

Essentials of Sports Injury Prevention & Rehabilitation

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Lecture - 35

Psychological aspects of injury & Rehabilitation - Part 01

My client is a kabaddi player. He suffered an ankle injury during his practice. He is young and a very aggressive player of his team. When he started the rehabilitation program, he was adherent, but slowly there was a change in his approach and became more and more irregular to the program. Why is there a change in this approach? How do I address the change in his behavior? If you are such a person looking for answers for such questions, then you are at the right place.

Welcome to this module on NPTEL offered course on essentials of sports injury and rehabilitation. The module is on psychological aspects of injury and rehabilitation, and I am Wing Cdr. Dr. Chandrasekara Guru. I am a sports medicine physician, and an assistant professor in the field with the armed forces medical services.

So, I shall be covering the week 8 of this course on essentials of sports injury and rehabilitation. You will be learning during this module on various psychological models. What are the various psychological factors that aid in injury prevention? What are the different aspects that are important during rehabilitation and return to sport? What about various psychological interventions that can be done during the process of injury prevention and rehabilitation, and certain practical considerations? So we know that sports injuries have a wide spectrum. The sports injuries can happen with varied epidemiological features, with respect to professional athlete, with respect to a recreational athlete and with respect to leisure athletes or weekend warriors. There may be a change in the pattern between the gender of male or female, or also because of specific sports played and as per the participation rate.

So, these are various factors which determine the sports injury prevalence and incidence in athletes. Based on the type of sports injuries, it can have at both the extremes of minor impact or major impact. The minor impact may be a certain period of training loss, problems because of the physical injury, some quality of life issues, whereas if it is on the other side of the spectrum; if it is of major impact, it can cause a stop to the sports career. It can also prevent someone from participating in a crunch or an important competition, and it can also have financial implications. So such are the ramifications of sports injuries, which definitely have psychological impairment in addition to physical impairment.

So why psychological aspects? As we have discussed in previous modules, Colonel Anup Krishnan and Lt. Col Atul would have covered all these topics with respect to the sports injuries. However sports injuries, the motto of treatment and management of sports injury would be to provide rehabilitation in phases, and return at the earliest as early as possible to the return to sports of the athlete. In addition to that, you also need to have a comprehensive injury prevention program so that the injury does not occur. The psychological aspects play a major role in this entire process; starting from the prevention of injury, occurrence of an injury, various rehabilitation processes and phases as well as in subsequent return to sport, and long-term prevention in terms of the severity of the injury, and the loss of function; and this determines also the quality of life of that particular athlete who has sustained injury. It also has ramifications in terms of financial burden.

It may be directly on the individual or on the family, or on the Federation or the sporting organization. Career opportunities may be at stake starting from an individual who is representing an organization, or it can be a student athlete who is looking for more opportunities. There may be life stress events which also can have an impact on the entire process. Life stress events may vary starting from personal issues to professional issues to athletic issues and social issues. There will be a definite time of training depending on the type and severity of the injuries.

This also can have a major psychological impact more so is the social support. So, let us drill into various psychological models which have connected the factors that would be playing a major role in terms of all these aspects of sports injury and rehabilitation. So sports injury prevention and rehabilitation have various models that have been proposed in the literature. Few of them to quote are “stress and injury model”, “bio-psycho-social model of injury”. We have the integrated model of psychological response to sports injury and rehabilitation.

Various models with respect to the stage of the return to play models, as well as certain generic motivational models. Let us focus on certain models in detail which are of very important aspects with respect to sports injury and rehabilitation. The first one is the stress injury model. So in this model, what we see is that an individual's personality has been attributed to cause a certain type of stress response. The stress response probably may be because of the way the athlete applies about the situation and thinks over it.

