

*Chapter II*

*REVIEW OF RELATED  
LITERATURE*

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### **REVIEW OF RELATED LITERATURE**

This section attempts to explain the research work already done in the area of sports especially athletic training. A brief review of related studies in the area of burnout, stress and burnout, stress and recovery and training stress are presented in this chapter.

#### **Burnout:**

The following reviews explained about burnout in sports:

Raedeke (1997) examined burnout of swimmers from the perspective of commitment, and expressed that swimmers could be engaged in a sport due to a variety of reasons linking to sport attraction (getting involved by freewill) and sport entrapment (getting involved by external force). Based on his idea, swimmers had greater chance of experiencing burnout; if they got involved in sport mainly due to undesired external force in other words, entrapment-related factors. Male and female swimmers divided according to their age groups (N = 236) responded to a questionnaire that measured theoretical benchmarks of commitment and burnout (mental and physical exhaustion, decreased value of swimming, and significantly low accomplishments in swimming). Results suggested that swimmers, who displayed sport entrapment type of characters, generally recorded greater burnout scores when compared to swimmers who were engaged in sport primarily out of own freewill or attraction related reasons. The results proved that commitment perspective of the swimmers to support a workable framework for understanding burnout among swimmers.

Gustafsson et al. (2010) tested 178 athletes (63 females and 115 males) aged 15–20 years who were competing to discover the relationship between hope and athlete burnout. He concluded that there was significant negative correlation of Hope with all the other 3 burnout subscales namely emotional/physical exhaustion, a reduced sense of accomplishment and sport devaluation. Multivariate analysis of variance suggested that

athletes who had low-hope scored significantly higher, in comparison to medium- and high-hope athletes on all 3 burnout parameters.

Purvanova and Muros (2010) focused on gender differences in males and females athletes who had burnt out, through Meta analysis by recruiting 409 effect sizes from 183 research works. Findings upset the general view that female employees were more susceptible to experience burnout when compared with male employees, revealing that women were marginally more emotionally exhausted than males ( $M=.10$ ), while males were slightly more depersonalized compared to women ( $M=-.19$ ). However, male typed against female-typed occupations did not throw up any significant differences.

Cresswell (2009) examined if possible early signs of burnout assessed during middle of a season were linked with burn out characters that were assessed at the end of the season. The level of burnout was identified with the help of quantitative techniques on perceptions of possible early indications among male players of professional rugby union ( $n = 183$ ). Their age ranged between 18–36 years. Results showed prominent associations with proposed early indications assessed during middle of the season and athlete burnout assesses at the end of the season. Perceptions of more than enough social support were correlated negatively with burnout characteristics. In conclusion this study added additional support for the proposed positive link between early signs of athlete burnout during middle of the season and end of the season.

Hodge et al. (2008) conducted a study on New Zealand Rugby Union players to understand the conditions leading to their burnout ( $n=133$ ). Relatedness and autonomy (i.e. basic psychological needs) and perceptions of competence were expected to be negatively linked to the scores of burnout, whereas players marked as “high-burnouts” were expected to respond with reduced fulfillment of needs when compared to players having lower burnout. Analysis through Canonical correlation showed that as a predictor of burnout, relatedness was only low to moderate, whereas players’ competence and autonomy resulted in significantly contributing to variance in following two athlete burnout symptoms namely reduced accomplishment and sport devaluation. The

proportion of variance that was recorded in the exhaustion dimension of athlete burnout was not very significant. Multivariate analysis of variance confirmed the derived results, as “high-burnout” players exhibited lower autonomy and competence scores than athletes who reported lower symptoms of burnout.

Harris and Ostrow (2008) examined the relationships between style of coaches and decision-making along with burnout among coaches and athletes. He also tried to measure the gender influence on burnouts. Coaches and collegiate swimmers were provided with questionnaires to measure the burnout and decision-making tendencies. Results suggested that there existed a strong relationship between autocratic behavior of the coaches and burn out of athletes. A powerful negative equation existed between athlete burnout and democratic behaviors. ANOVA showed no strong interactions between decisions making and gender scores of burnouts. Significant positive effects were associated with democratic patterns on exhaustion and depersonalization subscales; swimmers who perceiving fewer democratic characteristics scored higher on these subscales. Within coaches there were no significant relationships on gender differences.

