

THE PSYCHOLOGICAL ASPECTS OF INJURY IN SPORT

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Abstract. The benefit of sports and physical activity are widely known. However, the risk of injury is an unfavourable consequence in physical training. Age, gender, injury history, body size, local anatomy and biomechanics, aerobic fitness, muscle strength, psychological and psychosocial factors as well as general mental ability are factors in the predisposition to injury. In sports, regardless of the best efforts of coaches and trainers, injuries do occur. One of the most important aspects in sports injury is the psychological aspect. Which include psychological variables as predictors of injury occurrence, athlete's psychological response to injury, psychological aspects of the rehabilitation process, and also psychological readiness to return to competition. Psychological factors of injury occurrence in sports can be predicted. Among the factors already studied are the stress responses, personality, history of stressors, coping resources, state-trait anxiety, self-esteem, and mental toughness. With regard to the psychological response to injury, a few factors such as emotions and behaviour of the injured athletes have been identified. Studies on the psychological aspects of the rehabilitation process have indicated that injured athletes need a number of approaches that can be implemented such as communication skills and motivation techniques. Nevertheless, injured athletes need to consider some psychological readiness factors to return to competition like anxiety, fear and loss of confidence which subsequently may affect their performance when they return to competition.

Key words: sport, injury, psychological, predictors, response, rehabilitation, competition.

1.0 INTRODUCTION

Sports injuries occur with alarming frequency, and large number of sports performers are treated each year by medical personnel. Although contact sports produce more injuries per participant than non-contact sports, sudden and traumatic incapacitation may occur in either type of activity. In order to fully understand the injury occurrence/recovery process, practitioners must consider both psychological and physiological factors. Traditionally, the medical literature has focused on the physical aspects of the injury process and de-emphasized the importance of psychological factors. Previous evidence suggests, however, that psychosocial factors can also have significant impact on injury occurrence and recovery. This evidence can be categorized into four broad areas (Wiese & Weiss, 1987):

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- ◆ Psychological variables as predictors of injury occurrence
- ◆ The athlete's psychological response to injury
- ◆ Psychological aspects of the rehabilitation process
- ◆ Psychological readiness to return to competition

Andersen and Williams (1988) reported that there are somewhere between 3 and 5,000,000 injuries which occur in recreation or sports settings in the United States each year. A study conducted back in 1979 revealed that there were 600,000 injuries in U.S. high schools each year. Since there are five million high school students, if we assume that each student was injured only once, that would equate to a 12% injury rate. The rate changes dramatically as we begin to look at elite level competitors. It is also reported that within a two years period, 83% of the elite level gymnasts had been injured at least once.

2.0 PSYCHOLOGICAL PREDICTORS OF INJURY OCCURRENCE

Early work in this area provided descriptive accounts of the types of athletes prone to injury and suggested that interpersonal conflict, anxiety, depression, guilt and low self-confidence were important contributors to injury occurrence (Sanderson, 1977). Subsequent research has taken a variety of other factors into account, and the manner in which they interact has been summarized by Andersen and William (1988) in their stress-related model of the injury occurrence process in sport. This model, a simplified form of which is shown on figure 1.0, provides an excellent framework for examining the psychological precursors to injury.

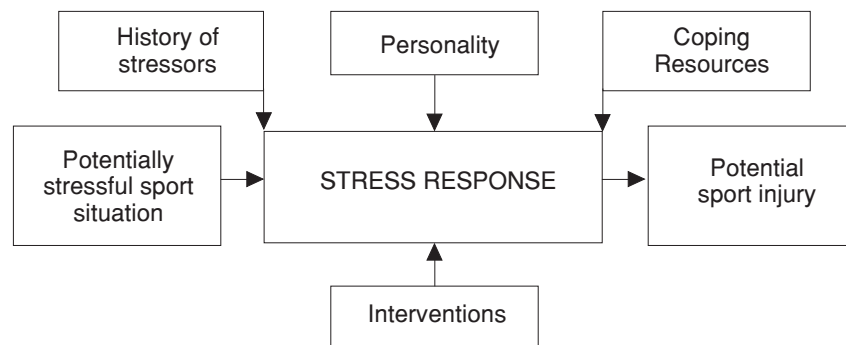


Figure 1 A stress-related model of sports injury (based on Andersen & Williams1988)