It is called as cognitive appraisal, and which can in turn result in a physiological or an attentional change, which can in fact affect the performance of the individual, or can result in injury. In addition to the personality, they may also be life stress events just immediately before that particular sporting event. Life stress events as I discussed earlier, might be personal or can be academic or professional as well. And also, depending on the individual's coping resources based on the past experience, based on various techniques that the individual has learnt over a

period of time, the stress response can vary. So all these three can also have an interplay between these factors, and with such a scenario, exposure of an individual to a potentially stressful sporting situation like a current situation like you are facing a qualifier competition as an international athlete to Olympics.

So that is a potential stressful sports situation for an Olympian. So, that is important for that athlete to clear and qualify for the upcoming next Olympics. So that's just the kind of stressful situation that a sports event can itself become. In such a situation, with the interplay of these psychological factors, there may be that may result in occurrence of an injury. So what this model proposed is that intervening at this junction to modify the stress response can help in preventing the injury.

Thus, this predominantly is the model used for psychological interventions to prevent sports injury. Moving on to the next model, this model says that there are three different factors, namely: the biological factors which correspond to the tissue healing per se, and the various other physiological aspects that contribute to healing of that particular injury. The second factor is the psychological factor: psychological factors as you are aware pertains to the personality, the way the individual thinks the beliefs, various emotional responses the individual can have, and the behaviors these are all psychological factors. In addition it also there is a third domain of factors which contribute that is your social and contextual factors. This is the social support that the individual has during the particular situation. So accordingly, the model is named as bio psychosocial model. So what it says is that this particular model is mainly towards the injury rehabilitation process, not for the injury prevention in the injury rehabilitation process based on the injury characteristics and the socio-demographic aspects of that particular individual; the interplay between these two factors can have major effects on these three factors.

So, the injury characteristics would be the type the severity the location and the cost or the mechanism by which the injury has happened; whereas the socio-demographic factors would be the age per se of the individual, the gender may be male or female, the type of race and the ethnicity the individual is, and the socio-economic status of the individual. So these all on the cluster of socio-demographic factors, the interplay between these two factors can influence the biological factors, namely the tissue repair, the kind of metabolism that happens around the injured tissue, the sleep cycle of the individual, nutritional status can be affected as well as the immune function of the individual. So, biological factors pertains to all these aspects related to the injury healing or the tissue healing; they also can influence the psychological factors. The psychological factors here would mean the personality, the cognition (cognition is the thought the way you think it's cognition), then the emotion (the way you feel is called as the emotion), and then the behavior. Based on these two aspects, how you act the way you do, what you do that would be called the behavior. So these are the psychological factors, and also the injury characteristics and social demographics can influence the social factors as well social factors

would mean the support that you enjoy with your close ones, like your parents or your friends. The support from your coach, support from your administration, as well as from your fans; so that forms the social support. The situation contextual factors can also be determined by this two domains, as well as the environment. The rehab environment post injury; how the environment can support you in terms of getting back to sport, so these are various factors that can influence the outcome of the rehabilitation process. This also can affect the intermediate outcomes in terms of the various motor qualities, like the range of motion that determines the flexibility, the strength of the muscle, the endurance, cardiorespiratory fitness, and the joint laxity. So these all factors would collectively determine the rehabilitation outcome per se, and psychological factor can directly have a role in kind of addressing these outcomes in terms of quality of life. The rehab adherence of the individual, the treatment satisfaction of the athlete per se, as well as the functional outcome that you are looking at. So that's the way this particular model explains the interplay between the biological factors, the psychological factors and the social factors in determining the sports injury rehabilitation outcome.