Lundkvist et al. (2012) analysed subjective experiences related with burnout in a set of elite soccer coaches. The study centered on how the coaches perceived the reasons of burnout, signs and the follow up recovery program. A qualitative method was selected, as the mission was to elicit the personal experiences of the coaches. He scheduled semi-structured interviews and prompted interpretative phenomenological analysis to scrutinize the data. Eight elite soccer coaches from Sweden were recruited. They had a reported history of high burnout levels. He identified two profiles of burnout that matched the causes of burnout as perceived by coaches. Issues in handling the performance culture were the first profile and the subsequent one had relation with the overall scenario, including family, health and workload. Results projected coach burnout as originating from a collection of issues which were closely associated with both home and work. When clubbed with overload of work, coaches with issues dealing with performance culture in elite sports and those who lacked the skill to speed up recovery, has more tendency to burnout.

Raedeke et al. (2002) examined coaches' experiential knowledge to triangulate existing academic definitions and coaches perspectives to describe defining sign and symptoms of athlete burnout. USA swimming senior coaches (N=13, 11 males and 2 females) were interviewed to characterize their view point on defining signs and symptoms of athlete burnout. Coaches view on cause/ preventive strategies were also examined to obtain additional sign on how they constructed this issue. Content analysis is used in this study results shows that withdrawal from sports is not because of reduced sense of accomplishment, devaluation or physical/ psychological exhaustion. Coaches also depicted a variety of stress related factors thought to contribute to burnout.

Maslach and Jackson (1981) studied the different aspects of the burnout syndrome which was treated on a wide spectrum of human services professionals. Three subscales were identified from the analysis of data: emotional exhaustion, depersonalization, and personal accomplishment. Group of psychometric analyses showed that for measurement of burnout, the scale proved to be both highly reliable and valid.

Cresswell and Eklund (2004) analyzed associations of athlete burnout syndrome with proposed early signs. Quantitative methods were incorporated to find the burnout levels and perceptions of proposed early signs among male semi- and fully-professional rugby union players from New Zealand ( $n= 199$ ). Their age range was from 19 to 33 years. Results supported high level of association of proposed early signs with athlete burnout. The key characteristics of burnout were negatively associated with perceptions of adequate social support, perceptions and competence of control.

Lai and Wiggins (2003) analysed perceptions of burnout in soccer players of college level. Their hypothesis was propounded on the basis of researches on gender and burnout done with the coaches. They concluded that symptoms of burnout significantly heightened during advent of the competitive season, Burnout perceptions did not exist across genders.

Gould (1996) selected competitive junior tennis players to examine burnout. This part of the study involved two parameters and was qualitative in character. Interviews were conducted with 10 individuals to start with. They were selected because they were the most burnt out tennis players in the quantitative study stage (Phase 1) of the study. Content analyses on the 10 respondents' interviews revealed both physical and mental nature of burnout along with reasons for burning out. Proactive suggestions to prevent burnout in coaches, players, parents were also highlighted. Subsequently, the 10 individual cases were analyzed with respect to the major factors related to the three existing models of athlete burnout.

Cobler (2009) studied the potential for burnout among certified trainers in athletics (ACT's) from Southwest Virginia and Northeast Tennessee areas. To establish the burnout tendencies, the Maslach Burnout Inventory-Human Services Survey was proposed, 45 surveys were completed satisfactorily. The project concluded with the indication that ACT's in Southwest Virginia and Northeast Tennessee reported potential for burnout which was similar to health professions from other allied fields. Emotional exhaustion and depersonalization parameters were in average range. However, high personal accomplishment scores which were statistically and significantly different from other professionals from allied health fields were reported. Significant variations were also spotted in females and males in the emotional exhaustion parameter. Further, ACT's did not exhibit any differences on working in different employment settings.

Appleton et al. (2009) selected a study on moderating influence of perceptions of goal progress and achievement goal orientations on the relationship between multidimensional perfectionism and athlete burnout. 201 junior-elite male athletes, with age range from 11 to 21 years were selected from professional sport clubs in the UK. They responded to a multi-section inventory which assessed their self oriented and socially prescribed perfectionism. Regression analyses exposed the socially prescribed perfectionism which showed significant positive relationship, and self-oriented perfectionism exposed significant negative relationship with burnout parameters. The project suggested that there was no proof to confirm the hypothesized moderation of the

perfectionism–burnout associations; the conclusions supported a growing body of literature which suggested that maladaptive forms of perfectionism may enhance burnout among elite junior athletes.