2.1 The Stress Responses

At the core of the Andersen and Williams model is the stress response. This response consists of a cognitive component and a psychological/attentional compo-

ment, both exerting reciprocal influences on each other. Evaluations of the demands inherent in the sports situation, the resources available to meet these demands and the consequences of successful versus unsuccessful coping produce physiological tension as well as attentional deficit. At the same time, these physiological and attentional changes influence the nature of the ongoing evaluation. If the perceived threat is sufficiently strong or recurrent, this response may increase the risk of injury by disrupting co-ordination and flexibility as well as interfering with the detection of important environmental cues: for example, an opposition player moving in from the side to attempt a tackle. A number of identifiable factors have the potential to exacerbate or moderate this response.

2.2 Personality

Perhaps the most widely researched mediating variable is the athlete's personality. Unfortunately, very few reliable relationships have been demonstrated between personality and sports injury. A few studies suggest, however, that certain variables are worthy of consideration: for example, several investigations have reported connections between injury occurrence and scores on Factor I (tender-minded vs. tough-minded) and Factor A (reserved vs. outgoing) of Cattell's 16 PF (Personality Factor) Questionnaire. Players scoring near the tender-minded and reserved ends of these scales may be more prone to injury than their more tough-minded and outgoing peers. Similarly, low scores on measures of general self-esteem have been implicated as a precursor to injury by a number of researchers.

Hardy & Crace (1991) have also reported interesting findings concerning the interaction of personality and the type of injury likely to be experienced. Their data suggest that acute injuries are frequent among competitors with extraverted tendencies and a low sense of responsibility. Overuse injuries, on the other hands, are frequent among competitors with high level of dedication and responsibility. Both researchers also suggest that different personality factors may be implicated in different types of injury. Other personality variables such as hardiness, the Type A behaviour pattern and optimism/pessimism have not been examined thoroughly in connection with injury, although they have been linked to other health-related outcomes (Rodin & Salovey, 1989; Grove, 1993).

2.3 History of Stressors

Another factor that may influence sports injury indirectly through its impact on the stress response is the athlete's history of stressors. The most frequent finding along these lines has been a positive association between measures of stress from major life events and the incidence of injury. This relationship appears to be strongest in contact sports such as American football where there is a high baseline rate of injury, nevertheless it has been observed in other sports as well. These has also been

speculation that 'daily hassles' experienced by the athlete may be positively related to the chance of injury. The effect of these chronic, low-level stressors may cumulative, and they have been shown to influence both mood and general health (DeLongis *et al.*, 1988).

A final history variable that may be important in producing stress for the athlete is his/her experience of prior injury. Situation which have led to injury in the past undoubtedly have the potential for generating considerable tension and anxiety which, may, in turn, predispose the athlete to injury by virtue of physical and/or attentional deficits. These 'situations' could be as general as the point in the season (pre-season, just before finals, etc.), or as specific as the playing surface, the venue, the opponent, or the game circumstances.

2.4 Coping Resources

The final general class of mediators in the stress-injury relationship is the nature of the athlete's coping resources. These consist of a variety of behaviours and interpersonal networks which aid the individual in dealing with life's positive and negative events (Andersen and Williams, 1988). Research indicates that social support systems are a particularly important coping resources, both in terms of general health and sport injury. These systems consist of coaches/team-mates, partners/spouse, friends/relatives and supervisors/co-workers that provide emotional support to the individual.

