' mental skills in preparation of volleyball players before competition.

M Eloff, MA Monyeki and HW Grobbelaar, (2011) conducted a survey of mental skills coaching among South African hockey players at tertiary establishments. The purpose of the study were to see student hockey players' perceived for Mental skills Training (MST), and their insight relating to their ability to prepare psychologically for matches, and also to compile a general profile of their psychological skills for the entire cluster and by gender. Total of 199 (92 men and 107 women) South African field hockey players at tertiary institutions. African country participated within University Sport of South Africa (USSA) tournament, where selected for the study. The selected players were given 2 standardized sport psychological questionnaires (the Psychological Skills Inventory (PSI) and also the Ottawa Mental Skills. Assessment Tool-3 (OMSAT-3). Descriptive statistics, t-tests and frequency analyses were measured using SPSS for Windows (Version 3.1). The results from the PSI form brought forth poor values for

skills like goal direct, activation control, maintaining confidence, concentration and imagery among the entire cluster. Major gender difference where shown in which the male subjects performed higher than the females in relation to concentration, action motivation and activation control. The very best mean scores on the OMSAT-3 were found for goal setting, confidence and commitment. Vital gender variations were found for goal setting and commitment (in which the females performed higher than the males), while the males fared higher than the females in stress reaction. The participants in the study discerned MST as a very important tool to enhance performance in hockey. From these results, it can be discerned that sport psychologists and other role players in hockey pay a lot of attention to the development and implementation of MST programmers.

Kelly A. Jones (2011), initiated investigation on mental strength on the exhibition of first class intercollegiate competitors. The researcher contemplated on mental sturdiness has picked upped energy in the previous decade, yet there is as yet a requirement for investigation of the subject, and definition, particularly from a formative point of view. This examination investigated the impact of mental durability on the presentation of first class intercollegiate competitors by considering the psychological abilities competitors used to make progress in their game; thought was likewise paid to the formative parts of the competitors. This examination used both subjective and quantitative techniques. Inside and our meetings were directed with 10 NCAA Division II All-American competitors utilizing predefined inquiries identified with the accompanying substance classes: formative perspectives, crest execution and stream, general execution attributes, mental durability, certainty, accomplishment inspiration and energy for game, adapting to difficulty, and performing viably under strain. Content investigation recognized 418 crude information subjects, from which 68 general topics were distinguished. Further substance examination brought about 28 risings subjects which were gathered into the accompanying umbrella classifications: encounters, inspiration, intellectual procedures, achievement related mental abilities, and mental strength characteristics. A few formative viewpoints, mental aptitudes, and mental strength properties were

found as widespread to all or most of the competitors who were met. In light of the substance examination results, a definition for mental sturdiness is proposed. The competitors were additionally regulated the Athletic Coping Skills Inventory – 28 as a quantitative proportion of the psychological aptitudes used to make progress in game. The outcomes acquired from this stock were utilized in a distinct way. As a gathering, the competitors scored most elevated on the sub scales of certainty and accomplishment inspiration, mentor capacity, and focus. There was impressive variety between the competitors with respect to add up to scores acquired from the stock.

Marius Craciun and et al; (2011) carried out the study on a Confirmatory Factor Analysis of the Ottawa Mental Skill Assessment Tool (OMSAT-3*). The purpose of this study was to compare the factorial validity of the Romanian version of the Ottawa Mental Skills Assessment Tool - 3* - OMSAT-3*. Cross-sectional with self-reported questionnaire. The sample consist of 212 athletes (98 women, 114 men; age = 24.3) who were competing at international and national levels in various sports. Confirmatory factor analysis of the Romanian version of the OMSAT-3* brought forth the rephcna of the factor instrument displaying an adequate level of goodness-of-fit. This study extended support for the original structure of the Romanian version of the OMSAT-3*. This version widened the chance for factor assessing the psychological resources of athletes so as to improve their performance and awareness towards mental skills.

Durand-Bush, N. ; Salmela, J. H. ; Green-Demers, I. carried out this study and the objective of the present study was to analysis the psychometric properties of the Ottawa Mental Skills Assessment Tool (OMSAT-3), a technique developed to calculate a broad range of mental skills. The OMSAT-3 was administered to 335 athletes (age=9-42 years, mean age=19.6 years) from 35 different sports (hockey, soccer, water polo, basketball, swimming, and baseball). An initial first-order confirmatory factor analysis (CFA) should that the model manifested an inadequate fit, which led to the postulation of a more robust version, the OMSAT-3*. A CFA on this latter version, which included 48 items and 12 mental skill scales grouped under

three broader conceptual components - foundation, psychosomatic, and cognitive skills - showed that the proposed model fit well the data. A second-order CFA comparing the validity of the three broader conceptual components also brought forth adequate indices of fit. The OMSAT-3* considerably discriminated between competitive and elite level athletes and its scales showed acceptable internal consistency and temporal stability. Implications for consultants, coaches, and researchers were also usually discussed.

Peter J. Lang, Michael J. Kozak and Gregory A. Miller; carried out this study (2005) their research studied deductions from a new theory of emotional imagery (Lang, 1979). Two experiments were performed, testing the hypothesis that the conceptual content processed during imagery determines the amplitude and pattern of coincident efferent activity. The image was manipulated by varying the content of the prompting directions (either stimulus detail or active responding was emphasized in the image script) and by previous imagery training (in which subjects' post-image verbal reports were shaped to stress either stimulus or response material). Three thematic contents were examined: neutral, action, and fear scenes. In Experiment I, a group which received response-oriented imagery training and response scripts were compared to a stimulus-oriented group. The results strongly supported the hypothesis: response subjects had greater physiological activity during imagery, and their efferent pattern usually followed the script content. In Experiment II, one group again received response training and the other, stimulus training. However, half of each group was later tested on response-structured scripts and the other half on stimulus scripts. Results were in support of the hypothesis. As in Experiment I, response-trained subjects tested on response scripts reviled substantial physiological activity. No other groups, which received stimulus training and/or stimulus scripts, showed major physiological responses during imagery. Response-trained subjects usually rated their imagery as more vivid. Subjects administered response-oriented scripts showed more emotional arousal than did subjects administered stimulus scripts.

Ashley E. Stirling Gretchen A. Kerr (2005) were the scholar who carried out the study. As we all know perfections in become a very important concentration in a applied psychology. . It is found that athletic population, both adaptive and maladaptive perfections is seen existing (Terry-Short et al, 1995) but no research has been done on the connections between perfectionist tendencies and mood states in competitors. By improving our understanding of potential relationships perfectionism mood. We will be able to improve the psychological health of competitors. The object of this study was to examine perfectionism and its possible connection with mood states among both elite and recreational athletes. 44 athletes from elite and recreational groups finished the profile of mood states (POMS) Multidimensional Perfectionism Scale for Athletes (MPS-A). This analysis revealed statistically significant association between specific mood and various dimensions perfectionism. Suggestions are made for future examination.

Pippa Grange (2005) made an effort to a study on the relationship between stress and performance in sport and has been quantitatively investigated in depth over the last 3 decades. The ability to manage stress is considered to be one amongst the important determinants in athletic performance (Patmore, 1990). Stress, impels different things to different people. Apart from individual differences in preferred arousal levels or the conditions and circumstances one athlete stress factor different from another athlete. Psychological responses to stress contribute to athletes' perceptions regarding what's happening to them, and within them, during sports performance. Examining athletes experience the dynamic shifts of emotions in sport may contribute to understanding the stress-performance relationship. This research uses a qualitative case-study approach to analyse the competitive lives of five elite athletes, more focus being paid to the perceptions the athletes have of their levels of control over their stress experiences. The concept of reversal theory is used for analyzing and interpreting the data.

Luke Behncke (2004), conducted the review of mental skills training for sports. Mental skills training for sport is reviewed in relation to general cognitive-somatic techniques. These techniques include mental rehearsal, mental imagery and

visualization, visual-motor behavior rehearsal, cognitive-behavior therapy, biofeedback, progressive muscle relaxation and meditation. It is concluded that the initial and continued ability to self-monitor, though enhanced by mental skills training, is fundamentally important for any implementation of cognitive-somatic therapy.

M. S. George, T. A. Ketter and P. I. Parekh carried out this study. (2004) the Stroop interference. In the study test requires a person to respond to specific elements of a stimulus while suppressing a competing response. Previous positron emission tomography (PET) work has shown increased activity in the right anterior cingulate gyros during the Stroop test. It is not sure, however, whether the anterior cingulate participates more in the attention rather than the response selection aspects of the task or whether different interference stimuli might activate different brain regions. We have to find out (1) whether or not the Stroop interference task results in increased activation in right anterior cingulate as reported previously, (2) whether this activation varied as a function of response time, (3) what brain regions were functionally linked to the cingulate during performance of the Stroop, and (4) whether a modified Stroop task involving emotionally distracting words would activate the cingulate and other limbic and par limbic regions. Twenty-one healthy volunteers were scanned with H215O PET while they performed the Stroop interference test (standard Stroop), a modified Stroop task using distracting words with sad emotional content (sad Stroop), and a control task of naming colors. These were given in a manner designed to boost the response choice aspects of the task. Images were stereo tactically normalized and analyzed using statistical parametric mapping (SPM). Predictably, subjects were significantly slower during was the shortly activated stand are Stroop compared to the control task. The sad Stroop also activated this same region, but to a lower degree. Correlation regional network analysis brought forth an inverse relationship between activation in the left midcingulate and the left insular and temporal lobe. In addition to the, activity in different regions of the cingulate gyros' correlated with performance speed during the standard Stroop. These results showed that the left midcingulate is probably going to be part of a neural network activated once one tries to override a competing

verbal response. At the time of cognitive interference tasks involving language the left midcingulate region was found to be functionally coupled to the left insula, temporal and frontal cortex. These results emphasize the important role of the cingulated gyros in selecting appropriate and suppressing inappropriate verbal responses.

Rainer Schandry(2003) made attempt to study what here the emotional experience is coupled to perception of bodily processes. Out of this study concluded that individuals who have better perception of heart activity tend to show higher levels of a momentarily experienced emotion (in the present study anxiety) and score higher on the personality trait "Emotional Liability." The future of cardiac awareness considered here is perception of heart beats. Subjects were asked to count heart beats (only by focusing on their body but not by taking their pulse) during a signaled time interval and the counted numbers of beats were then compared to the original number of beats as extracted from EKG. In addition to this skin conductance and respiration were recorded. At the time of the experimental task (i.e., counting heart beats) increases in heart rate, respiration rate and number of spontaneous fluctuations in skin conductance were also recorded. Groups of good and poor perceivers were grouped based on the accuracy on the perception task. The two groups did not differ in heart rate; however, in State Anxiety and Emotional Liability, the group of good perceivers had significantly higher scores. The importance of viscera caption for emotional experience is highlighted and the relevance for clinical psychology is concluded.

Smith, David J, Norris, Stephen R and Hogg, John M (2002) carried out a study to bring forth an analytical description of the physiological and psychological tools employed in the assessments of swimmers. The first-level assessment ought to be the competitive performance itself; since it is at this point energy elements interplay and give the 'highest form' of assessment. Competition video assessing of major swimming events has advanced a lot and has become an important tool for coaches, athletes, sport scientists, equipment manufacturers, and also e the media. The breakdown every swimming performance at the individual level to its

constituent parts permits comparison with the anticipated or predicted execution, further allowing for comparison with world competition level. The use of other 'on-going' monitoring protocols to be training officers usually involves criterion 'effort' swims and specific training sets where some of the aspects are examined in depth. Physiological parameters that are mostly examined together with swimming speed and technical aspects include oxygen uptake, heart rate, blood lactate concentration, blood lactate suck accumulation. For in-training examination of technical issues simple as well as complete procedures ware used. Strength and power also quantified via several modalities along with tethered, swimming and dry-land isokinetic devices. The provision of a 'swimming flume' provide coaches and sport scientists a better degree of flexibility in the type of monitoring and assessing. There is convincing proof that athletes maybe distinguished bared on their psychological skills and emotional competencies and this difference become more highlighted. When athlete improves. Regard of what test format is employed (physiological, biomechanical or psychological), similar criteria of validity should be ensured for the test to provide helpful and associative information concerning current or future performance. The practical worth of any suggested testing or monitoring protocol ought to be carefully examined. Apart from this the development, the stage of the athlete(s) in question ought to be shown in the testing/monitoring program. Finally, advancing technological innovations is expected to thing to the pool deck or dry-land training area simple, fast and advanced diagnostic tools, mainly in the areas of blood-borne markers of training response and neuromuscular excitability.

Ajayi, M. A. PhD and Fatokun, A. L. A. (2002) carried out a study on emotional intelligence (EI) which is considered to be more effective than other measures in evaluating performance in various field of human activities. However, research evidences show that its application to amateur athletics and its positive effect in enhancing sports performances is not established. Hence an attempt is made in this study to investigate the possible effectiveness of emotional intelligence program on the performances of amateur athletes from selected sports in Oyo state of Nigeria...For this study the pretest, posttest randomized control group quasi experimental design was adopted. Four sports which includes, basketball, handball,

and volleyball and weight lifting was elected using the fast bowl method of simple random, sampling technique. 92 male and female amateur athletes whose ages ranged between 18 to 25 were selected for the study. The modified emotional competence inventory version 2 (EC12 ($\alpha=0.8$) and emotional (ECDM Sports) ($\alpha=0.079$) were administered to these athletes. The groups were subjected to six weeks of emotional competence training. For this ECDM Sports program was used Two hypothesis were tested at the significant levels of 0.05. The data analysis was done using Analysis of Covariance (ANOVA). The results excesses major difference in (EI) posttest (exp, $x=196.20$) counted $x=186.98$ ($P>0.05$). It was found that the treated group performed better in the sports performance posttest ($X=66.19$) comparing the control group ($=52.30$) ($P>0.05$). Result also revealed that there is no much difference in the EI and sports performance scores between the sports groups that were treated ($P<0.05$) this study hence proved that amateur athletes from all the sports groups equally utilized and they all benefitted from the treatment programmers.

Raglin, John S (2001) carried out a study on the Mental Health Model (MHM) of sport performance. Thus study should that an inverse relationship exists between psychopathology and sport performance. The model highest that as athlete's mental health improves or directly affects performance. Thus view is imported widely. Studies have shown that between seventy and eighty fifth of victorious and non-victorious athletes are often identifies utility using general psychological measures of personality structure and mood state, a level superior to chance but insufficient for the purpose of selecting athletes. Longitudinal MHM analysis indicates that the mood state responses of athletes show a dose-response relationship with their training load, a finding that has needed to for reduce the incidence of the staleness syndrome in athletes who engage in intensive physical training. The MHM also having implications for the overall care of athletes as support services have generally been limited to preventing or treating physical problems. In spite of its simple premise and empirical support, the MHM has mostly been mischaracterized within the sport psychology literature and some authors have questioned its validity recently outline. This overview will summarize MHM research, including the more

recent work involving the model's dynamic features in an attempt to solve disputes about the model.

S. E. McInnes, J. S. Carlson, C. J. Jones and M. J. McKenna (2000) carried out this study. This intensities of activity and movement patterns throughout basketball were investigated by videoing the movements and checking the heart rate and blood lactate responses of eight elite players at the time of competition. The results are then depending 'live time', that is actual playing time, and 'total time', which includes live time and all stoppages in play. The mean (\pm S.D.) frequency of all activities was 997 ± 183 , with a change in movement category every 2.0 s. A mean total of 105 ± 52 high-intensity runs (mean duration 1.7 s) were recorded for each game, resulting in one high-intensity run every 21 s during live time. Sixty percent of live time was spent engaged in low-intensity activity, whereas 15% was spent in high-intensity activity. The mean heart rate (HR) during live time was 169 ± 9 beats min^{-1} ($89 \pm 2\%$ peaks HR attained during laboratory testing); 75% of live time was spent with a HR response of greater than 85% peak HR. The mean blood lactate concentration was 6.8 ± 2.8 mm, indicating the involvement of glycolysis in the energy requirements of basketball. It is decided that the physiological needs of men's basketball are high, requiring high cardiovascular and metabolic capacities of players.

Christopher J. Beedie, Peter C. Terry and Andrew M. Lane (2000) carried out this study. This study comprised of two meta-analyses of published studies that used the Profile of Mood States (POMS) to probe in to relationships between mood and athletic achievement ($n = 13$) and between mood and performance outcome ($n = 16$). Results revealed that effect sizes (ESs) for the level of achievement meta-analysis were minimum (Weighted Mean ES = .10, SD = .07), a finding consistent with a previous meta-analysis by Rowley, Landers, Kyllö, and Etnier (1995). Larger effects were found for the performance outcome meta-analysis (Weighted Mean ES = .31, SD = .12). Effects were moderate for vigor, confusion, and depression, small for anger and tension, and very small for fatigue. All effects similar to one's predicted by direction predicted by Morgan's (1985) Mental Health Model. Effects were larger

in sports of short period, in sports involving open skills, and where performance was judged using self-referenced criteria. Findings postulated that the POMS has utility in the predicting of performance outcome but not in the prediction of level of achievement.

Brian Jay Krylowicz, B.A., M.A. (2000) carried out this study. This study focused on student-athletes' transition out of collegiate athletics and the shift in identity from the athletic role into more of a work role. The study made an attempt determine if a highly salient athletic identity interfered with the development of other life roles and personal growth initiative. Selected persons included 83 men and 99 women collegiate basketball players from Division I programs who ensured questionnaires evaluating vocational identity, athletic identity, and personal growth initiative prior to the beginning of the basketball season. On the basis of current theory and prior research, hypotheses were tested that examined at the relationships of vocational and athletic identity with academic classification, gender, playing status, power rating, and personal growth initiative. Separate analyses were done with done with respect to gender. Results showed that (1) increased academic classification (from freshman to senior), was positively correlated to higher levels of vocational identity for women; (2) having a higher playing status (i.e., starter) was positively correlated with higher levels of vocational identity for women; (3) having a higher playing status was positively correlated with higher levels of athletic identity for both men and women; (4) playing for a school with a higher power ratings was positively related to higher levels of athletic identity for men and less for women; (5) men had higher levels of athletic identity comparing women; and (6) for women, having higher levels of either vocational or athletic identity was positively related to having higher levels of personal growth initiative. Suggestions for interventions with student-athletes and future research modes operand were also discussed.



Chapter III
METHODOLOGY

Chapter III

METHODOLOGY

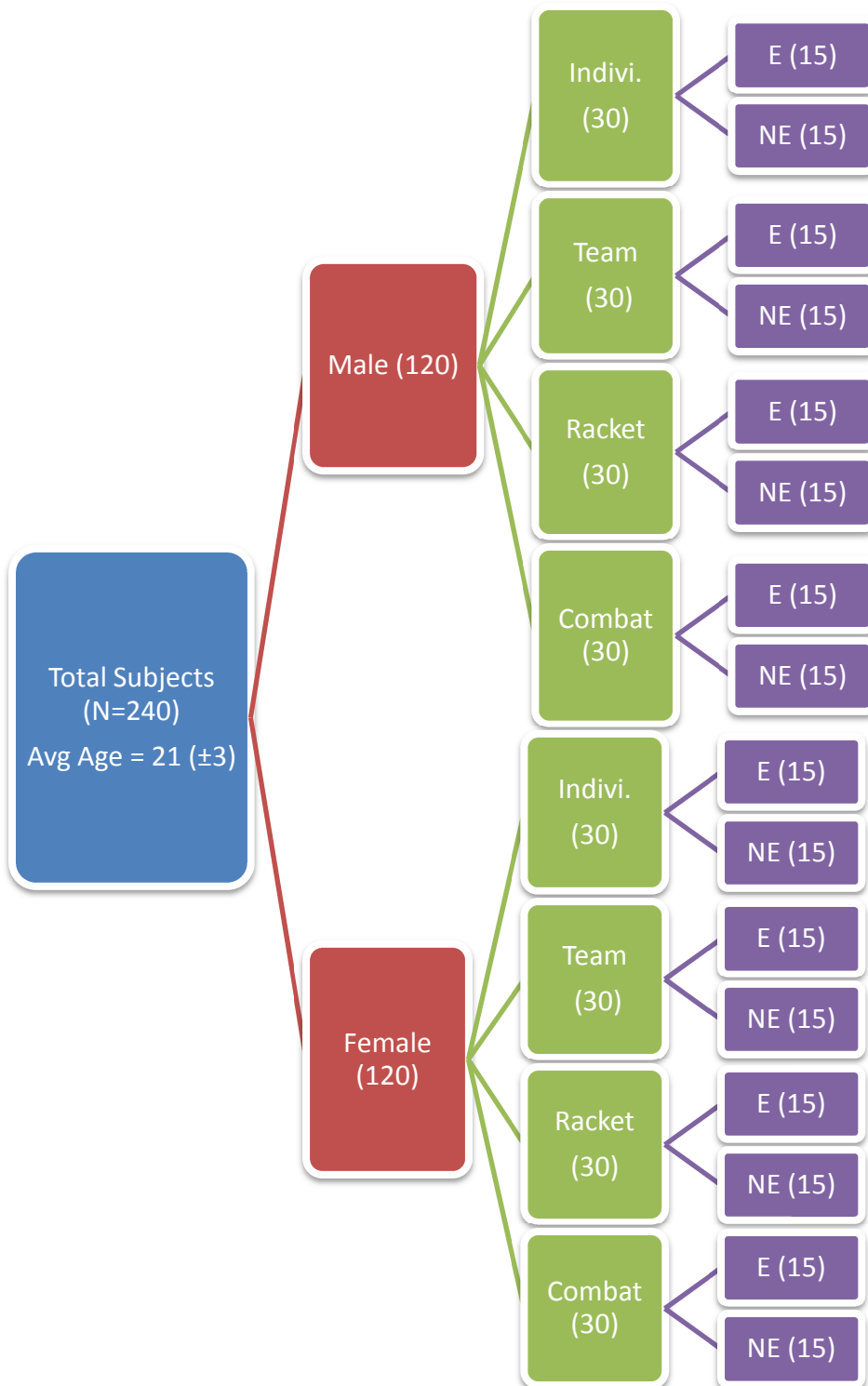
This chapter describes the methodology and procedure adopted for the study. It includes selection of subjects, selection of variables, selection of test item, test administration, collection of data, reliability of data, tester competency, instrument reliability, subject reliability, orientation of subjects and statistical tools used.

Selection of subjects

Statistical population of the study consisted of elite and, non-elite athletes from the state of Kerala. Elite athletes in the sense, those who had participated or medal winner in the International and National level competition and, medal winners in the University level competitions. Non – elite athletes are those who had participated in the University, state and intercollegiate level competitions. The samples comprised of two hundred and forty ($N = 240$) randomly selected. One hundred and twenty ($n_m = 120$) male and one hundred and twenty ($n_m = 120$) female was selected from state of Kerala. Their age ranged from 18 years to 24 years. The total number of subjects, in each category were further selected in following ways;

- a. Individual events (male 30 and female 30)
- b. Combative sports (male 30 and female 30)
- c. Racket games (male 30 and female 30)
- d. Team games (male 30 and female 30)

Figure 1
Flow chart of sample selected for the study



Selection of variables

A major tenet of sport and performance psychology is that mental skills are important factors of performance involving continue abilities achieved through mental skills training. The object of which is to provide a set of psychological tactics for performance enhancement of successfully recovering from sport injury, and help to maintain a positive life balance between sport and other aspects of life. Mental skills have a important to play in improving one's performance in any kind of sports and games. The following mental skills variables were examined for this study and are classified as follows.

Mental skills

1. Foundation skills
 - a. Goal Setting
 - b. Self Confidence
 - c. Commitments.
2. Psychological Traits
 - a. Stress Reaction
 - b. Fear Control
 - c. Relaxation,
 - d. Energizing (Activation)
3. Cognitive Skills
 - a. Imagery
 - b. Mental Practice
 - c. Focusing
 - d. Refocusing
 - e. Computation Planning

Performance— In those respective sports

Selection of test items

1. Mental skills

Ottawa Mental Skills Assessment Tool (OMSAT-3): The OMSAT was developed and validated by **Durand – Bush, N., Shamela, J.H., and Green – Demers, I. (2001)**. The Ottawa Mental Skills Assessment Tool (OMSAT-3) is a comprehensive measure that can assesses 12 mental skills. These mental skills are grouped under three broader factors: foundation skills, psychosomatic skills and cognitive skills.

2. Performance in their respective game/sports

Subjective judgment by five experts

Test Administration

1. Mental skill

Tool: Ottawa Mental Skills Assessment Tool (OMSAT-3)

Description: To find out selected mental skill variable, a standardized questionnaire - Ottawa Mental Skills Assessment Tool (OMSAT-3) was used which is devised by Durand – Bush, N., Shamela, J.H., and Green – Demers, I. (2001). The OMSAT-3 included 71 statements and 12 mental skill scales grouped under the following three boarder conceptual components.

- A. Foundation skills – goal setting, self-confidence and commitment
- B. Psychosomatic skills – stress reactions, fear control, relaxation, activation
- C. Cognitive skills – imagery, mental practice, focusing, refocusing and competition planning.

A questioner was used to collect personal detail like sex, age and achievement levels for evaluating extend of selected mental skill application OMSAT-3 was used. The questioner classified the 12 mental skills in to 3 categories

and examined them. Mental skills in three categories: 1) Foundation skills including goal setting, commitment and self-confidence, 2) Psycho-somatic skills including fear control, relaxation, activation and stress reaction, 3) cognitive skills including focus, refocus mental practice, imagery and game planning. The questioner reliability and validity was measured and approved by researchers. Each item was answered on an always – never 5 point Likert scale. The Likert scale also includes don't know option.

Score: the OSMAT – 3 is a self-evaluation questionnaire of 71 statements. Each statement carries a maximum of five and minimum of zero.

The subjects were requested to put (√) mark in appropriate box. Each statement represents one's own reaction.

Never		Sometimes	Always		Don't know
1	2	3	4	5	0

Table 1
The scoring pattern of sub variables

SI No.	Description	No. of Questions	Question numbers
1.	Goal setting	6	1 – 6
2.	Self confidence	7	7 – 13
3.	Commitment	10	14 – 23
4.	Stress reactions	8	24 – 31
5.	Fear control	5	32 – 36
6.	Relaxing	3	37 – 39
7.	Energizing	5	40 – 44
8.	Imagery	5	45 – 49
9.	Mental practice	8	50 – 57
10.	Focusing	5	58 – 62
11.	Refocusing	4	63 – 66
12.	Competition planning	5	67 - 71

2. Performance score

Tool: Subjective judgment by five experts

Description: Five experts each from the respective games and events are assessed in the performance of the subjects. Experts subjectively awarded marks to each subjects based on their performance in the training and competition. The marks for a player were given out of 10. From the five experts, the highest and lowest marks were expelled out and the average of middle three were taken to the performance score.

Collection of data

The data pertains to the mental skill such as foundation skills – goal setting, self-confidence and commitment; psychosomatic skills – stress reactions, fear control, relaxation, activation and cognitive skills – imagery, mental practice, focusing, refocusing and competition planning were collected by conducting standardized questionnaires –Ottawa Mental Skills Assessment Tool (OMSAT-3): The OMSAT was developed and validated by Durand – Bush, N., Shamela, J.H., and Green – Demers, I. (2001). And performance was assessed subjectively by five experts in their respective games, and events.

Reliability of data

The reliability of data was censured by establishing the tester competency and instrument reliability.

Tester competency

Every data on selected variables in this study was taken by the investigator with the help from study perspective. The investigator had experienced preparing under a specialist, keeping in mind the end goal to guarantee the unwavering quality. Measurements were taken during the rest period.

Instrument reliability

For assessing selected mental skill variables, standardized questionnaire were used to collect the data for this study. Thus instrument used in this study was reliable for the purpose of the study.

Orientation of the Subjects

Once all other formalities have been completed (approval from coaches, trainers, principals, teachers and parents), the subjects were asked to participate in this study. Research scholar clearly explained the purpose of the study, issues related to the confidentiality of the results. Every single doubt of the subjects was clarified. The session was jointly conducted by the research Scholar and his supervisor. Wherever, necessary clarifications were made in their mother tongue, Malayalam.

Statistical Analysis

The collected data on mental skill and subjective judgment of performance of subjects were statistically treated. Descriptive statistics, independent t test, one way ANOVA were used for comparison. Pearson's Product moment correlation was used to correlate the mental skills in relation to the performance of athletes of Kerala. The calculated numerical results were interpreted meaningfully. In all cases, the criterion for statistical significance was set at 0.05 level of confidence ($P < 0.05$). All the data was analyse with the help of SPSS version 23.



CHAPTER IV

ANALYSIS OF DATA AND DISCUSSION OF FINDINGS

Chapter IV

ANALYSIS OF DATA AND DISCUSSION OF FINDINGS

This chapter of the thesis deals with the analysis of the data collected from samples under study as a result of trussed mental skills of athletes from the state of Kerala.

The subjects were selected and randomly assigned for the study consisting of elite and non-elite athletes from the state of Kerala. Elite athletes in the sense, those who had participated or medal winner in the International and National level competition and medal winners in the University level competitions. Non – elite athletes in the sense, those who had participated in the University, state and intercollegiate level competitions. The samples comprised of two hundred and forty (N = 240) and they were randomly selected. In the total, one hundred and twenty ($n_m = 120$) male and one hundred and twenty ($n_m = 120$) female were selected from state of Kerala. Total number of subjects, in each category were further divided by following ways; Individual events (male 30 and female 30), Combative sports (male 30 and female 30), Racket games (male 30 and female 30), Team games (male 30 and female 30).

The purpose of the study was to analyse mental skill in relation to the performance of athletes from the state of Kerala. The selected mental skill variables were considered for this study under the following classifications; Foundation Skills, Psycho-Somatic Skills and Cognitive Skill. These skills are related with cognitive processes such as learning, preparation, memory and thinking. To find out selected mental skill variable, a standardized questionnaire - Ottawa Mental Skills Assessment Tool (OMSAT-3) was used which is devised by Durand – Bush, N., Shamela, J.H., and Green – Demers, I. (2001). The OMSET - 3 included 71 statements and 12 mental skill scales grouped under the following three boarder conceptual components. (1) Foundation skills –These skills include, goal setting, self-confidence and commitment; (2) Psychosomatic skills – These skills include stress reactions, fear control, relaxation, activation and (3) Cognitive skills – These

skills include imagery, mental practice, focusing, refocusing and competition planning. The scholar also collected their performance scores as subjective judgment of five experts.

After collecting data the scores obtained from standardized test of mental skill and subjective judgment of performance of subjects were statistically treated. Mean, standard deviation, independent t test and one way ANOVA were employed to test different hypothesis. Pearson's Product moment correlation was used to analyse the mental skill in relation to the performance of athletes of Kerala. The calculated numerical results were interpreted meaningfully. In all cases, the criterion for statistical significance is set at 0.05 level of confidence ($P < 0.050$). All the data were analysed with the help of SPSS version 23.

Analysis of data

The analysis of mental skill variables

A. Foundation skills of mental skill

In this category of foundation skill in mental skill, three sub variables were analysed separately namely goal setting, self-confidence and commitment.

1. Goal setting

The comparative analysis of goal setting between elite and non-elite athletes from different sports was presented in the table 2.

Table 2

Comparison of goal setting between elite and non-elite athletes

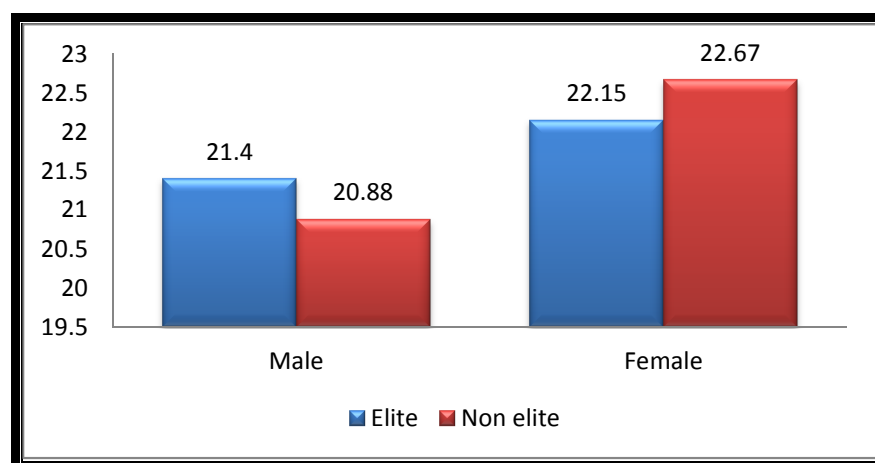
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	21.40	3.51	60	20.88	2.86	0.88	118	0.38
Female	60	22.15	3.11	60	22.67	3.21	0.89	118	0.37

The table 2 revealed that the calculated t value of elite and non-elite male athletes was 0.88, which was not significant (p value $0.38 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their goal setting level of foundation skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.89, which was not significant (p value $0.37 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their goal setting level of foundation skill category of mental skill.

Figure 2

Comparison of goal setting between elite and non-elite athletes



The comparative analysis of goal setting between male and female athletes from different sports was presented in the table 3.

Table 3

Gender wise comparison on goal setting

Category	Male			Female			t ratio	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	21.40	3.51	60	22.15	3.11	1.24	118	0.22
Non Elite	60	20.88	2.86	60	22.67	3.21	3.22*	118	0.00

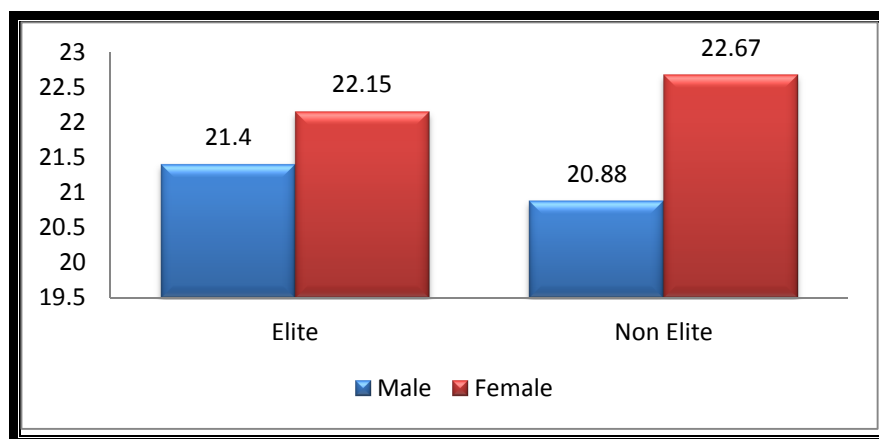
* Significant at the 0.05 level of Significance

The table 3 revealed that the calculated t value of male and female elite athletes was 1.24, which was not significant (p value $0.22 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their goal setting level of foundation skill category of mental skill.

The calculated t value of male and female non elite athletes was 3.22, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes significantly differ on their goal setting level of foundation skill category of mental skill. It may be said that goal setting level of foundation skill category of non-elite female athletes were found significantly greater than non-elite male athletes.

Figure 3

Gender wise comparison on goal setting



The one way analysis variance of goal setting among elite athletes from different sports discipline is presented in the following tables.

Table 4

Comparison of goal setting among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	235.63	3	78.54	8.44*	0.00
Within	1079.30	116	9.30		
Total	1314.93	119			

* Significant at the 0.05 level of Significance

From table 4, it was evident that the calculated F value was 8.44, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline significantly differ on their goal setting level of foundation skill category. In order to find which sports discipline gained more goal setting level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

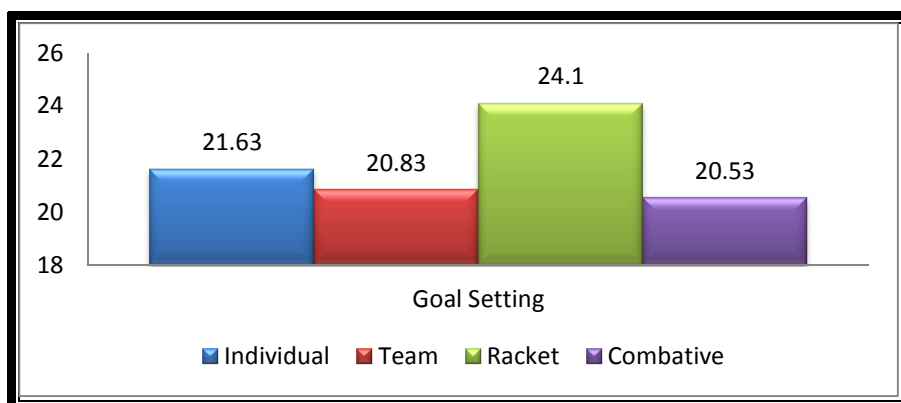
Table 5
Post hoc analysis on goal setting
among elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
21.63	20.83			0.80	0.31
21.63		24.10		2.47*	0.00
21.63			20.53	1.10	0.17
	20.83	24.10		3.27*	0.00
	20.83		20.53	0.30	0.70
		24.10	20.53	3.57*	0.00

* Significant at the 0.05 level of Significance

The table 5 shows that the mean difference of goal setting between racket game players and individual, team, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that elite racket game players are more dominant in goal setting of foundation skill than other discipline namely individual, team and combative players.

Figure 4
Comparison of Goal setting
among elite athletes from different sports discipline



The one way analysis variance of goal setting among non-elite athletes from different sports discipline is presented in the following tables.