Moving on with the third model; we will discuss this third model as the final one. This third model further amplifies the previous model was more concentrated towards the biological factors, the psychological factors, and the social factors. So it was not dwelling in detail about the psychological factors, whereas in this particular model they try to incorporate in detail about the psychological factors in addition to these other factors. Broadly, the model starts with the personal factors; personal factors include includes your personality, the social demographics pertaining to the individual, and we have adherence and other aspect, now the situational factors would mean to the kind of a sport specific level that the individual is playing, and the kind of social support that he gets or he or she gets, and the rehab environment of the situational factors. These both factors influence the way the individual things that is the cognitive operation, how the individual appraises about that particular situation, so that broadly depends upon the individual's own beliefs and past experiences, and various coping skills that he already possessed based on either past experience or based on some psychological counseling or some kind of learned techniques. So this determines the way how the individual feels about the situation, so that is called as the emotional response. The first step would be how appraise a situation, that is the process of thinking or thought process, then thereafter based on the thought process and the belief that the individual has, the individual feels the situation as emotional response. The emotional response may be anxiety, can be fear, it can be aggression, it can be frustration, it can be kind of optimistic a positive mindset. So, these are the various emotional responses one individual can feel, based on what you feel, you actually act or react to the situation, so that is what you call a behavioral response. So this can be kind of adherence to the treatment, so based on the positive aspect from the environment, from the way you feel that you will be coming back early to the sport, returning back early to sport, the way you behave towards the program changes, so this particular model explains you the answer for the first question; that I started in the first slide. That is, what determines the change in the behavior, so this is what these models gives you the answer for what are the factors that determine the change in the

behavior. So it is not a fixed static component, it is more dynamic, so it keeps on changing based on the changing situation changing various factors with respect to the personal factors or the situational factors, and the way the individual perceives and acts based on the appraisal of the situation. So, that determines the recovery outcome.

So let us focus on the psychological aspects with respect to injury prevention. In this particular session, wherein injury prevention model definitely as component in terms of the psychological factors, so the model you would have gone through this injury prevention model earlier in the various modules covered by the other faculty, so as for the models, psychological factor is also an important internal risk factor that contributes or predispose the individual or the athlete to injury. So that's the initial stage when presence of certain psychological factor predisposes an athlete to sustain injury. With exposure of these situational factor, that is the sports specific situational factor. So the stress injury model, we just saw that which is proposed by Brewer, which says that the psychological factors broadly are divided into personality factors, life stress factors and the coping resources. So, it is important to target all these three domains of psychological factors if you want to prevent injury. Incorporating the psychological aspects, in fact various research studies have proven that with psychological intervention, there has been an increase in the prevention of certain injuries, and this shows the importance of psychological or handling the psychological aspects during the injury prevention program process per se. So, let's say a well in detail, like using the stress injury model let me explain this using this. We've seen that personality, the life stress and the coping resources have kind of interplay between among them, and the influence the way the individual responds to a stressful situations, the stress response. So the stress response initially involves the way how you perceive the situation, and then in response to the perception or the appraisal of the situation, your body acts accordingly. So, it may be in the form of emotional response, or it may be in the form of a behavioral response, but then this also can affect your performance aspect. So, when exposed to such a critical sports situation, these kind of stress response can cause injury, and we focus on preventing this injury using this model. So let's see the different factors that are under these three domains. Let's focus on the personality: personality factors has certain characteristics like type; your personality where the individual is aggressive hard-driven, and then is more into perfection and it's very kind of impatient in terms of achieving the goals, this is attribute of type A personality, in such individual the stress response will be different. So, they tend to have more chances of injury. The other factors are those who have competitive trait, you know anxiety features you all must be aware about the two different types of anxiety: the trait anxiety, and state accident. What do you mean by that trait anxiety, is because by birth or by naturally the individual has certain traits we call them as traits, so because of the innate trait personality, and the kind of development of the nervous system, the individual has anxiety to competition whenever exposed to a competitive condition. So, that's termed as competitive trait anxiety, whereas state is defined based on the situation, the type of response the individual has, the anxious response it is only present when the individual is exposed to certain situation, so that determines each state. So this is where you can address, you can modify or train the individual