The quality of the social support system will be determined by the extent to which the athlete believes these people care about him/her, trusts and confides in them and can access them in times of need. A number of studies indicate that high levels of social support are associated with low incidences of injury, and that low levels of social support are associated with high incidence of injury. Although other coping resources have not been studied as extensively as support networks, there is speculation that life-style factors such as diet, sleep habits, exercise regimens and alcohol/drug use could also contribute to the risk of injury.

3.0 PSYCHOLOGICAL RESPONSE TO INJURY

Because injury will never be completely eliminated from sport, it is important to understand how athletes typically react to injury as well as the psychological factors that might influence this response. Awareness along these lines will help therapists, coaches, administrators, team-mates, family and friends interact with injured athlete in a more effective and positive manner.

3.1 Emotions and Behaviour

There is agreement among practitioners, athletes and researchers that sports injuries

have strong emotional and behavioural consequences. In a general sense, this emotion/behaviour syndrome can be viewed as a three-element, repeating cycle comprised of distress, denial and a determination to cope (Heil, 1993). Distress and denial tend to peak in the early stages of rehabilitation and then give way to increasing amounts of determined coping in the later stages. However, even in the later stages of recovery, transient periods of distress/denial can be expected to occur in response to specific difficulties, such as pain or lack of progress.

This specific emotions experienced by the injured athlete may be similar to those experienced as part of the grief response. Physical capabilities constitute an important dimension of personal identity for most athletes, and injury can therefore pose a threat to their self-concept. Particularly in the case of a serious injury, the athlete is likely to respond initially with shock, denial and an overly-optimistic belief that the injury is less serious than it appears (Grove, 1993).

This initial numbness is followed by a period of heightened emotionally in which feelings of isolation/loneliness, anger/resentment, depression and anxiety may be experienced (Rotella & Heyman, 1993). The athlete may become irritable and/or self-critical at this time, and there may be a loss of interest in usual activities. The athlete may also question the value of treatment and fail to comply with recommended rehabilitation procedures.

3.2 Mediating Factors

It is likely that the duration and intensity of emotional and behavioural reactions to injury will depend on number of factors. At present, however, theoretical models and empirical evidence address psychological factors primarily as predictors of injury occurrence and not as determinants of injury response. Some potential psychological mediators of injury response using the Andersen and Williams (1988) model as a guide (Fig. 1.0). A similar approach has been adopted by other researchers who have addressed the psychological aspects of rehabilitation (Grove et al., 1990; Grove, 1993; Wiese-Bjornstal & Smith, 1993). Coaches, medical practitioners and other support personnel are urged to consider these potential mediators in their work with injured athletes.

Sanderson (1978) has proposed that the personality dimensions of extraversion/introversion and neuroticism/stability could be important in determining behavioural responses to injury. Extraverts have shown to be impatient and to have relatively high pain tolerance, so it is possible that highly extraverted athletes would tend to ignore pain and return to competition too soon. Introverts, on the other hand, may not return soon enough because they tend to be apprehensive, indecisive and guarded. High neuroticism scores could also delay progress during rehabilitation because of a tendency to over-react to the injury. As hardiness, dispositional optimism, and explanatory style have demonstrated a relationship to general health, it is suggested that they might also influence reactions to sport injury (Grove, 1993).

The athlete's stress history and coping resources are also potentially important mediators of the response to injury. The experience of previous injuries, the trauma associated with them and the success of prior rehabilitation efforts will undoubtedly influence the nature of post-injury stress. There is evidence that general life stress delays recovery from minor illness and injury among athletes and it is reasonable to assume that daily 'hassle' occurring during rehabilitation may produce similar effects. Although it is difficult to find direct evidence that social support networks or life-style factors influence recovery from sports injury, such an assumption also appears reasonable (Gordon *et al.*, 1991; Ford & Gordon, 1993).

Finally, it appears that injury-related factors should be taken into account when analysing the athlete's response to injury. Sanderson (1977) notes that players are likely to react negatively if they feel that their injury occurred as a result of a teammates illegal or unacceptable behaviour. Similarly, the severity of the injury in terms of pain, persistence and disruption of normal activities may effect emotions and behaviour. The timing of the injury within the season as well as within the athlete's career has also been noted as an important determinant of the response to injury.