Table 6
Comparison of goal setting among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	134.63	3	44.88	4.96*	0.00
Within	1050.30	116	9.05		
Total	1184.93	119			

* Significant at the 0.05 level of Significance

From table 6, it was evident that the calculated F value was 8.44, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significantly differ on their goal setting level of foundation skill category. In order to find which sports discipline gained more goal setting level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 7

**Post hoc analysis on goal setting
among non-elite athletes from different sports discipline**

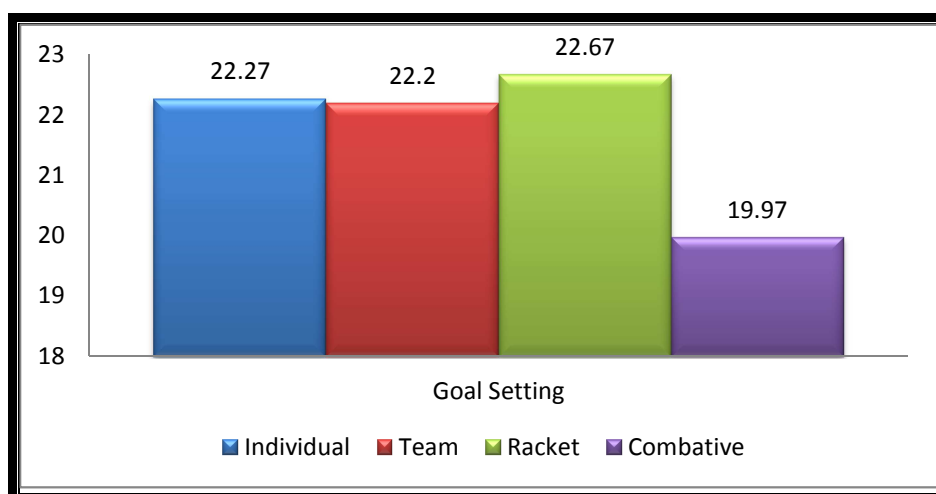
Individual	Team	Racket	Combative	M.D.	CD at 5% level
22.27	22.20			0.07	0.93
22.27		22.67		0.40	0.61
22.27			19.97	2.30*	0.00
	22.20	22.67		0.47	0.55
	22.20		19.97	2.23*	0.01
		22.67	19.97	2.70*	0.00

* Significant at the 0.05 level of Significance

The table 7 shows that the mean difference of goal setting between combative game players and individual, team, racket game players were significant differences since critical differences were 0.00, 0.01 and 0.00 respectively lesser than at 0.05 level. This table clearly indicates that non elite combative game players are less dominant in goal setting of foundation skill than other discipline namely individual, team and racket players.

Figure 5

**Comparison of Goal setting
among non-elite athletes from different sports discipline**



The one way analysis variance of goal setting among male athletes from different sports discipline was presented in the following tables.

Table 8
Comparison of goal setting among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	87.89	3	29.30	3.01*	0.03
Within	1128.70	116	9.73		
Total	1216.59	119			

* Significant at the 0.05 level of Significance

From table 8, it was evident that the calculated F value was 3.01, which was significant (p value $0.03 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their goal setting level of foundation skill category. In order to find which sports discipline more goal setting level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 9
Post hoc analysis on goal setting among male athletes from different sports discipline

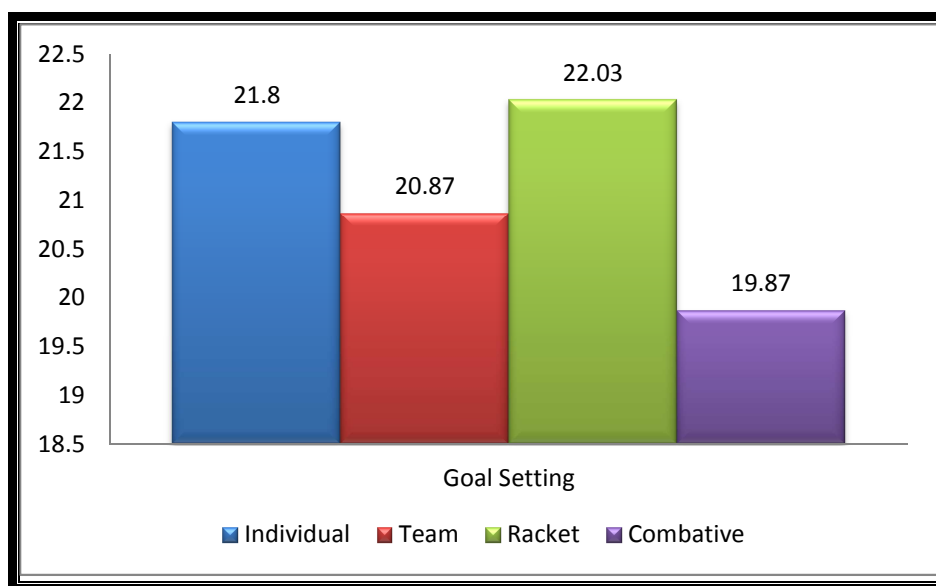
Individual	Team	Racket	Combative	M.D.	CD at 5% level
21.80	20.87			0.93	0.25
21.80		22.03		0.23	0.77
21.80			19.87	1.93*	0.02
	20.87	22.03		1.17	0.15
	20.87		19.87	1.00	0.22
		22.03	19.87	2.17*	0.01

* Significant at the 0.05 level of Significance

The table 9 shows that the mean difference of goal setting between combative game players and individual, racket game players were significant differences since critical differences were 0.02 and 0.01 respectively lesser than at

0.05 level. This table clearly indicates that male Racket game players are more dominant in goal setting of foundation skill and less dominant in combative players.

Figure 6
Comparison of Goal setting
among male athletes from different sports discipline



The one way analysis variance of goal setting among female athletes from different sports discipline was presented in the following tables.

Table 10
Comparison of goal setting among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	261.29	3	87.10	10.91*	0.00
Within	925.70	116	7.98		
Total	1186.99	119			

* Significant at the 0.05 level of Significance

From table 10, it was evident that the calculated F value was 10.91, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their goal setting level of foundation skill category. In order to find which sports

discipline more goal setting level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

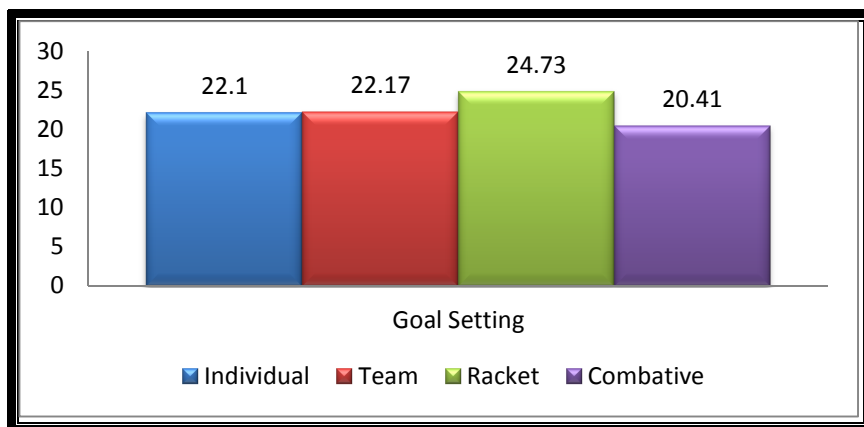
Table 11
Post hoc analysis on goal setting
among female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
22.10	22.17			0.67	0.93
22.10		24.73		2.63*	0.00
22.10			20.41	1.47*	0.05
	22.17	24.73		2.56*	0.00
	22.17		20.41	1.53*	0.04
		24.73	20.41	4.10*	0.01

** Significant at the 0.05 level of Significance*

The table 11 shows that the mean difference of goal setting between combative game players and individual, racket game players were significant differences since critical differences were 0.05, 0.04 and 0.01 respectively lesser than at 0.05 level. The mean difference of goal setting between racket game players and individual, team game players were significant differences since critical differences were 0.00 and 0.04 respectively lesser than at 0.05 level. This table clearly indicates that female racket game players are more dominant in goal setting of foundation skill and less dominant in combative players.

Figure 7
Comparison of Goal setting
among female athletes from different sports discipline



The correlative analysis between goal setting and performance score of elite and non-elite athletes was presented in table 12.

Table 12
Relationship between goal setting
and performance of elite and non-elite athletes

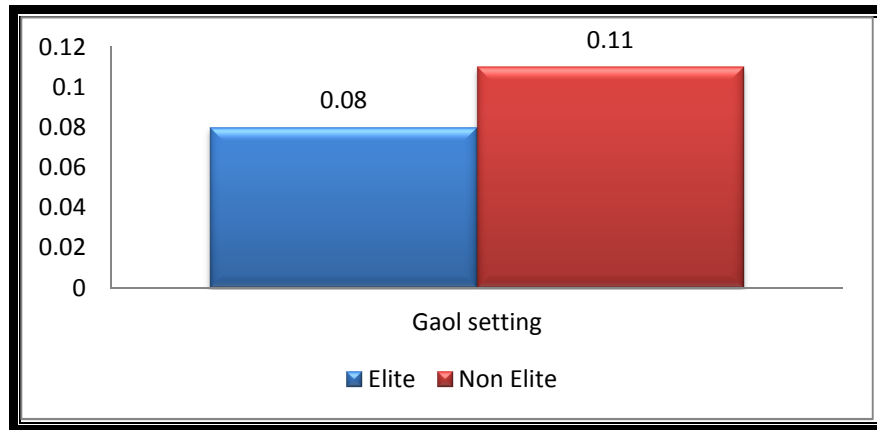
	Elite	Non Elite
Pearson Correlation	0.08	0.11
Sig. (2-tailed)	0.41	0.25
N	120	120

The analysis of table 12 shows that the elite players of obtained correlation value on goal setting to the performance was 0.08 and p value was 0.41. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with goal setting in foundation skill of mental skill.

The obtained correlation value of non-elite players on goal setting to the performance was 0.11 and p value was 0.25. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no

relationship when the performance was related with goal setting in foundation skill of mental skill.

Figure 8
Relationship between goal setting and performance of elite and non-elite athletes



The correlative analysis between goal setting and performance score of male and female athletes was presented in table 13.

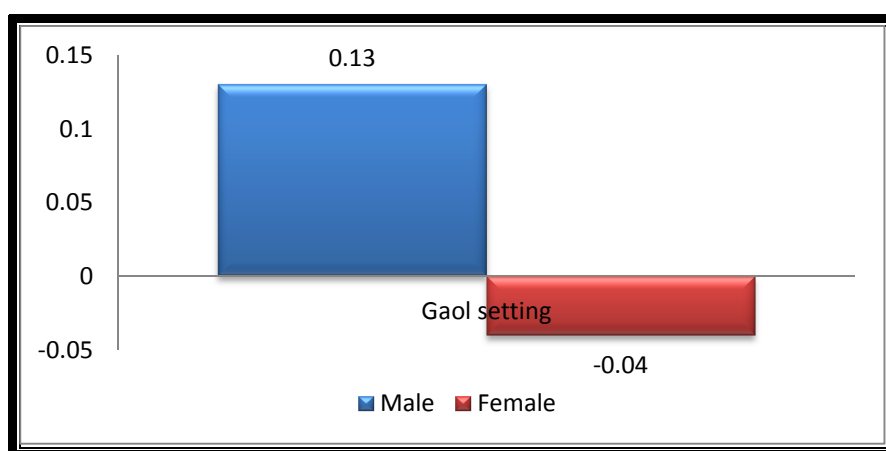
Table 13
Relationship between goal setting and performance male and female athletes

	Male	Female
Pearson Correlation	0.13	-0.04
Sig. (2-tailed)	0.15	0.66
N	120	120

The analysis of table 13 shows that the male players of obtained correlation value on goal setting to the performance was 0.13 and p value was 0.15. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with goal setting in foundation skill of mental skill.

The obtained correlation value of female players on goal setting to the performance was -0.04 and p value was 0.66. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with goal setting in foundation skill of mental skill.

Figure 9
Relationship between goal setting and performance male and female athletes



2. Self Confidence

The comparative analysis of self-confidence between elite and non-elite athletes from different sports was presented in the table 14.

Table 14
Category wise comparison of Self Confidence

Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	26.63	4.17	60	26.10	4.43	0.68	118	0.50
Female	60	25.62	4.12	60	26.17	4.83	0.67	118	0.49

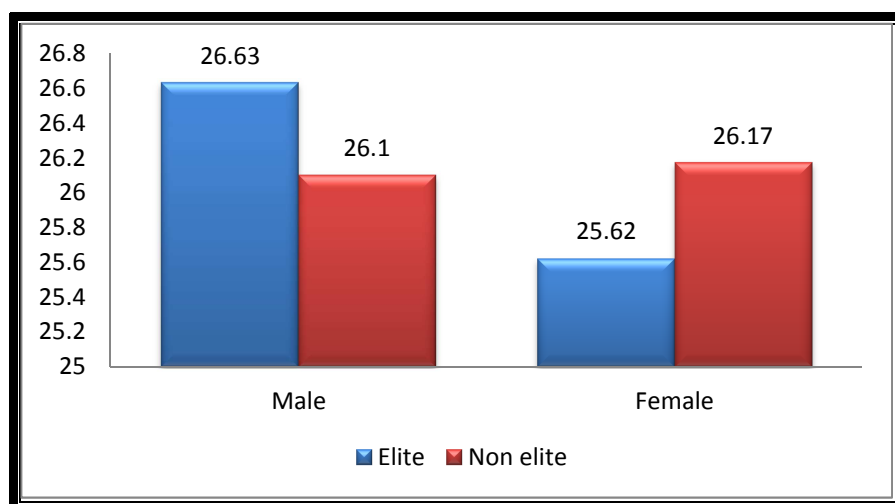
The table 14 revealed that the calculated t value of elite and non-elite male athletes was 0.68, which was not significant (p value $0.50 > 0.05$) at 0.05 level with

df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Self Confidence level of foundation skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.67, which was not significant (p value 0.49>0.05) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their Self Confidence level of foundation skill category of mental skill.

Figure 10

Category wise comparison of Self Confidence



The comparative analysis of self-confidence between male and female athletes from different sports was presented in the table 15.

Table 15

Gender wise comparison of Self Confidence

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	26.63	4.17	60	25.62	4.12	1.34	118	0.18
Non Elite	60	26.10	4.43	60	26.17	4.83	0.08	118	0.94

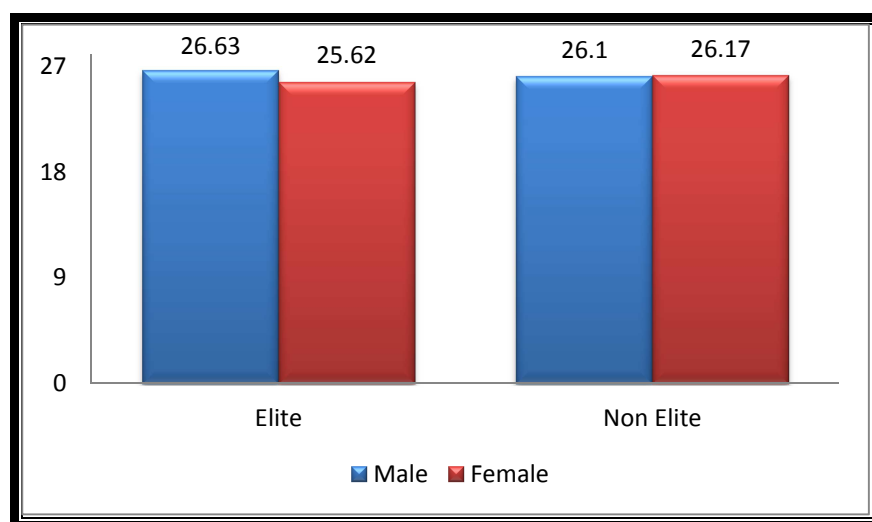
The table 15 revealed that the calculated t value of male and female elite athletes was 1.34, which was not significant (p value 0.18>0.05) at 0.05 level with

df equal to 118. It showed that the mean scores of elite male and female athletes similar on their Self Confidence level of foundation skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.08, which was not significant (p value $0.94 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their Self Confidence level of foundation skill category of mental skill.

Figure 11

Gender wise comparison of Self Confidence



The one way analysis variance of self confidence among elite athletes from different sports discipline was presented in the following tables.

Table 16

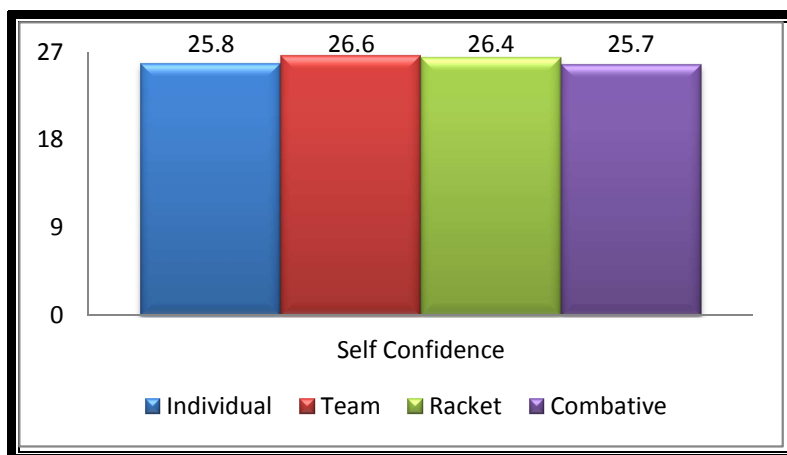
Comparison of Self Confidence among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	17.63	3	5.88	0.33	0.80
Within	2039.50	116	17.58		
Total	2057.13	119			

From table 16, it was evident that the calculated F value was 0.33, which was not significant (p value $0.80 > 0.05$) at 0.05 level with df equal to 3, 116. It showed

that elite athletes from different types of sports discipline similar on their Self Confidence level of foundation skill category.

Figure 12
Comparison of Self Confidence
among elite athletes from different sports discipline



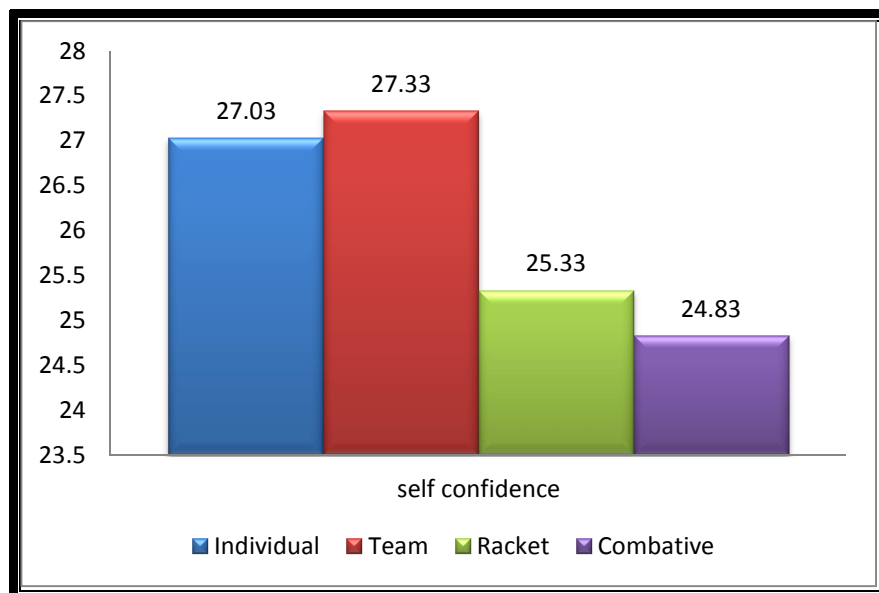
The one way analysis variance of self confidence among non-elite athletes from different sports discipline was presented in the following tables.

Table 17
Comparison of Self Confidence among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	137.40	3	45.80	2.22	0.09
Within	2394.47	116	20.64		
Total	2531.87	119			

From table 17, it was evident that the calculated F value was 2.22, which was not significant (p value 0.09>0.05) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline similar on their Self Confidence level of foundation skill category.

Figure 13
Comparison of Self Confidence
among non-elite athletes from different sports discipline



The one way analysis variance of self confidence among male athletes from different sports discipline was presented in the following tables.

Table 18
Comparison of Self Confidence among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	139.33	3	46.44	2.63*	0.05
Within	2050.53	116	17.68		
Total	2189.87	119			

From table 18, it was evident that the calculated F value was 2.63, which was significant (p value 0.05=0.05) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Self Confidence level of foundation skill category. In order to find out which sports discipline has more Self Confidence level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

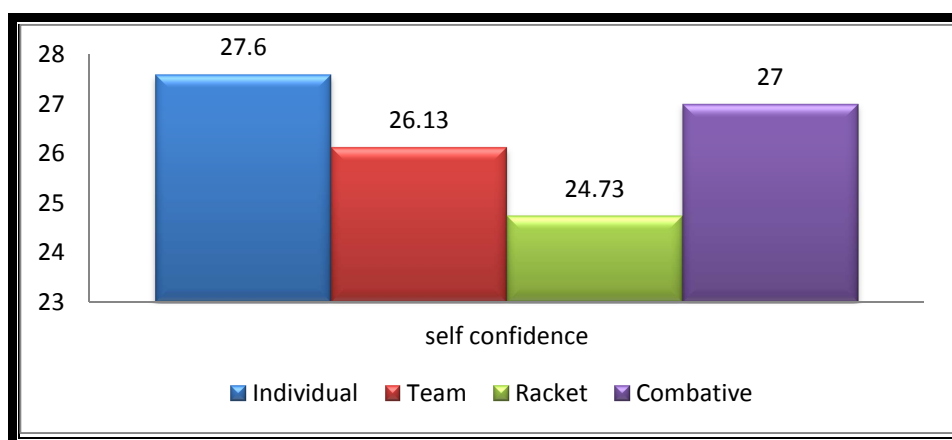
Table 19
Post hoc analysis on Self Confidence
among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
27.60	26.13			1.47	0.18
27.60		24.73		2.87*	0.01
27.60			27.00	0.60	0.58
	26.13	24.73		1.40	0.20
	26.13		27.00	0.87	0.43
		24.73	27.00	2.27*	0.04

* Significant at the 0.05 level of Significance

The table 19 shows that the mean difference of Self Confidence between racket game players and individual, combative game players was significant differences since critical differences were 0.01 and 0.04 respectively lesser than at 0.05 level. This table clearly indicates that male Racket game players are less Self Confidence of foundation skill than the other discipline namely individual, team and combative players.

Figure 14
Comparison of Self Confidence
among male athletes from different sports discipline



The one way analysis variance of self confidence among female athletes from different sports discipline was presented in the following tables.

Table 20
Comparison of Self Confidence among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	325.96	3	108.65	6.12*	0.00
Within	2059.63	116	17.76		
Total	2385.59	119			

* Significant at the 0.05 level of Significance

From table 20, it was evident that the calculated F value was 6.12, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Self Confidence level of foundation skill category. In order to find which sports discipline more Self Confidence level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 21
Post hoc analysis on Self Confidence among female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
25.23	27.80			2.57*	0.02
25.23		27.00		1.77	0.11
25.23			23.53	1.70	0.12
	27.80	27.00		0.80	0.46
	27.80		23.53	4.27*	0.00
		27.00	23.53	3.47*	0.00

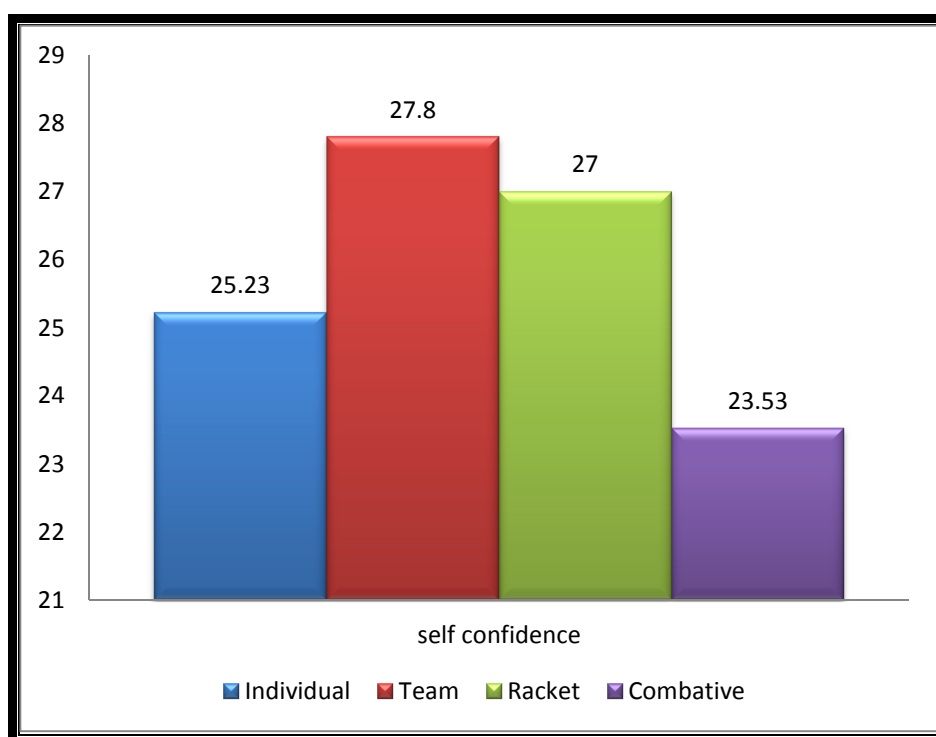
* Significant at the 0.05 level of Significance

The table 21 shows that the mean difference of Self Confidence between team game players and individual, combative game players were significant differences since critical differences were 0.02 and 0.00 respectively lesser than at

0.05 level. The mean difference of Self Confidence between racket game players and combative game players were significant differences since critical differences was 0.00 lesser than at 0.05 level. This table clearly indicates that female team and racket game players are more Confident in foundation skill and less confident in individual and combative players.

Figure 15

Comparison of Self Confidence among female athletes from different sports discipline



The correlative analysis between self-confidence and performance score of elite and non-elite athletes was presented in table 22.

Table 22

**Relationship between self-confidence
and performance of elite and non-elite athletes**

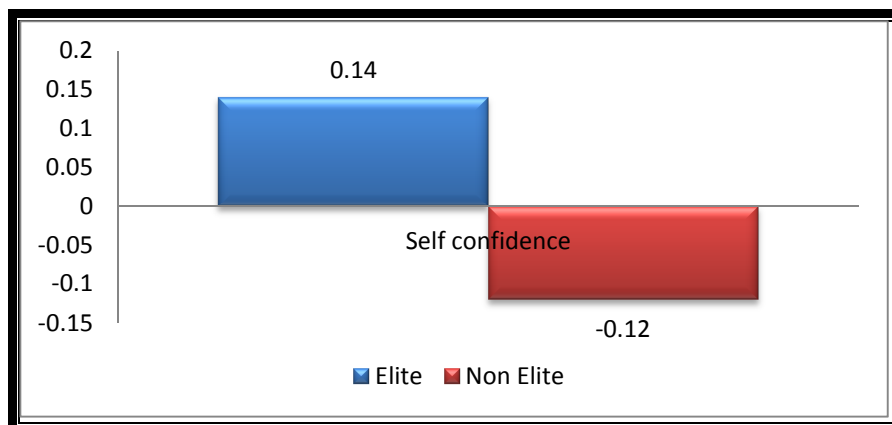
	Elite	Non Elite
Pearson Correlation	0.14	-0.12
Sig. (2-tailed)	0.12	0.19
N	120	120

The analysis of table 22 shows that the elite players of obtained correlation value on self-confidence to the performance was 0.14 and p value was 0.12. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with self confidence in foundation skill of mental skill.

The obtained correlation value of non-elite players on self-confidence to the performance was -0.12 and p value was 0.19. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with self confidence in foundation skill of mental skill.

Figure 16

**Relationship between self-confidence
and performance of elite and non-elite athletes**



The correlative analysis between goal setting and performance score of male and female athletes was presented in table 23.

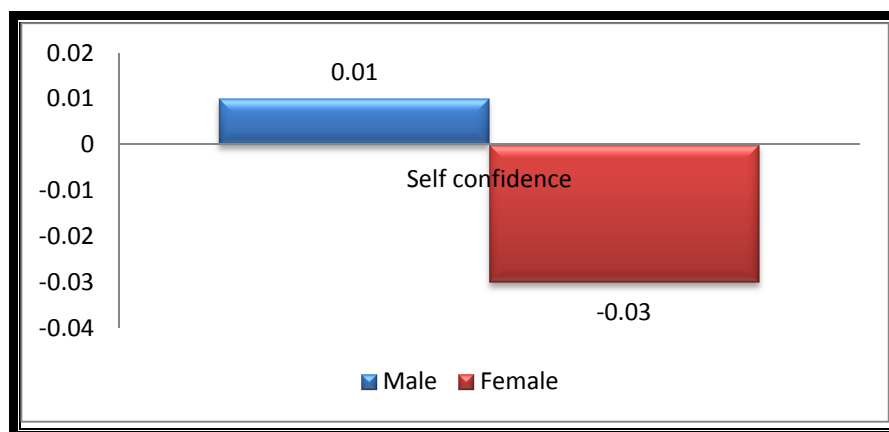
Table 23
Relationship between goal setting
and performance of male and female athletes

	Male	Female
Pearson Correlation	0.01	-0.03
Sig. (2-tailed)	0.94	0.78
N	120	120

The analysis of table 23 shows that the male players of obtained correlation value of self-confidence to the performance was 0.01 and p value was 0.94. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with self confidence in foundation skill of mental skill.

The female players of obtained correlation value of self-confidence to the performance was -0.03 and p value 0.78. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with self confidence in foundation skill of mental skill.

Figure 17
**Relationship between goal setting
and performance of male and female athletes**



3. Commitment

The comparative analysis of commitment between elite and non-elite athletes from different sports was presented in the table 24.

Table 24
Category wise comparison of Commitment

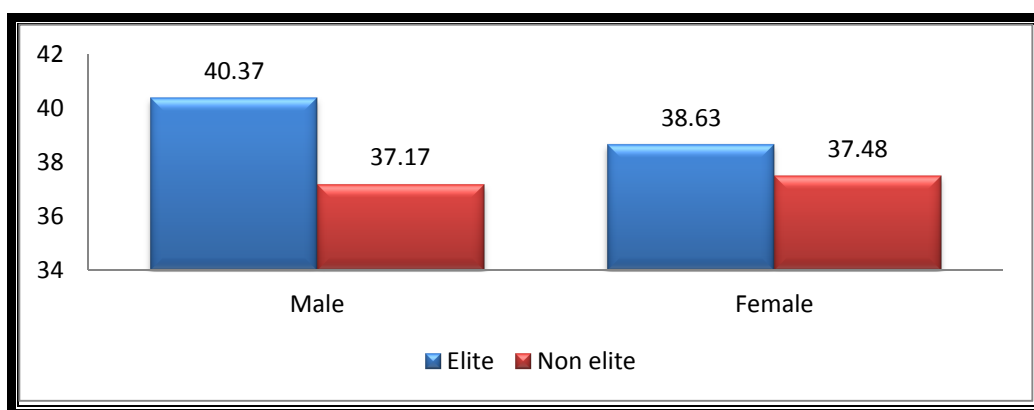
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	40.37	5.47	60	37.17	4.54	3.49*	118	0.00
Female	60	38.63	4.64	60	37.48	5.92	0.37	118	0.24

* Significant at the 0.05 level of Significance

The table 24 revealed that the calculated t value of elite and non-elite male athletes was 3.49, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes significantly differ on their commitment of foundation skill category of mental skill. It may be said that commitment of foundation skill category of male elite athletes were found significantly greater than male non elite athletes.

The calculated t value of female elite and non-elite athletes was 0.37, which was not significant (p value $0.24 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their commitment of foundation skill category of mental skill.

Figure 18
Category wise comparison of Commitment



The comparative analysis of commitment between male and female athletes from different sports was presented in the table 25.

Table 25
Gender wise comparison of Commitment

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	40.37	5.47	60	38.63	4.64	1.87	118	0.06
Non Elite	60	37.17	4.54	60	37.48	5.92	0.33	118	0.74

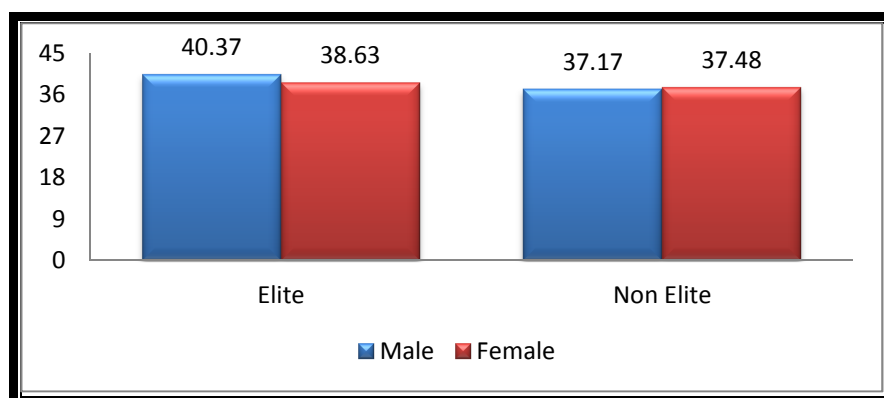
The table 25 revealed that the calculated t value of male and female elite athletes was 1.87, which was not significant (p value $0.06 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their Commitment level of foundation skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.33, which was not significant (p value $0.74 > 0.05$) at 0.05 level with df equal to 118. It showed

that the mean scores of non-elite male and female athletes similar on their Commitment level of foundation skill category of mental skill.

Figure 19

Gender wise comparison of Commitment



The one way analysis variance of commitment among elite athletes from different sports discipline was presented in the following tables.

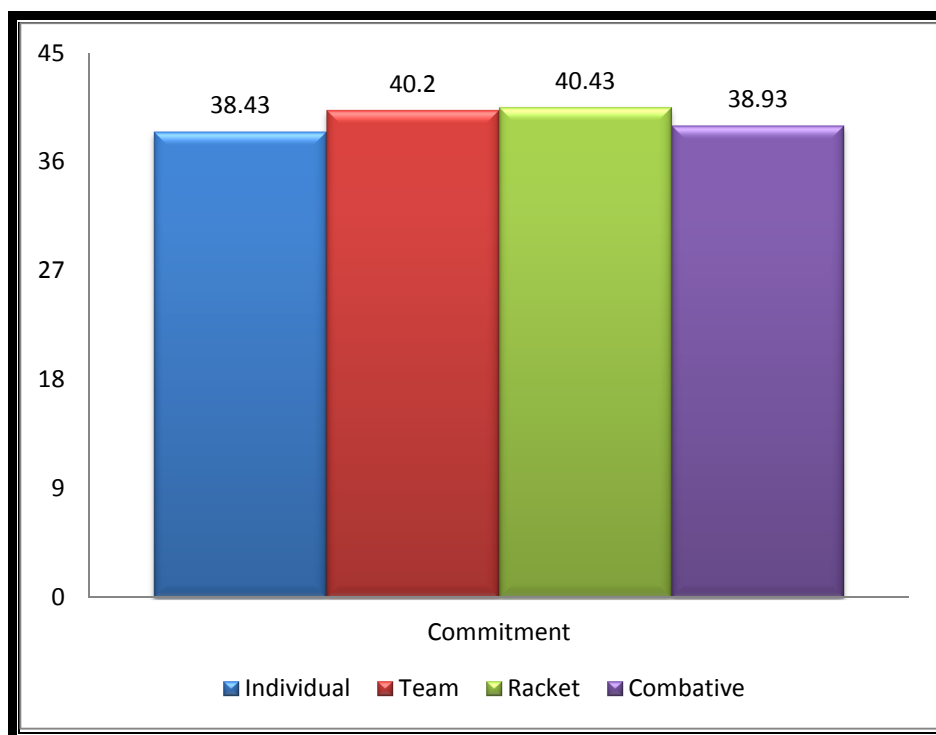
Table 26

Comparison of Commitment among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	84.60	3	28.20	1.08	0.36
Within	3041.40	116	26.22		
Total	3126.00	119			

From table 26, it was evident that the calculated F value was 1.08, which was not significant (p value 0.36>0.05) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their commitment of foundation skill category.

Figure 20
Comparison of commitment
among elite athletes from different sports discipline



The one way analysis variance of commitment among non-elite athletes from different sports discipline was presented in the following tables.

Table 27
Comparison of Commitment among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	572.29	3	190.76	8.15*	0.00
Within	2716.03	116	23.41		
Total	3288.33	119			

* Significant at the 0.05 level of Significance

From table 27, it was evident that the calculated F value was 8.15, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significantly differ on their commitment of foundation skill category. In order to find which sports discipline

more Self Confidence level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

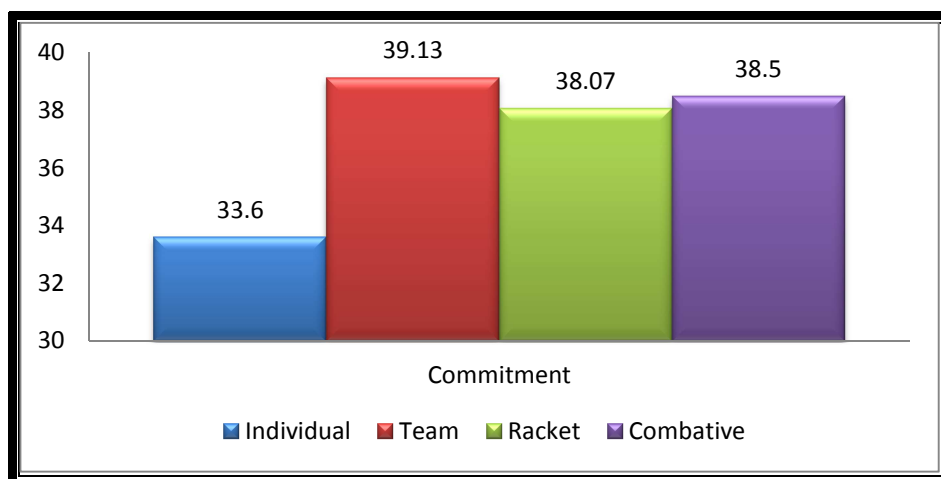
Table 28
Post hoc analysis on commitment
among non-elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
33.60	39.13			5.53*	0.00
33.60		38.07		4.47*	0.00
33.60			38.50	4.90*	0.00
	39.13	38.07		1.07	0.39
	39.13		38.50	0.63	0.61
		38.07	38.50	0.43	0.73

* Significant at the 0.05 level of Significance

The table 28 shows that the mean difference of commitment between individual game players and team, racket, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that non elite were less commitment in foundation skill and similar in the rest of the cases namely individual, racket and combative players.