Gustafsson et al. (2011) investigated if harmonious passion and obsessive passion had equal risks leading to burnout. Subjects were 164 males and 94 female competitive athletes from 21 different sports and games. Multivariate analyses and partial correlation of variance exposed that athletes characterized with an obsessive passion scored higher on a burnout inventory than athletes characterized with harmonious passion. Perceived stress and negative effect also scored high on obsessively passionate athletes, and lower on positive effect. The results support the hypothesis that, though both the two of passions may be an integral to elite sportspersons, athletes who scored high on obsessive passion could be at higher risk of burning out than harmoniously passionate athletes.

### **Training Stress and Burnout:**

It includes the studies which has relationship to training stress and burnout:

Gustafsson (2007) conducted three studies on athlete's burnout. In the first study he examined the existence of burnout in competitive athletes. The athletes who showed high levels of burnout were between 1 and 9%. The athletes struggling with severe burnout was measured at 1-2%. In his subsequent study he examined the burnout process with the help of a case-study approach. He propounded that burnout can develop from differing levels of severity, time perspectives and nature. There seemed to be an association with the overtraining syndrome and burnout. The results gave support to the view that burnout is the most extreme result of the training fatigue continuum. In the last project, the burnout experience was examined with the help of qualitative interviews. Reduced recovery, too much sports and extreme external demands were suggested as reasons of burnout. Hence, the results of all the projects proved that burnout is a serious issue in competitive and elite sportsmen.

Coakley (1992) conducted a study on adolescent athlete's burnout with respect to personal failure and social problem. Most common reasons for burnout among young athletes indicate prolonged or excessive stress as the trigger. 15 adolescent athletes through informal interviews were identified as cases of burnout resulting due to social problems.

Gustafsson et al. (2008) conducted a study on elite athletes to understand burnouts caused by personal experiences as well as perceived antecedents. 10 Swedish athletes who had quit sport due to burnout were put through a semi-structured in-depth interview. Their age group was between 22 and 26 years. The interview records were inductively analyzed with the help of qualitative content analysis. The results support the notion that athlete burnout must be treated as a multidimensional syndrome, while stressors like multiple demands, too much sport, lack of recovery and high expectations were prime reasons leading to burnout. He recorded that burnout in athletes appears to be a complex influence of series of stressors, incomplete recovery and frustration from unfulfilled expectations.

Flor (1996) conducted a study to find out the association of personality, hardiness, stress with burnout in some collegiate athletes. 181 NCAA division 1 sports persons from track and field, softball and tennis were selected as the subjects, they were from three different Midwestern conferences. Maslach Burnout Inventory (MBI) was used as a measuring tool and was found that stress was highly correlated with burnout. He concluded that stress would increase the level of mental exhaustion, depersonalization and bring down the level of personal fulfillment.

Smith et al. (2010) studied the impact of social surroundings in enhancement of athlete burnout, with special regard to the context of social peers. He controlled the weekly training hours and perceived stress and examined the relationship of perceptions among the peer-created motivational climate with the athlete burnout in adolescent athletes. He also tested the potential differences in gender among peer induced motivational climate perceptions. 206 Adolescent athletes (Mean age =17.2 yrs)

responded to the questionnaires which measured their weekly training hours and stress perceptions, involving tasks, involving ego, peer motivational climate and burnout. Multivariate multiple regression analysis with stress, peer motivational climate and training hour variables which predicted the burnout components showed a high multivariate relationship with 24.6% of burnout variance. The results provided deep insight on the possible influence of social context in formulating burnout perceptions and offered suggestions that peers needed to be on the watch list for greater understanding of the burnout process.

Halvari and Kjormo (2002) observed the association of burnout with personal characteristics and environment. Time constraints to be with important friends and family outside sport, team work in group training, role conflict, and self-confidence in 136 elite athletes. Analysis showed that mean scores of burnout fell in the low range. Synergy in group trainings and self-confidence were negatively linked with burnout, however lack of time to be with important friends, family members and role conflict had positive relationship with scores of burnout. Results were in conformity with Coakley's (1992) idea of burnout which proposed that it was a social issue and recorded that conflict was positively associated with stress leading to burnout. Kahn's (1978), Factors of personality namely self-confidence was related to cognitive appraisal of demands of a situation related to burnout with Smith's (1986).