4.0 PSYCHOLOGICAL ASPECTS OF THE REHABILITATION PROCESS

Once athletes have adapted to their injury and learned to accept their incapacity, the first step towards rehabilitation must be determined. Adherence to physical treatment protocols is necessary; however, in order to facilitate and promote a positive and determined attitude to rehabilitation, certain psychological factors must also be considered. A concomitant mental and physical effort therefore seems necessary for effective rehabilitation to take place. Wiese and Weiss (1987) potential to facilitate such an effort have summarized two sets of psychological strategies as having. Both are educational strategies, namely communication skills and motivation techniques.

4.1 Communication Skills

Health care professionals can facilitate rehabilitation by providing detailed information about all aspects of the athlete's injury (Weiss & Troxell, 1986). A detailed description of the nature of the injury and the prescribed rehabilitation programme and a programme rationale should be provided, together with realistic expectations concerning pain, physical and psychological setbacks, lack of mobility, and inconvenience. An emphasis on positive attitude and persistence during rehabilitation must be communicated. Heil's (1993) list of factors to be addressed in a comprehensive injury management programme are shown in Table 1.0 (page 10) and emphasize the educational value and importance of communication.

To achieve effective communication, health care professionals must become responsive listeners with athletes, who may require assistance in dealing with the emotional challenges posed by rehabilitation. While severely troubled or depressed athletes should be referred to licensed psychologists, preferably with sports science training, the majority of non-professional counselors who deal with athletes on a daily basis such as coaches, physiotherapists and parents, can easily learn to communicate effectively with an injured athlete.

Table 1 Injury Education Guidelines

<p>Basic anatomy of the injured area. Changes caused by injury. Description of diagnostic and surgical procedures (if necessary). Guide-lines for independent use of modalities (i.e. heat, cold). Purpose of medication with emphasis on consistent use as prescribed. Potential side-effect of medication with encouragement to report these to the physician. Potential problems with pain and how to cope with these. Differentiation of benign pain from dangerous pain. Active and passive rehabilitation methods. Mechanisms by which rehabilitation methods work. Plan to progressing active rehabilitation (e.g. resistance training). Anticipated timetable for rehabilitation. Possibility of treatment plateaus. Rationale for limits on daily physical activities during healing. Guidelines for the use of braces, orthotic devices or crutches. Injury as a source of stress and a challenge to maintaining a positive attitude. Rehabilitation as an active collaborative learning process. Methods of assessing readiness for return to play. Deciding when to hold back and when to go all-out. Long-term maintenance and care of healing injury.</p>
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4.2 Motivation Techniques

The question of motivation during rehabilitation becomes particularly critical during inevitable setbacks and periods of little or no improvement, which will challenge the athlete's motivation and enthusiasm for treatment. Five categories of strategies have been identified that can be employed when assisting athletes to maintain their motivation and persistence (Heil, 1993).

4.2.1 Goal Setting

The process of goal setting should include goals to follow the prescribed treatment protocol (e.g. attendance at treatment sessions, perseverance with homework exercises) and goals for incorporating psychological strategies (e.g. relaxation, imagery,

self-talk) within the rehabilitation programme. The first step is to set realistic, specific and measurable goals, which should be written down by athletes and re-evaluated frequently. Daily, weekly and monthly goals need to be monitored and updated periodically as progress is recorded. Feedback to the athlete must be provided and based upon objectively determined standards of achievement. The observable improvements should promote motivation as well as healing.