Figure 21
Comparison of Commitment
among non-elite athletes from different sports discipline



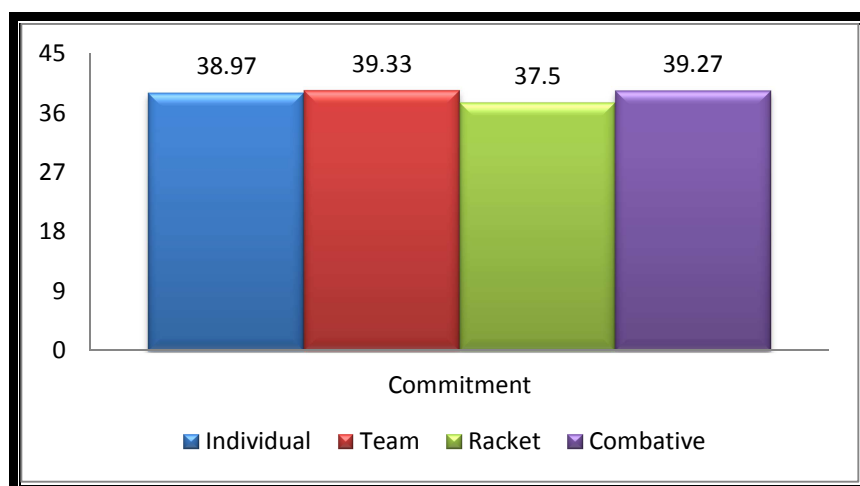
The one way analysis variance of commitment among male athletes from different sports discipline was presented in the following tables.

Table 29
Comparison of Commitment among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	66.47	3	22.16	0.79	0.49
Within	3225.00	116	27.80		
Total	3291.47	119			

From table 29, it was evident that the calculated F value was 0.79, which was not significant (p value $0.49 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline not significantly differ on their commitment level of foundation skill category. It may be said that commitment of foundation skill category was similar in male athletes from different types of sports discipline.

Figure 22
Comparison of commitment among male athletes from different sports discipline



The one way analysis variance of commitment among female athletes from different sports discipline was presented in the following tables.

Table 30**Comparison of Commitment among female athletes**

	Sum of Squares	df	Mean Square	F	Sig.
Between	1120.56	3	373.52	19.21*	0.00
Within	2256.03	116	19.45		
Total	3376.59	119			

* Significant at the 0.05 level of Significance

From table 30, it was evident that the calculated F value was 19.21, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their commitment of foundation skill category. In order to find which sports discipline more commitment level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 31**Post hoc analysis on commitment among female athletes from different sports discipline**

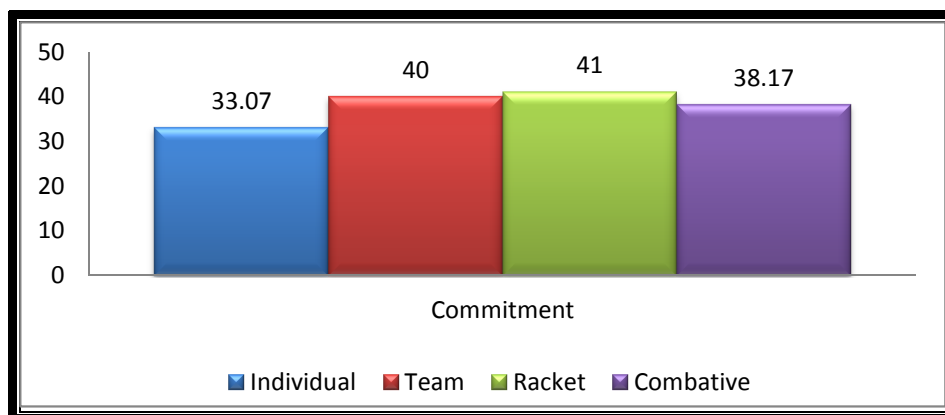
Individual	Team	Racket	Combative	M.D.	CD at 5% level
33.07	40.00			6.93*	0.00
33.07		41.00		7.93*	0.00
33.07			38.17	5.10*	0.00
	40.00	41.00		1.00	0.38
	40.00		38.17	1.83	0.11
		41.00	38.17	2.83*	0.01

* Significant at the 0.05 level of Significance

The table 31 shows that the mean difference of commitment between individual game players and team, racket, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. And also the mean difference of commitment between racket game players and combative game players were significant differences since critical differences was 0.01 lesser than at

0.05 level. This table clearly indicates that female team and racket game players are more commitment in foundation skill and less commitment in individual players.

Figure 23
Comparison of Commitment
among female athletes from different sports discipline



The correlative analysis between commitment and performance score of elite and non-elite athletes was presented in table 32.

Table 32
Relationship between commitment
and performance of elite and non-elite athletes

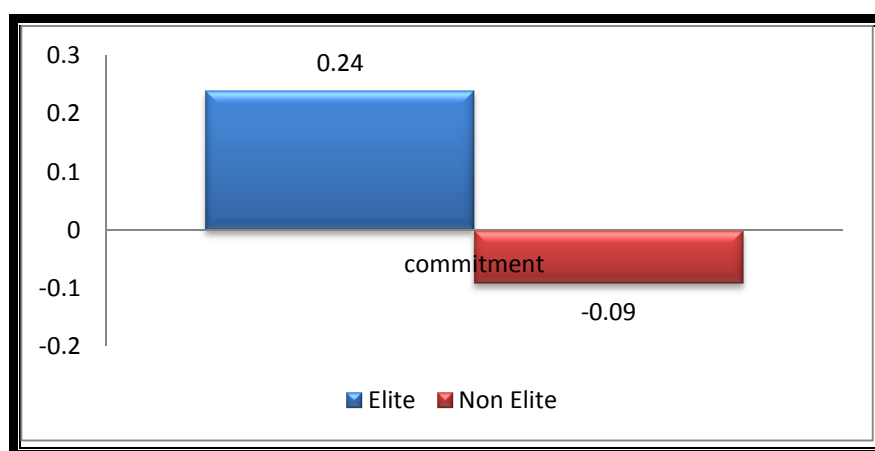
	Elite	Non Elite
Pearson Correlation	0.24*	-0.09
Sig. (2-tailed)	0.05	0.33
N	120	120

The analysis of table 32 shows that the elite players of obtained correlation value on commitment to the performance was 0.24 and p value was 0.05. The p value was lesser than the 0.05 level of significance. However, in the case of elite players there was positive relationship when the performance was related with commitment in foundation skill of mental skill.

The obtained correlation value of non-elite players on commitment to the performance was -0.09 and p value was 0.33. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with commitment in foundation skill of mental skill.

Figure 24

Relationship between commitment and performance of elite and non-elite athletes



The correlative analysis between goal setting and performance score of male and female athletes was presented in table 33.

Table 33

Relationship between commitment and performance of male and female athletes

	Male	Female
Pearson Correlation	0.32*	0.06
Sig. (2-tailed)	0.00	0.53
N	120	120

* Significant at the 0.05 level of Significance

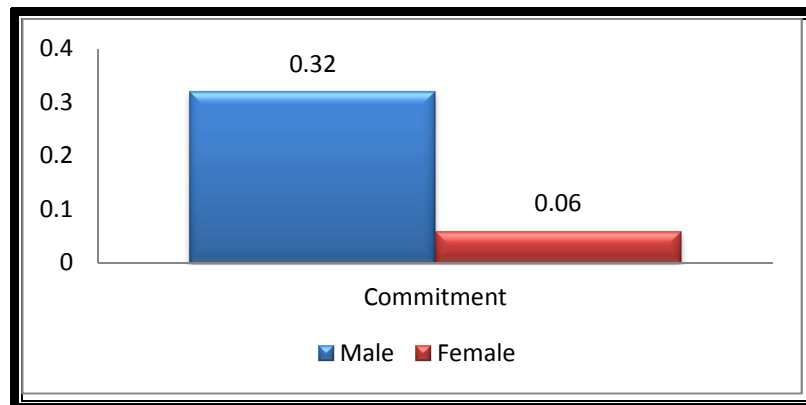
The analysis of table 33 shows that the male players of obtained correlation value of commitment to the performance was 0.32 and p value was 0.00. The p value was lesser than the 0.05 level of significance. However, in the case of male

players there was a significant positive relationship when the performance was related with commitment in foundation skill of mental skill.

The female players of obtained correlation value of commitment to the performance was 0.06 and p value 0.53. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with commitment in foundation skill of mental skill.

Figure 25

Relationship between commitment and performance of male and female athletes



B. Psycho cognitive skills of mental skill

Four sub variables were listed in this category of mental skill. They were analysed separately namely stress reaction, fear control, relaxation and energizing.

1. Stress reaction

The comparative analysis of stress reaction between elite and non-elite athletes from different sports was presented in the table 34.

Table 34

Category wise comparison of Stress reaction

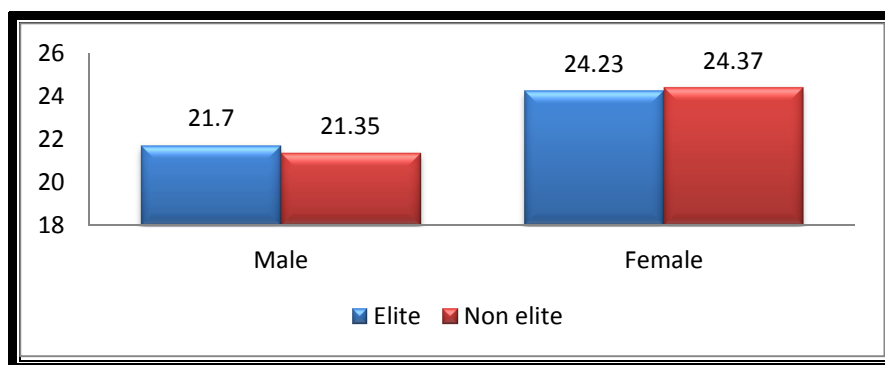
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	21.70	3.92	60	21.35	3.29	0.53	118	0.59
Female	60	24.23	4.47	60	24.37	4.15	0.17	118	0.87

The table 34 revealed that the calculated t value of elite and non-elite male athletes was 0.53, which was not significant (p value $0.59 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their stress reaction level of psycho somatic skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.17, which was not significant (p value $0.87 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their stress reaction level of psycho somatic skill of mental skill.

Figure 26

Category wise comparison of Stress reaction



The comparative analysis of stress reaction between male and female athletes from different sports was presented in the table 35.

Table 35

Gender wise comparison of Stress reaction

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	21.70	3.92	60	24.23	4.48	3.30*	118	0.00
Non Elite	60	21.35	3.29	60	24.37	4.15	4.41*	118	0.00

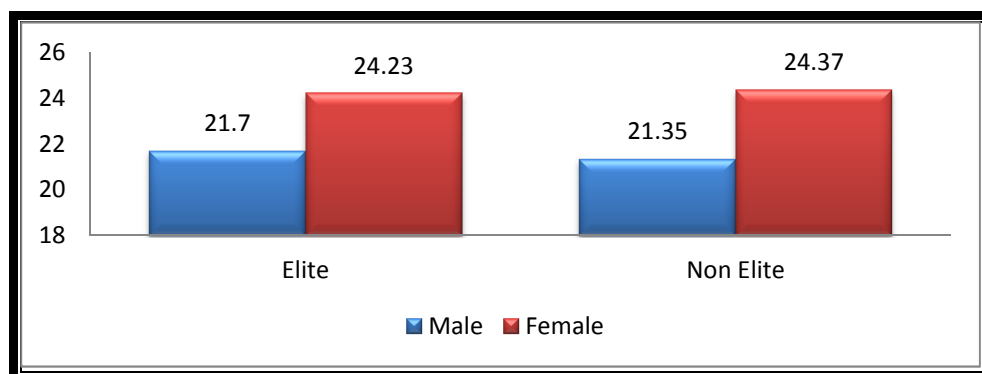
* Significant at the 0.05 level of Significance

The table 35 revealed that the calculated t value of male and female elite athletes was 3.30, which was significant (p value 0.00 <0.05) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes significantly differ on their stress reaction level of psycho somatic skill category of mental skill. It may be said that stress reaction level of psycho somatic skill category of female elite athletes were found significantly greater than male elite athletes.

The calculated t value of male and female non elite athletes was 4.41, which was significant (p value 0.00 < 0.05) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes significantly differ on their stress reaction level of psycho somatic skill category of mental skill. It may be said that stress reaction level of psycho somatic skill category of female non elite athletes were found significantly greater than male non elite athletes.

Figure 27

Gender wise comparison of Stress reaction



The one way analysis variance of stress reaction among elite athletes from different sports discipline was presented in the following tables

Table 36
Comparison of stress reaction among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	228.87	3	76.29	4.32*	0.01
Within	2051.00	116	17.68		
Total	2279.87	119			

* Significant at the 0.05 level of Significance

From table 36, it was evident that the calculated F value was 4.32, which was significant (p value $0.01 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline significantly differ on their stress reaction level of psycho somatic skill category. In order to find which sports discipline more Stress reaction level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 37
Post hoc analysis on stress reaction among elite athletes from different sports discipline

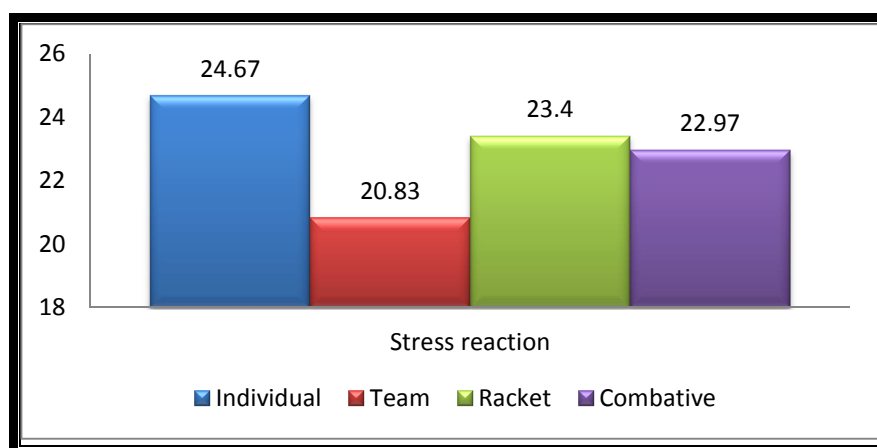
Individual	Team	Racket	Combative	M.D.	CD at 5% level
24.67	20.83			3.83*	0.00
24.67		23.40		1.27	0.25
24.67			22.97	1.70	0.12
	20.83	23.40		2.57*	0.02
	20.83		22.97	2.13	0.06
		23.40	22.97	0.43	0.69

* Significant at the 0.05 level of Significance

The table 37 shows that the mean difference of stress reaction between team game players and individual, racket game players were significant differences since critical differences were 0.00 and 0.02 respectively lesser than at 0.05 level. This

table clearly indicates that elite team game players are less stress reaction in psychosomatic skill category.

Figure 28
Comparison of Stress reaction
among elite athletes from different sports discipline



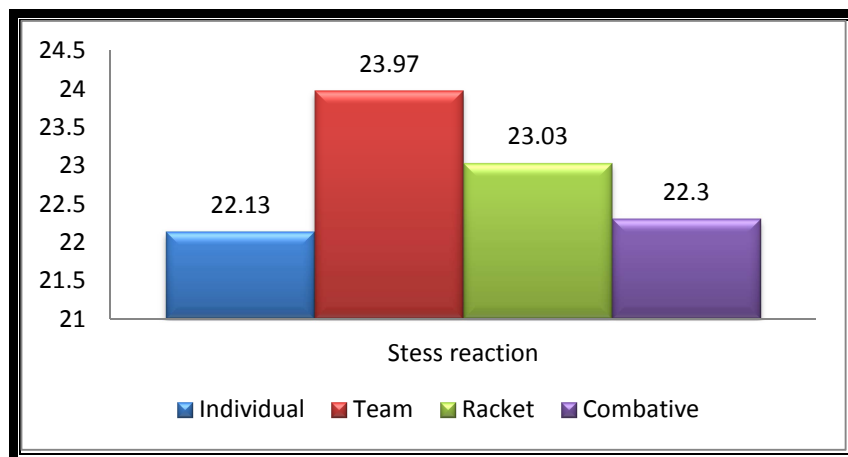
The one way analysis variance of stress reaction among non-elite athletes from different sports discipline was presented in the following tables.

Table 38
Comparison of Stress reaction among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	62.89	3	20.96	1.30	0.28
Within	1867.70	116	16.10		
Total	1930.59	119			

From table 42, it was evident that the calculated F value was 1.30, which was not significant (p value $0.28 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline similar on their stress reaction level of psychosomatic skill category.

Figure 29
Comparison of Stress reaction
among non-elite athletes from different sports discipline



The one way analysis variance of stress reaction among male athletes from different sports discipline was presented in the following tables.

Table 39
Comparison of stress reaction among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	159.56	3	53.19	4.44*	0.01
Within	1388.37	116	11.97		
Total	1547.93	119			

* Significant at the 0.05 level of Significance

From table 39, it was evident that the calculated F value was 4.44, which was significant (p value $0.01 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Stress reaction level of psycho somatic skill category. In order to find which sports discipline more Stress reaction level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

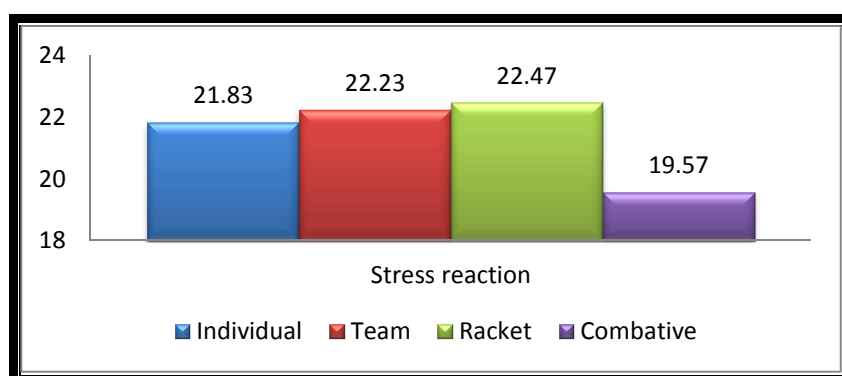
Table 40
Post hoc analysis on Stress reaction
among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
21.83	22.23			0.40	0.66
21.83		22.47		0.63	0.48
21.83			19.57	2.27*	0.01
	22.23	22.47		0.23	0.79
	22.23		19.57	2.66*	0.00
		22.47	19.57	2.90*	0.00

* Significant at the 0.05 level of Significance

The table 40 shows that the mean difference of stress reaction between combative game players and individual, team, racket game players were significant differences since critical differences were 0.01, 0.00 and 0.00 respectively lesser than at 0.05 level. This table clearly indicates that male combative game players are less stress reaction in psycho somatic skill category. Rest of the sports disciplines namely, individual, team and racket game players were similar in stress reaction level.

Figure 30
Comparison of Stress reaction
among male athletes from different sports discipline



The one way analysis variance of stress reaction among female athletes from different sports discipline was presented in the following tables.

Table 41**Comparison of Stress reaction among female athletes**

	Sum of Squares	df	Mean Square	F	Sig.
Between	165.60	3	55.20	3.15*	0.03
Within	2035.60	116	17.55		
Total	2201.20	119			

* Significant at the 0.05 level of Significance

From table 41, it was evident that the calculated F value was 3.15, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their stress reaction level of psycho somatic skill category. In order to find which sports discipline more Stress reaction level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

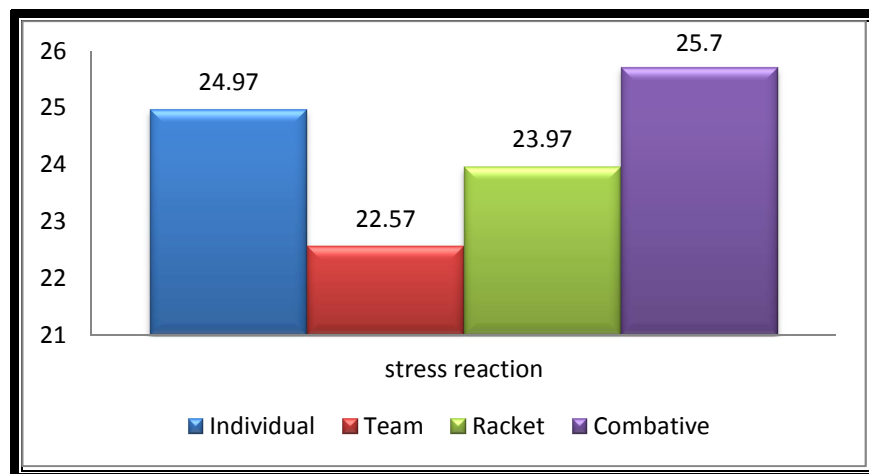
Table 42**Post hoc analysis on stress reaction among female athletes from different sports discipline**

Individual	Team	Racket	Combative	M.D.	CD at 5% level
24.97	22.57			2.40*	0.03
24.97		23.97		1.00	0.36
24.97			25.70	0.73	0.50
	22.57	23.97		1.40	0.20
	22.57		25.70	3.13*	0.01
		23.97	25.70	1.73	0.11

* Significant at the 0.05 level of Significance

The table 42 shows that the mean difference of stress reaction between team game players and individual, combative game players were significant differences since critical differences were 0.03 and 0.01 respectively lesser than at 0.05 level. This table clearly indicates that female team game players are less stress reaction in psycho somatic skill category.

Figure 31
Comparison of Stress reaction
among female athletes from different sports discipline



The correlative analysis between goal setting and performance score of elite and non-elite athletes was presented in table 43.

Table 43
Relationship between stress reaction
and performance of elite and non-elite athletes

	Elite	Non Elite
Pearson Correlation	-0.24*	0.03
Sig. (2-tailed)	0.01	0.79
N	120	120

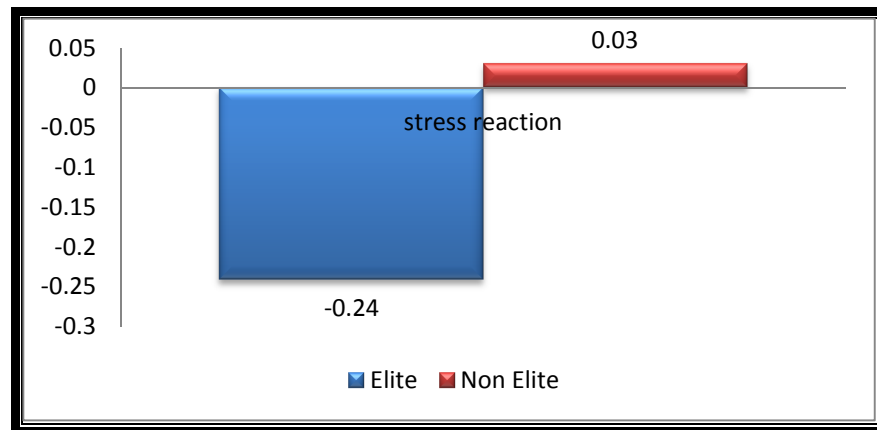
The analysis of table 43 shows that the elite players of obtained correlation value on stress reaction to the performance was -0.24 and p value was 0.01. The p value was lesser than the 0.05 level of significance. However, in the case of elite players there was negative relationship when the performance was related with stress reaction in psycho somatic skill of mental skill.

The obtained correlation value of non-elite players on stress reaction to the performance was 0.11 and p value was 0.25. The p value was higher than the 0.05

level of significance. However, in the case of non-elite players there was no relationship when the performance was related with stress reaction in psychosomatic skill of mental skill.

Figure 32

Relationship of stress reaction to the performance



The correlative analysis between stress reaction and performance score of male and female athletes was presented in table 44.

Table 44

Relationship of stress reaction level of psychosomatic category to the performance

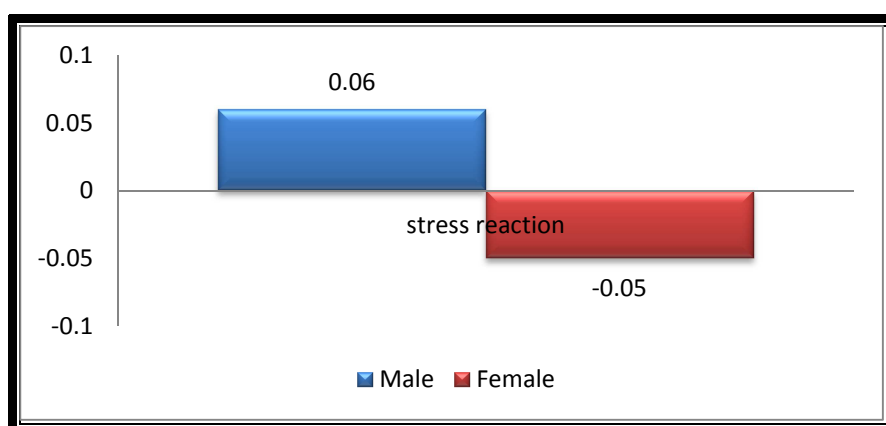
	Male	Female
Pearson Correlation	0.06	-0.05
Sig. (2-tailed)	0.55	0.61
N	120	120

The analysis of table 44 shows that the male players of obtained correlation value of stress reaction to the performance was 0.06 and p value was 0.55. The p value was higher than the 0.05 level of significance. However, in the case of male players there no relationship when the performance was related with stress reaction in psychosomatic of mental skill.

The female players of obtained correlation value of stress reaction to the performance were -0.05 and p value 0.61. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with stress reaction in psycho somatic of mental skill.

Figure 33

Relationship of stress reaction to the performance



2. Fear control

The comparative analysis of fear control between elite and non-elite athletes from different sports was presented in the table 45.

Table 45

Category wise comparison of Fear control

Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	10.65	3.09	60	11.30	3.84	1.02	118	0.31
Female	60	11.28	3.45	60	12.40	3.07	1.78	118	0.06

* Significant at the 0.05 level of Significance

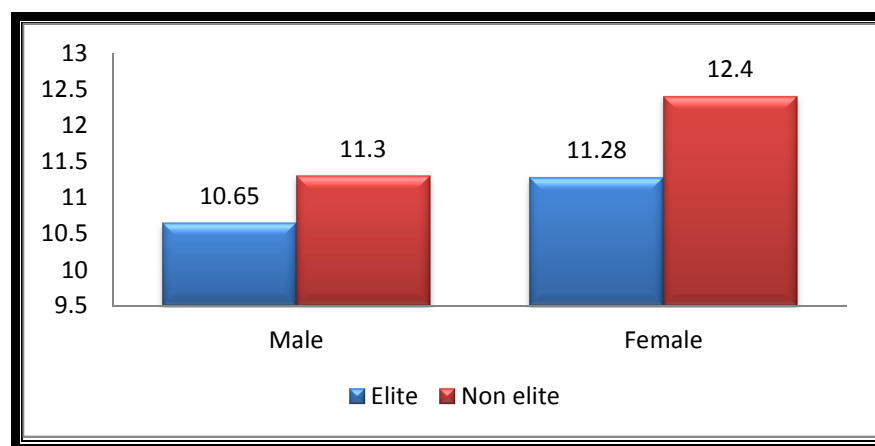
The table 45 revealed that the calculated t value of elite and non-elite male athletes was 1.02, which was not significant (p value 0.31>0.05) at 0.05 level with

df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their fear control level of psycho somatic skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 1.78, which was not significant (p value 0.06>0.05) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their fear control level of psycho somatic skill category of mental skill.

Figure 34

Category wise comparison of Fear control



The comparative analysis of goal setting between male and female athletes from different sports was presented in the table 46.

Table 46

Gender wise comparison of Fear control

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	10.65	3.09	60	11.28	3.45	1.06	118	0.29
Non Elite	60	11.30	3.84	60	12.40	3.07	0.44	118	0.09

* Significant at the 0.05 level of Significance

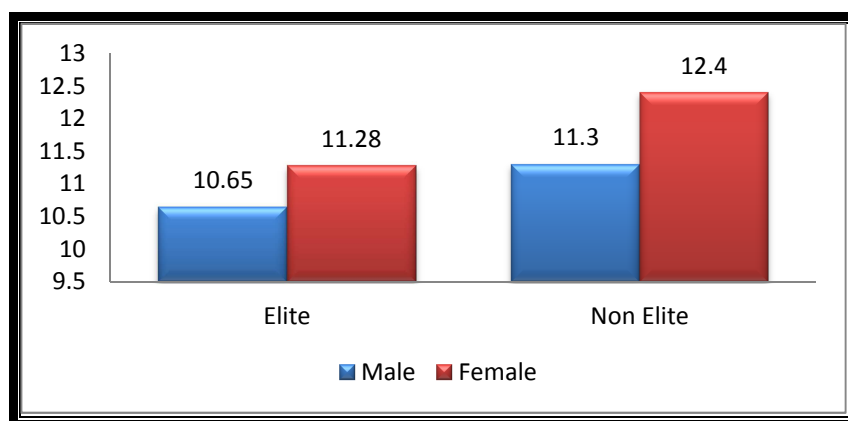
The table 46 revealed that the calculated t value of male and female elite athletes was 1.06, which was not significant (p value 0.29>0.05) at 0.05 level with

df equal to 118. It showed that the mean scores of elite male and female athletes similar on their fear control level of psycho somatic skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.44, which was not significant (p value $0.09 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their fear control level of psycho somatic skill category of mental skill.

Figure 35

Gender wise comparison of Fear control



The one way analysis variance of fear control among elite athletes from different sports discipline was presented in the following tables.

Table 57

Comparison of Fear control among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	235.13	3	78.38	8.72*	0.00
Within	1042.73	116	8.99		
Total	1277.87	119			

* Significant at the 0.05 level of Significance

From table 47, it was evident that the calculated F value was 8.72, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline significant differ on their fear

control level of psycho somatic skill category. In order to find which sports discipline more fear control level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

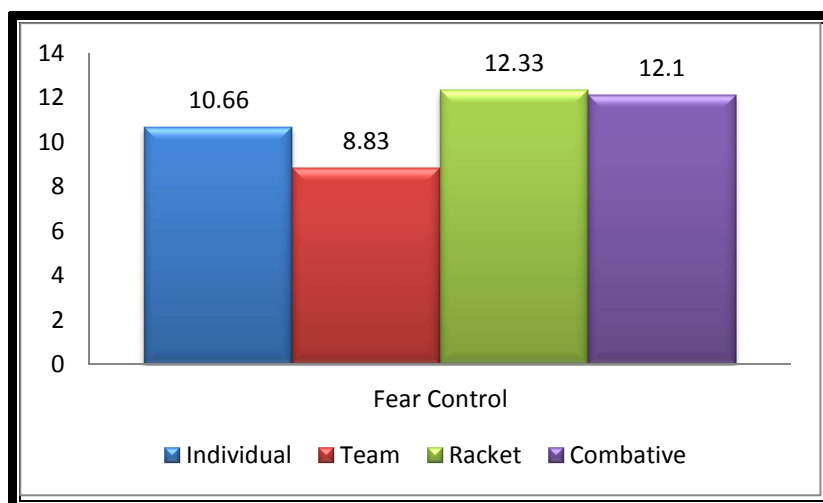
Table 48
Post hoc analysis on Fear control
among elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
10.66	8.83			1.77*	0.02
10.66		12.33		1.73*	0.03
10.66			12.10	1.50	0.06
	8.83	12.33		3.50*	0.00
	8.83		12.10	3.27*	0.00
		12.33	12.10	0.23	0.76

* Significant at the 0.05 level of Significance

The table 48 shows that the mean difference of fear control between team game players and individual, Racket, combative game players were significant differences since critical differences were 0.02, 0.00 and 0.00 respectively lesser than at 0.05 level. The mean difference of fear control between individual game players and racket game players were significant differences since critical differences was 0.03 lesser than at 0.05 level. This table clearly indicates that elite racket and combative game players are more level of fear control in psycho somatic skill and less control in fear in team game players.

Figure 36
Comparison of fear control
among elite athletes from different sports discipline



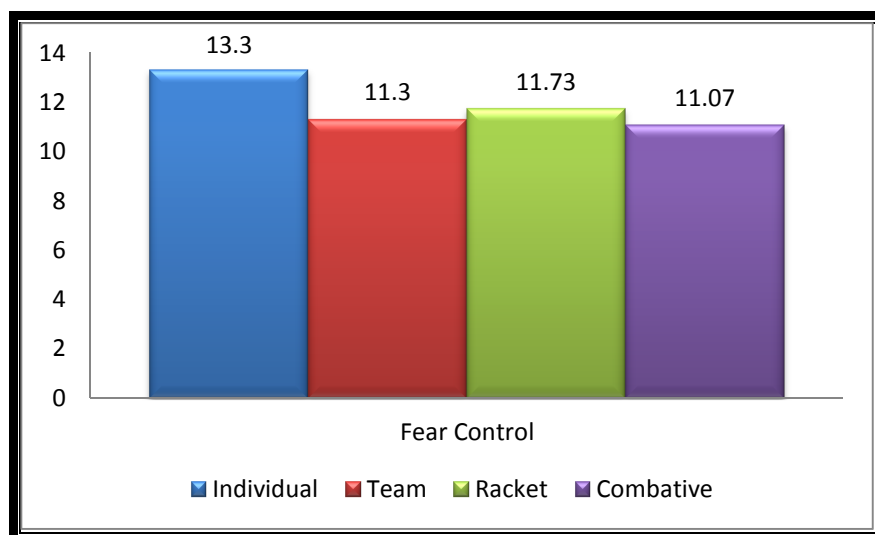
The one way analysis variance of fear control among non-elite athletes from different sports discipline was presented in the following tables.

Table 49
Comparison of Fear control among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	90.97	3	30.32	2.56	0.06
Within	1372.33	116	11.83		
Total	1463.30	119			

From table 49, it was evident that the calculated F value was 2.56, which was not significant (p value $0.06 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline similar on their fear control level of psycho somatic skill category.

Figure 37
Comparison of Fear control
among non-elite athletes from different sports discipline



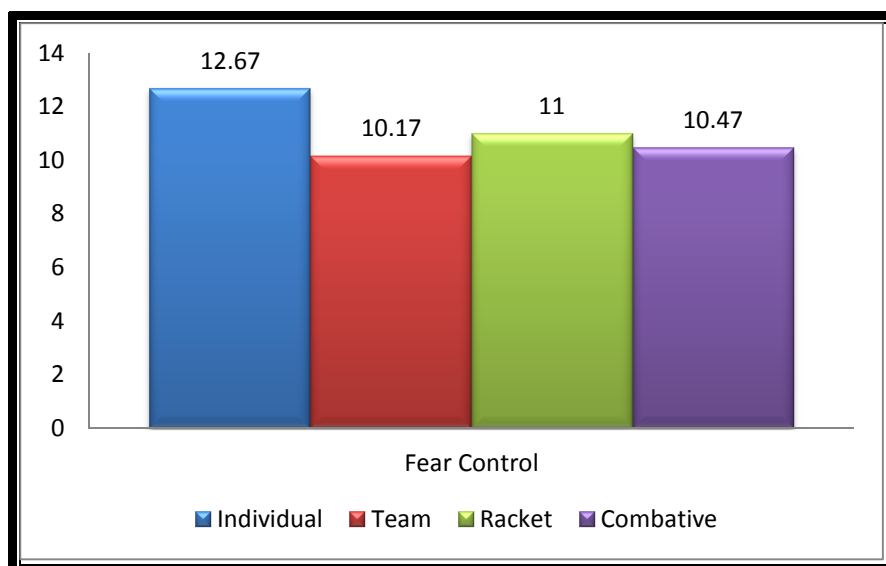
The one way analysis variance of fear control among male athletes from different sports discipline was presented in the following tables.

Table 50
Comparison of Fear control among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	77.43	3	25.81	2.19	0.09
Within	1369.50	116	11.81		
Total	1446.93	119			

From table 50, it was evident that the calculated F value was 2.19, which was not significant (p value $0.09 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline similar scores on their Fear control level of psycho somatic skill category.

Figure 38
Comparison of Fear control
among male athletes from different sports discipline



The one way analysis variance of fear control among female athletes from different sports discipline was presented in the following tables.

Table 51
Comparison of Fear control among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	173.89	3	57.96	5.99*	0.00
Within	1122.10	116	9.67		
Total	1295.99	119			

* Significant at the 0.05 level of Significance

From table 51, it was evident that the calculated F value was 5.99, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their fear control level of psycho somatic skill category. In order to find which sports discipline more Fear control level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

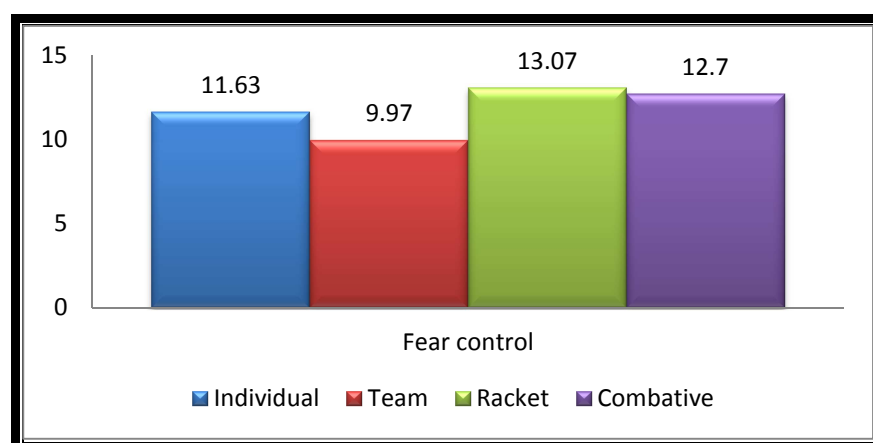
Table 52
Post hoc analysis on Fear control
among female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
11.63	9.97			1.67*	0.04
11.63		13.07		1.43	0.07
11.63			12.70	1.07	0.19
	9.97	13.07		3.10*	0.00
	9.97		12.70	2.73*	0.00
		13.07	12.70	0.37	0.65

* Significant at the 0.05 level of Significance

The table 52 shows that the mean difference of Fear control between team game players and individual, racket, combative game players were significant differences since critical differences were 0.04, 0.00 and 0.00 respectively lesser than at 0.05 level. This table clearly indicates that female team game players were less fear control in psycho somatic skill category.