to face the situation, but then your their response is more innate; so generally they have predominant response in this group of people. So these type of people who have competitive trait anxiety, also those who have a negative mindset, you will find a situation you know progressing in different outcome based on the mindset as well say for example you are trying to go to office on time; before going to office you been looked after, you get ready, you find your things in place you get ready for the office, and then you move with a smiley face you know seeing of your friends are you seeing of your wife or your husband or your parents and then you leave for the office. So the outcome there at the office might be very pleasant and you would be able to feel a cheerful mode in your office. There is imagine in a situation where you start the day with you know kind of lethargic mode, you don't want to go to office so-called the 'Monday blues' you can see and you're not slept well the previous night, you are in a kind of irritable mode you couldn't find your watch to wear, you're looking for it and then you have a altercation with your spouse, and you leave to office in a negative mode and you miss your bus and further you take a cab and then reach the office, where you are delayed and then you gets told by your boss and the colleagues; so that creates a kind of a different outcome. So it's the same you, but it's the mind space, the negative mind state actually determine the outcome. So these type of negative mind states like anger, mood disturbances can also affect the stress response and can cause injury. So, these are the type of factors that one need to understand with respect to the personality factors.

What about the life stress events. Let's dwell in detail; the life stress events probably would be social, personal, academic, can be financial, can be athletic related or it can be professional. Let's say example of social, say you're a very famous sports celebrity and you have huge fan followers in your Instagram or your social account, okay so you have millions of followers; you make a frivolous remark and then you suddenly see the next day when you get up some 10 thousands of followers have kind of moved away or unfollowed you from your social media. So that sometimes also creates a kind of stress in you, the way you see at that event. So, that's one of the example that you can quote as a social kind of life stress, even that can happen in other terms in pertaining to the playing scenario; you can say that your coach was always very supportive to you finds after a certain event that you are not very keen in kind of learning, and then he is not supporting you in certain kind of tasks. That itself creates a kind of stressful situation in terms of the social support that you gain from your coach, so that's the life stress event. So the life stress as a broad category it can range from minor event to a major event, but then it is how the individual appraise the situation, so totally this individualistic. If it is a young athlete a student athlete, obviously for him coach not kind of displaying the same kind of rewarding and affectionate approach would have a major kind of impact on the student athlete, so has the kind of impact that can happen depending on the individuals appraisal of the situation. A family related a personal life stress even maybe a breakup in the romantic relationship, it can be as huge as kind of losing a close one in an accident that can have an impact on your psychological, the way you appraise the situation. So these are various life stress events.

Then, the third one is the coping resources: coping resources, is need to handle a situation so the coping resources would mean would be kind of based on the past experiences, if I am a seasoned athlete an international level athlete obviously even though I have competitive anxiety since I have the whole experience of participating in competition, I can manage I know already with the past experiences how to handle the situation I know that it is like kind of short term and I would have already learned certain techniques to control them to focus on what is required at that point of time. So that's called as the stress management techniques. So those things you would have already learned, this forms the broad umbrella terms of coping resources, so the interplay of these three can determine your stress response. So the intervention or the psychological intervention that needs to focus is to address this stress response, if you are able to address the stress response using any of the psychological intervention, you can prevent the occurrence of the injury.

So, let's discuss this model: it's more of a theoretical model, but then we can apply it to our clinical and you know day-to-day sports practice as well. So let's see with the example of a case scenario. Let me read out for you, "Ankita is a gymnast from Delhi, she used to get anxious before the competition as an athlete recently shared experienced a bitter breakup of a romantic relationship, she is competing in a national qualifier against fierce competitors in Chennai where she had never been before, so this time around her father who used to be an hardened supporter could not turn up because of some official commitment to this particular competition. She deeply thinks about the importance and the magnitude of this competition, and was feeling completely stressed out, she could not sleep well the previous night. During the competition her heart rate was so high and she had the palms so sweaty and she was feeling tightness of the entire muscles of a body during the performance of over vault, she became very nervous and landed on the outer aspect of her left leg and resulted in a grade 2 ankle sprain." So this is the situation; analyze this particular situation based on the stress injury model which we discussed just now. So let's analyze this case so, Ankita is a 17 year old gymnast, so this gives you a clue that she is a young athlete, and she is a female so this is the personality or the social demographic character, she is a young individual and she is female she used to get anxious before the competition as an athlete, so this gives an idea that she she may or may not have but she definitely has some competitive anxiety; that's why she used to get anxious before the competition, so that's one of her personality factor attributing to psychological aspect, and recently she had a bitter breakup with a boyfriend, so this gives a clue that she had a life stress event in the recent past wherein there was a breakup in the romantic relationship, and now cognitive response is that the individual now is attending to a qualifier in a new place Chennai, where she has never been before; second thing is her father, who used to be always be with her during the matches could not accompany because of some official commitment. So the father could not attend, so there is lack of social support, this is the cognitive response so in such a scenario what she does the stress response that she had is that the cognitive appraisal is that she becomes worried about the competition per se, thinking about the importance in the magnitude of the competition where she has to definitely been to get qualified for the Nationals, so this