4.2.2 Relaxation

A relaxed condition facilitates healing by moderating the sympathetic nervous system functions, which are usually activated by stressful situations and conditions. Relaxation therefore helps to conserve vital energy required to promote healing and fight discomfort and disease. Through regular use of relaxation skills, athletes can facilitate and perhaps accelerate their recovery from injury. Three techniques that could be employed are: progressive muscular relaxation (PMR); autogenic training; and biofeedback. PMR teaches injured athletes to recognize the build-up and release of tension in different muscle groups and is particularly applicable for dealing with pain experiences or sensations, and for preparing for treatment.

Autogenic training works through self-suggestion and focuses on both physical relaxations, using sensations of warmth and heaviness, and mental relaxation in the form of visualization. In medical as well as sports studies, the ability of subjects to control blood flow, alter skin temperature and procedure hot or cold sensations in different parts of the body has been attributed to autogenic training. Biofeedback can be incorporated into rehabilitation programmes to help individuals train and control their body reactions. Through the use of electromyography or galvanic skin response indicators, both visual and audible, injured athletes can be taught to monitor and control relaxation levels during treatment.

4.2.3 Imagery

The 'imagination' can also be used to facilitate the rehabilitation process, particularly when used in conjunction with relaxation exercises. Athletes whose imaginations dwell on 'worst possible' scenarios can be taught to control and channel their images and thus reduce anxiety and fear, as well as enhance healing. Various imagery techniques can be taught to injured athletes and are described below.

Emotive imagery helps athletes feel more positive about themselves and what they can achieve. By using imaginary scenes that the athlete recalls with pride and enthusiasm, for example feelings of pride in having recovered from previous injuries or set backs, this technique boosts confidence levels. The goal is not to deceive the athlete but rather to evoke positive, composed and calm feelings associated with memorable past experience.

Body rehearsal is a second technique that facilitates healing, by using positive images. First, the athlete is given details of what has happened internally as a result of the injury, so that he/she can develop a clear picture of the internal damage caused by the injury. Next the intent of the rehabilitation programme is explained, which enables the athlete to imagine precisely what is happening internally during the healing process.

Mastery rehearsal, in which physicians and physiotherapists explain in specific detail what must occur internally to effect healing, can also be used in concert with body rehearsal. Only successful surgery or recovery is visualized, never setbacks or problems. While these techniques may induce confidence levels in athletes and enhance physical performance, mastery rehearsal may not be applicable to certain cases or suitable in dealing with inevitable setbacks in rehabilitation.

Coping rehearsal, on the other hand, teaches athletes to anticipated problems in recovery through the preparation of plans to deal with periods of anxiety worry and pain. Such preparation might also induce unnecessary anxiety on the part of some athletes who may find anxiety level over whelming; however, this technique is generally regarded as a realistic and valuable tool to learn and use.

Finally, time projection is an imagery technique, which effectively distances injured athletes from their current frustrations, inconveniences or pain. If athletes are taught to picture themselves 2 or 6 weeks in the future, they can attain some instant relief from their present experience. By planning ahead through time projection on a day-by-day/week-by-week basis, using a range of positive steps, athletes will learn to deal with current crises more effectively.

4.2.4 Positive Self-Talk

Self-talk differs markedly from the 'power-of-positive-thinking' approach which tends to promote a formula of rote repetition and emotionless patter. While there is an element of positive thinking and self-reliance inherent in self-talk, the latter is unmistakably an active problem-solving approach and not simply a series of verbal palliatives. Injured athletes can benefit enormously from learning a cognitive restructuring programme because they tend to dwell on negative and irrational thoughts and belief about themselves and their chances of recovery, particularly during long and painful periods of treatment (Rotella & Heyman, 1993).

In implementing cognitive restructuring techniques, mental skills consultants would first assist athletes in understanding the nature of their reactions to the stressor (e.g. pain associated with treatment). Athletes would then be shown how automatic and irrational thought processes could negatively affect responses to injury and rehabilitation.