Bozorgi et al. (2014) investigated the relationship between quality of life and burnout of athletes. The result indicated that there was a negative significant relationship between quality of life and athlete burnout. Also, there was negative significant relationship between Physical performance, Energy/Fatigue, Mental Health, Social performance, Perceived general health and athlete burnout. Again, there was positive significant relationship between Limitations on roles due to physical Problems, Limitation on roles due to emotional problems, physical pain and athlete burnout. Developing quality of life could decrease the number of burnout athletes.

Salguero et al. (2003) examined causes for discontinuation of participation in sports among competitive swimmers from Spain. Sixty-two dropped out swimmers (40 males and 22 females with the age range of 14 to 30 years) responded to the Questionnaire on Reasons for Attrition. The survey concluded that the need to engage in some other thing was the most critical reason for attrition. Other items which received significant value were associated with lack of fun, perception of failure or low skill. However, low scores were recorded for items linked to achievement/success or affiliation. A high multivariate effect was gathered for gender and for dropout experience. Examination of individual items by "t"-test established that females opted to place greater emphasis on excessive pressure than males, dislike of competition, hard training, not feeling important enough and not winning enough. Former swimmers without much experience at dropout selected interest in some other sport as more critical and being too old as less critical than swimmers with rich experience. This study concluded that the value of negative factors associated with certain parts of the athletic climate could lead to discontinuing competitive swimming.

Vealey et al. (1998) investigated the impact of perceived behavior of coaching on athlete's burnout. He recruited 149 female athletes from colleges and 12 coaches; he identified that many coaching behaviors could be linked to burn out of athletes. Results proved that athletes who scored high on emotional and physical exhaustion, negative self concept, psychological withdrawal dimensions and devaluation felt coaching behaviors to be less enjoyable, stressing more on winning when compared to development and using substantial dispraise and an autocratic style of coaching.

Raedeke and Smith (2004) ventured to evaluate if coping behaviors and social support satisfaction had indirect stress-mediated association with burnout or if an independent or conjunctively moderated relationship existed between perceived stress and burnout. Senior level swimmers ( $N = 244$ ) in the age group between 14 to 19 years responded to the questionnaire that measured burnout, general coping behaviors, social support satisfaction and perceived stress. The results established that perceived stress, general coping behaviors, and social support satisfaction had strong links to burnout.

Structural equation modeling suggested that general coping behaviors and social support satisfaction was prone to stress-mediated associations with overall level of burnouts.

Gustafsson et al. (2007) observed the existence of burnout in adolescent elite athletes and if burnout was common in individual sports when compared with team sports. The EABI was issued to 980 athletes (402 females and 578 males) in 29 different sports and games. Confirmatory- factor analyses showed an agreeable factorial validity for a theoretically supported four-factor model of the EABI. Between 1% and 9% of the athletes exhibited higher burnout scores on the four subscales. It was hypothesized that would be higher existence of burnout in individual sports, however this was not supported. Further, it found no association between training load and burnout scores. These conclusions suggest that other factors such as psychological ones must be considered when an athlete is at risk of burnout along with training load.

Gustafsson et al. (2013) investigated the association between trait hope and burnout in elite junior soccer players and if stress had positively or negatively intervened in this relationship. The subjects were 238 soccer players from Sweden (166 males, 71 females). Their age ranged between 15 to 19 years. They completed questionnaires that evaluated trait hope, perceived stress, positive and negative affect and athlete burnout. Bi- variate correlations were positively associated with conclusions of hope theory indicating significant negative association between hope and all three burnout dimensions. The association between hope with physical and emotional exhaustion was completely linked to stress and positive affect. Hope was partially mediated by sport devaluation, reduced sense of accomplishment, stress and positive affect. In contrast, negative affect did not intervene in the relationships between hope and any of the burnout dimensions. The results confirmed the earlier conclusions that hope was negatively associated with athlete burnout. Support was also indicated for the hypothesis that high hope individuals felt lesser stress and hence lesser burnout.

Lemyre et al. (2008) proposed to observe athlete burnout from a social-cognitive angle by investigating the association between social cognitive motivational variables at the beginning of a season and signs of burnout in elite athletes at the completion of the season. 141 ( $F=60, M=81$ ) elite winter sport athletes participating in Alpine skiing, Biathlon, Nordic Combined, Nordic skiing, and Speed skating were recruited for the purpose. The subjects were evaluated through a comprehensive motivation package which was administered at the start of the season and a further burnout inventory at the end season. The study concluded that motivational dispositions, evaluations of achievement climate, perceived ability and dimensions of perfectionism were linked with burnout in a conceptually consistent manner.