Figure 39
Comparison of Fear control
among female athletes from different sports discipline



The correlative analysis between fear control and performance score of elite and non-elite athletes was presented in table 53.

Table 53

Relationship between fear control and performance of elite and non-elite athletes

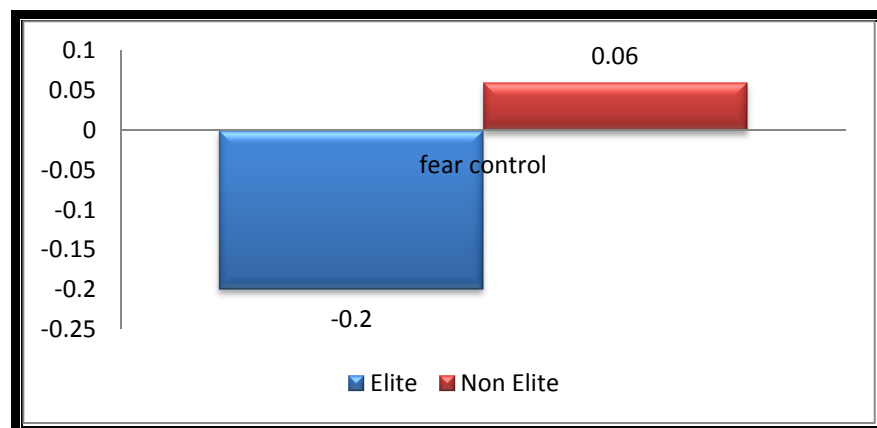
	Elite	Non Elite
Pearson Correlation	-0.20*	0.06
Sig. (2-tailed)	0.03	0.54
N	120	120

The analysis of table 53 shows that the elite players of obtained correlation value on fear control to the performance was -0.20 and p value was 0.03. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was negative relationship when the performance was related with fear control in foundation skill of mental skill.

The obtained correlation value of non-elite players on fear control to the performance was 0.06 and p value was 0.54. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with fear control in foundation skill of mental skill.

Figure 40

Relationship between fear control and performance of elite and non-elite athletes



The correlative analysis between fear control and performance score of male and female athletes was presented in table 54.

Table 54
Relationship between fear control
and performance of male and female athletes

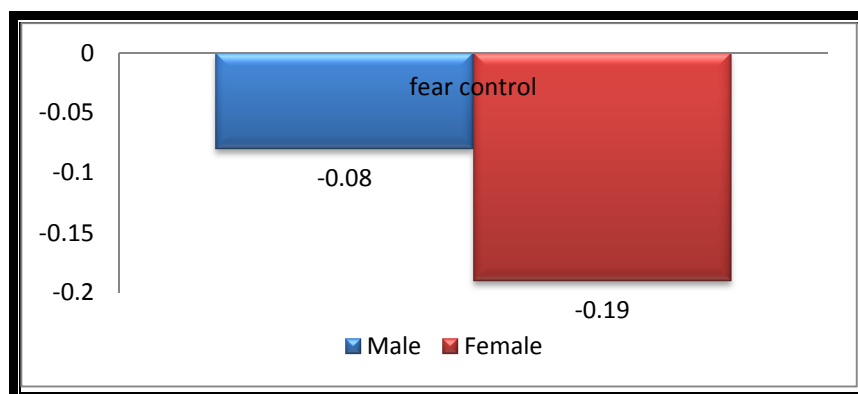
	Male	Female
Pearson Correlation	-0.08	-0.19*
Sig. (2-tailed)	0.38	0.04
N	120	120

** Significant at the 0.05 level of Significance*

The analysis of table 54 shows that the male players of obtained correlation value of fear control to the performance was -0.08 and p value was 0.38. The p value was higher than the 0.05 level of significance. However, in the case of male players there no relationship when the performance was related with fear control in psychosomatic of mental skill.

The female players of obtained correlation value of fear control to the performance were -0.19 and p value 0.04. The p value was lesser than the 0.05 level of significance. However, in the case of female players there was a significant negative relationship when the performance was related with fear control in psychosomatic of mental skill.

Figure 41
Relationship between fear control
and performance of male and female athletes



3. Relaxing

The comparative analysis of relaxing between elite and non-elite athletes from different sports was presented in the table 55.

Table 55
Category wise comparison of Relaxing

Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	10.48	2.55	60	9.52	1.76	2.41*	118	0.02
Female	60	9.42	1.75	60	9.35	2.38	0.18	118	0.86

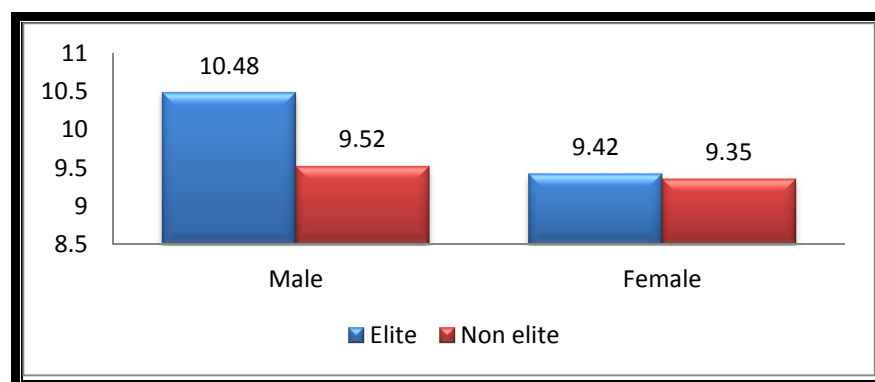
* Significant at the 0.05 level of Significance

The table 55 revealed that the calculated t value of elite and non-elite male athletes was 2.41, which was significant (p value $0.02 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes' significant difference on their relaxing level of psycho somatic skill category of mental skill. It may be said that relaxing level of psycho somatic skill category of elite male athletes were found significantly greater than non-elite male athletes.

The calculated t value of female elite and non-elite athletes was 0.18, which was not significant (p value $0.86 > 0.05$) at 0.05 level with df equal to 118. It showed

that the mean scores of female elite and non-elite athletes similar on their relaxing level of psycho somatic skill category of mental skill.

Figure 42
Category wise comparison of Relaxing



The comparative analysis of relaxing between male and female athletes from different sports was presented in the table 55.

Table 56
Gender wise comparison of Relaxing

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	10.48	2.55	60	9.42	1.75	2.67*	118	0.01
Non Elite	60	9.52	1.76	60	9.35	2.38	0.06	118	0.66

* Significant at the 0.05 level of Significance

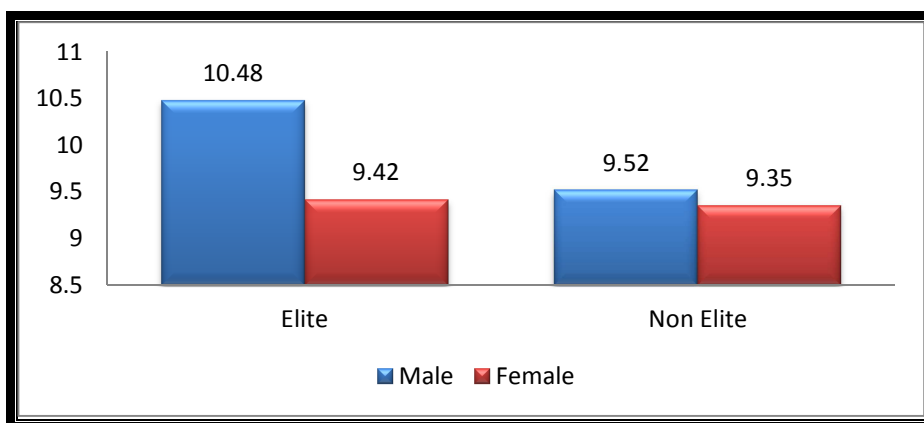
The table 55 revealed that the calculated t value of male and female elite athletes was 2.67, which was significant (p value $0.01 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes were significant differences on their relaxing level of psycho somatic skill category of mental skill. It may be said that relaxing level of psycho somatic skill category of male elite athletes were found significantly greater than male non elite athletes.

The calculated t value of male and female non elite athletes was 0.06, which was not significant (p value $0.66 > 0.05$) at 0.05 level with df equal to 118. It showed

that the mean scores of non-elite male and female athletes similar on their relaxing level of psycho somatic skill category of mental skill.

Figure 43

Gender wise comparison of Relaxing



The one way analysis variance of relaxing among elite athletes from different sports discipline was presented in the following tables.

Table 57

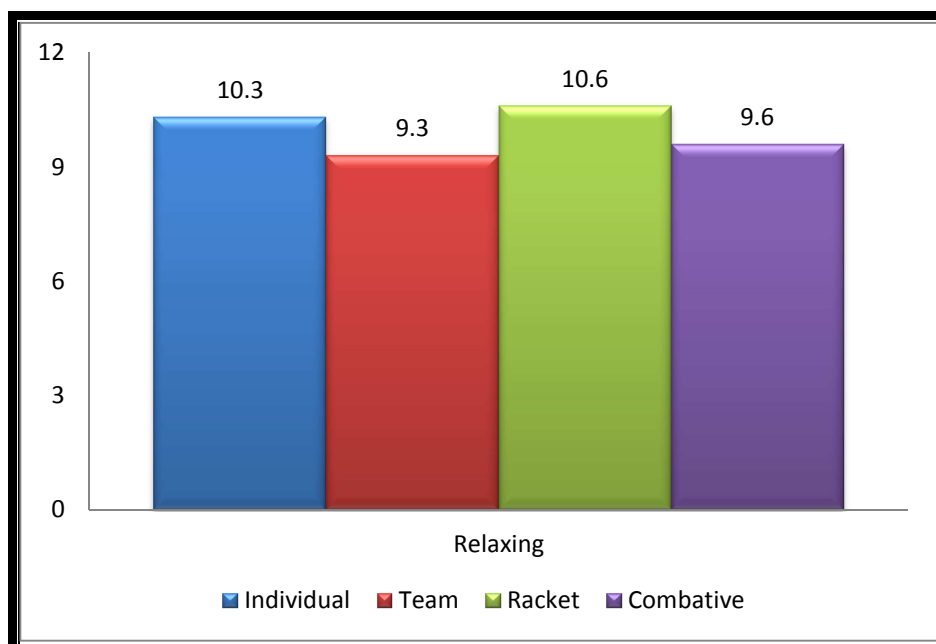
Comparison of relaxing among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	32.70	3	10.90	2.23	0.09
Within	567.00	116	4.89		
Total	599.70	119			

From table 57, it was evident that the calculated F value was 2.23, which was not significant (p value 0.09>0.05) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their relaxing level of psycho somatic skill category.

Figure 44

Comparison of Relaxing among elite athletes from different sports discipline



The one way analysis variance of relaxing among on elite athletes from different sports discipline was presented in the following tables.

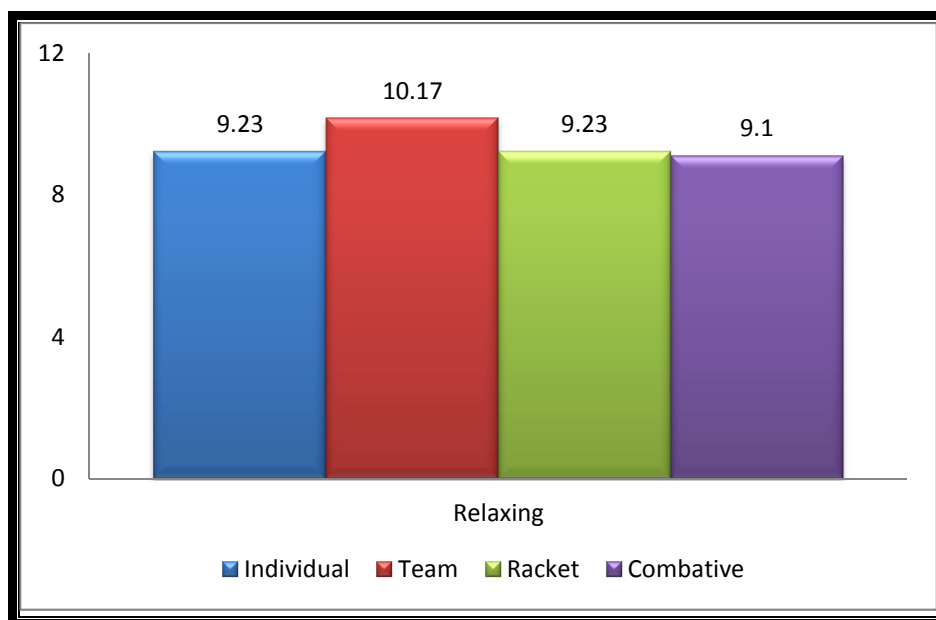
Table 58

Comparison of Relaxing among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	21.87	3	7.29	1.71	0.17
Within	495.60	116	4.27		
Total	517.47	119			

From table 58, it was evident that the calculated F value was 1.71, which was not significant (p value $0.17 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline similar on their relaxing level of psycho somatic skill category.

Figure 45
Comparison of relaxing among non- elite athletes from different sports discipline



The one way analysis variance of relaxing among male athletes from different sports discipline was presented in the following tables.

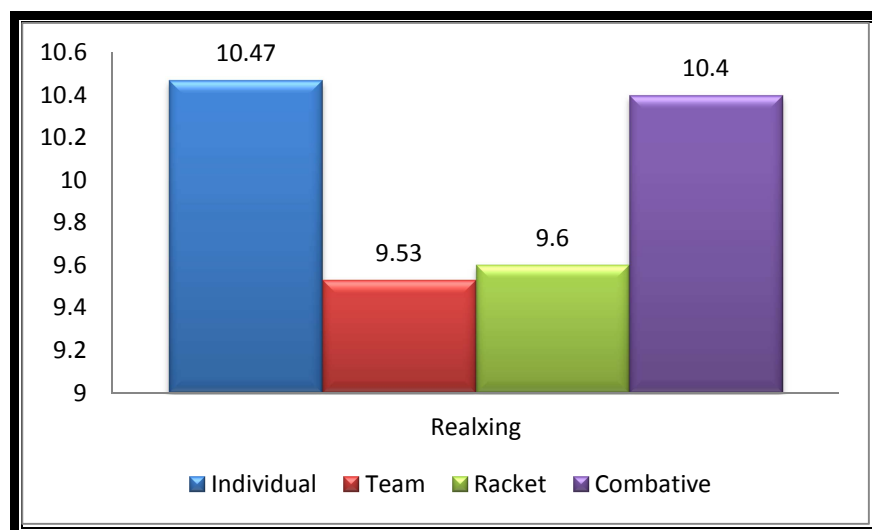
Table 59
Comparison of Relaxing among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	22.67	3	7.56	1.53	0.21
Within	573.33	116	4.94		
Total	596.00	119			

From table 59, it was evident that the calculated F value was 1.53, which was not significant (p value $0.21 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline similar on their relaxing level of psycho somatic skill category.

Figure 46

Comparison of Relaxing among male athletes from different sports discipline



The one way analysis variance of relaxing among female athletes from different sports discipline was presented in the following tables.

Table60

Comparison of relaxing among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	68.97	3	22.99	5.99*	0.00
Within	445.40	116	3.84		
Total	514.37	119			

* Significant at the 0.05 level of Significance

From table 60, it was evident that the calculated F value was 5.99, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their relaxing level of psycho somatic skill category. In order to find which sports discipline more relaxing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 61

Post hoc analysis on relaxing among female athletes from different sports discipline

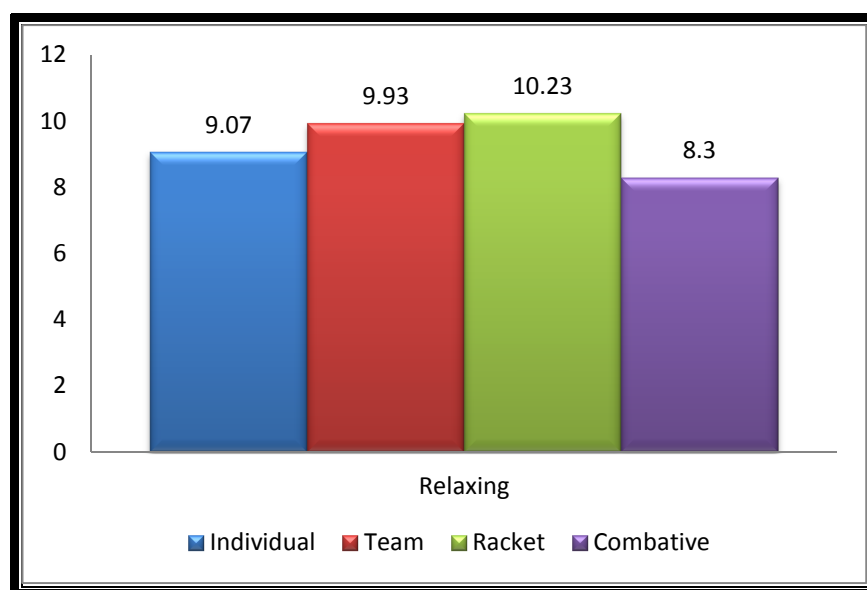
Individual	Team	Racket	Combative	M.D.	CD at 5% level
9.07	9.93			0.87	0.09
9.07		10.23		1.17*	0.02
9.07			8.30	0.77	0.13
	9.93	10.23		0.30	0.55
	9.93		8.30	1.63*	0.00
		10.23	8.30	1.93*	0.00

* Significant at the 0.05 level of Significance

The table 61 shows that the mean difference of relaxing between racket game players and individual, combative game players were significant differences since critical differences were 0.02 and 0.00 respectively lesser than at 0.05 level. The mean difference of relaxing between team game players and combative game players were significant differences since critical differences was 0.00 lesser than at 0.05 level. This table clearly indicates that female combative game players were low score on relaxation in psycho somatic skill.

Figure 47

Comparison of relaxing among female athletes from different sports discipline



The correlative analysis between relaxing and performance score of elite and non-elite athletes was presented in table 62.

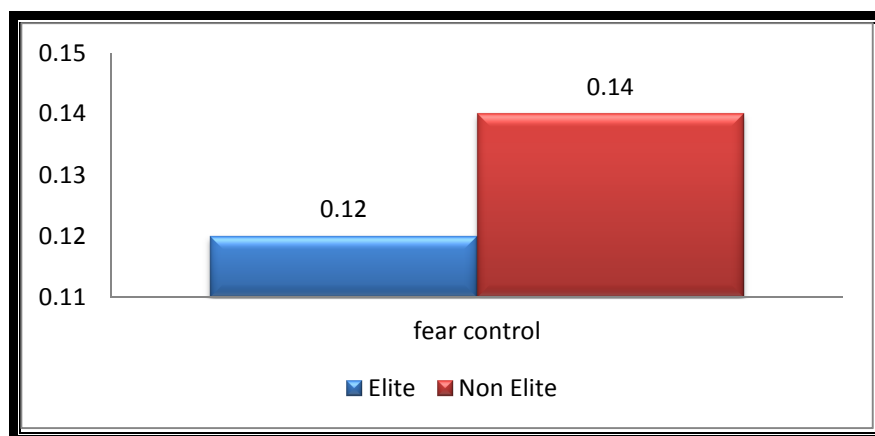
Table 62
Relationship between relaxing
and performance of elite and non-elite athletes

	Elite	Non Elite
Pearson Correlation	0.12	0.14
Sig. (2-tailed)	0.19	0.12
N	120	120

The analysis of table 62 shows that the elite players of obtained correlation value on fear control to the performance was 0.12 and p value was 0.19. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with fear control in foundation skill of mental skill.

The obtained correlation value of non-elite players on fear control to the performance was 0.14 and p value was 0.12. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with fear control in foundation skill of mental skill.

Figure 48
Relationship between relaxing
and performance of elite and non-elite athletes



The correlative analysis between relaxing and performance score of male and female athletes was presented in table 63.

Table 63
Relationship between relaxing
and performance of male and female athletes

	Male	Female
Pearson Correlation	0.20*	0.09
Sig. (2-tailed)	0.03	0.34
N	120	120

* Significant at the 0.05 level of Significance

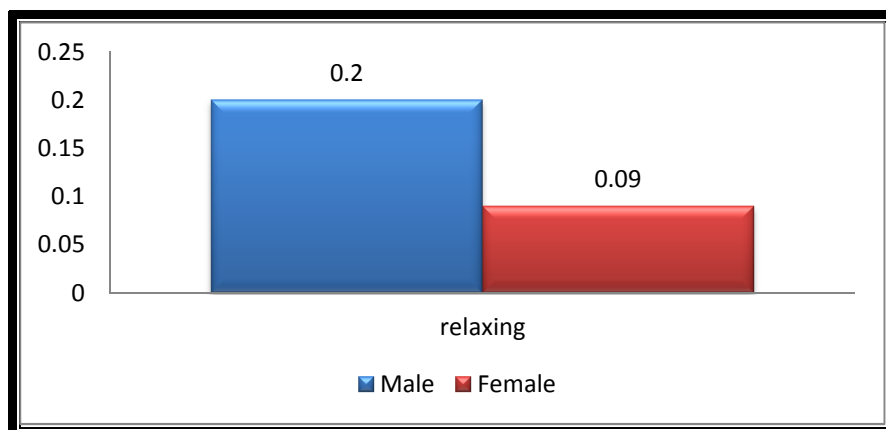
The analysis of table 63 shows that the male players of obtained correlation value of relaxing to the performance was 0.20 and p value was 0.38. The p value was lesser than the 0.05 level of significance. However, in the case of male players there was a significant positive relationship when the performance was related with relaxing in psycho somatic of mental skill.

The female players of obtained correlation value of relaxing to the performance were 0.09 and p value 0.34. The p value was higher than the 0.05 level

of significance. However, in the case of female players there was no relationship when the performance was related with relaxing in psycho somatic of mental skill.

Figure 49

Relationship between relaxing and performance of male and female athletes



4. Energizing

The comparative analysis of energizing between elite and non-elite athletes from different sports was presented in the table 64.

Table 64

Category wise comparison of energizing

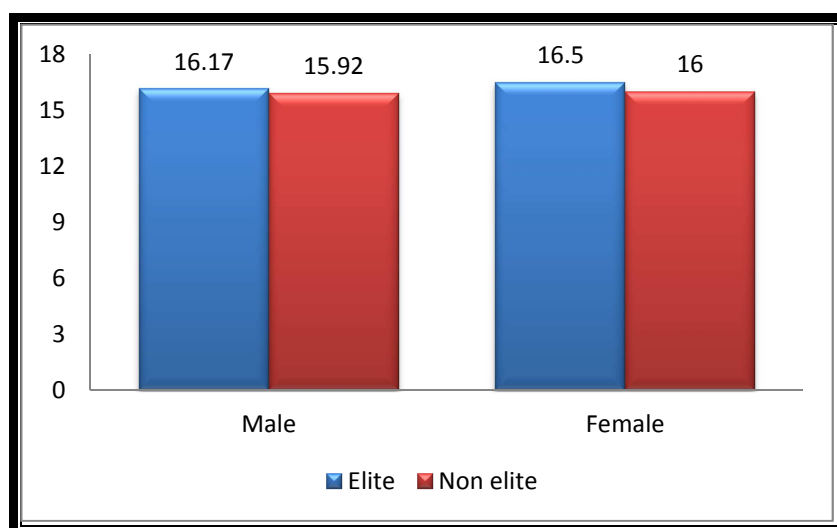
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	16.17	2.86	60	15.92	3.03	0.47	118	0.64
Female	60	16.50	2.88	60	16.00	2.64	0.09	118	0.32

The table 65 revealed that the calculated t value of elite and non-elite male athletes was 0.47, which was not significant (p value $0.64 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their energizing level of psycho somatic skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.09, which was not significant (p value $0.32 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their energizing level of psycho somatic skill category of mental skill.

Figure 50

Category wise comparison of Energizing



The comparative analysis of energizing between male and female athletes from different sports was presented in the table 65.

Table 65

Gender wise comparison of Energizing

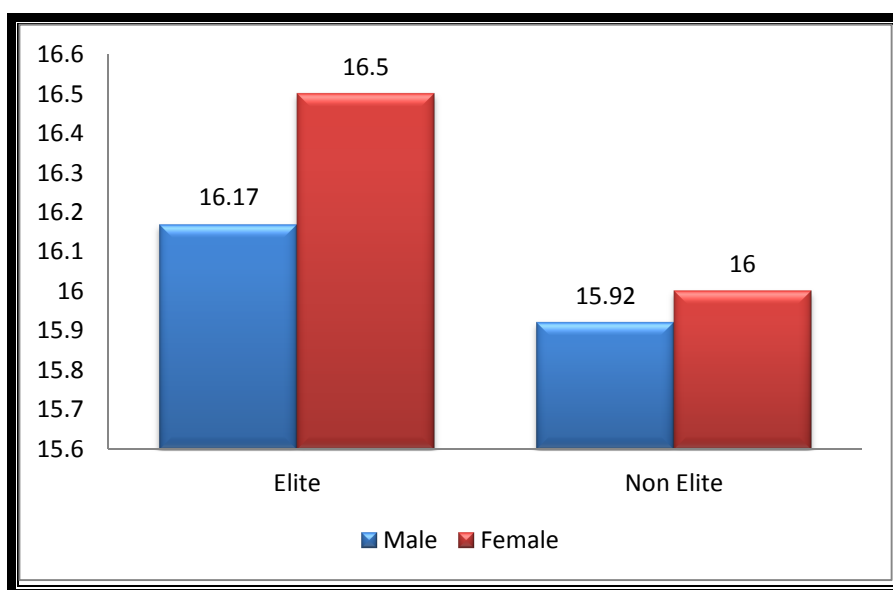
Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	16.17	2.86	60	16.50	2.88	0.64	118	0.53
Non Elite	60	15.92	3.03	60	16.00	2.64	0.16	118	0.87

The table 65 revealed that the calculated t value of male and female elite athletes was 0.64, which was not significant (p value $0.53 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their energizing level of psycho somatic skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.16, which was not significant (p value $0.87 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their energizing level of psycho somatic skill category of mental skill.

Figure 51

Gender wise comparison of energizing



The one way analysis variance of energizing among elite athletes from different sports discipline was presented in the following tables.

Table 66

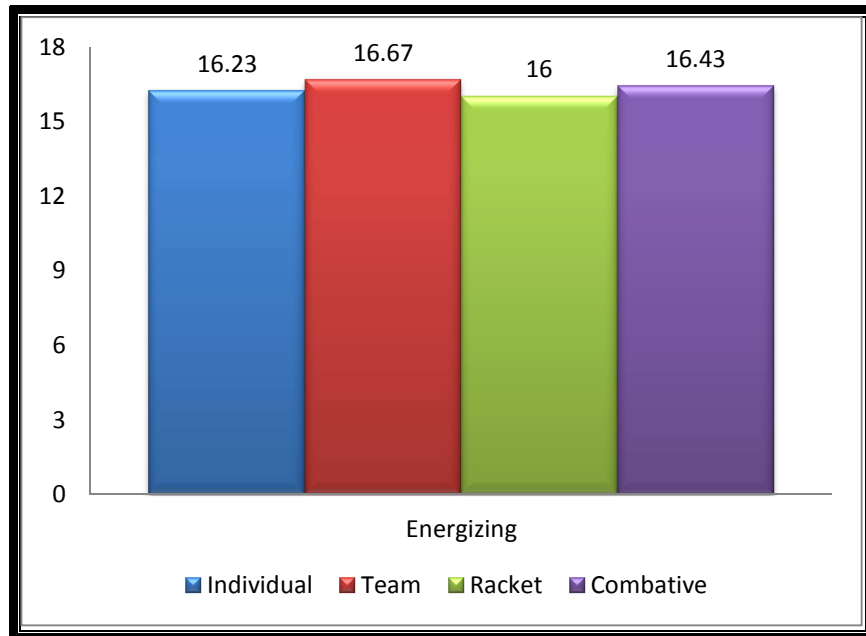
Comparison of Energizing among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	7.27	3	2.42	0.29	0.83
Within	969.40	116	8.36		
Total	976.67	119			

From table 66, it was evident that the calculated F value was 0.29, which was not significant (p value $0.83 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their energizing level of psycho somatic skill category.

Figure 52

Comparison of energizing among elite athletes from different sports discipline



The one way analysis variance of energizing among non-elite athletes from different sports discipline was presented in the following tables.

Table 67

Comparison of Energizing among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	62.23	3	20.74	2.70*	0.05
Within	892.57	116	7.70		
Total	954.79	119			

* Significant at the 0.05 level of Significance

From table 67, it was evident that the calculated F value was 2.70, which was significant (p value 0.05=0.05) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significant difference on their energizing level of psycho somatic skill category. In order to find which sports

discipline more energizing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 68
Post hoc analysis on Energizing
among non-elite athletes from different sports discipline

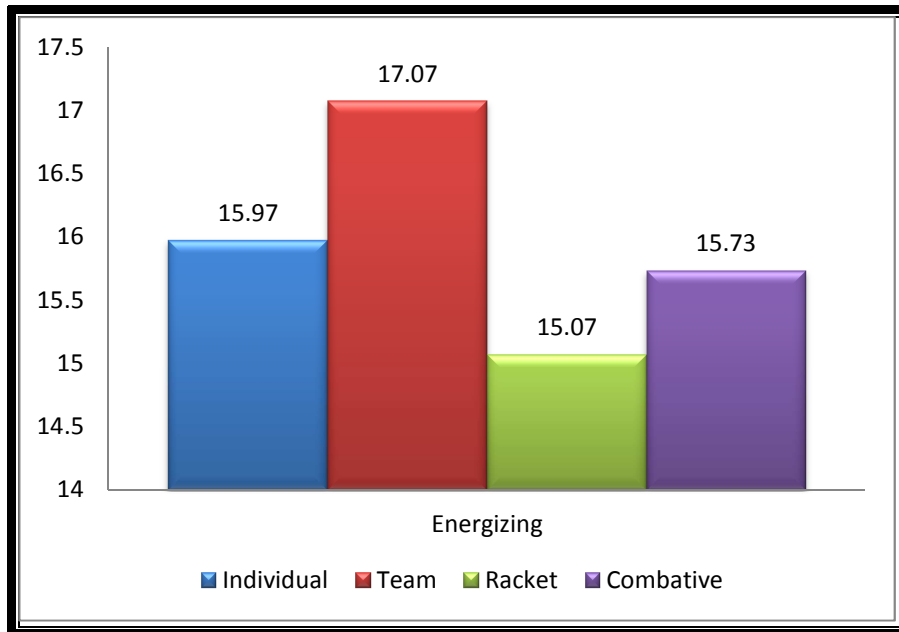
Individual	Team	Racket	Combative	M.D.	CD at 5% level
15.97	17.07			1.10	0.13
15.97		15.07		0.90	0.21
15.97			15.73	0.23	0.75
	17.07	15.07		2.00*	0.01
	17.07		15.73	1.33	0.07
		15.07	15.73	0.67	0.35

* Significant at the 0.05 level of Significance

The table 68 shows that the mean difference of energizing between team game players and racket game players was significant differences since critical differences were 0.01 lesser than at 0.05 level. This table clearly indicates that female team game players are more energy level in psycho somatic skill and less energy level in individual, racket and combative players.

Figure 53

Comparison of Energizing among non-elite athletes from different sports discipline



The one way analysis variance of energizing among male athletes from different sports discipline was presented in the following tables.

Table 69

Comparison of energizing among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	206.49	3	68.83	9.73*	0.00
Within	820.30	116	7.07		
Total	1026.79	119			

* Significant at the 0.05 level of Significance

From table 69, it was evident that the calculated F value was 9.73, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their energizing level of psycho somatic skill category. In order to find which sports discipline more energizing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

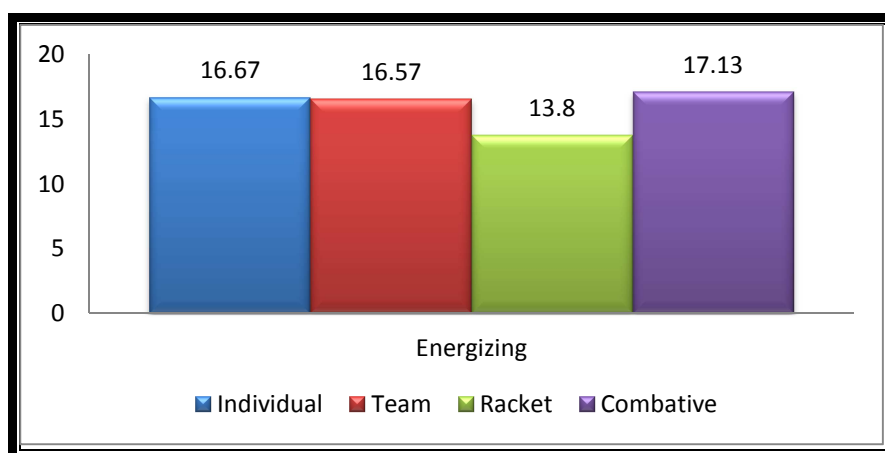
Table 70
Post hoc analysis on energizing
among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
16.67	16.57			0.10	0.88
16.67		13.80		2.87*	0.00
16.67			17.13	0.47	0.49
	16.57	13.80		2.77*	0.00
	16.57		17.13	0.57	0.41
		13.80	17.13	3.33*	0.00

* Significant at the 0.05 level of Significance

The table 70 shows that the mean difference of energizing between racket game players and individual, team, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that female racket game players are less energy level in psycho somatic skill than the other three disciplines namely individual, team and combative players.

Figure 54
Comparison of Energizing among
male athletes from different sports discipline



The one way analysis variance of energizing among female athletes from different sports discipline was presented in the following tables.

Table 71
Comparison of Energizing among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	116.03	3	38.68	5.65*	0.00
Within	794.47	116	6.85		
Total	910.50	119			

* Significant at the 0.05 level of Significance

From table 71, it was evident that the calculated F value was 5.65, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their energizing level of psycho somatic skill category. In order to find which sports discipline more energizing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 72
Post hoc analysis on Energizing among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
15.33	17.17			1.63*	0.02
15.33		17.27		1.73*	0.01
15.33			15.03	0.50	0.46
	17.17	17.27		0.10	0.88
	17.17		15.03	2.13*	0.00
		17.27	15.03	2.23*	0.00

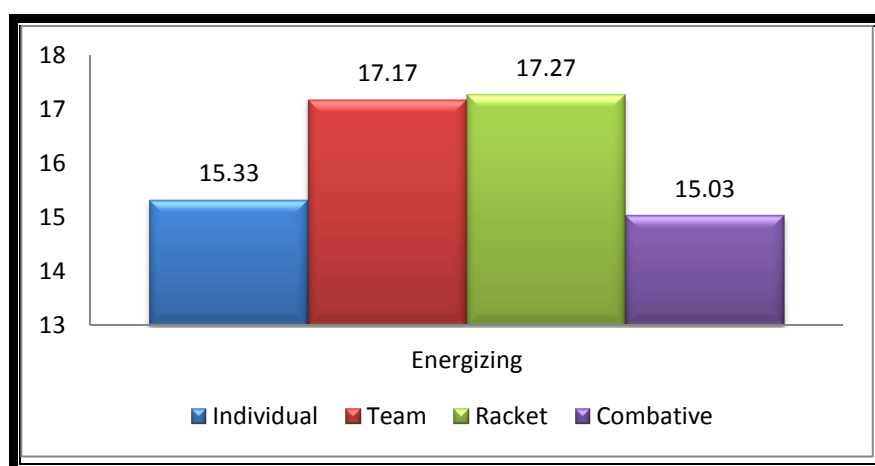
* Significant at the 0.05 level of Significance

The table 72 shows that the mean difference of energizing between team game players and individual, racket game players were significant differences since critical differences were 0.02 and 0.01 respectively lesser than at 0.05 level. The

mean difference of energizing between combative game players and team, racket game players were significant differences since critical differences was 0.00 lesser than at 0.05 level. This table clearly indicates that female team and racket game players are more energizing level in psycho somatic skill and less energy level in individual and combative players.

Figure 55

Comparison of Energizing among female athletes from different sports discipline



The correlative analysis between energizing and performance score of elite and non-elite athletes was presented in table 73.