Next, athletes would be assisted in breaking down their responses into components and taught how and when to use both cognitive and behavioural coping strat-

egies to deal with each component. The primary purpose is to teach athletes how to integrate cognitive and behavioural skills and to apply them to all situations perceived as stressful during the rehabilitation process. One of the easiest cognitive techniques to both teach and learn is thought stoppage, which effectively 'stops' self-defeating inner dialogue and turns it into self-enhancing inner dialogue.

4.2.5 Social Support

A final factor that can affect motivation during rehabilitation concerns the influence and support of other individuals. According to Rosenfeld et al. (1989), social support networks can influence stress levels in athlete and involve a unique set of contributions from coaches, teammates family and friends. While coaches and teammates provide technical support for athletes, they are generally not expected to provide as much emotional support as family and friends. Some contrasting evidence exists concerning the level of social support coaches and teammates can provide to athletes (Gordon & Lindgren, 1990); however, such contributions are exceptional and it is usually left to family and friends to provide empathy and emotional support.

Hardy and Crace (1991) have proposed eight distinguishable types of social support that injured athletes could benefit from during rehabilitation. They are as follows:

- Listening support – behaviours that indicate people are listening without giving advice or being judgemental.
- Emotional comfort – behaviours that comfort the individual and indicate people care about them.
- Emotional challenge – behaviours that challenge the individual to evaluate their attitudes, values and feelings.
- Task appreciation – behaviours that acknowledge individual efforts and express appreciation for the work that they do.
- Task challenge – behaviour that prompts, encourages and challenges the individual to do more and achieve more.
- Reality confirmation – behaviours by people with similar experiences, priorities, value and views that reassure the individual during times of stress or confusion and confirm perceptions and perspectives of the situation.
- Material assistance – behaviours that provide the individual with financial assistance, products or gifts.
- Personal assistance – behaviours that indicate a giving of time, skills, knowledge and/or expertise to help the individual accomplish tasks.

5.0 PSYCHOLOGICAL READINESS TO RETURN TO COMPETITION

Although closely related, physical readiness and psychological readiness to return to competition following injury are synonymous. Unfortunately, however, some health care professionals, coaches and athletes often assume that the latter follows 'naturally' from the former. In some cases this has led to heightened anxiety and fear and loss of confidence on the part of athletes, who subsequently perform poorly when they return to competition or re-injure themselves. In order to avoid a repeat of the injury and further loss of confidence in their performance, it is essential that injured athletes be fully consulted about their complete recovery and readiness to return to competition (Heil 1993).

Physical recovery from injury can be determined objectively from the physical signs and symptoms of healing, for example absence of pain, full range of motion, and a return to full strength of the injured body part. However, psychological recovery is a highly subjective phenomenon and ultimately rest with the perceived confidence of injured athletes in meeting the physical demands of full competition.

Although little empirical evidence supports the contention that 'confidence' is significant to the athlete when deciding to return to competition, researchers (e.g. Weiss & Troxell, 1986; Wiese & Weiss, 1987; Gordon & Lindgren, 1990; Rotella & Heyman, 1993) believe it is vital. The evidence suggests that athletes should only be allowed to return to competition when they themselves consider that they are both physically and mentally ready to do so.

6.0 CONCLUSION

The psychological aspects of sports injury include psychosocial factors related to injury occurrence, specific emotional and behavioural responses to injury, psychological principles used in rehabilitation programme and psychological readiness for return to competition. Although research into psychosocial predictors of injury has been criticized for adopting an atheoretical approach, some consistent relationships have emerged. Certain personal, historical and social variables appear to exert weak but reliable influences on the occurrence of injury, and psychologists are now expanding their investigations into the area of injury responses and rehabilitation.

Further research on the psychological readiness of injured athletes to return to competition is necessary, requiring both qualitative and quantitative methodology approaches. The common attitude that 'if the body is ready the mind is also' must continue to be challenged, as an athlete's anxiety and fear and lack of confidence must be addressed and alleviated before he/she returns to competition. This highlights the important role of the mental skill consultant as part of the coaching team who, together with athlete, can make more informed decisions on complete recovery and readiness to return to competition.

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