### **Training Stress and Recovery:**

This section includes the studies which related to training stress and recovery:

Altfeld and Kellmann (2014) examined and compared the recovery-stress state of German full-time, part-time, and volunteering coaches. Examining individual stressors and recovery activities of coaches would provide a deeper understanding of their stress and recovery states. 296 coaches of different kinds of sport completed the Recovery-Stress Questionnaire for Coaches (RESTQ-Coach). Additionally, they answered open-ended questions about their individual stressors and recovery activities over the past four weeks. The results showed that full-time coaches had significant higher Social Stress values than part-time and volunteering coaches. They also showed significant lower Social Recovery values. The three groups of coaches showed increased scores on the subscale Conflicts/Pressure.

Filho et al. (2015) examined if the association of recovery-stress factors with performance would vary at the start and the end of a multi-stage cycling competition. Sixty-seven cyclists were recruited for this study. The cyclists were presented with the Recovery-Stress Questionnaire for Athletes (RESTQ-Sport) and they also rated their performance (1=extremely poor to 10=excellent). Two, step-down multiple regression models were employed to assess the relationship between recovery

and stress factors in relation to performance. Physical recovery, injury and general well-being could be predicted in the initial stage whereas conflicts/pressure and lack of energy combined with performance at the final stage. Collectively, these results imply that the association of recovery and stress factors changed significantly over a relatively short period of time, and dynamically impacted performance in multi-stage competitions.

Kellmann and Gunther (2000) examined the variations in stress and recovery in elite rowers while preparing for the Olympic Games. Eleven elite rowers of the German National rowing team responded four times through the Recovery-Stress-Questionnaire for Athletes (RESTQ-Sport). Results projected that trend parameters exposed significant interactions of somatic components of stress namely lack of energy, somatic complaints, fitness/injury) and recovery factors namely fitness or being in shape over time that reflected the average length of daily extensive endurance training sessions. Significant modulations in the scales related to conflicts/pressure and social relaxation reflected interpersonal processes within the team. He had highlighted the value of balancing training stress and recovery for an optimal performance.

Trudine (2012) conducted a study to monitor changes in stress and recovery states among U-20 rugby union players during a training year. Relationships regarding monitoring variables and differences in stress and recovery between playing positions were examined. 55 Players between the ages of 18 and 20 were monitored for 27 weeks, over a training year. The training year was divided into 5 training phases: Developing phase (week 1 – 7), Transitional phase (week 8 - 11), Early Competition phase (week 12 - 17), Performance phase (week 18 – 24) and High Performance phase (week 25 - 27). Recovery-Stress Questionnaire (RESTQ-76-Sport) was completed once in a month. The backline players experienced increased stress and decreased feelings of well-being during the competitive phases when compared to the forwards. Lack of psychological skills-training might also have resulted in the players not knowing how to properly handle stressful situations and how to regulate their stress and recovery states. The lack of an educational system regarding recovery strategies, and the reinforcement thereof,

especially during the Developing phases might play a role in the later increased fatigue and injury rates among the players.

Kellmann (2010) initiated a project on preventing overtraining in athletes in high-intensity sports and stress/recovery monitoring. He suggests that in sports, the importance of optimizing recovery–stress state is critical. Effective recovery from intense training loads often faced by elite athletes can often determine sporting success or failure in elite athletes is determined by an effective recovery program and he added that athletes must learn to cross the barrier like overtraining, fatigue, injury, illness, and burnout to improve the quality and quantity of training for athletes. He concluded that an instrument like the Recovery- Stress Questionnaire for athletes can be used as a tool to evaluate their perceived state of stress and recovery.

Maestu et al. (2006) conducted a study to assess (a) the usefulness of RESTQ-Sport in the process of training monitoring and (b) whether a change in psychological parameters is reflected by similar changes in specific biochemical parameters. The high volume training period, in general, caused increases in stress scales and decreases in recovery scales of the RESTQ-Sport, while during the recovery period, stress levels declined. The results of the present study demonstrate that changes in training volume were reflected by changes in the RESTQ-Sport scales.