Table 73

Relationship between energizing and performance of elite and non-elite athletes

	Elite	Non Elite
Pearson Correlation	0.02	0.12
Sig. (2-tailed)	0.79	0.19
N	120	120

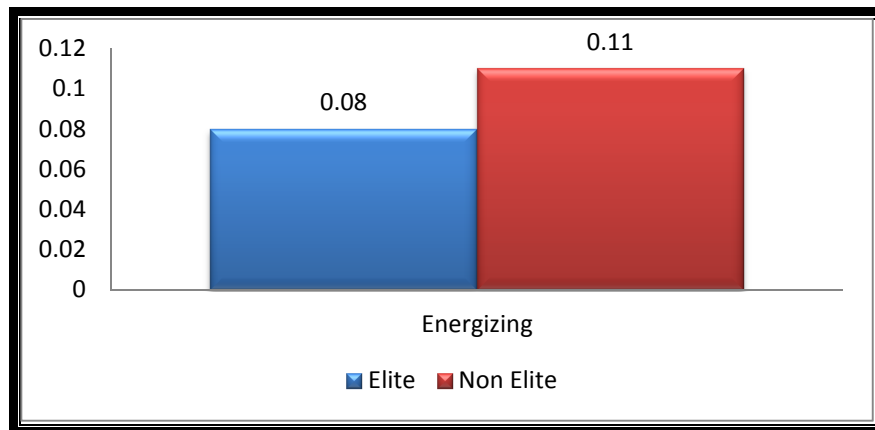
The analysis of table 73 shows that the elite players of obtained correlation value on energizing to the performance was 0.02 and p value was 0.79. The p value was higher than the 0.05 level of significance. However, in the case of elite players

there was no relationship when the performance was related with energizing in psycho somatic skill of mental skill.

The obtained correlation value of non-elite players on energizing to the performance was 0.12 and p value was 0.19. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with energizing in psycho somatic skill of mental skill.

Figure 56

Relationship between energizing and performance of elite and non-elite athletes



The correlative analysis between energizing and performance score of male and female athletes was presented in table 74.

Table 74

Relationship between energizing and performance of male and female athletes

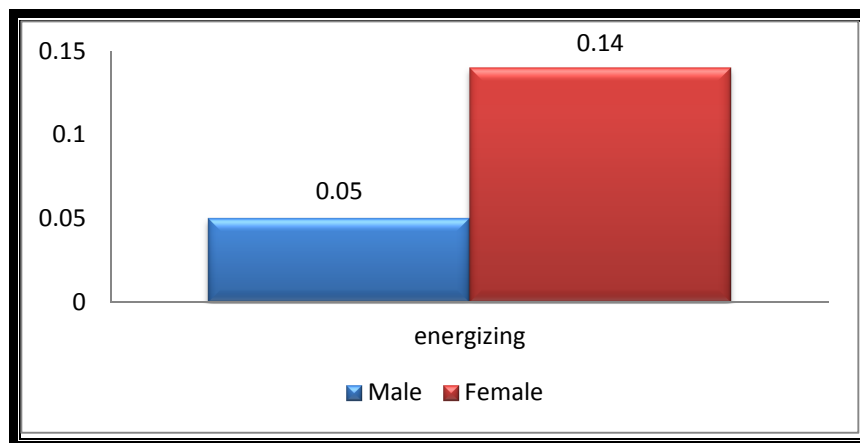
	Male	Female
Pearson Correlation	0.05	0.14
Sig. (2-tailed)	0.61	0.12
N	120	120

The analysis of table 74 shows that the male players of obtained correlation value of energizing to the performance was 0.05 and p value was 0.61. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with energizing in psycho somatic of mental skill.

The female players of obtained correlation value of energizing to the performance were 0.14 and p value 0.12. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with energizing in psycho somatic of mental skill.

Figure 57

Relationship between energizing and performance of male and female athletes



C. Cognitive skills of mental skill

In this category of cognitive skill of mental skill, there are five sub scales. They were analysed separately namely imagery, mental practice, focusing, refocusing, competition planning.

1. Imagery

The comparative analysis of imagery between elite and non-elite athletes from different sports was presented in the table 75.

Table 75

Category wise comparison of Imagery

Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	17.62	2.58	60	17.80	2.47	0.40	118	0.69
Female	60	16.77	3.18	60	17.85	2.58	2.05*	118	0.04

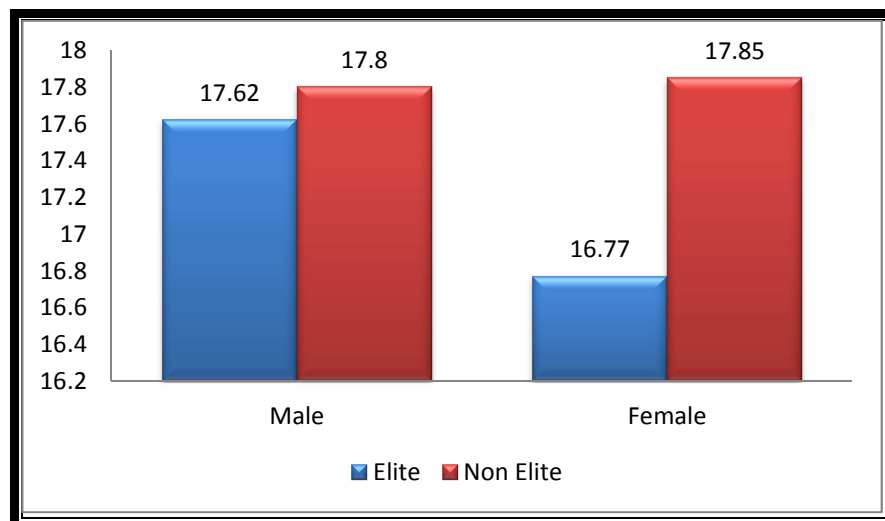
* Significant at the 0.05 level of Significance

The table 75 revealed that the calculated t value of elite and non-elite male athletes was 0.40, which was not significant (p value $0.69 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Imagery level of cognitive skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 2.05, which was significant (p value $0.04 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes significant differences on their Imagery level of cognitive skill category of mental skill.

Figure 58

Category wise comparison of Imagery



The comparative analysis of imagery between male and female athletes from different sports was presented in the table 76.

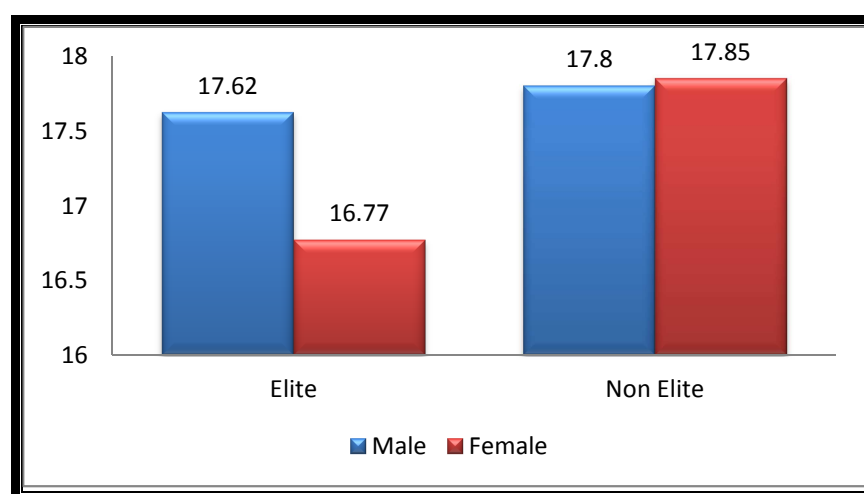
Table 76
Gender wise comparison of imagery

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	17.62	2.58	60	16.77	3.19	1.61	118	0.11
Non Elite	60	17.80	2.47	60	17.85	2.58	0.53	118	0.91

The table 76 revealed that the calculated t value of male and female elite athletes was 1.61, which was not significant (p value $0.11 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their Imagery level of cognitive skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.53, which was not significant (p value $0.91 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their Imagery level of cognitive skill category of mental skill.

Figure 59
Gender wise comparison of Imagery



The one way analysis variance of imagery among elite athletes from different sports discipline was presented in the following tables.

Table 77
Comparison of Imagery among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	157.96	3	52.65	7.15*	0.00
Within	854.63	116	7.37		
Total	1012.59	119			

* Significant at the 0.05 level of Significance

From table 77, it was evident that the calculated F value was 7.15, which was significant (p value $0.80 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their Imagery level of cognitive skill category. In order to find which sports discipline more Imagination level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 78
Post hoc analysis on Imagery among elite athletes from different sports discipline

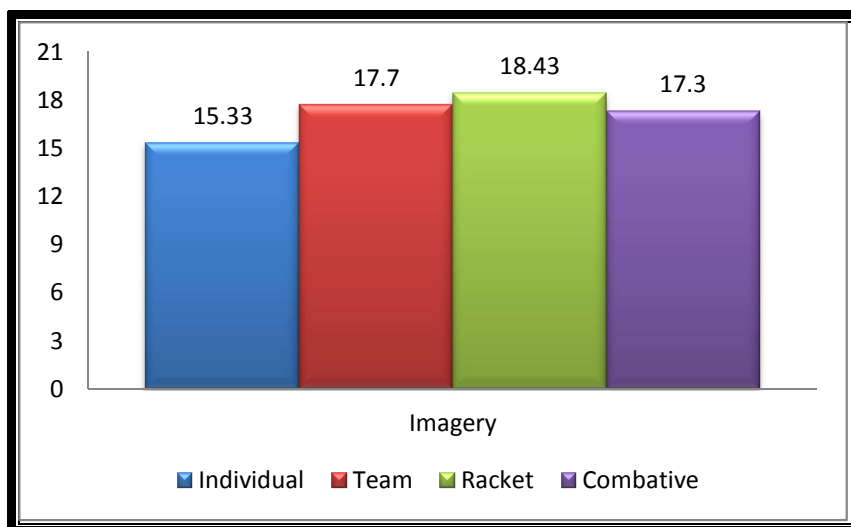
Individual	Team	Racket	Combative	M.D.	CD at 5% level
15.33	17.70			2.37*	0.00
15.33		18.43		3.10*	0.00
15.33			17.30	1.97*	0.01
	17.70	18.43		0.73	0.30
	17.70		17.30	0.40	0.57
		18.43	17.30	1.13	0.70

* Significant at the 0.05 level of Significance

The table 78 shows that the mean differences of Imagery between individual game players and team, racket, combative game players were significant differences since critical differences were 0.00, 0.00 and 0.01 respectively lesser than at 0.05

level. This table clearly indicates that female individual game players are less imagination in cognitive skill category.

Figure 60
Comparison of Imagery among elite athletes from different sports discipline



The one way analysis variance of imagery among non-elite athletes from different sports discipline was presented in the following tables.

Table 79
Comparison of Imagery among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	101.63	3	33.88	6.05*	0.00
Within	649.70	116	5.60		
Total	751.33	119			

* Significant at the 0.05 level of Significance

From table 79, it was evident that the calculated F value was 6.05, which was significant (p value $0.00 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significant different on their imagery level of cognitive skill category. In order to find which sports

discipline more Imagination level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

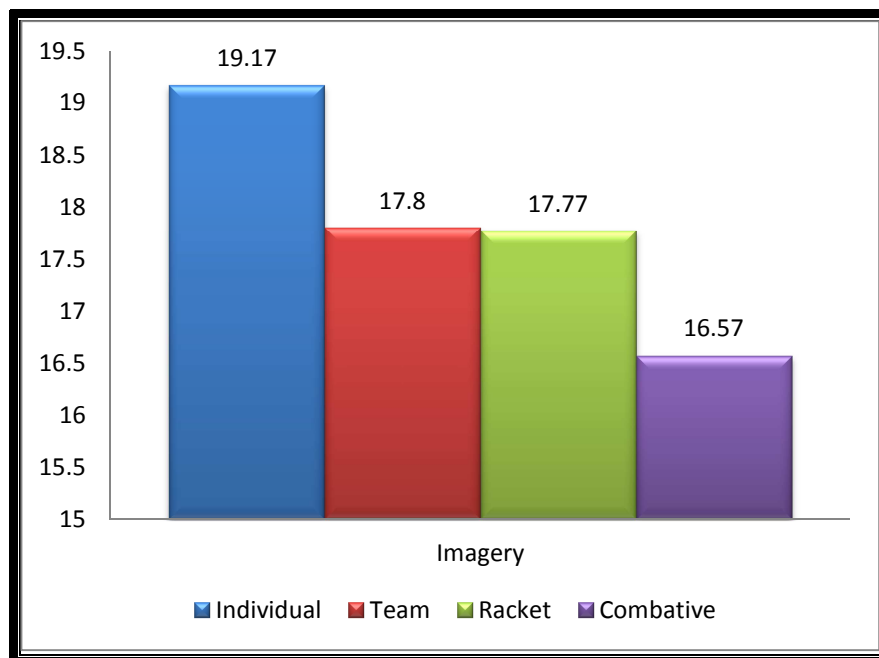
Table 80
Post hoc analysis on Imagery among
non-elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
19.17	17.80			1.37*	0.03
19.17		17.77		1.40*	0.02
19.17			16.57	2.60*	0.00
	17.80	17.77		0.03	0.96
	17.80		16.57	1.23*	0.05
		17.77	16.57	1.20	0.06

** Significant at the 0.05 level of Significance*

The table 80 shows that the mean difference of imagery between individual game players and team, racket, combative game players were significant differences since critical differences were 0.03, 0.02 and 0.00 respectively lesser than at 0.05 level. The mean difference of Imagery between team game players and racket game players were significant differences since critical differences was 0.05 lesser than at 0.05 level. This table clearly indicates that non elite individual game players are more imagination skill in cognitive skill category than the other three disciplines namely individual, racket and combative players.

Figure 61
Comparison of Imagery among
non-elite athletes from different sports discipline



The one way analysis variance of imagery among male athletes from different sports discipline was presented in the following tables.

Table 81
Comparison of Imagery among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	76.89	3	25.63	4.40*	0.01
Within	675.90	116	5.83		
Total	752.79	119			

* Significant at the 0.05 level of Significance

From table 77, it was evident that the calculated F value was 4.40, which was significant (p value $0.01 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Imagery level of cognitive skill category. In order to find which sports discipline

more Imagery level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

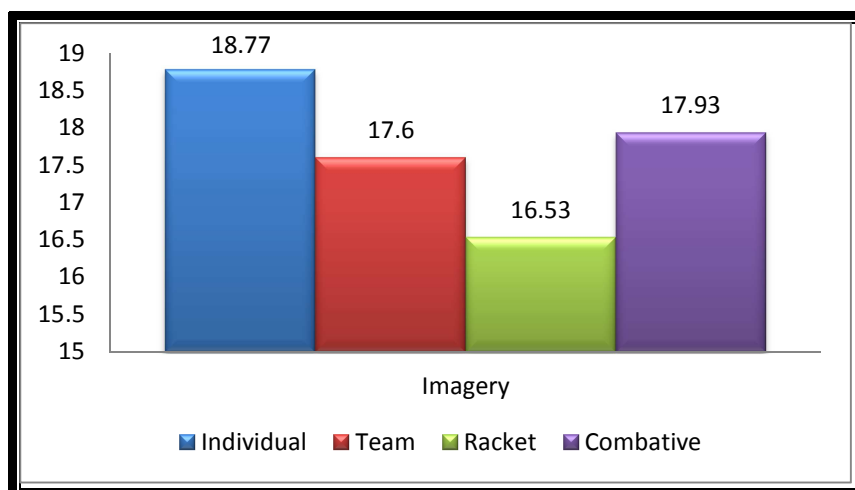
Table 82
Post hoc analysis on Imagery
among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
18.77	17.60			1.17	0.06
18.77		16.53		2.23*	0.00
18.77			17.93	0.83	0.18
	17.60	16.53		1.07	0.09
	17.60		17.93	0.33	0.59
		16.53	17.93	1.40*	0.03

** Significant at the 0.05 level of Significance*

The table 82 shows that the mean difference of Imagery between racket game players and individual, combative game players were significant differences since critical differences were 0.00 and 0.03 respectively lesser than at 0.05 level. This table clearly indicates that female racket game players are more imagination in cognitive skill category.

Figure 62
Comparison of Imagery among male athletes from different sports discipline



The one way analysis variance of imagery among female athletes from different sports discipline was presented in the following tables.

Table 83
Comparison of Imagery among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	308.49	3	102.83	16.63*	0.00
Within	717.10	116	6.18		
Total	1025.59	119			

* Significant at the 0.05 level of Significance

From table 83, it was evident that the calculated F value was 16.63, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Imagery level of cognitive skill category. In order to find which sports discipline more Imagery level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

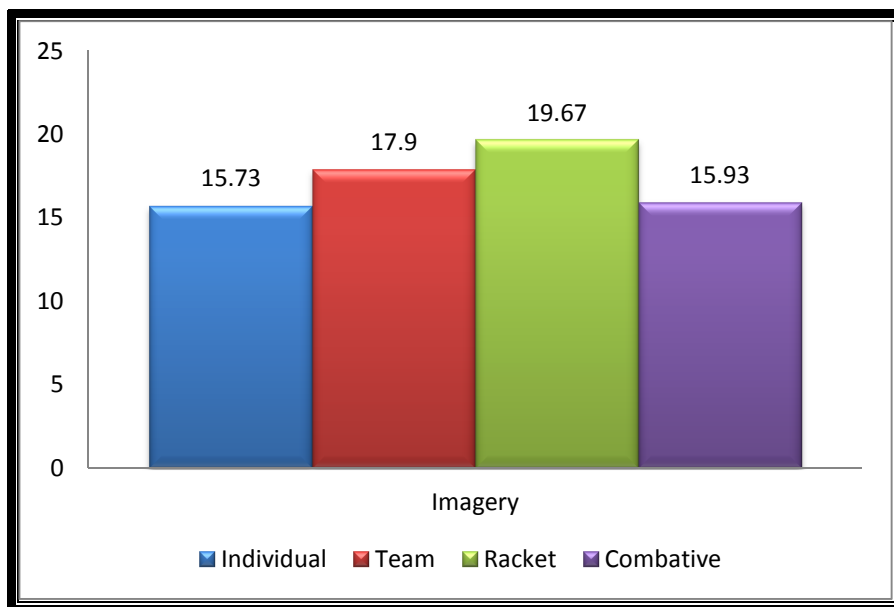
Table 84
Post hoc analysis on Imagery among
female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
15.73	17.90			2.17*	0.00
15.73		19.67		3.93*	0.00
15.73			15.93	0.20	0.76
	17.90	19.67		1.77*	0.01
	17.90		15.93	1.97*	0.00
		19.67	15.93	3.73*	0.00

** Significant at the 0.05 level of Significance*

The table 84 shows that the mean differences of Imagery between racket game players and individual, team combative game players were significant differences since critical differences were 0.00, 0.01 and 0.00 respectively lesser than at 0.05 level. The mean difference of Imagery between team game players and individual, combative game players were significant differences since critical differences was 0.00 lesser than at 0.05 level. This table clearly indicates that female racket game players are more imagination in cognitive skill category and less imaginative skill in individual and combative players.

Figure 63
Comparison of Imagery among
female athletes from different sports discipline



The correlative analysis between imagery and performance score of elite and non-elite athletes was presented in table 84.

Table 84
Relationship between imagery
and performance of elite and non-elite athletes

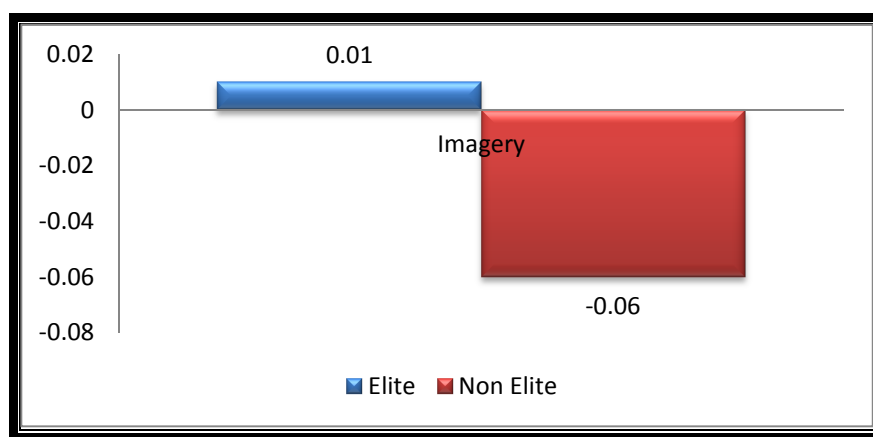
	Elite	Non Elite
Pearson Correlation	0.01	-0.06
Sig. (2-tailed)	0.96	0.52
N	120	120

The analysis of table 84 shows that the elite players of obtained correlation value on imagery to the performance was 0.01 and p value was 0.96. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with imagery in cognitive skill of mental skill.

The obtained correlation value of non-elite players on imagery to the performance was -0.06 and p value was 0.52. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with imagery in cognitive skill of mental skill.

Figure 64

Relationship between imagery and performance of elite and non-elite athletes



The correlative analysis between imagery and performance score of male and female athletes was presented in table 86.

Table 86

Relationship between imagery and performance of male and female athletes

	Male	Female
Pearson Correlation	-0.07	-0.18*
Sig. (2-tailed)	0.47	0.05
N	120	120

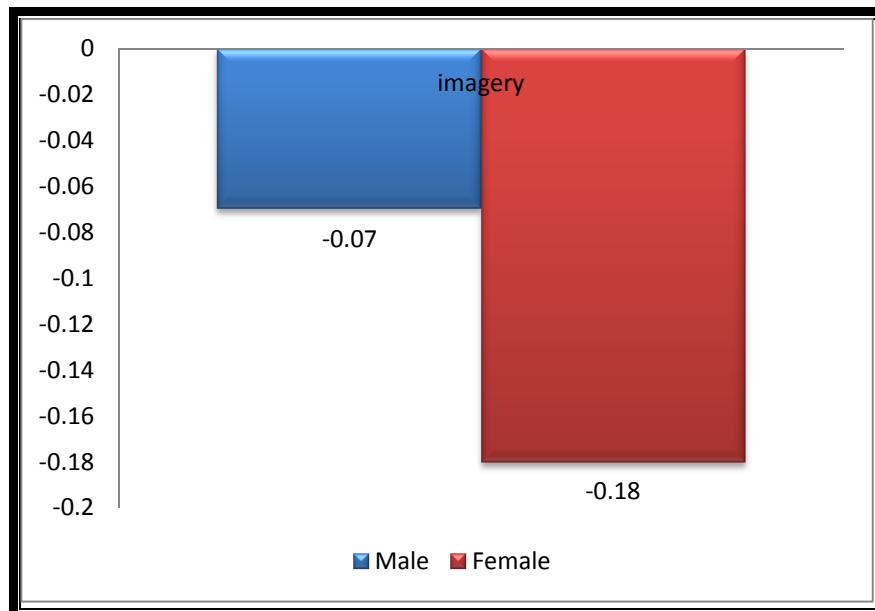
* Significant at the 0.05 level of Significance

The analysis of table 86 shows that the male players of obtained correlation value of imagery to the performance was -0.07 and p value was 0.47. The p value was higher than the 0.05 level of significance. However, in the case of male players

there was no relationship when the performance was related with imagery in cognitive of mental skill.

The female players of obtained correlation value of imagery to the performance were -0.18 and p value 0.05. The p value was lesser than or equal to the 0.05 level of significance. However, in the case of female players there was a significant negative relationship when the performance was related with imagery in cognitive of mental skill.

Figure 65
Relationship between imagery
and performance of male and female athletes



2. Mental Practice

The comparative analysis of mental practice between elite and non-elite athletes from different sports was presented in the table87.

Table 87

Category wise comparison of Mental Practice

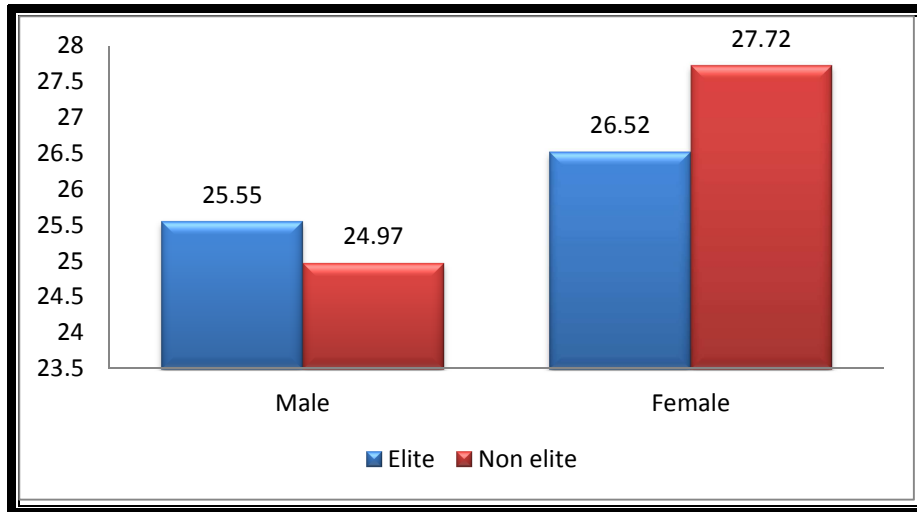
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	25.55	4.92	60	24.97	3.77	0.73	118	0.47
Female	60	26.52	4.61	60	27.72	3.99	1.52	118	0.13

The table 87 revealed that the calculated t value of male elite and non-elite athletes was 0.73, which was not significant (p value $0.47 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Mental Practice level of cognitive skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 1.52, which was not significant (p value $0.13 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their Mental Practice level of cognitive skill category of mental skill.

Figure 66

Category wise comparison of Mental Practice



The comparative analysis of mental practice between male and female athletes from different sports was presented in the table 88.

Table 88

Gender wise comparison of Mental Practice

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	25.55	4.92	60	26.52	4.61	1.11	118	0.27
Non Elite	60	24.97	3.77	60	27.72	3.99	3.88*	118	0.00

* Significant at the 0.05 level of Significance

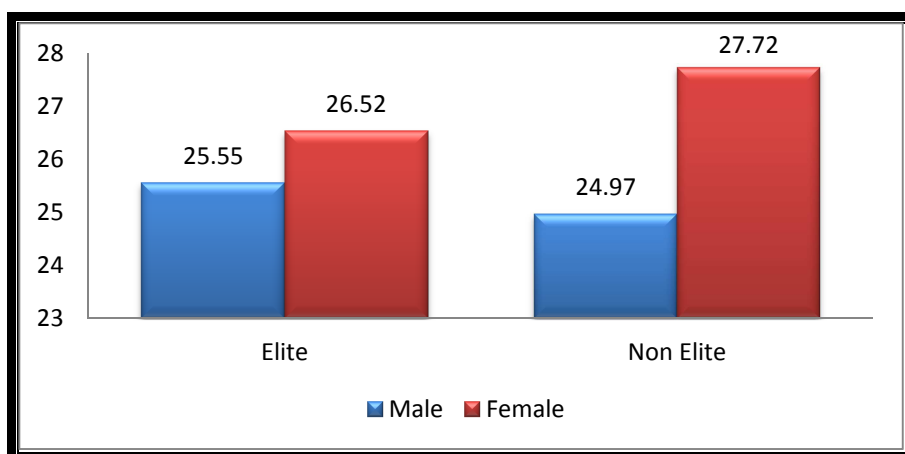
The table 88 revealed that the calculated t value of male and female elite athletes was 1.11, which was not significant (p value $0.27 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their mental practice level of cognitive skill category of mental skill.

The calculated t value of male and female non elite athletes was 3.88, which was significant (p value $0.00 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes' significant difference on their mental practice level of cognitive skill category of mental skill. It may be said that

mental practice level of cognitive skill category of female non elite athletes were found significantly greater than male non elite athletes.

Figure 67

Gender wise comparison of Mental Practice



The one way analysis variance of mental practice among elite athletes from different sports discipline was presented in the following tables.

Table 89

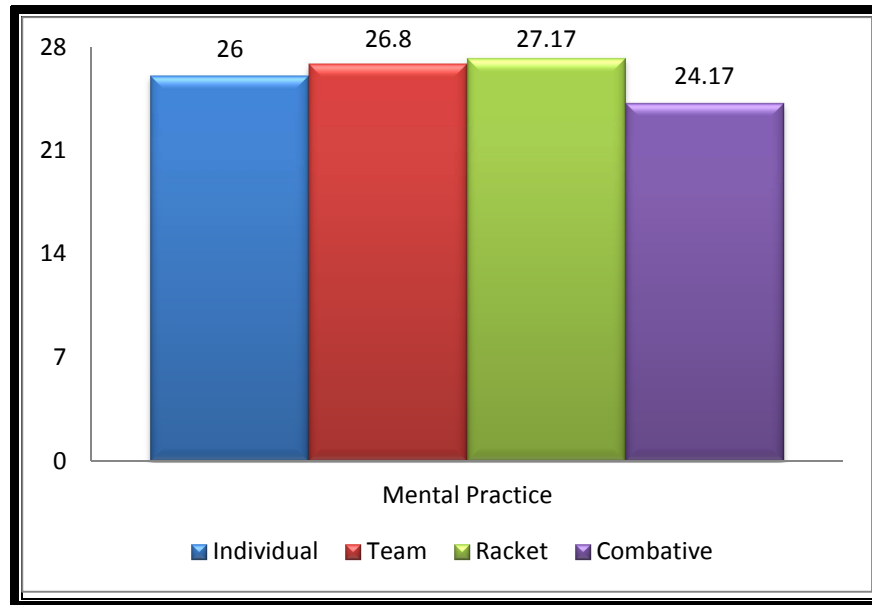
Comparison of Mental Practice among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	160.73	3	53.58	2.44	0.07
Within	2549.13	116	21.98		
Total	2709.87	119			

From table 89, it was evident that the calculated F value was 2.44, which was not significant (p value 0.07>0.05) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their Mental Practice level of cognitive skill category.

Figure 68

Comparison of Mental Practice among elite athletes from different sports discipline



The one way analysis variance of mental practice among non-elite athletes from different sports discipline was presented in the following tables.

Table 90

Comparison of Mental Practice among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	419.89	3	139.96	7.59*	0.00
Within	2138.70	116	18.44		
Total	2558.59	119			

* Significant at the 0.05 level of Significance

From table 90, it was evident that the calculated F value was 7.59, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significant difference on their Mental Practice level of cognitive skill category. In order to find which sports discipline more Mental Practice level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 91

**Post hoc analysis on Mental Practice
among non-elite athletes from different sports discipline**

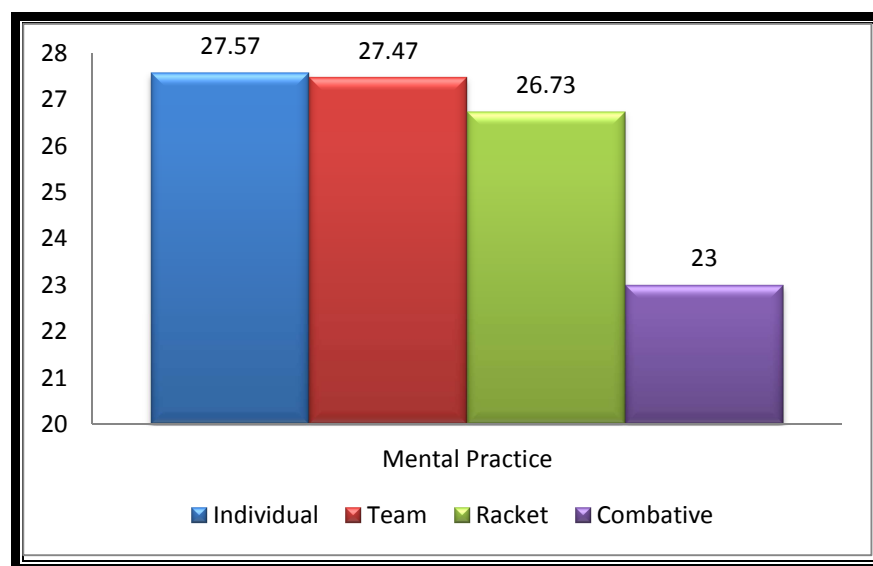
Individual	Team	Racket	Combative	M.D.	CD at 5% level
27.57	27.47			0.10	0.93
27.57		26.73		0.83	0.45
27.57			23.00	4.57*	0.00
	27.47	26.73		0.73	0.51
	27.47		23.00	4.47*	0.00
		26.73	23.00	3.73*	0.00

* Significant at the 0.05 level of Significance

The table 91 shows that the mean difference of Mental Practice between combative game players and individual, team, racket game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that non elite game players are low level of mental practice in cognitive skill category.

Figure 69

**Comparison of Mental Practice
among non-elite athletes from different sports discipline**



The one way analysis variance of mental practice among male athletes from different sports discipline was presented in the following tables.

Table 92
Comparison of Mental Practice among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	475.29	3	158.43	10.19*	0.00
Within	1803.70	116	15.55		
Total	2278.99	119			

* Significant at the 0.05 level of Significance

From table 92, it was evident that the calculated F value was 10.19, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Mental Practice level of cognitive skill category. In order to find which sports discipline more Mental Practice level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 93
Post hoc analysis on Mental Practice among male athletes from different sports discipline

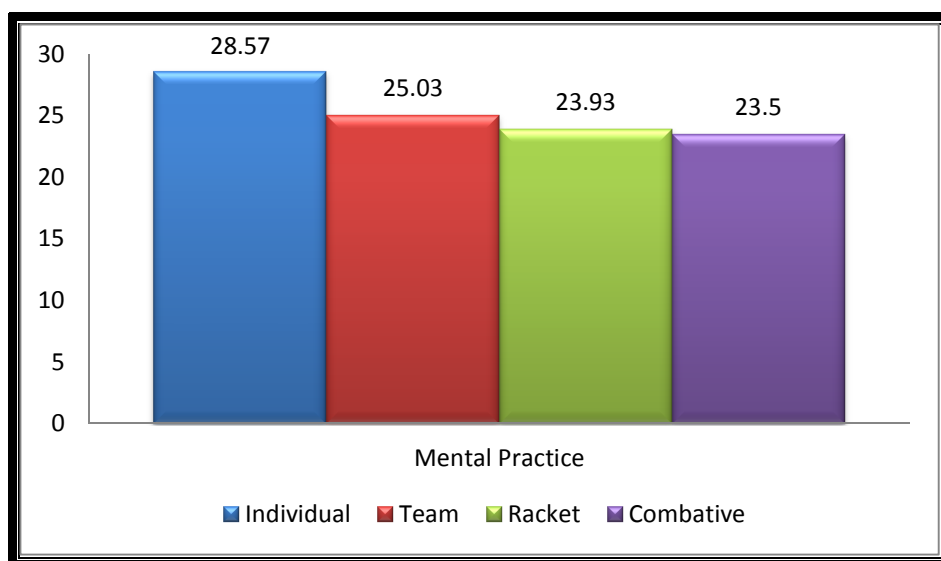
Individual	Team	Racket	Combative	M.D.	CD at 5% level
28.57	25.03			3.53*	0.00
28.57		23.93		4.63*	0.00
28.57			23.50	5.07*	0.00
	25.03	23.93		1.10	0.28
	25.03		23.50	1.53	0.14
		23.93	23.50	0.43	1.02

* Significant at the 0.05 level of Significance

The table 93 shows that the mean difference of Mental Practice between individual game players and team, racket, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table

clearly indicates that male individual game players are high mental practice score in cognitive skill category.

Figure 70
Comparison of Mental Practice
among male athletes from different sports discipline



The one way analysis variance of mental practice among female athletes from different sports discipline was presented in the following tables.

Table 94
Comparison of Mental Practice among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	756.17	3	252.06	19.73*	0.00
Within	1482.20	116	12.78		
Total	2238.37	119			

* Significant at the 0.05 level of Significance

From table 94, it was evident that the calculated F value was 19.73, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Mental Practice level of cognitive skill category. In order to find which sports

discipline more Mental Practice level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

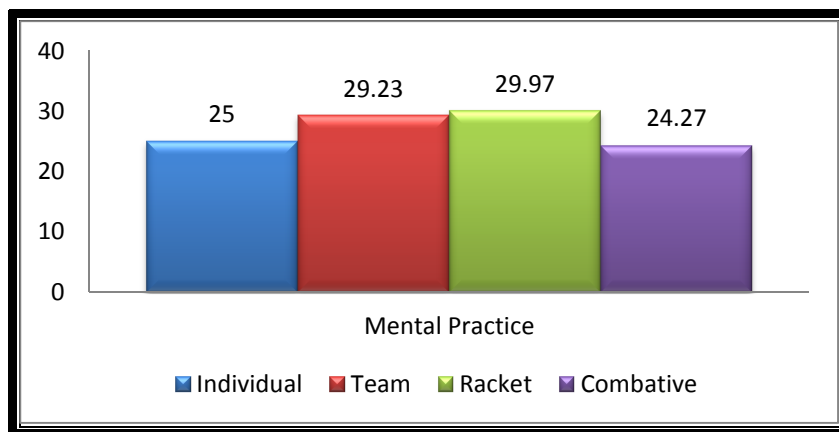
Table 95
Post hoc analysis on Mental Practice
among female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
25.00	29.23			4.23*	0.00
25.00		29.97		4.97*	0.00
25.00			24.27	0.73	0.43
	29.23	29.97		0.74	0.43
	29.23		24.27	4.97*	0.00
		29.97	24.27	5.70*	0.00

** Significant at the 0.05 level of Significance*

The table 95 shows that the mean difference of Mental Practice between individual game players and team, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. The mean difference of Mental Practice between combative game players and team, racket players were significant differences since critical differences was 0.00 lesser than at 0.05 level. This table clearly indicates that female team and racket game players are high scores of mental practice in cognitive skill category and low scores of mental practice in individual and combative players.

Figure 71
Comparison of Mental Practice
among female athletes from different sports discipline



The correlative analysis between mental practice and performance score of elite and non-elite athletes was presented in table 96.