### **Training Stress:**

The following review explains about the factors which affect the training and performances of athletes:

Silva (1990) investigated the training stress syndrome in competitive athletics. 68 Athletes from two Atlantic Coast Conference (ACC) universities of which 25 were females and 43 were males. The subjects had voluntarily agreed to join in the study. The study was designed to examine the self-report causes, symptoms and frequency of negative responses to training stress. The age range of the subjects was 18 to 25 years. The athletes belonged to ten different intercollegiate sports and games namely Football

(38.2%); Basketball (22.1%); Volleyball (1 1.8%); Swimming and Diving (7.4%); Fencing (7.4%); Soccer (5.9%); Lacrosse (2.9%); Field Hockey (1 *Soh*); Golf (1.4%); Track and Field (1 *AVO*). The training experience of the subjects in the years of competitive athletics was from 1-16 years ( $x= 9.3$ ;  $SD = 4.1$ ). Subjects were evaluated in small groups (6-10 subjects per group) in a classroom environment and were read standardized instructions for filling out the questionnaire. It presented a conceptual model that explains the nature of positive and negative adaptations to training stress. The positive response to training stress was presented in a model emphasizing that training stress was critical for training gain. Negative training stress responses are hypothesized to regress along a continuum from staleness to overtraining leading to burnout. The regressive pattern was labeled the “training stress syndrome”.

Fraser-Thomas et al. (2008) conducted a study to understand training patterns and roles of significant others which included coaches, parents, peers, and siblings. They were tested in the patters of adolescent swimmers’ sport participation. 10 dropout and 10 active swimmers, reported identical scores on key demographic variables. They were assessed through a semi-structured qualitative interview. Results brought to light that Groups had a number of similar experiences ranging from early training, involved parents and supportive and unsupportive coaches. But, only dropouts recorded talk of premature peak performances, restricted one-on-one coaching, and parental pressure during their adolescence, shortage of peers in swimming during their adolescence and finally sibling rivalries.

Cosh and Tully (2015) initiated a study on stress, coping, and support mechanisms for student athletes which was combined with elite sport and tertiary education and analyzing their effect on practice. 20 student athletes were selected from Australian University. They were interviewed and the collected data were scrutinized through a thematic process. Participants’ response included, going through number of stressors that were linked with fatigue, schedule clashes, rigidity of coaches and financial pressure. Participants suggested some coping strategies but emphasized that support from parents and coaches was of critical importance. They were of the view that they could

benefit by improving their skills in a number of aspects such as efficient time management, enhanced self care and self-efficacy. They welcomed initiatives to learn specific strategies for coping with stress. A pivotal role is played by the Coaches in the successful integration of sport and education program.

Coutts et al. (2007) investigated the previously identified physiological, biochemical, and psychological markers of overreaching in triathletes and compared their responses. Sixteen male triathletes with good experience were segregated into matched groups based on their physical and performance parameters. They were divided randomly to either intensified training (IT) or normal training (NT) groups. The baseline that was considered suitable for the study included physiological, biochemical, and psychological measures. After an overload training of four weeks a two-week tapering schedule was initiated. 290 % greater physical training load was bestowed on the IT group and the NT group during overloading phase. The obtained results showed that none of the physiological and biochemical variables measured in this study were effective for the early identification of overreaching in experienced triathletes. The RESTQ-76 Sport questionnaire projected a recovery-stress state that was very much impaired during the period when training load was increased. However, the recovery- stress state improved after tapering was carried out in the IT group ( $p < 0.05$ ). The study concluded that the RESTQ-76 Sport questionnaire can be used as a practical tool for the recognition of overreaching in its early stages.

Sohal et al. (2013) observed the Indian elite female athletes who experienced organizational stressors and its effect on their psychological health. Ten athletes were selected for the interview on their experiences with sports federations ahead of any international competitions. The project added to the existing literature on organizational stress by treating them in the context of a different culture and combined it with their psychological wellbeing. The most commonly cited stressors were perceived bias, lack of support from the sport federations, restricted role of support staff, and lack of basic training infrastructure. Analysis of the resultant data led to the discovery of new themes which were significantly and closely related to the climate

surrounding Indian sports. The themes were perceived gender discrimination and restricted scope for a career in sports for female athletes.

Siekanska (2012) observed the effect of factors related to family environment on student athletes featuring varying levels of sports achievements namely a low level corresponding to no significant achievements (N = 46), medium level corresponding to significant achievements at a regional level (N = 86) and high level corresponding to significant achievements at national or international level or both (N = 33). The subjects were provided with a demographic survey and the Athletes' Family Environment Questionnaire (AFEQ). The results of one way ANOVA suggested that families of high achievers varied from the family of medium- and low-level achievers in five out of nine environmental factors that were taken up for study. The study proved that though there can be beneficial effects of parent's involvement in their child sports career but, they can even produce negative impact such as quitting sports, experiencing burnout or run a injury risk. From a practical point of view, the family surroundings may be the easiest and the most critical of the socio-environmental factors that an young athlete may face.

Zhang, J. (2013) worked on biomechanical aspects and counter measures for knee pain through the practice of Taijiquan. The study suggested that the symptoms of knee pain had close links with unscientific training and inability to master the appropriate technique.

Ruiz-Tendero and Martin (2012) analyzed high-level sport using the complex system model. Important positive and negative factors that influence performance as perceived by the Coaches and athletes were compared. The subjects selected were 48 elite international triathletes (n = 34) along with their coaches (n = 14). A questionnaire designed by four accredited experts was used during a personal interview. A set of factors from greater to lesser importance which were opined by the athletes and coaches was generated. The triathletes rated personal surrounding factors ranging from family, teammates, and lack of support from relatives on a higher scale, and the coaches felt that the athletes should have given more value to technical and institutional areas

like institutional support, coach, medical support. The highest rated positive factor for coaches and athletes was engagement or dedication while injuries were ranked as the top factor which adversely affected performance.

Smith et al. (2006) conducted a study to describe profiles of youth sport participants with their peer relationship and hoped to evaluate the motivational importance of these profiles by investigating the variations within the profile group variable associated with sports motivation. 243 subjects were selected from the Youth sport camp with the age range of 10 to 14 years. They were entrusted with a multi section questionnaire that focused on measures related to sports environment and expected quality of friendship which was centered on following factors positive conflict, perceived peer acceptance, perceived competence, pleasure, distress, self-presentational issues, and self-efficacy. Cluster analysis was employed to assess the positive friendship quality, friendship conflict, and peer acceptance responses. The variations in profiles sort for all variables related to motivation and were treated in theoretically consistent directions. Greater adaptive motivation-related responses were obtained from those young athletes who were categorized in adaptive peer relationship profiles. The results confirmed the theoretical proposals on social relationships and motivation and the efficacy of a person-centered approach to the evaluation of peer relationships in sport.

Beneka et al. (2007) studied the occurrence of injury rates in the elite and local division volleyball players in Greece and compared them in relation to their injury profile. A total of 649 Greek male and female volleyball players were recruited from the Volleyball championships in Greece that involved first and local division players. They were observed every month during the period from 2005 to 2006. The injury incidence rate, severity, diagnosis and the anatomical location of the injuries, which occurred during practice and competition in all the championship period, were recorded prospectively.  $X_2$  analysis with SPSS was used to statistically analyze the data. In terms of professional volleyball exposure time, elite athletes suffered fewer injuries when compared to local division players. Though ankle sprain was the most common injury for subjects from both the groups, chronic injuries reportedly decreased

for elite players when compared with local division players. Further, the most critical injury factor apart from 'step on others foot' for elite players was 'fatigue' while for the local division players it was 'incorrect sprawls' and 'improper technique'. Most injuries were caused while training and competitive season. The study concluded that elite players reported fewer injuries when compared with local division players and their injury profile also varied significantly.

Ran et al. (2006) analyzed common parts of athletic injury, pathological causes, curative method and preventive measures through questionnaire-investigations of badminton enthusiast by combining with the athletic characteristics of badminton. The experiment was conducted in the badminton club of Department of Physical Education, Chengdu Medical College between March and November 2005. The athletic injuries in 156 badminton enthusiast were investigated, and all subjects voluntarily participated in the study. Integrated method of questionnaire and expert visit was adopted. Combining with the athletic characteristics of badminton, the attack rate, injury type and cause of injury of sports were probed into, and the common treating methods as well as preventive measures were analyzed. Results show that a total of 156 questionnaires were sent out and were taken back with detailed consents. 1) The attack rate of injury was 78.84%. 2) Injury type: subjects with acute injury (52.56%), chronic injury (26.28%), shoulder injury (30.89%) and the most vulnerable part was wrist (37.39%). 3) Injury causes: unscientific action (72.35%) was the main cause of injury, inadequate preparation (63.41%) and body fatigue (22.76%) was the other causes. It concluded that to effectively prevent wrist and shoulder injuries, preventive measures such as training of local muscular strength should be reinforced, and it is necessary to learn and master correct sports technique and make sufficient preparations.