Table 96
Relationship between mental practice
and performance of elite and non-elite athletes

	Elite	Non Elite
Pearson Correlation	-0.02	0.01
Sig. (2-tailed)	0.84	0.92
N	120	120

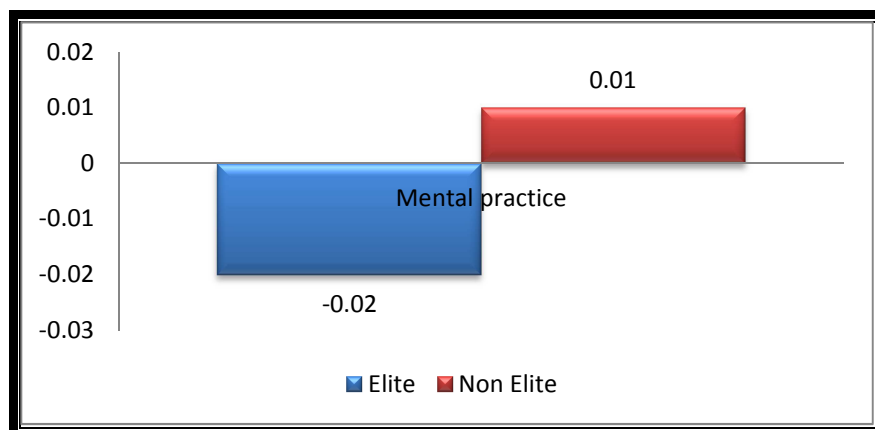
The analysis of table 96 shows that the elite players of obtained correlation value on mental practice to the performance was -0.02 and p value was 0.84. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with mental practice in cognitive skill of mental skill.

The obtained correlation value of non-elite players on mental practice to the performance was 0.01 and p value was 0.92. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no

relationship when the performance was related with mental practice in cognitive skill of mental skill.

Figure 72

Relationship between mental practice and performance of elite and non-elite athletes



The correlative analysis between mental practice and performance score of male and female athletes was presented in table 97.

Table 97

Relationship between mental practice and performance of male and female athletes

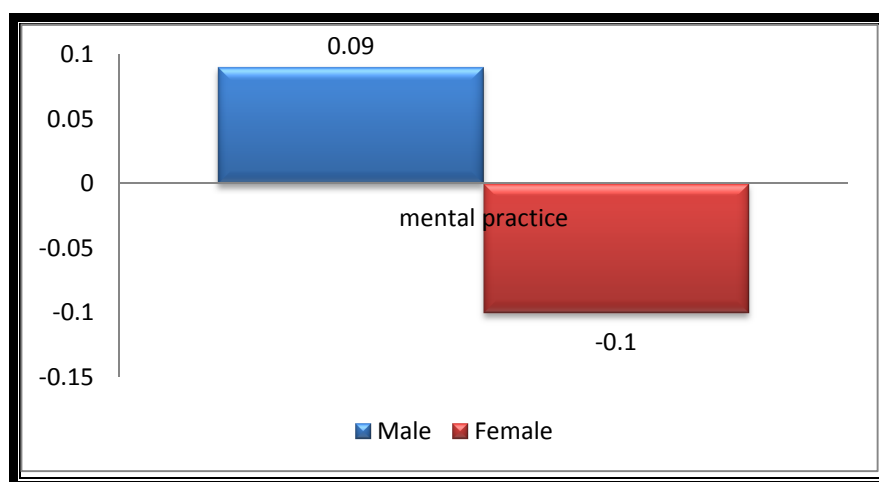
	Male	Female
Pearson Correlation	0.09	-0.10
Sig. (2-tailed)	0.30	0.28
N	120	120

The analysis of table 97 shows that the male players of obtained correlation value of mental practice to the performance was 0.09 and p value was 0.30. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with mental practice in cognitive of mental skill.

The female players of obtained correlation value of mental practice to the performance were -0.10 and p value 0.28. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with mental practice in cognitive of mental skill.

Figure 73

Relationship between mental practice and performance of male and female athletes



3. Focusing

The comparative analysis of focusing between elite and non-elite athletes from different sports was presented in the table 98.

Table 98

Category wise comparison of Focusing

Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	13.17	3.01	60	13.95	3.36	1.35	118	0.18
Female	60	13.58	2.42	60	13.85	2.95	0.54	118	0.59

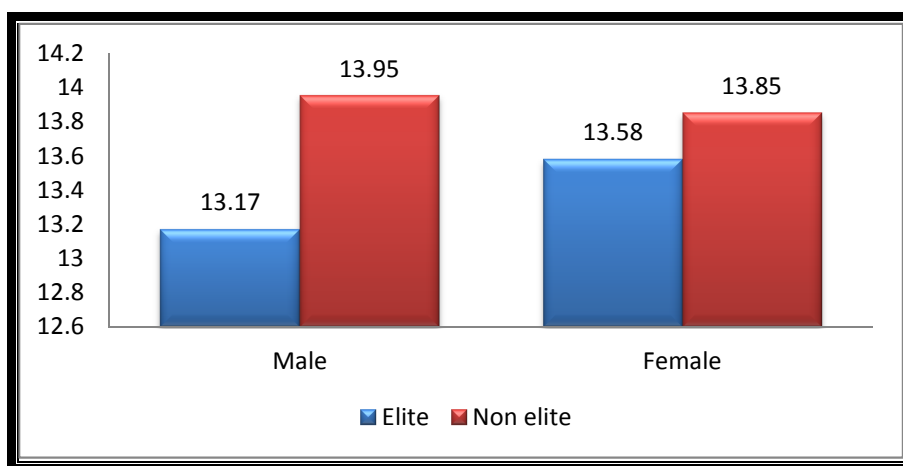
The table 98 revealed that the calculated t value of elite and non-elite male athletes was 1.35, which was not significant (p value 0.18>0.05) at 0.05 level with

df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Focusing level of cognitive skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.54, which was not significant (p value 0.59>0.05) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their Focusing level of cognitive skill category of mental skill.

Figure 74

Category wise comparison of Focusing



The comparative analysis of focusing between male and female athletes from different sports was presented in the table 99.

Table 99

Gender wise comparison of Focusing

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	13.17	3.01	60	13.58	2.42	0.84	118	0.41
Non Elite	60	13.95	3.36	60	13.85	2.96	0.17	118	0.86

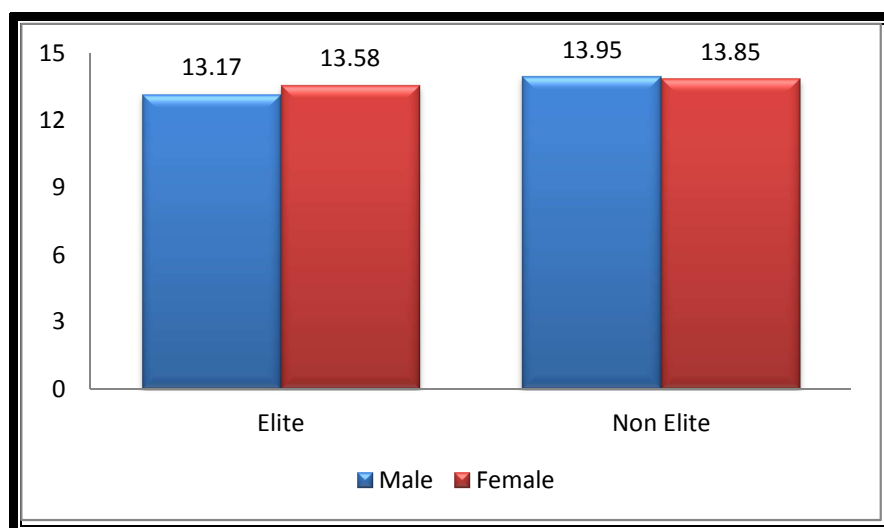
The table 99 revealed that the calculated t value of male and female elite athletes was 0.84, which was not significant (p value 0.41>0.05) at 0.05 level with

df equal to 118. It showed that the mean scores of elite male and female athletes similar on their focusing level of cognitive skill category of mental skill.

The calculated t value of male and female non elite athletes was 0.17, which was not significant (p value $0.86 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their Focusing level of cognitive skill category of mental skill.

Figure 75

Gender wise comparison of Focusing



The one way analysis variance of focusing among elite athletes from different sports discipline was presented in the following tables.

Table 100

Comparison of Focusing among elite athletes

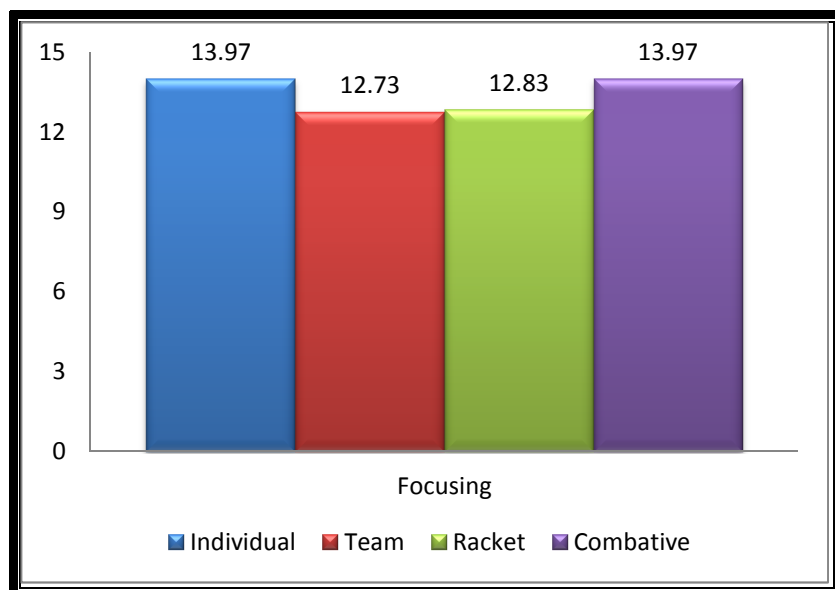
	Sum of Squares	df	Mean Square	F	Sig.
Between	42.16	3	14.05	1.94	0.13
Within	841.97	116	7.26		
Total	884.13	119			

From table 100, it was evident that the calculated F value was 1.94, which was not significant (p value $0.13 > 0.05$) at 0.05 level with df equal to 3, 116. It

showed that elite athletes from different types of sports discipline similar on their Focusing level of cognitive skill category.

Figure 76

Comparison of Focusing among elite athletes from different sports discipline



The one way analysis variance of focusing among non-elite athletes from different sports discipline was presented in the following tables.

Table 101

Comparison of Focusing among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	110.20	3	36.73	3.98*	0.01
Within	1070.60	116	9.23		
Total	1180.80	119			

* Significant at the 0.05 level of Significance

From table 101, it was evident that the calculated F value was 3.98, which was significant (p value $0.01 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline similar on their

Focusing level of cognitive skill category. It showed that elite athletes from different types of sports discipline similar on their Focusing level of cognitive skill category.

Table 102

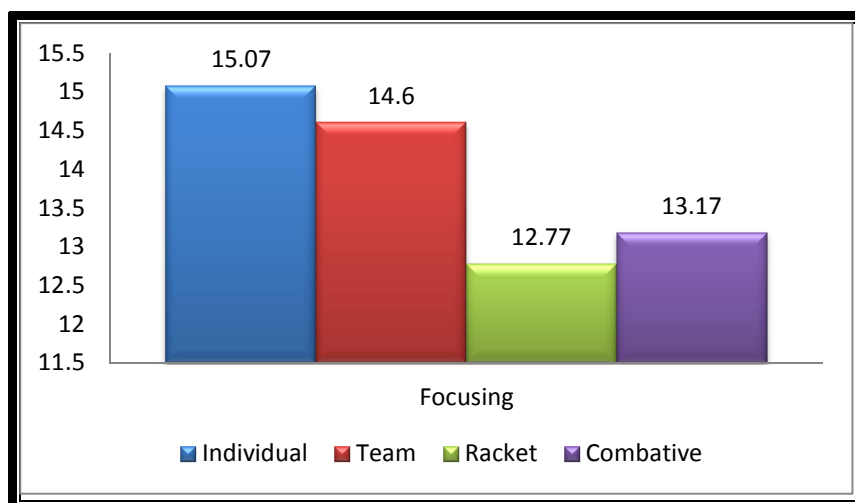
Post hoc analysis on Focusing among non-elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
15.07	14.60			0.47	0.55
15.07		12.77		2.30*	0.00
15.07			13.17	1.90*	0.02
	14.60	12.77		1.83*	0.02
	14.60		13.17	1.43	0.07
		12.77	13.17	0.40	0.61

** Significant at the 0.05 level of Significance*

The table 102 shows that the mean differences of Focusing between individual game players and racket, combative game players were significant differences since critical differences were 0.00 and 0.02 respectively lesser than at 0.05 level. The mean difference of Focusing between team game players and racket game players were significant differences since critical differences was 0.02 lesser than at 0.05 level. This table clearly indicates that non elite individual and team game players are more focusing in cognitive skill category and less focusing in racket and combative players.

Figure 77
Comparison of Focusing among non-elite athletes from different sports discipline



The one way analysis variance of focusing among male athletes from different sports discipline was presented in the following tables.

Table 103
Comparison of Focusing among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	93.49	3	31.16	3.22*	0.03
Within	1124.10	116	9.69		
Total	1217.59	119			

* Significant at the 0.05 level of Significance

From table 103, it was evident that the calculated F value was 3.22, which was significant (p value $0.03 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Focusing level of cognitive skill category. In order to find which sports discipline more Focusing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 104

Post hoc analysis on Focusing among male athletes from different sports discipline

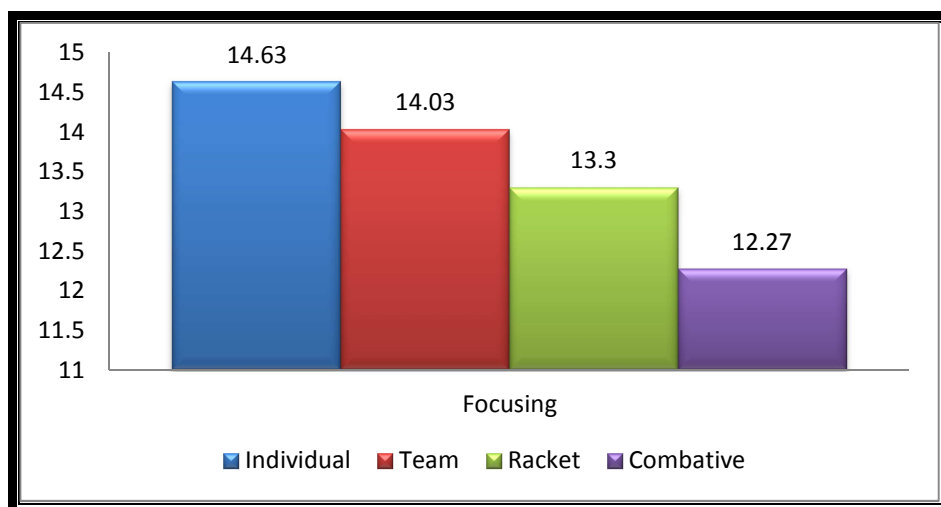
Individual	Team	Racket	Combative	M.D.	CD at 5% level
14.63	14.03			0.60	0.46
14.63		13.30		1.33	0.10
14.63			12.27	2.37*	0.00
	14.03	13.30		0.73	0.36
	14.03		12.27	1.77*	0.03
		13.30	12.27	1.03	0.20

* Significant at the 0.05 level of Significance

The table 104 shows that the mean differences of Focusing between combative game players and individual, team game players were significant differences since critical differences were 0.00 and 0.03 respectively lesser than at 0.05 level. This table clearly indicates that male combative game players are less focus in cognitive skill category than other discipline players namely individual, team and racket players.

Figure 78

Comparison of Focusing among male athletes from different sports discipline



The one way analysis variance of focusing among female athletes from different sports discipline was presented in the following tables.

Table 105
Comparison of Focusing among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	119.10	3	39.70	6.20*	0.00
Within	743.27	116	6.41		
Total	862.37	119			

* Significant at the 0.05 level of Significance

From table 105, it was evident that the calculated F value was 6.120, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Focusing level of cognitive skill category. In order to find which sports discipline more Focusing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 106
Post hoc analysis on Focusing among female athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
14.40	13.30			1.10	0.10
14.40		12.30		2.10*	0.00
14.40			14.87	0.47	0.48
	13.30	12.30		1.00	0.13
	13.30		14.87	1.57*	0.02
		12.30	14.87	2.57*	0.00

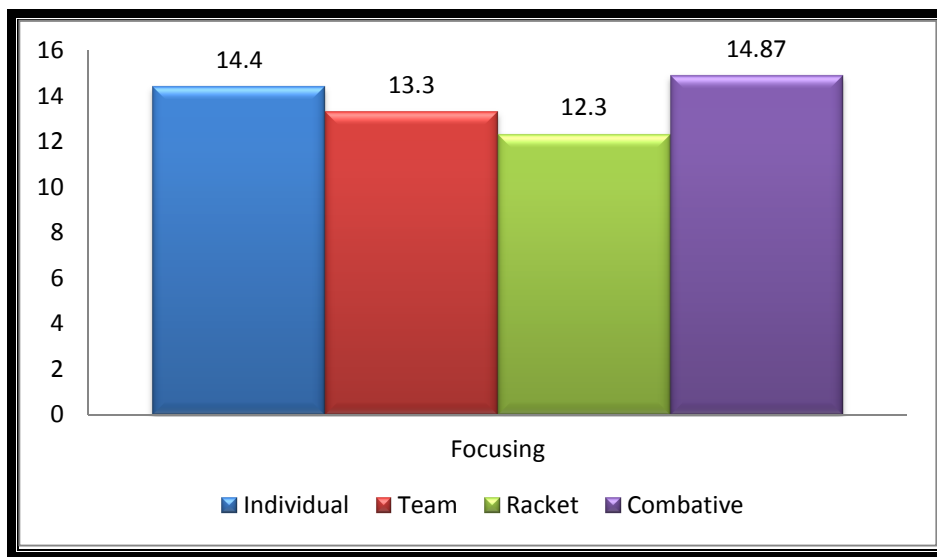
* Significant at the 0.05 level of Significance

The table 106 shows that the mean difference of Focusing between racket game players and individual, combative game players were significant differences since critical differences were 0.00 and 0.00 respectively lesser than at 0.05 level.

The mean difference of Focusing between team game players and combative game players were significant differences since critical differences was 0.02 lesser than at 0.05 level. This table clearly indicates that female team and racket game players are less focusing in cognitive skill category.

Figure 79

Comparison of Focusing among female athletes from different sports discipline



The correlative analysis between focusing and performance score of elite and non-elite athletes was presented in table 107.

Table 107

Relationship between focusing and performance of elite and non-elite athletes

	Elite	Non Elite
Pearson Correlation	0.02	0.30*
Sig. (2-tailed)	0.84	0.00
N	120	120

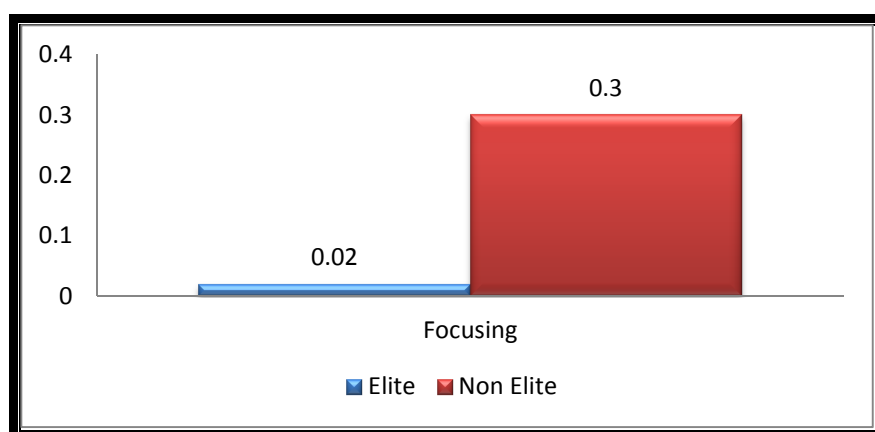
The analysis of table 107 shows that the elite players of obtained correlation value on focusing to the performance was 0.02 and p value was 0.84. The p value

was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with focusing in cognitive skill of mental skill.

The obtained correlation value of non-elite players on focusing to the performance was 0.30 and p value was 0.00. The p value was lesser than the 0.05 level of significance. However, in the case of non-elite players there was a positive relationship when the performance was related with focusing in cognitive skill of mental skill.

Figure 80

Relationship between focusing and performance of elite and non-elite athletes



The correlative analysis between focusing and performance score of male and female athletes was presented in table 108.

Table 108

Relationship between focusing and performance of male and female athletes

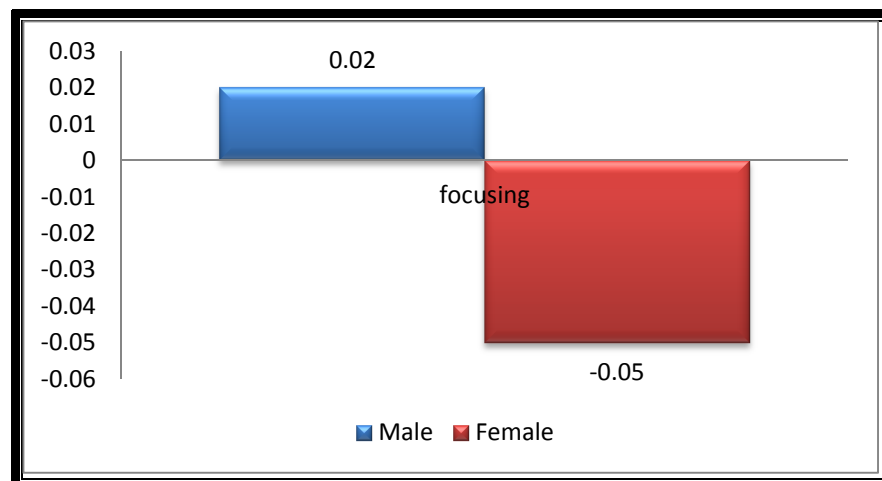
	Male	Female
Pearson Correlation	0.02	-0.05
Sig. (2-tailed)	0.85	0.56
N	120	120

The analysis of table 108 shows that the male players of obtained correlation value of focusing to the performance was 0.02 and p value was 0.85. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with focusing in cognitive of mental skill.

The female players of obtained correlation value of focusing to the performance were -0.05 and p value 0.56. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with focusing in cognitive of mental skill.

Figure 81

**Relationship between focusing
and performance of male and female athletes**



4. Refocusing

The comparative analysis of refocusing between elite and non-elite athletes from different sports was presented in the table 109.

Table 109
Category wise comparison of Refocusing

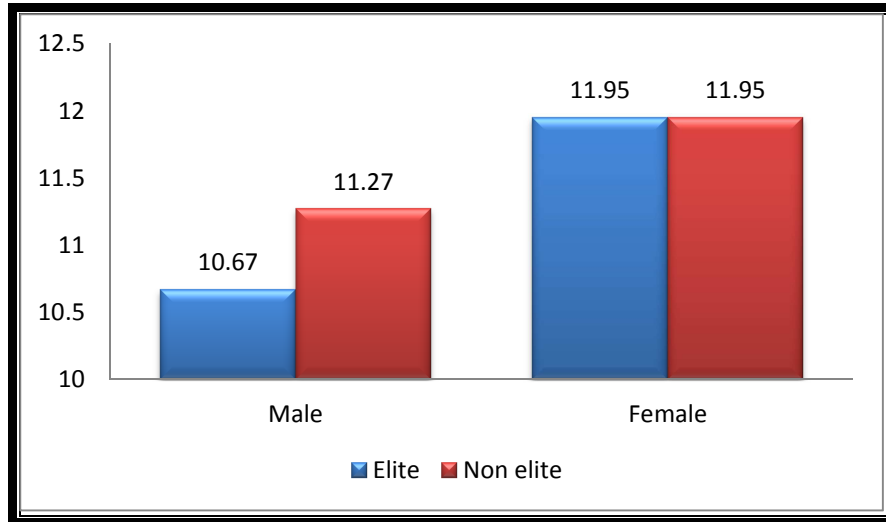
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	10.67	1.89	60	11.27	2.09	1.65	118	0.10
Female	60	11.95	2.00	60	11.95	2.00	0.00	118	1.00

The table 109 revealed that the calculated t value of elite and non-elite male athletes was 1.65, which was not significant (p value $0.10 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Refocusing level of cognitive skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.00, which was not significant (p value $1.00 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their Refocusing level of cognitive skill category of mental skill.

Figure 82

Category wise comparison of Refocusing



The comparative analysis of refocusing between male and female athletes from different sports was presented in the table110.

Table 110

Gender wise comparison of Refocusing

Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	10.67	1.89	60	11.95	2.00	3.61*	118	0.00
Non Elite	60	11.27	2.09	60	11.95	2.04	1.81	118	0.07

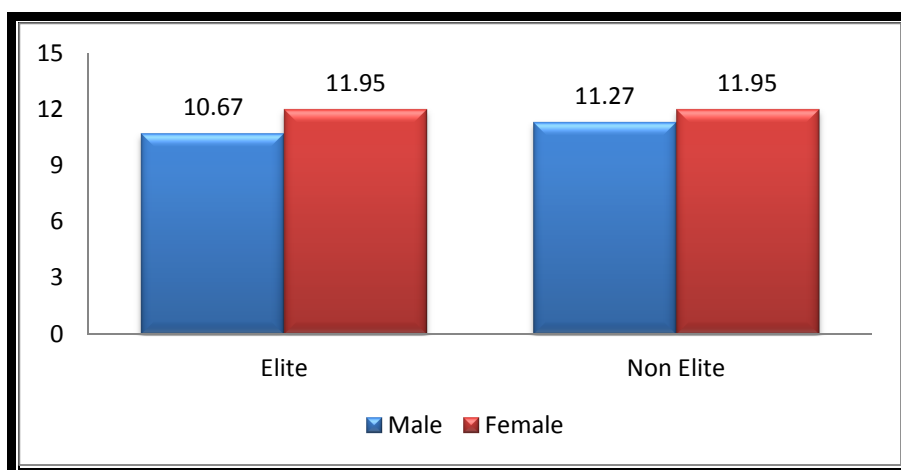
* Significant at the 0.05 level of Significance

The table 109 revealed that the calculated t value of male and female elite athletes was 3.61, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes' significant difference on their Refocusing level of cognitive skill category of mental skill. It may be said that refocusing level of cognitive skill category of elite female athletes were found significantly greater than elite male athletes.

The calculated t value of male and female non elite athletes was 1.81, which was not significant (p value $0.07 > 0.05$) at 0.05 level with df equal to 118. It showed

that the mean scores of non-elite male and female athletes similar on their Refocusing level of cognitive skill category of mental skill.

Figure 83
Gender wise comparison of Refocusing



The one way analysis variance of refocusing among elite athletes from different sports discipline was presented in the following tables.

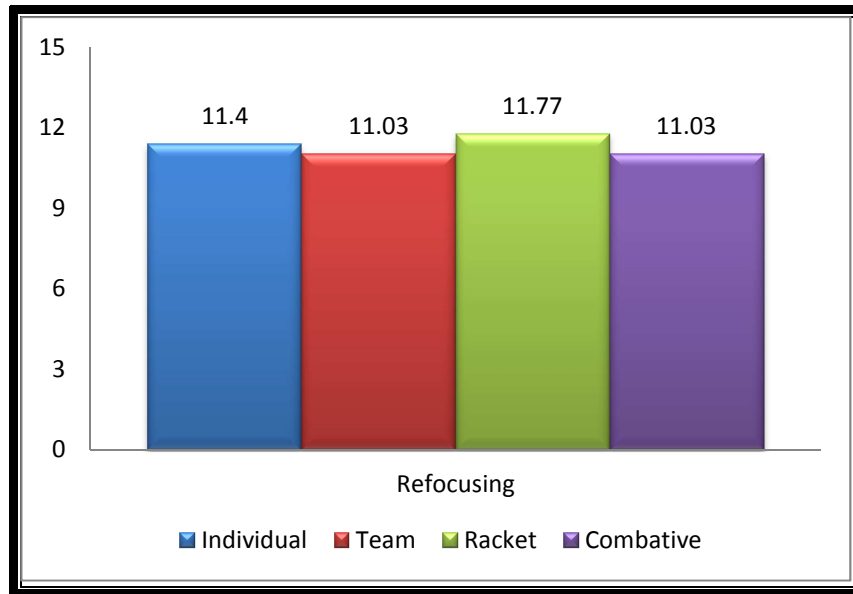
Table 111
Comparison of Refocusing among elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	11.09	3	3.70	0.88	0.45
Within	486.50	116	4.19		
Total	497.59	119			

From table 111, it was evident that the calculated F value was 0.88, which was not significant (p value $0.45 > 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline similar on their Refocusing level of cognitive skill category.

Figure 84

Comparison of Refocusing among elite athletes from different sports discipline



The one way analysis variance of refocusing among non-elite athletes from different sports discipline was presented in the following tables.

Table 112

Comparison of Refocusing among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	42.36	3	14.12	3.45*	0.02
Within	474.23	116	4.09		
Total	516.59	119			

* Significant at the 0.05 level of Significance

From table 112, it was evident that the calculated F value was 3.45, which was not significant (p value $0.02 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significant difference on their Refocusing level of cognitive skill category. In order to find

which sports discipline more Refocusing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

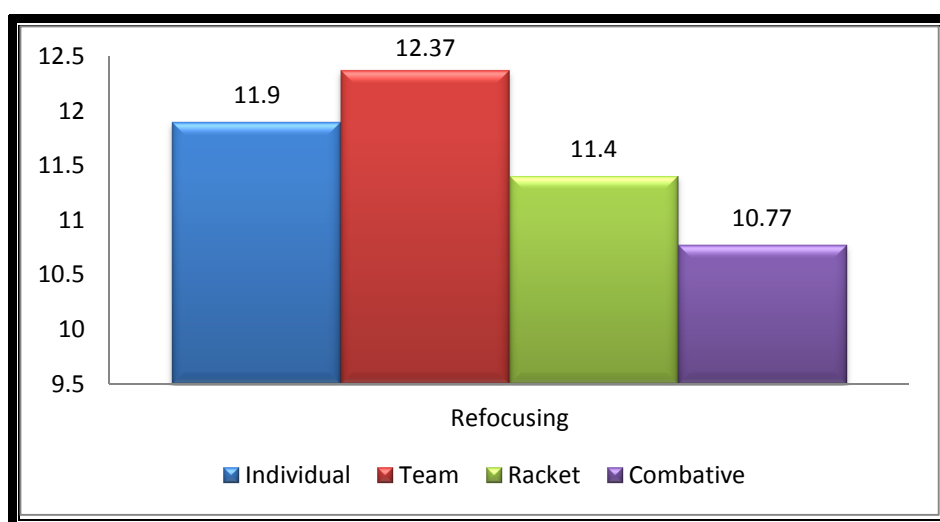
Table 113
Post hoc analysis on Refocusing among non-elite athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
11.90	12.37			0.47	0.37
11.90		11.40		0.50	0.34
11.90			10.77	1.13*	0.03
	12.37	11.40		0.97	0.07
	12.37		10.77	1.60*	0.00
		11.40	10.77	0.63	0.22

* Significant at the 0.05 level of Significance

The table 113 shows that the mean differences of Refocusing between combative game players and individual, team game players were significant differences since critical differences were 0.03 and 0.00 respectively lesser than at 0.05 level. This table clearly indicates that non elite combative game players are less refocusing in cognitive skill category.

Figure 85
Comparison of Refocusing among non-elite athletes from different sports discipline



The one way analysis variance of refocusing among male athletes from different sports discipline was presented in the following tables.

Table 114
Comparison of Refocusing among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	65.27	3	21.76	6.09*	0.00
Within	414.60	116	3.57		
Total	479.87	119			

From table 114, it was evident that the calculated F value was 6.09, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Refocusing level of cognitive skill category. In order to find which sports discipline more Refocusing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 115
Post hoc analysis on Refocusing among male athletes from different sports discipline

Individual	Team	Racket	Combative	M.D.	CD at 5% level
10.67	12.23			1.57*	0.00
10.67		10.57		0.10	0.84
10.67			10.40	0.27	0.59
	12.23	10.57		1.67*	0.00
	12.23		10.40	1.83*	0.00
		10.57	10.40	0.17	0.73

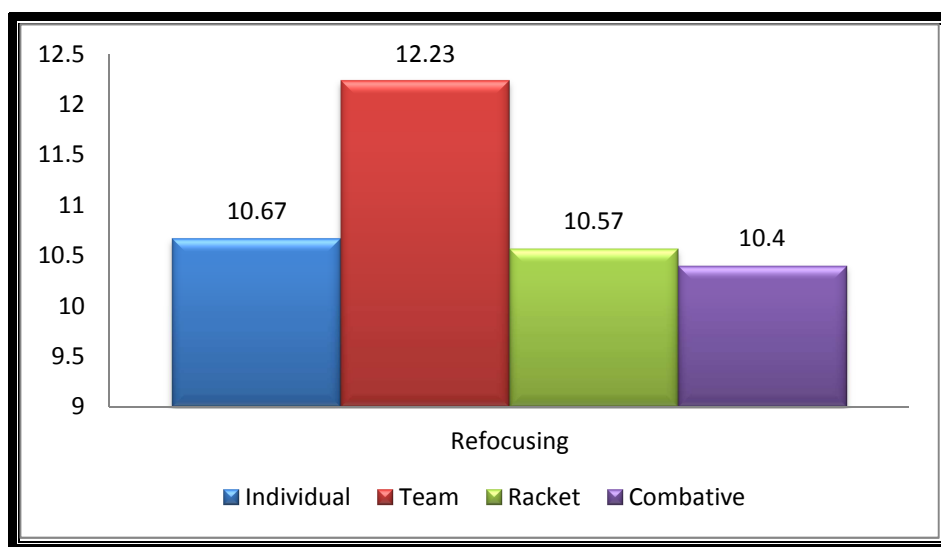
* Significant at the 0.05 level of Significance

The table 115 shows that the mean differences of Refocusing between team game players and individual, racket, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table

clearly indicates that female team game players are more refocusing in cognitive skill category than the rest of the sports disciplines.

Figure 86

Comparison of Refocusing among male athletes from different sports discipline



The one way analysis variance of refocusing among female athletes from different sports discipline was presented in the following tables.

Table 116

Comparison of Refocusing among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	54.17	3	18.06	4.90*	0.00
Within	427.53	116	3.69		
Total	481.70	119			

* Significant at the 0.05 level of Significance

From table 116, it was evident that the calculated F value was 4.90, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Refocusing level of cognitive skill category. In order to find which sports

discipline more Refocusing level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 117
Post hoc analysis on Refocusing
among female athletes from different sports discipline

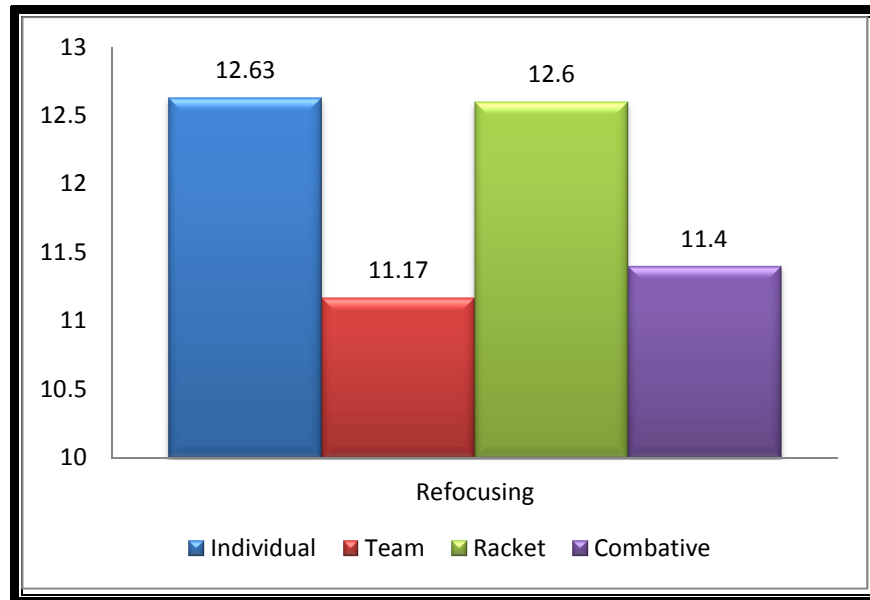
Individual	Team	Racket	Combative	M.D.	CD at 5% level
12.63	11.17			1.47*	0.00
12.63		12.60		0.03	0.95
12.63			11.40	1.23*	0.01
	11.17	12.60		1.43*	0.00
	11.17		11.40	0.23	0.64
		12.60	11.40	1.20*	0.02

** Significant at the 0.05 level of Significance*

The table 117 shows that the mean differences of Refocusing between individual game players and team, combative game players were significant differences since critical differences were 0.00 and 0.01 respectively lesser than at 0.05 level. The mean differences of Refocusing between racket game players and team, combative game players were significant differences since critical differences were 0.00 and 0.02 respectively lesser than at 0.05 level. This table clearly indicates that female team and racket game players are more Confident in cognitive skill category and less confident in individual and combative players.

Figure 87

Comparison of Refocusing among female athletes from different sports discipline



The correlative analysis between refocusing and performance score of elite and non elite athletes was presented in table 118.