Lautenbach et al. (2015) investigated the impact of a non automated pre-performance routine (PPR) on performance in a high-pressure situation. Low and high pressure serve situations were simulated for 29 tennis players with a help of a pre- and posttest format. The experimental group was able to master a non automated PPR in 4 weeks. High pressure conditions led to a corresponding higher level of stress. During

high pressure significant decrease in performance was recorded for the intervention group. The study concluded that a non automated PPR may be used to help tennis players who faced a drop in performance during high-pressure conditions.

Gearity and Murray (2011) looked to pinpoint the psychological impact of poor coaching based on the feedback of collegiate, professional and semi-professional athletes. Qualitative research design was applied for the purpose. This research design provided the blueprint for bringing out the impact of poor coaching on athletes. 16 subjects were requested to vividly explain their views on poor coaching. Five themes that constituted the cream of athletes experiences with poor coaching was derived after systematic recording of opinions which was later transcribed and further analyzed with the help of series of steps. The five themes which were formulated was poor teaching by the coach, uncaring attitude, unfair behavior, restricting the athlete's psychological abilities, and athlete coping. Restricting the athlete's psychological capabilities and coping were closely related to psychological parameters. The theme of restricting athlete's psychological abilities was built on athletes' descriptions of coaches as being poor, distracting, creating self doubt engendering, de motivating, and killing team spirit. The athlete coping theme describes the method in which the athletes choose to respond to being coached poorly. The study recommended that the two themes, restricting athlete's mental skills and athlete coping, were complementary to several parameters in the literature of sport psychology such as motivation, self-efficacy, focus and concentration, team cohesion, and stress and coping. Lessons on coping skills were suggested for athletes who were dealing with poor coaching.

Shrier and Halle (2011) conducted a study to investigate the association between possible psychological risk parameters and risk of injury in circus artists. Forty-seven circus artists volunteered and 'Cirque du Soleil' training program was administered to them. Historical cohort study design was used in this study. For assessment of risk factors RESTQ questionnaire was used during their first 2 weeks of training. Result of the study revealed that interest, injury, emotional exhaustion, self-efficacy and fatigue were linked to an increased risk of injury with ratios between 1.8 and 2.8. Low self-efficacy had the

strongest relationship of the many targeted psychological factors which were considered as risk for injuries. He suggested that there was a strong relation with most of the targeted psychological risk factors for injuries in circus artists that were previously identified as risk factors in athletes.

Rees et al. (2010) investigated the important and relationships with holding effect between social support and psychological feedback to injuries in sport with the help of injured subjects from high- and low performances. Injured high performance subjects numbered 147 and similar low-performance subjects numbered 114. The injured but normal subjects were measured on expected social support, stressors related to injuries and psychological feedback at the time of visits to physiotherapy clinics. Moderated hierarchical regression analyses exposed these important results. Significant positive effects of social support in relation to psychological responses was identified in the high performance participants and significant buffering effects of social support in relation to psychological responses was identified in low performance subjects. These results extracted that, depending on the performance level of an injured athlete the association between social support, stressors, and psychological responses may differ. The role of social support in the dealing with the injury process may hence be highly complicated than previously observed, and this aspect was sure to have its effect on interventions which was directed towards increasing social support for athletes who were injured.

Holt et al. (2008) examined engagement of parents in competitive youth sport situations. Two distinct phases of fieldwork was undertaken to gather the data. Phase 1 engaged four families in a longitudinal data collection technique and Phase 2 involved youth soccer settings observations. Individual interviews were conducted to gather the responses from the four families along with audio-diaries which were later supplemented through 120 hours of observation. After verbatim transcription of the collected data, it was analyzed with the help of grounded theory method. Results suggested that verbal reaction of parents on sport performance behaviors of their children. Their comments moved from more supportive to more controlling in nature. These comments were classified into praise/encouragement, instruction, feedback, performance contingent,

striking a balance, negative and derogatory comments. Empathy was exhibited by the parents in the sense that they shared the emotions their children felt in sport, and these emotions seem to change in relation to game dynamics and contextual situations. Parents perception that they possessed the knowledge and expertise in the sport helped them to make comments to their children.