Table 118

Relationship between refocusing and performance of elite and non-elite athletes

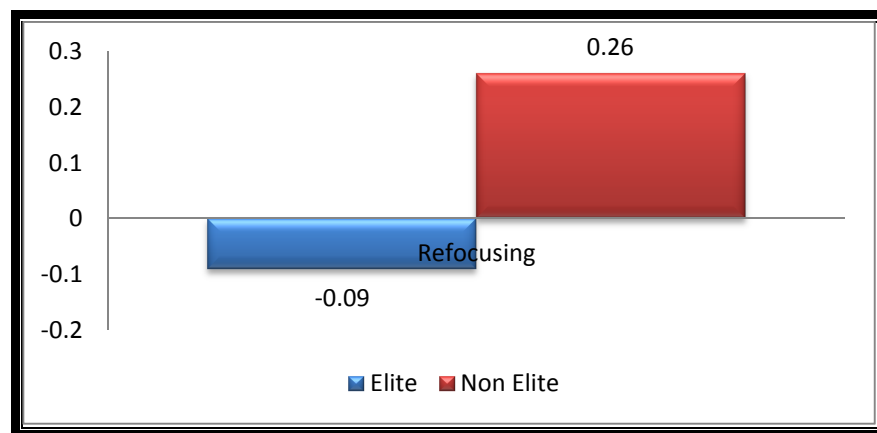
	Elite	Non Elite
Pearson Correlation	-0.09	0.26*
Sig. (2-tailed)	0.33	0.00
N	120	120

The analysis of table 118 shows that the elite players of obtained correlation value on refocusing to the performance was -0.09 and p value was 0.33. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with refocusing in cognitive skill of mental skill.

The obtained correlation value of non-elite players on refocusing to the performance was 0.26 and p value was 0.00. The p value was lesser than the 0.05 level of significance. However, in the case of non-elite players there was a positive relationship when the performance was related with refocusing in cognitive skill of mental skill.

Figure 88

Relationship between refocusing and performance of elite and non-elite athletes



The correlative analysis between refocusing and performance score of male and female athletes was presented in table 119.

Table 119

Relationship between refocusing and performance of male and female athletes

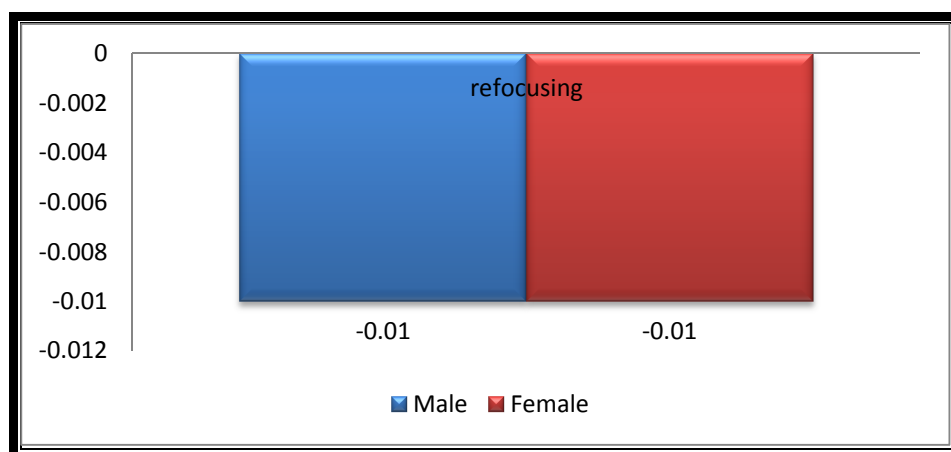
	Male	Female
Pearson Correlation	-0.01	-0.01
Sig. (2-tailed)	0.89	0.91
N	120	120

The analysis of table 119 shows that the male players of obtained correlation value of refocusing to the performance was -0.01 and p value was 0.89. The p value was higher than the 0.05 level of significance. However, in the case of male players

there was no relationship when the performance was related with refocusing in cognitive of mental skill.

The female players of obtained correlation value of refocusing to the performance were -0.01 and p value 0.91. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no relationship when the performance was related with refocusing in cognitive of mental skill.

Figure 89
Relationship between refocusing and performance of male and female athletes



5. Competition planning

The comparative analysis of competition planning between elite and non-elite athletes from different sports was presented in the table 120.

Table 120
Category wise comparison of Competition planning

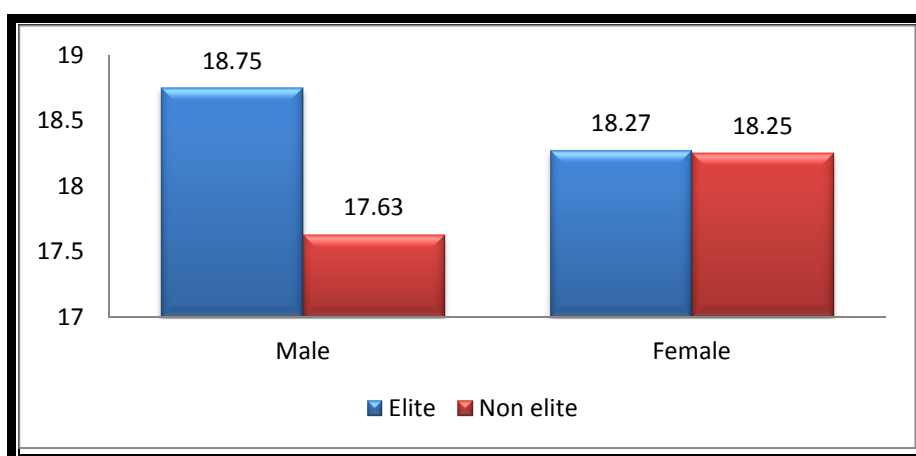
Category	Elite			Non elite			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Male	60	18.75	3.41	60	17.63	2.88	1.94	118	0.06
Female	60	18.27	3.19	60	18.25	3.13	0.03	118	0.98

The table 120 revealed that the calculated t value of elite and non-elite male athletes was 1.94, which was not significant (p value $0.06 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of male elite and non-elite athletes similar on their Competition planning level of cognitive skill category of mental skill.

The calculated t value of female elite and non-elite athletes was 0.03, which was not significant (p value $0.98 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of female elite and non-elite athletes similar on their Competition planning level of cognitive skill category of mental skill.

Figure 90

Category wise comparison of Competition planning



The comparative analysis of competition planning between male and female athletes from different sports was presented in the table 121.

Table 121

Gender wise comparison of Competition planning

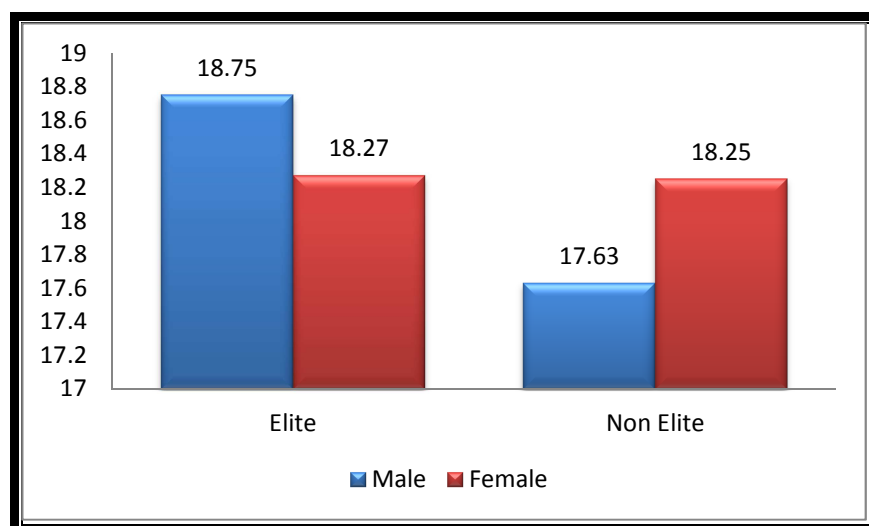
Category	Male			Female			t	d.f.	Sig. (2-tailed)
	N	Mean	S.D.	N	Mean	S.D.			
Elite	60	18.75	3.41	60	18.27	3.19	0.80	118	0.43
Non Elite	60	17.63	2.88	60	18.25	3.13	1.12	118	0.26

The table 121 revealed that the calculated t value of male and female elite athletes was 0.80, which was not significant (p value $0.43 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of elite male and female athletes similar on their Competition planning level of cognitive skill category of mental skill.

The calculated t value of male and female non elite athletes was 1.12, which was not significant (p value $0.26 > 0.05$) at 0.05 level with df equal to 118. It showed that the mean scores of non-elite male and female athletes similar on their Competition planning level of cognitive skill category of mental skill.

Figure 91

Gender wise comparison of Competition planning



The one way analysis variance of competition planning among elite athletes from different sports discipline was presented in the following tables.

Table 122**Comparison of Competition planning among elite athletes**

	Sum of Squares	df	Mean Square	F	Sig.
Between	347.03	3	115.68	14.14*	0.00
Within	948.97	116	8.18		
Total	1295.99	119			

From table 122, it was evident that the calculated F value was 14.14, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that elite athletes from different types of sports discipline significant difference on their Competition planning level of cognitive skill category. In order to find which sports discipline more Competition planning level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 123**Post hoc analysis on Competition planning among elite athletes from different sports discipline**

Individual	Team	Racket	Combative	M.D.	CD at 5% level
17.33	19.47			2.13*	0.01
17.33		20.77		3.43*	0.00
17.33			16.47	0.87	0.24
	19.47	20.77		1.30	0.08
	19.47		16.47	3.00*	0.00
		20.77	16.47	4.30*	0.00

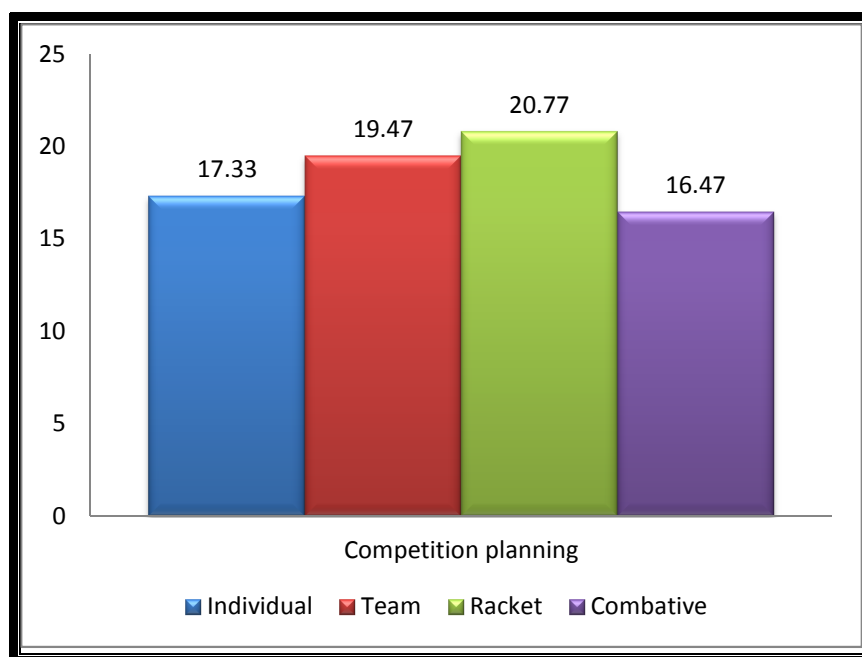
* Significant at the 0.05 level of Significance

The table 123 shows that the mean difference of Competition planning between individual game players and team, racket game players were significant differences since critical differences were 0.01 and 0.00 respectively lesser than at 0.05 level. The mean differences of Competition planning between combative game players and team, racket game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that elite

team and racket game players are more Competition planning in cognitive skill category and less planning in individual and combative players.

Figure 92

Comparison of Competition planning among elite athletes from different sports discipline



The one way analysis variance of competition planning among non-elite athletes from different sports discipline was presented in the following tables.

Table 124

Comparison of Competition planning among non-elite athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	265.03	3	88.34	12.60*	0.00
Within	813.57	116	7.01		
Total	1078.59	119			

* Significant at the 0.05 level of Significance

From table 124, it was evident that the calculated F value was 12.60, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that non elite athletes from different types of sports discipline significant difference on their Competition planning level of cognitive skill category. In order to find which sports discipline more Competition planning level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 125
Post hoc analysis on Competition planning
among non-elite athletes from different sports discipline

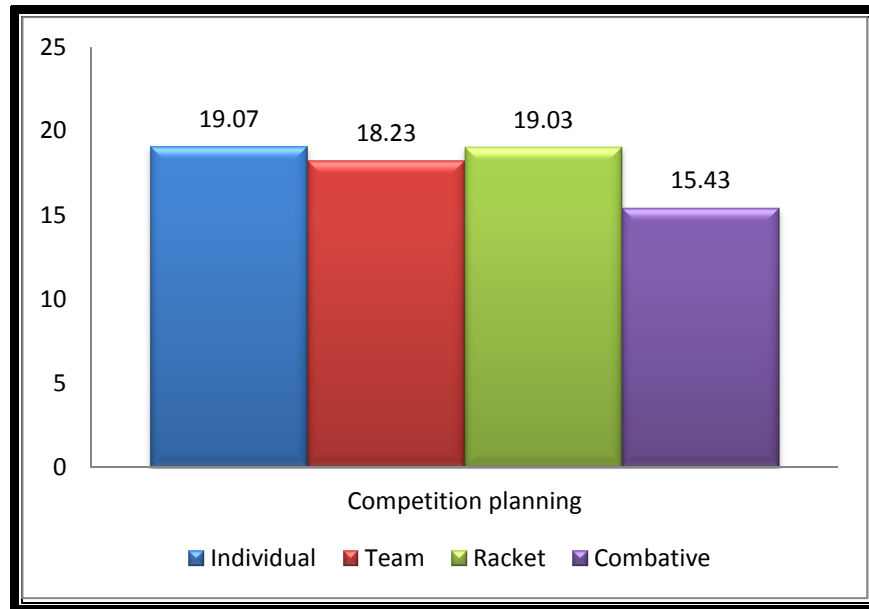
Individual	Team	Racket	Combative	M.D.	CD at 5% level
19.07	18.23			0.83	0.23
19.07		19.03		0.03	0.96
19.07			15.43	3.63*	0.00
	18.23	19.03		0.80	0.24
	18.23		15.43	2.80*	0.00
		19.03	15.43	3.60*	0.00

* Significant at the 0.05 level of Significance

The table 125 shows that the mean differences of Competition planning between combative game players and individual, team, racket game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that non elite combative game players are less planning competition in cognitive skill category than the rest of the discipline players.

Figure 93

Comparison of Competition planning among non-elite athletes from different sports discipline



The one way analysis variance of competition planning among male athletes from different sports discipline was presented in the following tables.

Table 126

Comparison of Competition planning among male athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	134.23	3	44.74	4.81*	0.00
Within	1078.37	116	9.30		
Total	1212.59	119			

* Significant at the 0.05 level of Significance

From table 126, it was evident that the calculated F value was 4.81, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that male athletes from different types of sports discipline significantly differ on their Competition planning level of cognitive skill category. In order to find which sports discipline more Competition planning level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 127

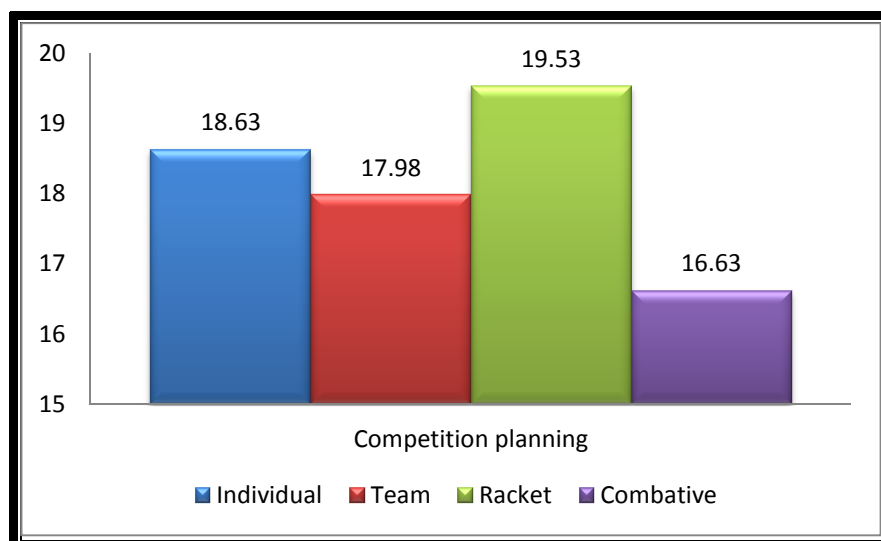
**Post hoc analysis on Competition planning
among male athletes from different sports discipline**

Individual	Team	Racket	Combative	M.D.	CD at 5% level
18.63	17.98			0.67	0.39
18.63		19.53		0.90	0.26
18.63			16.63	2.00*	0.01
	17.98	19.53		1.57*	0.05
	17.98		16.63	1.33	0.93
		19.53	16.63	2.90*	0.00

** Significant at the 0.05 level of Significance*

The table 127 shows that the mean difference of Competition planning between individual game players and combative game players were significant differences since critical differences was 0.01 respectively lesser than at 0.05 level. The mean difference of Competition planning between racket game players and team, combative game players were significant differences since critical differences were 0.05 and 0.00 respectively lesser than at 0.05 levels. This table clearly indicates that male racket game players are more competition planning level in cognitive skill category and less in combative players.

Figure 94
Comparison of Competition planning
among male athletes from different sports discipline



The one way analysis variance of competition planning among female athletes from different sports discipline was presented in the following tables.

Table 128
Comparison of Competition planning among female athletes

	Sum of Squares	df	Mean Square	F	Sig.
Between	462.03	3	154.01	24.85*	0.00
Within	718.97	116	6.20		
Total	1180.99	119			

* Significant at the 0.05 level of Significance

From table 128, it was evident that the calculated F value was 24.85, which was significant (p value $0.00 < 0.05$) at 0.05 level with df equal to 3, 116. It showed that female athletes from different types of sports discipline significantly differ on their Competition planning level of cognitive skill category. In order to find which sports discipline more Competition planning level, pair wise comparison analysis (Least Significant Difference LSD test) were carried out.

Table 129

Post hoc analysis on Competition planning among female athletes from different sports discipline

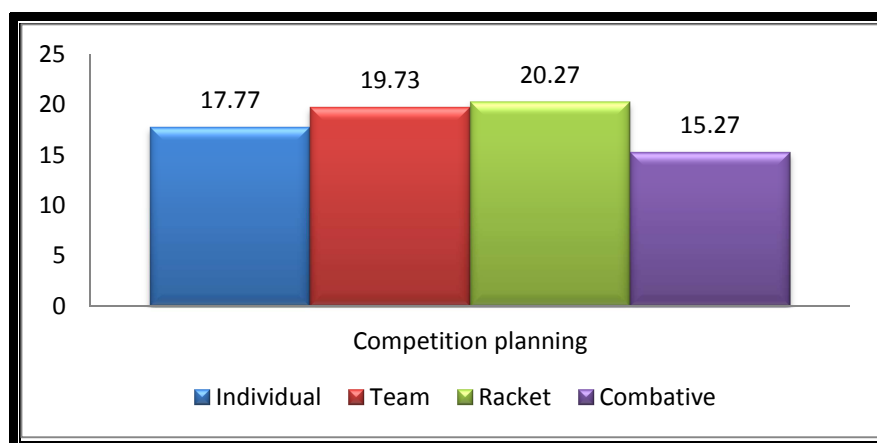
Individual	Team	Racket	Combative	M.D.	CD at 5% level
17.77	19.73			1.97*	0.00
17.77		20.27		2.50*	0.00
17.77			15.27	2.50*	0.00
	19.73	20.27		0.53	0.41
	19.73		15.27	4.47*	0.00
		20.27	15.27	5.00*	0.00

* Significant at the 0.05 level of Significance

The table 129 shows that the mean difference of Competition planning between individual game players and team, racket, combative game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. The mean differences of Competition planning between combative game players and team, racket game players were significant differences since critical differences were 0.00 lesser than at 0.05 level. This table clearly indicates that female team and racket game players are more Competition planning in cognitive skill category and less planning in individual and combative players.

Figure 95

Comparison of Competition planning among female athletes from different sports discipline



The correlative analysis between competition planning and performance score of elite and non-elite athletes was presented in table 130.

Table 130

Relationship between competition planning and performance of elite and non-elite athletes

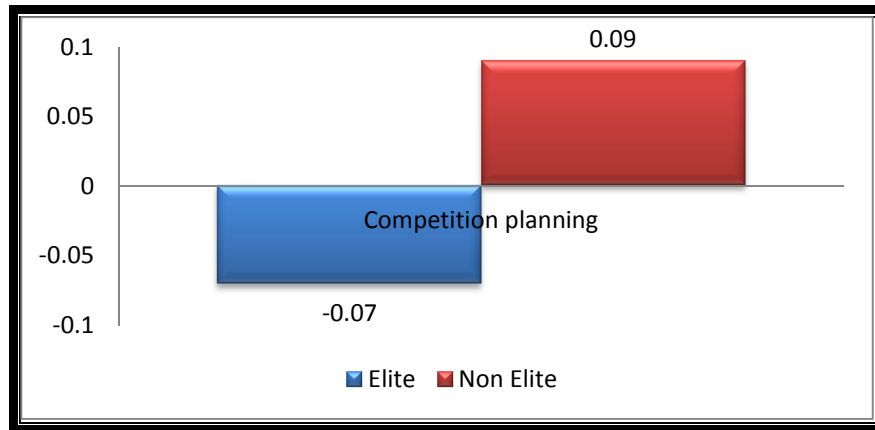
	Elite	Non Elite
Pearson Correlation	-0.07	0.09
Sig. (2-tailed)	0.47	0.32
N	120	120

The analysis of table 130 shows that the elite players of obtained correlation value on competition planning to the performance was -0.07 and p value was 0.47. The p value was higher than the 0.05 level of significance. However, in the case of elite players there was no relationship when the performance was related with competition planning in cognitive skill of mental skill.

The obtained correlation value of non-elite players on competition planning to the performance was 0.19 and p value was 0.32. The p value was higher than the 0.05 level of significance. However, in the case of non-elite players there was no relationship when the performance was related with competition planning in cognitive skill of mental skill.

Figure 96

Relationship between competition planning and performance of elite and non-elite athletes



The correlative analysis between competition planning and performance score of male and female athletes was presented in table 131.

Table 131

Relationship between competition planning and performance of male and female athletes

	Male	Female
Pearson Correlation	0.14	0.04
Sig. (2-tailed)	0.13	0.66
N	120	120

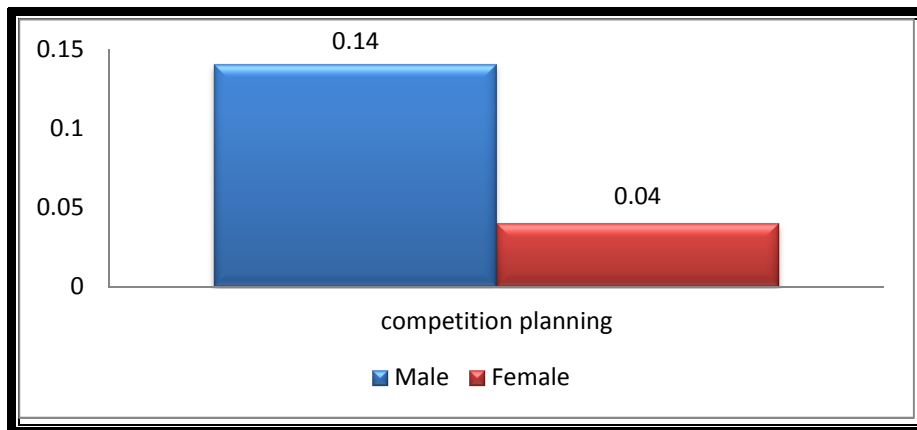
The analysis of table 131 shows that the male players of obtained correlation value of competition planning to the performance was 0.14 and p value was 0.13. The p value was higher than the 0.05 level of significance. However, in the case of male players there was no relationship when the performance was related with competition planning in cognitive of mental skill.

The female players of obtained correlation value of competition planning to the performance were 0.04 and p value 0.66. The p value was higher than the 0.05 level of significance. However, in the case of female players there was no

relationship when the performance was related with competition planning in cognitive of mental skill.

Figure 97

Relationship between competition planning and performance of male and female athletes



Discussion on Findings

One of the important aspect of sports and performance psychology is that mental skills are major determinants of performance involving cognitive (thinking) abilities which can be improved through mental skills training. The object of which is to provide a set of psychological strategies for improving performance, while successfully recovering from sport injury, and also to help maintain a positive life-balance between sport and other aspects of life, including family. Professional and athletes from college may know this term but, may not possess all the same conceptual definition of mental skills. Mental skills can be defined as internal capabilities that facilitate an athlete improve performance by learning to manage their minds effectively as they execute their goals. Mental skills training is said to be the process that gives the strategies and techniques to enhance performance by developing self-confidence and making a positive mind-set through goal setting, positive self-talk, visualization, imagery, and self-efficacy. (Gerald S., 2019)

The purpose of the study was to analyse mental skill in relation to performance of athletes from the state of Kerala. The selected mental skill variables

were considered for this study under the following classifications; Foundation Skills, Psycho-Somatic Skills and Cognitive Skill. These skills are related with cognitive processes such as learning, preparation, memory and thinking. After collecting data the scores obtained from standardized test of mental skill and subjective judgment of performance of subjects were statistically treated. The discussion was done in the each variable separately with the analysis and results of the study of each variable.

A. Foundation skill variables

1. Goal setting

Setting goals is very important to our success as athletes in both sports and life. It's necessary to evaluate and change our goals when needed. One should create and monitor goals for practice and competitions or games. *Younger athletes 'set goals merely for fun for making or learning friends to run faster. As they get older, their goals become specific and more focused on improving their performance* (Mike Edger, 2011).

The result of the study revealed that in the category wise comparison elite and non-elite athletes were similar in setting their goals. In the case of gender wise comparison, female athletes were significantly high in goal setting than male athletes. The comparison of type of sports disciplines among elite athletes, the racket game athletes were significantly higher in setting their goal than the other sports disciplines namely individual, team and combative game players. But in the case of non-elite athletes, individual, team and racket game players were similar in the goal setting and combative game players found low. In the case of male and female athletes, racket game athletes were significantly higher in goal setting level than the other sports disciplines namely individual, team and combative game players. In the case of correlation, there was no significant relationship between goal setting to foundation skill to elite and non-elite athletes' performance score. And also there was no significant relationship between goal setting to foundation skill and performance between male and female athletes.

It is important that athlete need to set inspiring and suitable goals, without the heavy burden of severe anticipations. First, athlete get prepared for a win/lose situation. They either achieve their expectations or fail to achieve their expectations. Second, if athlete doesn't achieve these expectations, their ability is questioned. Especially, when the expectation is high athlete set him/herself up for failure before beginning. If he or she couldn't achieve these expectations they'll feel as if they are failing to meet their goals.

2. Self confidence

Self-confidence is considered to be an important aspect of the psychological make-up of the individual athlete. A high level of self-confidence is one among the most important psychological characteristics of elite athletes, and research revealed that self-confidence often distinguishes highly successful athletes from the not so successful athletes (Gould, Weiss, & Weinberg, 1981; Highlen& Bennett, 1979; Mahoney &Avener, 1977; Weiss, Wiese, &Klint, 1988).

In the case of self-confidence, the result of the study showed that in the category wise comparison elite and non-elite athletes were similar in confidence level. And also gender wise comparison male and female athletes were similar in confidence level. The comparison of type of sports disciplines among category wise elite and non-elite athletes, there is no significant differences on self confidence among the sports disciplines. Among the male athletes, individual and combative game athletes were significantly higher in their confidence level comparing to racket game players. But in the case of female players, team and racket games players confidence level were higher than individual and combative players. In the case of correlative analysis, there was no significant relationship between self confidence in foundation skill and elite and non-elite athletes' performance score. And also there was no significant relationship between self confidence in foundation skill and male and female athletes' performance score.

Gill (1992) made an attempt to review the sports psychology literature on basis of gender and found that females generally report lower levels of expectations

for achievement than males do and that this distinction explain gender differences in achievement situations. Sports psychology research indicates that women score lower than men in self- confidence for motor performance (Corbin, 1981; Corbin, Landers, Feltz, & Senior, 1983; Corbin & Nix, 1979; Duquin, 1986; Petruzzello& Corbin, 1988; Ryan & Pryor, 1976), but research goes beyond gender differences to consider other factors. Specifically, when gender appropriateness of the task has been considered, women have displayed lower confidence on tasks viewed as masculine (Corbin & Nix, 1979; Lirgg, 1991; Sanguinetti, Lee, & Nelson, 1985).

3. Commitment

Sports commitment is a central motivational aspect because it goes right to the heart of the athlete's persistent pursuit of their sport. To speak generally, it is said to be a psychological state explaining why athletes do what they are doing. Sport commitment is said to be of two types. They are; enthusiastic and constrained. Enthusiastic commitment is the psychological construct representing the desire and resolve to persist in a sport over time. Constrained commitment is the psychological construct representing perceptions of obligation to persist in a sport over time. (Scanlan, T. K., 2013).

The analysis and result of the commitment variable showed that, in the category wise comparison elite athletes were committed that the non-elite athletes. But in the case of gender wise comparison, male and female athletes were similar in their commitment to their competitive field. There was no significant differences on commitment level among elite different sports discipline athletes. In the case of non-elite athletes from different sports disciplines, more commitment was shown in the team, racket and combative game players and less commitment was seen in individual game players. The comparison of type of sports disciplines among male athletes, all the athletes had similar level of commitment. But in the case of female players, team and racket games players showed more commitment in their field than individual and combative players. In the case of correlative analysis, there was positive relationship between commitment in foundation skill and elite athletes' performance, whereas there was no significant relationship between commitments in

foundation skill to performance of elite athletes. And also, there was significant positive relationship between commitment in foundation skill and male athletes' performance score, whereas there was no significant relationship between commitment in foundation skill and female athletes' performance score.

It is said that team sport is all about making commitments, and everyone involved makes a lots of commitments. Some commitments are explicit: for example contracts between players and coaches, contracts between parents and coaches, etc. Other commitments are implied, nothing is written or even verbal but the commitment is understood nonetheless. (Mitch Alexander, 2001).

B. Psycho somatic skill

1. Stress reaction

By participating in a sport one can reduce stress levels and increase feeling of physical and mental well-being. Regular exercise is to be a part of everyone's regular stress-management routine because of its various physical and mental benefits. Sports and regular exercise offer physical and mental stress relief, which can give relief from certain mental health disorders like depression and anxiety. Anxiety and depression are often triggered or exacerbated by excessive levels of stress. According to the Mayo Clinic, exercise can decrease mild symptoms of depression and anxiety and promote improved quality of sleep -- a problem for many people suffering from mental health disorders. Quality sleep can decrease levels of stress caused by depression and anxiety and can lead to an improved sense of well-being (Ashley Miller, 2010).

No significant differences were found on comparison between elite and non-elite athletes. In the stress reaction level of psycho somatic skill in the present study, female athletes were more responsive to stress than the male athletes. Elite Individual athletes showed more stress response while elite team game players scored low. Non elite athletes were similar in the case of stress reaction level. Male Individual, team and racket game players showed more reaction against the stress level than the combative players. In female athletes, stress reaction level was higher

in the individual and combative games. In the case of correlative analysis, there was negative relationship between stress reaction in psycho somatic skills and elite athletes' performance, whereas there was no significant relationship between stress reactions in psycho somatic to non-elite athletes' performance. And also, there was significant relationship between stress reaction in psycho somatic and performance of male and female athletes.

By engaging in a sport one's feelings of self-esteem and self-efficacy, will be increased which will in turn reduce your overall level of stress. If we have ever remained inactive for an extended period of time, we would be familiar with that sluggish, apathetic feeling that can quickly turn to feelings of self-loathing or even depression, which can further exacerbate our stress levels. According to the American Council on Exercise, regular exercise can help increase our feeling of self-worth, which can be a powerful mechanism for alleviating stress.

2. Fear control

Each and every athlete experiences some kind of fear or anxiety at some level. Sports psychology for athletes establishes methods to diminish the effect of fear which limits a player's ability, and also utilizes that fear in a positive way to strengthen mental toughness. As a player one should achieve the capacity to manage fear and anxiety both inside and outside the court. By doing this their mental game of sports strengthens which in turn improve physical play as well. (Delice Coffey, 2014)

The result of the study has shown that in the category wise comparison between elite and non-elite athletes they were similar in the fear controlling skill. In the case of gender wise comparison, female athletes have significantly high control over fear than male athletes. In the elite athletes, the racket and combative game athletes were significantly higher in their stress fear level than the other sports disciplines namely individual and team game players. But in the case of non-elite athletes, all sports discipline athletes had similar score in the stress level scores. In comparison of type of sports disciplines among male athletes, no significant

differences were found, whereas among female athletes racket, combative and individual game athletes scored higher in their fear control level and very low fear control level were found in the in the female team game players. In the case of correlative analysis, there was negative relationship between fear control in psycho somatic skill and elite athletes' performance, whereas there was no significant relationship between fear control in psycho somatic and non-elite athletes' performance. And also, there was no significant relationship between fear control in psycho somatic and male athletes' performance. Whereas, there was negative relationship between fear control in psycho somatic to female athlete's performance.

3. Relaxation

Relaxation has been defined as a psychological strategy used by sports performers to help manage or reduce stress-related emotions (e.g., anxiety and anger) and physical symptoms (e.g., physical tension and increased heart rate [HR]) during high pressure situations. Several types of physical and mental relaxation strategies will be discussed in this entry, all of which can be used to relax the performer and, potentially, benefit athletic performance Cullen. (2011).

No significant differences were found between elite and non-elite athletes in the relaxation of psycho somatic skill, whereas male athletes were more relaxed than female athletes. In the case of comparison among types of sports discipline, there were no significant differences between elite and non-elite category athletes. And also male category, there was no significant difference in relaxation whereas in female category, racket and team game players were relaxed more than individual and combative game players. In the case of correlative analysis, there was no significant relationship between relaxation in psycho somatic skill and elite and non-elite athletes' performance. There was significant positive relationship between relaxation in psycho somatic skill and male athletes' performance, whereas there was no significant relationship between relaxation in psycho somatic skill and female athletes' performance.

4. Energizing

Energizing strategies, sometimes called activation strategies, are primarily designed to increase the task-specific level of performer's mental and physical activity. They are of interest to applied sport psychologists, coaches, and athletes alike as occasionally performers require strategies that help stimulate levels of physical and mental activity (Williams, J. M., 2010).

In the case of energizing, the result of the study has shown that in category wise comparison elite and non-elite athletes were similar in energizing level. And also in gender wise comparison, male and female athletes were similar in energizing level. Comparison of different sports disciplines among elite category athletes, it was shown that there was no significant difference on energizing. But in the case of non-elite athletes, individual, team and combative game players were significantly more energizing and low energy level was visible in the racket game players. The comparison of different sports disciplines among male athletes, individual, team and combative game athletes showed significantly higher energy level and less energy level in male racket game players. But in the case of female players, team and racket games players had more energy than individual and combative players. In the case of correlative analysis, there was no significant relationship between energizing in psycho somatic skill and elite, non-elite, male and female athlete's performance.

C. Cognitive skill

1. Imagery

Imagination, or imagery practice, is a powerful tool to enhance sport performance because it produces various senses. It is the senses of sight, sound, smell, touch, taste, and vision that create the emotional hooks necessary for an efficient mental movie. The more the senses you incorporate into an imagery session, the more powerful the image will work in favor during competition. "Imagery is stated to be one of the important tools employed in sport psychology to boost performance. This is done by improving motor skills and muscle memory and it can be used for motivation. Studies have revealed that using the techniques of

imagery, along with regular training, enhances muscle memory and sport skills faster and further than regular training alone (Steven Roy Mann 2010).

The analysis and result of the imagery variable reveals that category wise (elite and non-elite) and gender wise (male and female) comparison, there were no significant differences. There was a significant difference on imagery level among elite different sports discipline athletes. Team, racket and combative game players had similar imagination while individual game players had a little imagination. In the case of non-elite athletes from different sports discipline, more imagination was shown by the individual game players and a little imagination was shown by team, racket and combative players. The comparison of type of sports disciplines among male athletes revealed that individual and combative game players have effective imagery than the team and racket game players. But in the case of female players, racket game players showed more imagination than individual, team and combative players. In the case of correlative analysis, there was no significant relationship between imagery level in cognitive skill and elite and non-elite athlete's performance. There was no significant relationship between imagery level in cognitive skill and male athlete's performance, whereas there was negative relationship between imagery level in cognitive skill and female athlete's performance score.

2. Mental practice

Mental practice is said to be a cognitive (thinking) rehearsal of a physical skill without any movement to support. It is useful for skill learning as well as preparing for competition. Sport psychologist generally use visualizations and rehearsal to enhance motivation, self-confidence, and also to reduce competitive anxiety. It is the established fact that, training the mind is key factor in achieving success in sport performance. Here, the focus is on skill acquisition. Athletes can benefit from this technique in two ways. *Internal imaging and External imaging*

Internal imaging –by internal imaging one athlete imagine a real life scenario that he or she might expect in competition. **External imaging** – by external imaging one view himself as an observer.

The result of the study revealed that in category wise comparison elite and non-elite athletes were similar in the mental practice skill. In the case of gender wise comparison, female athlete had a significantly high mental practice than male athletes. In comparison type of sports disciplines among elite athletes, there was no significant difference found whereas in the case of non-elite athletes, the individual, team, racket athletes were significantly higher in their mental practice scores and low mental practice was shown in combative game by individual and team game players. The comparison of type of sports disciplines among male athletes, no significant differences were found, whereas among female athletes individual game athletes showed higher in mental practice scores that the other sports disciplines namely team, racket and combative game players. In the case of correlative analysis, there was no significant relationship between mental practice scores in cognitive skill and elite, non-elite, male and female athlete's performance score.

3. Focusing

One reason athletes lose confidence and obstruct in competition is because they focus on the wrong things. Focusing on outcomes, with whom he has to compete that day or other distractions can pull the attention away from what is important. Effective mental focus in sports can be learned. By learning to focus on the right things, an athlete can keep or regain confidence in the game and avoid obstructing. The most effective mental focus is what many mental game specialists call a process focus (Barb Kia, 2007).

In the case of focusing, the result of the study showed that in category wise comparison elite and non-elite athletes were similar in focusing level. And also in gender wise comparison, male and female athletes were similar in focusing level. The comparison of type of sports disciplines among elite category athletes, there is no significant difference on focusing among the sports disciplines where in the case

of non-elite category athletes, individual and team game players had more focused skill than the racket and combative game players. The comparison of type of sports disciplines among male athletes, individual, team and racket game athletes were significantly higher and similar in their focusing skill and less focusing skill were found in male combative game players. But in the case of female players, team and combative games players had more focusing skill than individual and racket players. In the case of correlative analysis, there was no significant relationship between focusing in cognitive skill to elite athlete's performance, whereas, there was positive relationship between focusing in cognitive skill to non-elite athletes' performance. There was no significant relationship between focusing in cognitive skill to male and female athletes' performance.

4. Refocusing

Unlike other mental skills refocusing is a very difficult one. The ability to refocus is the second most difficult skill for mental skill. Confidence greatly impacts our ability to refocus, and the ability to refocus greatly impacts the other skills. If athletes can't refocus once their focus has strayed, it doesn't matter how much motivation they have or how good they are with making decisions, the ability to refocus comes down to how flexible one's mind is. Only if the mind is flexible one will be able to focus from one thing to another. If it isn't flexible it becomes harder to focus on what is important (Kate, 2017).

The analysis and result of the refocusing variable has shown that category comparison of elite and non-elite athletes were found to be similar in refocusing skill. But in the case of gender wise comparison, female athletes have more refocusing skill than male players. The comparison of type of sports disciplines showed that there was no significant difference on refocusing level among elite different sports discipline athletes. In the case of non-elite athletes from different sports discipline, more refocusing was shown in the individual, team and racket game players than combative game players. The comparison of type of sports disciplines among male athletes, team game athletes have higher level of refocusing than the rest of the sports discipline players namely, individual, racket and

combative game players. But in the case of female players, team and racket games players refocused better in their field than individual and combative players. In the case of correlative analysis, there was no significant relationship between refocusing in cognitive skill to elite athletes' performance, whereas, there was significant positive relationship between refocusing in cognitive skill to non-elite athlete's performance. There was no significant relationship between refocusing in cognitive skill to male and female athlete's performance.

5. Competition planning

All athletes seem to be nervous before competition, this is could be natural, but sometimes it leads to lack of confidence of the athletes. The intension is to refocus the athlete so they will remain positive and confident in their ability. There is a chance that on the day of competition and at the competition venue teams will arise that will panic the athletes and lose their confidence. Some situations may arise because of athletes, for example (misplaced kit) others come from outside which are beyond their control, for example (weather conditions). To cure the problem Prepare the athlete by going through a series of "what if" situations so when such a situation arise they have a solution (Shirreffs, S. et al., 2004).

The result of the study showed that in the category wise (elite and non-elite) and gender wise (male and female) comparison, all athletes were similar in planning their competition skill. Among the elite athletes, the team and racket game athletes were scored higher in their competition planning level than the other two sports disciplines namely individual and combative game players. But in the case of non-elite athletes, three sports discipline athletes were similar and significantly had high competition planning score than combative game players. The comparison of type of sports disciplines among male athletes showed that there was significant difference between individual and racket game players and combative game players. The individual and racket games players had more planning than team and combative team players were more planning than the team. Whereas among female athlete's team and racket game athletes scored higher in their mental practice level and very low mental practice level was seen in the female individual and combative game

players. In the case of correlative analysis, there was no significant relationship between competition planning in cognitive skill to elite, non-elite, male and female athletes' performance.

In this study, many of the mental skills variables were examine and found that female athletes were more dominant than the male player. In category wise, elite and non-elite athletes were similar in nature. On analysis of mental skill variables among male athletes from different types of sports disciplines it was found that individual, team and racket game male athletes were dominating in most of the variables and combative players were dominating in a very few of the them. Out of twelve sub variables of mental skills all the male athletes were similar in nature. Among female athletes, none of the variables of mental skills were found similar between each group. Individual, team and racket game players were dominating in most of the variables and in a very few variables combative game players dominated. The study revealed that most of the variables of mental skills were similar in nature among elite and non-elite athletes from different types of sports disciplines. After the study the research scholar concluded that, the conditions and reasons of the findings of this study might be as follows; in the state of Kerala, more numbers of female athletes participated in the international and national level championship and secured individual achievements comparing the Kerala male athletes. The research scholar categorized the total subjects in to elite and non-elite athletes and scholar got only a limited number of international medalists. Most of the players participated in national and inter university level championship in their respective games. In the selected subjects, most of the combative game players secured positions and participated in the south zone national championships. In the case of racket game players, the selected subjects were high of socio economic status than the rest of the other sports disciplines.

Discussion on hypothesis

The study results have led to the following conclusions, decisions for the hypothesis being formulated.

The first hypothesis (H_{R1}) that was framed for the study says that *there would be significant difference in selected mental skills between elite and non-elite athletes of Kerala*. The results of the following variables of mental skills; goal setting, self-confidence, stress reaction, relaxation, energizing, imagery, mental practice, focusing, refocusing and competition planning; showed that that the hypothesis is accepted and in the case of commitment variable the research hypothesis is rejected.

The second hypothesis (H_{R2}) that was framed for the study says that *there would be significant difference in selected mental skills between male and female athletes of Kerala*. The results of the following variables of mental skills; goal setting, stress reaction, fear control, relaxation, focusing, mental practice and refocusing; showed that the hypothesis is accepted and rest of the variables of mental skills namely; self-confidence, commitment, energizing, imagery, refocusing and competition planning; the research hypothesis is rejected.

The third hypothesis (H_{S1}) that was framed for the study says that *there would be found no significant difference in selected mental skills among elite category athletes from the different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala*. The results of the following variables of mental skills; goal setting, stress reaction, fear control, imagery, and competition planning; leads that the null hypothesis is accepted and rest of the variables of mental skills namely, self-confidence, commitment, fear control, imagery and competition planning; the null hypothesis is rejected.

The fourth hypothesis (H_{S2}) that was framed for the study says that *there would be found no significant difference in selected mental skills among non-elite category athletes from the different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala*. The results of the following

variables of mental skills; self-confidence, stress reaction, fear control and relaxation; leads that the null hypothesis is accepted and rest of the variables of mental skills namely goal setting, commitment, energizing, imagery, mental practice, focusing, refocusing and competition planning; the null hypothesis is rejected.

The fifth hypothesis (H_{S3}) that was framed for the study says that *there would be found no significant difference in selected mental skills among male athletes from the different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala*. The results of the following variables of mental skills; goal setting, self-confidence, stress reaction, energizing, imagery, mental practice, focusing, refocusing and competition planning; leads that the hypothesis is accepted and rest of the variables of mental skills namely; commitment, fear control and relaxation the null hypothesis is rejected.

The sixth hypothesis (H_{S4}) that was framed for the study says that *there would be found no significant difference in selected mental skills among female athletes from the different sports disciplines (individual sports, team sports, racket sports and combative sports) of Kerala*. The results of the following variables of mental skills; goal setting, self-confidence, commitment, stress reaction, fear control, relaxation, energizing, imagery, mental practice, focusing, refocusing and competition planning; leads that the null hypothesis is accepted.

The seventh hypothesis (H_{S5}) that was framed for the study says that *there would be found no significant relationship between of mental skills and elite and non-elite athletes' performance of Kerala*. The results of the following variables in mental skills; goal setting, self-confidence, relaxation, energizing, imagery, mental practice, focusing, refocusing and competition planning; leads that the null hypothesis is accepted and rest of the variables in mental skills namely commitment, stress reaction and fear control; the null hypothesis is rejected.

The eighth hypothesis (H_{S6}) that was framed for the study says that *there would be found no significant relationship between of mental skills and male and female athletes' performance of Kerala*. The results of the following variables in

mental skills; goal setting, self-confidence, stress reaction, energizing, mental practice and competition planning; leads that the null hypothesis is accepted and rest of the variables in mental skills namely commitment, fear control, relaxation, imagery, focusing and refocusing; the null hypothesis is rejected.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS



Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Sports that involve teams of players would require completely different mental skills for every player because of the various demands of their specific roles in the team. For example, needs of the goal keeper will differ from those who take penalty corners, and roles that are responsible for re-starting a particular phase (e.g., hooker in rugby) will have different needs. A coach ought to be able to identify these needs through careful observation and assessment. The assessment generally takes the form of some form of mental skills profiling. There are a lot of ways this could be achieved. Hence it is the duty of the coach to help the individual become conscious of their perceptions of the mental demands placed upon him or her. Once these have been identified, the athlete should be encouraged to examine where he or she is in terms of his or her mental strengths and weaknesses and processes should be put in place to improve those areas that have been identified as requiring improvement. (Hodge, K., Sleivert, G. & McKenzie A., 1996).

The present study was designed to analyse mental skill in relation to the performance of athletes from the state of Kerala. The subjects were selected and randomly assigned for the study consisting of elite and non-elite athletes from the state of Kerala. The samples comprised of two hundred and forty ($N = 240$) members who were randomly selected. In the total, one hundred and twenty ($n_m = 120$) male and one hundred and twenty ($n_m = 120$) female were collected from state of Kerala. Total number of subjects, in each category were further divided in following ways; Individual events (male 30 and female 30), Combative sports (male 30 and female 30), Racket games (male 30 and female 30), Team games (male 30 and female 30).

To find out selected mental skill variable, a standardized questionnaire - Ottawa Mental Skills Assessment Tool (OMSAT-3) was used which is devised by Durand – Bush, N., Shamela, J.H., and Green – Demers, I. (2001). The OMSET - 3

included 71 statements and 12 mental skill scales grouped under the following three broader conceptual components. (1) Foundation skills goal setting, self-confidence and commitment; (2) Psychosomatic skills – stress reactions, fear control, relaxation, energizing and (3) Cognitive skills – imagery, mental practice, focusing, refocusing and competition planning. The scholar also collected their performance scores as subjective judgment of five experts.

After collecting data the scores obtained from standardized test of mental skill and subjective judgment of performance of subjects were statistically treated. Mean, standard deviation, independent t test and one way ANOVA were employed to test different hypothesis. Pearson's Product moment correlation was used to analyse the mental skill in relation to the performance of athletes of Kerala. The calculated numerical results were interpreted meaningfully. In all cases, the criterion for statistical significance is set at 0.05 level of confidence ($P < 0.050$). All the statistical analysis was carried out with the help of SPSS 23.0 version.

Conclusions

Following conclusions are drawn on the basis of the findings of the study;

1. Significant differences were obtained in the following mental skill variables such as; goal setting, stress reactions, fear control, relaxation, mental practice, refocusing and competition planning in the gender wise comparison and female players were more dominant than the male players except in relaxation variables.
2. No significant differences were obtained in the following mental skill variables such as; self-confidence, commitment, energizing, imagery, focusing and competition planning between male and female players from different sports disciplines in the state of Kerala.
3. Significant differences were obtained in the following mental skill variables such as; commitment and fear control in the category wise comparison and

elite players dominated in commitment whereas non elite players were dominant in the fear control variables.

4. No significant differences were obtained in the following mental skill variables such as; goal setting, self-confidence, stress reaction, relaxation, energizing, imagery, mental practice, focusing, refocusing and competition planning in the category wise comparison.
5. Among the selected mental skill variables of the study, goal setting, self-confidence, stress reaction, energizing, imagery, mental practice, focusing, refocusing and competition planning showed significant difference among male players from the different sports disciplines in the state of Kerala, by which individual and team game players scored higher than the racket and combative game players.
6. No differences were obtained in the following mental skill variables such as; commitment, fear control and relaxation among male players from different sports disciplines in the state of Kerala.
7. In case of female players, all the variables of mental skill namely, goal setting, self-confidence, commitment, stress reaction, fear control, relaxation, energizing, imagery, mental practice, focusing, refocusing and competition planning showed significant differences among the selected samples and scored high in the majority of the variables.
8. Among the selected mental skill variables of the study, goal setting, stress reaction, fear control, imagery and competition planning showed significant difference among elite players from the different sports disciplines in the state of Kerala, out of that, racket game players scored higher than the individual, team and combative game players.
9. No significant differences were obtained in the following mental skill variables such as; self-confidence, commitment, relaxation, energizing, mental practice, focusing and refocusing among elite players from different sports disciplines in the state of Kerala.

10. In case of non-elite players, following variables of mental skill namely, goal setting, commitment, energizing, imagery, mental practice, focusing, refocusing and competition planning showed significant differences among the selected samples. Individual, team and racket game players scored high score whereas combative game players scored low.
11. No significant differences were obtained in the following mental skill variables such as; self-confidence, stress reaction, fear control, and relaxation among non-elite players from different sports disciplines in the state of Kerala.
12. Positive relationships were found in commitment and relaxation to the performance of players from different sports disciplines in the state of Kerala.
13. Negative relationships were found in the fear control to the performance scores of players from different sports disciplines in the state of Kerala.
14. No significant relationship were found in the following mental skill variables namely; goal setting, self-confidence, stress reaction, energizing, imagery, mental practice, focusing, refocusing and competition planning with the performance scores of players from different sports disciplines in the state of Kerala.

Recommendations

Based on the results of the study it is highly recommended that in the training session of the athlete's, along with the physical conditioning and coaching, they need psychological intervention training also for the consistency in their performance.

1. The findings of the present study can be used by the players for understanding his or her mental skill level.

2. The findings of the present study can be used by coaches and trainers for assessing mental skill of their players
3. The study can be further extended to the research areas by adding more variables in psychological factors.
4. The extended version of the study can be conducted in other age categories, and other geographical regions.
5. The study will further help to select the mode of motivation during the training, coaching and competition sessions
6. The result of the study will help the physical education teachers and coaches to know the current capabilities and weak points of different sport discipline players.
7. The result of the study will significantly help the other scholars to take up research projects in other states and games in India.
8. The selected mental skill variables will help to identify the talents, selection and team preparation to achieve top performance.

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APPENDICES

Appendix A

Ottawa Mental Skills Assessment Tool (OMSAT - 3)

The OMSAT was created and validated by John H. Salmela, Stuart Barbour, Jennifer Cox, Steve Howlett, Kyoko Imaj and Wang Run Ping, School of Human Kinetics, University of Ottawa, 1992. It was validated by John H. Salmeal and Jordache Bota University of Ottawa, 1993.

Think of your most recent performance in this sport while responding to this questionnaire

Just as different athletes have various strengths and weaknesses in technical ability and physical capacity, they also differ in their mental skills. One athlete may be extremely dedicated to sport training but may be affected more by the stress of competition. Another may be extremely good at maintaining a clear focus during training, but gets distracted during competition.

The OMSAT is a diagnostic tool which allows us to help you better understand your relative strengths and weaknesses in the area of mental training for sport and will help us propose a tailor-made mental skills training program for you. Please indicate the degree to which each of these statements applies to your recent training and competitions.

On the following pages are a number of statements related to mental skills found to be important in the performance of high level athletes. Rate each of the statements in terms of your present state of mental skills and practices. Be brutally honest since the OMSAT is only of use if you really wish to benefit from the results.

Use the five point scale below and circle the appropriate number for each of the following statements:

Never		Sometimes	Always		Don't know
1	2	3	4	5	0

1. Goal-Setting

Read this first. In this section, we want to find out what do you do to plan the goals that you have set in your sport.

1. I set long term goals in my sport.
2. I set daily training goals.
3. I set short-term performance goals.
4. My goals push me to work harder.
5. I have told others my exact goals.
6. I have a specific plan which I use to achieve my goals.

2. Beliefs

Read this first. In this section we want to find out what you do that makes you believe you can do well in your sport.

7. I believe that I am a mentally tough competitor.
8. I believe that I have the personal capacity to reach my goals.
9. I believe that the sport goals that I have set are very significant and meaningful in my life.
10. I believe that I can succeed in my chosen activity in spite of any obstacles I encounter.
11. I am confident in most aspects of my performance.
12. I act confidently even in difficult sport situations.
13. After a poor performance, I still believe in myself.

3. Commitment

Read this first. In this section, we want to find out what you do that demonstrates commitment in your sport.

14. Sport is my whole life.
15. I am willing to sacrifice most other things to excel in my sport.
16. I am committed to becoming an outstanding performer.
17. I am determined to never let up or give up in my sport.
18. I take personal responsibility for mistakes and work hard to correct them.
19. I give 100 percent, whether my practice is going well or not so well.
20. I give 100 percent effort in performing whether ahead or behind.

21. I make sure that I get something from every training.
22. I push hard even if it hurts.
23. I feel more committed to improvement in my sport than to anything else in my life.

4. Stress Reactions

Read this first. In this section, we want to find out what causes particularly high levels of stress.

24. Being evaluated by others makes me very anxious.
25. I experience performance problems because I am too nervous.
26. My body tightens unnecessarily in competition.
27. I compete better in practice than I do in competition.
28. I find that big crowds get me worried and nervous.
29. My parents make me anxious and nervous in competition.
30. I find it difficult to control my stress level.
31. My competitors make me anxious and nervous in competition.

5. Fear

Read this first. In this section, we want to find out how fear affects you in your sport.

32. There are a number of things in my sport which are potentially dangerous and make me afraid.
33. I find it difficult to train and compete because of the fear involved in my sport.
34. I find it hard to gain control of things to reduce my fears.
35. There are certain things about losing which make me afraid.
36. Fear arises no matter what I do.

6. Relaxing

Read this first. In this section, we want to find out what you do to relax in your sport.

37. I find it easy to relax quickly.
38. I can easily and consciously lower my level of stress.
39. I can easily relax during appropriate moments in a competition.

7. Energizing

Read this first. In this section, we want to find out the nature of your mental pictures or images in your sport.

40. I can easily activate myself before a competition if I find myself too relaxed.
41. I have an effective method of getting my energy level up when I am tired in training.
42. I have an effective method of getting my energy level up when I am tired in competition.
43. I can maintain high levels of performance when I am tired.
44. Tough situations inspire and challenge me.

8. Imagery

Read this first. In this section, we want to find out the nature of your mental pictures or imagery in your sport.

45. I find it easy to create mental images.
46. My mental images are vivid and clear.
47. I can imagine myself warming up before a big competition.
48. I can feel the movements that I make when I am using imagery.
49. I can hear the various sounds around me in competition when I am imaging my performances.

9. Mental Practice

Read this first. In this section, we want to find out how you use your images to mentally practice your sport.

50. My mental practice is planned.
51. I mentally practice my sport on a daily basis.
52. I mentally practice my sport with maximum performance in mind.
53. I mentally practice for critical situations in competition.
54. I am relaxed when I mentally practice.
55. In training, I put myself into situations which could occur in competition.
56. In training, I like to provoke high levels of stress similar to competition.
57. I like to create situations in practice in which I have to come from behind to win

10. Focus

Read this first. In this section, we want to find out what you do to concentrate or focus to do well in your sport.

- 58. I lose my focus during important competitions.
- 59. I lose my focus during daily training.
- 60. I find it difficult to concentrate in certain situations.
- 61. During critical situations, my thoughts become a blur.
- 62. When fatigued, I find it difficult to focus.

11. Refocusing

Read this first. In this section, we want to find out what you do to refocus or get back on track, after a setback or a mistake.

- 63. I dwell upon mistakes during training.
- 64. I find it hard to get a mistake or a bad call off my mind.
- 65. Unexpected events or mistakes lead to other mistakes during training or competition.
- 66. I find it hard to refocus my attention after a setback.

12. Competition Planning

Read this first. In this section, we want to find out what you do to plan for possible events in competition.

- 67. I plan a regular set of things that I do before a competition.
- 68. I plan a regular set of things that I think about before a competition.
- 69. My plan includes certain cue words which I say to myself in competition.
- 70. I plan for reactions to positive situations which could occur during competition.
- 71. After a competition, I draw out lessons from my performance for planning my next competition.

Appendix B

Ottawa Mental Skills Assessment Tool (OMSAT)

Subject name: _____ Age: _____ Sex: _____

Sport: _____ Highest Sport Level Achieved: _____

Score card

Q No.	Scoring Scale					
	Never		Some times	Always		Don't know
	1	2	3	4	5	0
1. GOAL SETTING						
1						
2						
3						
4						
5						
6						
2. BELIEFS						
7						
8						
9						
10						
11						
12						
13						
3. COMMITMENT						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						

4. STRESS REACTIONS						
24						
25						
26						
27						
28						
29						
30						
31						
5. FEAR						
32						
33						
34						
35						
36						
6. RELAXING						
37						
38						
39						
7. ENERGIZING						
40						
41						
42						
43						
44						
8. IMAGERY						
45						
46						
47						
48						
49						
9. MENTAL PRACTICE						
50						
51						
52						
53						
54						
55						

56						
57						
10. FOCUS						
58						
59						
60						
61						
62						
11. REFOCUSING						
63						
64						
65						
66						
12. COMPETITION PLANNING						
67						
68						
69						
70						
71						
<p>Any Comments</p> <p style="text-align: right;"><i>Signature</i></p> <p style="text-align: right;"><i>Thank you for your collaboration</i></p>						

Appendix C
Raw data of Goal setting

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
26	27	26	20	23	16	19	23
19	16	19	20	20	21	23	18
19	21	22	20	16	21	19	20
28	20	20	18	24	22	23	16
25	21	25	24	20	18	23	18
20	23	20	24	20	21	20	24
19	23	24	18	24	24	23	23
19	21	23	16	24	24	21	18
19	23	20	22	24	16	23	20
28	24	19	20	24	23	23	20
25	24	25	18	23	25	23	22
22	7	24	24	21	23	23	18
20	24	20	18	20	10	20	18
19	19	26	18	20	24	17	18
20	25	25	20	23	20	23	20
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
25	18	25	18	25	18	25	18
19	19	19	19	19	19	19	19
21	19	21	19	21	19	21	19
21	23	21	23	21	23	21	23
21	21	21	21	21	21	21	21
25	17	25	17	25	17	25	17
19	26	19	26	19	26	19	26
21	18	21	18	21	18	21	18
21	19	21	19	21	19	21	19
21	19	21	19	21	19	21	19
21	23	21	23	21	23	21	23
21	21	21	21	21	21	21	21
21	20	21	20	21	20	21	20
25	26	25	26	25	26	25	26
19	18	19	18	19	18	19	18

Appendix D
Raw data of Self confidence

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
30	34	30	25	28	23	19	28
24	29	21	25	32	28	29	28
25	31	28	32	20	26	21	28
27	25	22	30	28	29	28	25
31	29	25	28	28	11	20	28
31	28	24	28	33	30	28	28
25	24	29	30	28	28	28	26
26	28	22	25	25	34	21	32
25	24	29	30	20	21	27	25
27	34	21	26	28	29	21	30
31	29	28	26	30	20	28	20
31	6	21	25	28	25	21	20
28	21	28	27	28	33	25	32
25	23	29	25	30	29	19	25
25	30	25	28	31	23	25	25
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
30	27	22	21	29	32	20	21
23	20	34	28	24	33	30	24
22	26	26	24	32	24	26	24
24	29	22	23	30	32	22	23
22	32	34	21	25	22	34	21
30	22	26	28	12	27	26	26
23	32	22	24	26	26	22	24
22	27	34	23	26	35	30	23
24	20	26	21	32	32	26	21
22	26	22	28	32	25	22	22
22	29	34	24	30	29	34	24
24	32	26	21	30	29	26	21
22	22	22	28	28	32	22	24
30	32	34	24	12	25	34	24
23	27	26	23	26	28	26	23

Appendix E
Raw data of Commitment

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
55	48	46	35	43	41	35	44
37	43	31	38	27	40	38	40
36	42	44	45	34	37	37	40
43	40	33	36	37	38	44	35
45	45	40	37	43	29	31	38
44	40	36	44	26	37	38	40
37	34	38	45	36	40	44	38
42	41	38	35	34	41	31	35
36	34	41	38	34	37	38	37
42	50	37	45	37	40	35	35
45	43	44	44	40	33	44	44
42	26	31	36	34	33	31	44
55	36	38	37	35	47	31	45
37	44	45	37	34	41	35	35
44	48	36	38	35	32	35	38
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
43	44	44	36	40	44	40	36
32	41	44	45	32	45	40	42
34	38	39	38	28	30	39	38
30	38	44	35	41	37	42	35
32	41	44	36	46	39	38	36
43	33	39	45	24	30	39	42
32	41	44	38	28	37	38	38
34	44	44	35	32	50	40	35
30	41	39	36	33	50	39	36
32	38	44	45	30	35	40	42
34	41	44	38	28	42	38	38
30	39	39	36	41	38	39	36
32	32	44	42	26	47	42	40
43	39	44	37	24	37	42	38
32	42	39	36	26	47	39	35

Appendix F
Raw data of Stress reaction

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
19	23	22	26	21	20	23	22
29	20	23	19	12	19	22	20
20	25	20	14	24	23	23	19
27	20	25	24	25	24	22	19
25	26	24	15	21	27	23	20
23	19	19	20	12	24	22	18
16	17	20	26	24	27	22	14
26	26	25	19	25	28	23	16
20	28	24	22	24	30	22	22
27	26	23	18	18	18	23	20
25	16	22	14	21	21	22	23
23	30	23	16	20	21	23	20
21	18	22	22	20	17	22	20
23	17	22	20	20	25	23	19
23	12	23	20	21	20	22	20
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
24	13	29	24	24	23	28	24
27	23	20	27	25	15	20	26
22	21	24	22	22	19	24	22
28	15	29	32	23	31	26	30
30	19	20	24	31	29	20	24
24	28	24	27	17	22	24	27
27	22	29	22	16	30	28	22
22	13	20	32	26	27	20	28
28	23	24	24	32	28	24	24
30	21	29	27	24	32	26	27
22	15	20	22	24	21	20	22
28	19	24	24	23	22	24	24
30	28	29	27	31	23	26	27
24	22	20	28	20	34	20	22
27	20	24	32	18	19	24	28

Appendix G
Raw data of Fear control

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
11	12	5	14	10	11	14	14
13	8	17	11	9	10	8	15
10	8	15	7	24	12	10	10
16	10	8	8	11	6	14	12
15	10	6	10	10	6	12	10
7	8	18	15	9	11	6	10
8	10	10	10	24	11	10	8
8	14	17	12	11	5	12	12
10	10	12	12	14	14	12	9
16	7	10	15	13	8	11	8
15	8	8	10	10	13	10	12
7	13	9	9	24	17	14	8
11	14	8	11	12	8	6	8
8	10	10	8	12	11	14	10
10	7	12	8	10	13	12	8
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
8	5	14	12	8	14	14	12
11	6	12	14	15	14	12	12
12	5	15	9	13	13	10	9
8	7	14	19	17	15	14	16
12	11	12	12	13	13	12	12
8	13	15	14	13	9	12	14
11	7	14	9	12	14	14	9
12	5	12	19	20	7	12	12
8	6	15	12	12	10	15	12
12	5	14	14	15	18	14	14
12	7	12	12	6	9	12	9
8	11	15	12	17	9	10	12
12	13	14	14	11	11	14	14
8	7	12	12	14	22	12	9
11	8	15	19	10	5	10	12

Appendix H
Raw data of Relaxing

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
12	9	6	10	12	11	7	12
12	6	12	11	6	10	9	8
13	9	8	11	9	12	9	12
13	9	12	12	11	9	9	10
12	10	8	9	12	9	8	8
9	11	18	8	6	10	8	10
9	8	12	12	10	9	7	12
11	8	18	10	9	9	14	11
13	7	10	11	9	9	9	9
13	12	9	10	10	9	9	10
12	15	9	12	9	7	9	12
9	5	8	11	9	7	8	8
12	10	8	12	10	10	8	12
9	7	7	10	9	12	7	10
12	14	13	11	12	13	9	8
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
11	9	11	9	11	12	11	8
11	11	13	9	3	12	10	7
8	9	8	9	10	5	8	9
9	10	11	7	10	8	11	7
7	11	13	9	8	15	10	9
11	6	8	9	5	10	8	7
11	9	11	9	12	3	11	9
8	9	13	7	10	13	10	7
9	11	8	9	11	11	8	9
7	9	11	9	9	11	11	9
8	10	13	9	9	10	12	8
9	11	8	9	10	13	8	7
7	6	11	8	8	12	11	9
11	9	13	8	6	10	10	9
11	9	8	8	12	14	8	7

Appendix I
Raw data of Energizing

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
17	16	12	15	20	12	14	16
18	18	16	16	15	14	16	15
14	19	14	21	13	14	18	15
19	16	18	15	18	16	10	15
18	17	10	16	20	16	10	16
15	18	14	20	15	17	12	17
17	14	14	18	13	18	12	16
17	15	12	21	18	24	16	18
14	14	14	17	13	16	16	15
19	22	18	15	18	18	18	18
18	18	10	16	20	21	10	16
15	6	14	18	13	12	10	20
18	20	12	17	18	18	12	18
17	14	16	18	13	18	14	21
17	20	16	17	20	16	16	18
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
16	14	20	17	18	19	18	16
18	19	21	18	17	18	18	14
17	15	13	13	19	12	13	13
14	20	20	14	14	17	16	14
13	19	21	17	16	19	16	14
16	14	13	18	11	18	13	16
18	19	20	13	16	8	20	13
17	14	21	14	14	21	18	14
14	19	13	17	14	19	13	16
13	15	20	18	14	18	16	16
17	20	21	13	18	18	18	13
14	20	13	17	14	19	18	14
13	12	20	18	16	19	18	18
16	19	21	12	15	16	20	13
18	14	13	14	16	21	13	14

Appendix J
Raw data of Imagery

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
19	15	17	20	21	18	15	18
18	16	16	18	23	15	18	16
18	21	18	17	16	18	14	18
16	18	12	21	22	15	15	17
11	21	19	17	21	13	16	16
20	18	14	16	24	18	18	18
16	20	20	18	20	18	15	20
18	19	16	17	22	14	16	20
18	18	18	16	16	20	18	18
16	24	14	18	22	14	18	17
11	20	15	20	21	17	15	18
20	17	16	20	16	16	16	16
19	18	18	19	22	19	18	18
16	12	15	17	20	16	18	17
20	21	20	21	21	19	18	16
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
13	18	22	20	21	18	22	18
13	19	22	15	18	19	20	14
16	16	17	15	17	16	17	15
13	14	22	15	19	22	22	15
13	20	22	20	18	15	20	17
13	13	17	15	13	17	17	15
13	18	22	15	15	18	20	15
16	18	22	15	18	23	20	15
13	19	17	20	19	19	16	18
13	16	22	15	23	16	20	15
16	14	22	15	20	20	20	15
13	20	17	19	19	23	17	18
13	13	22	15	18	19	18	15
13	18	22	15	15	16	19	14
13	17	17	15	15	23	17	15

Appendix K
Raw data of Mental practice

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
34	27	26	23	32	25	32	27
29	19	24	28	29	27	22	24
30	28	24	20	23	19	24	28
30	17	20	25	27	26	26	19
26	35	26	26	32	24	24	18
33	29	20	24	29	23	22	28
25	26	24	28	23	18	24	23
28	20	18	19	27	27	22	18
30	27	26	18	23	29	22	22
30	28	24	28	27	21	24	28
26	30	26	23	32	27	24	27
33	7	24	18	26	22	22	24
34	30	26	22	27	28	22	28
25	23	26	28	27	30	26	19
28	32	26	24	32	27	22	18
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
21	28	29	29	27	27	30	28
18	30	34	27	26	31	32	26
27	25	28	23	27	18	28	24
26	20	29	20	31	30	27	20
21	34	34	29	30	26	32	2
21	32	28	27	26	29	29	26
18	30	29	23	29	30	29	23
27	28	34	20	25	34	31	20
26	30	28	29	24	36	28	26
21	25	29	27	30	32	29	27
27	20	34	22	27	34	32	23
26	34	28	28	28	30	28	24
21	32	29	24	26	31	29	27
21	30	34	23	26	24	32	23
18	28	28	20	29	39	28	20

Appendix L
Raw data of Focusing

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
16	15	11	17	20	16	14	15
15	16	15	12	15	11	17	18
11	15	12	13	14	14	10	10
17	11	16	10	14	17	15	9
17	11	10	12	20	17	14	8
11	13	14	18	15	12	10	12
8	14	12	10	14	14	12	14
13	13	16	9	14	15	15	16
11	16	13	10	14	12	17	8
17	7	10	12	14	17	10	8
17	13	15	14	20	16	15	15
11	22	14	16	14	16	14	18
16	18	11	8	14	6	10	10
12	11	13	13	14	18	14	9
11	7	13	16	20	18	17	8
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
13	9	10	17	11	15	10	16
17	13	12	15	11	15	12	12
16	9	16	14	16	15	15	14
13	10	10	15	15	14	10	15
13	13	12	17	15	24	10	16
13	15	16	15	14	15	16	15
17	15	10	14	12	15	10	14
16	9	12	15	14	10	12	12
13	13	16	17	18	13	14	16
13	9	10	15	16	17	10	15
16	10	12	14	17	11	12	14
13	13	16	17	15	11	14	16
13	15	10	15	15	15	10	15
13	15	12	14	14	23	10	12
17	12	16	15	13	6	14	15

Appendix M
Raw data of Refocusing

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
10	13	9	13	11	18	12	12
12	8	12	10	10	12	12	10
12	12	10	8	11	12	9	8
13	13	11	8	11	8	10	10
11	12	8	12	11	13	12	12
10	9	13	10	10	9	8	10
8	9	8	8	11	16	10	12
9	10	12	10	11	17	12	13
12	14	12	12	11	13	12	12
13	10	9	10	11	16	10	10
11	12	10	12	11	14	10	12
10	15	12	13	11	14	12	10
10	12	10	12	10	12	8	8
8	13	10	9	10	12	12	10
10	6	12	8	11	13	10	8
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
12	11	10	11	15	12	10	11
15	11	12	11	11	11	12	10
11	11	17	11	13	16	15	11
12	9	10	14	13	11	10	12
11	11	12	11	15	10	12	11
12	13	17	11	13	11	12	11
15	10	10	11	13	14	10	10
11	11	12	14	12	11	12	12
12	11	17	11	16	9	16	11
11	11	10	11	13	15	10	11
11	9	12	12	11	9	12	11
12	11	17	11	10	8	14	11
11	13	10	12	15	13	10	11
12	10	12	11	13	15	12	11
15	11	17	14	13	7	16	12

Appendix N
Raw data of Competition planning

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
19	19	25	12	22	17	18	17
19	15	16	14	20	19	19	18
17	21	24	24	12	19	22	20
20	19	18	14	20	19	16	16
19	15	22	16	22	11	16	16
18	21	17	20	20	16	18	14
21	13	24	24	12	16	18	18
18	22	16	16	20	22	16	16
17	16	24	16	12	18	19	20
20	25	22	14	20	17	22	14
19	20	16	14	22	15	16	16
18	12	18	18	12	15	18	16
19	22	19	16	20	20	18	14
21	18	25	18	20	17	20	16
18	24	22	16	22	16	22	16
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
19	20	20	18	19	17	20	14
13	17	22	19	23	19	22	16
17	20	21	12	18	15	18	12
17	22	20	15	18	16	20	15
13	23	22	18	19	17	22	15
19	17	21	19	18	17	18	16
13	22	20	12	21	16	20	12
17	20	22	15	16	25	18	15
17	17	21	18	20	23	21	16
13	20	20	19	23	20	20	15
17	22	22	12	23	24	19	12
17	23	21	18	20	18	17	16
13	17	20	19	19	22	20	15
19	22	22	13	19	18	17	12
13	20	21	15	20	23	21	15

Appendix O
Raw data of Performance

Male Elite				Male Non Elite			
IS	TG	RG	CG	IS	TG	RG	CG
7.8	7.8	7.6	7.8	5.8	6	5.6	5.6
7.2	7.2	7.6	7.8	5.4	5.4	5.4	5.4
7.8	7.6	7.4	7.2	5.4	5.4	5.4	5.4
7.7	7.4	7	7	5.4	5.4	5.4	5.4
7	7.4	8	8	5.4	5.9	5.4	5.4
8.2	8	7.6	7.8	4.8	4.6	4.6	4.6
7.8	7.6	7	7.2	5	5	5	5
7.7	7.4	7	7.1	6.3	6.2	6.2	6.2
7.4	7.2	7	7.4	5	5.4	5	5
8	7.8	7.6	7.8	4.4	6.1	4.4	4.4
8.2	7.8	8.2	8.6	5.8	5.8	5.8	5.8
8	8	8	8	5.2	5.2	5.2	5.2
7.9	7.6	7	7	4.2	4.2	4	4.2
7.3	7.4	7.4	7.3	5	5	5	5
7.8	7.5	7	7.3	5.4	5.4	5.4	5.4
Female Elite				Female Non Elite			
IS	TG	IS	TG	IS	TG	IS	TG
7.8	7.1	7.6	7	5.8	5.8	5.6	5.6
7.8	7.1	7.6	7	5.4	5.4	5.4	5.4
7.8	7.25	7	7	5.8	4.8	4.8	4.4
7	7.9	7.4	7.4	5.2	5	4.8	4.8
7.8	7.05	7.6	7	5.4	5.4	5.4	5.4
7.2	7.1	7	7	5.2	5.4	5.4	5.4
7.6	7.8	7.4	7.6	5.2	4.6	4.8	4.8
7.2	7.1	7	7	5.2	5	4.8	4.9
7.8	7.2	7.6	7	5	4.6	4.6	4.8
7	7.1	7	7	6	6	6	5.8
7.2	7.9	7.4	7.6	5	4.6	4.6	4.9
7.8	7.2	7	7	5.2	5.2	5	5
7	7.1	7	7	5.2	4.4	4.4	4.7
8	7.9	8	7.6	5.4	5	4.6	4.6
7.6	7.4	7	7	5.8	5.8	5.6	4.7