creates kind of worry and fear in a cognitive appraisal pathway, and she also because of this cognitive appraisal she has certain physiological response, so they say that a sleep was disturbed the previous night because of this overthinking, she couldn't sleep well. We all know that a proper seven to eight hours sleep in quantity and a good quality sleep is required for you to have good reaction time for good balance and motor performance. So the previous day of the important competition she wouldn't sleep well, I agree certain type of or certain amount of stress will be there which would affect the sleep, but then improper irregular sleep will definitely have a motor performance so she has because of the cognitive you know operation she have had physiological response in terms of sleep disturbance, and because of the competitive anxiety that she has that has increased the sympathetic drive resulting in increasing in the heart rate, in the muscle tension and sweating peripheries, so these are all the physiological motor responses that has happened because relative anxiety has got converted into somatic kind of manifestation, wherein the various organ systems are targeted. The stressful situation here would be the qualifier, so it's an important match where she has to compete and qualify for the Nationals so that creates, that becomes an potential stressful sports situation moreover, she also found that her competitors were equally good and they were in fact better than her so the face competition also adds on to the stressful situation; however because of the lack of proper attention during the motor performance probably because of poor sleep, probably because she was not in a positive frame of mind, probably she didn't have proper social support, that she landed up on her outer aspect of the foot and injured the left leg. So that's how you kind of fit in various factors in a stress injury prevention model, so very psychological interventions that have been you know used in literature for injury prevention are, cognitive behavior therapy.

Cognitive behavior therapy is generally given by trained psychologists wherein they try to target the way you think, so it's basically restructuring of the cognitive pathway so that you think in a different way, that includes various sessions for the psychologist to note, address and train certain cognitive appraisal techniques. Actually the second one is the mindful technique; mindfulness is a process by which you pay attention to each and every detail, so that your attention and focus improves during the process. Imagery is a kind of a simulation technique where you try to simulate all the, assimilate or recreate the situation closing your eyes in kind of invigorating all the type of senses that is involved in performance of the task on ground, so that is kind of a more of a simulation technique where you go into each and every detail more vividly. So that is also shown to reduce the kind of or modify the kind of stress response that one can have. Stress management techniques which I earlier mentioned are a group of techniques to address the anxiety symptoms that the individual processes. You also have various muscle relaxation techniques so earlier I said that the way you think and result in you know tight muscles and all. So if you it's also shown that when you relax your tight muscles that also can influence in allowing your anxiety levels so thereby your attention to a task will improve so that you don't get distracted by the peripheral distractors and another important aspect is the attention training itself more of a mindfulness and the way you pay attention to the task which is at hand and also in the meanwhile I have some divided attention whenever it is required and shift the

attention as and when that is necessary self-talk is again an important intervention that coaches follow on ground, wherein you would have seen in various important matches where individuals speaking to themselves it's a better way they say that before going to the venue or the arena, you speak to yourself in front of the mirror, you boost yourself with positive aspects keywords thereby you boost your mindset as such and you venture there with full of energy and enthusiasm. So, that's one of the method that you commonly see in most of the on-ground practices of psychological intervention, and obviously an important aspect here is the improving the social support, so improving social support in terms of from the coaches from the colleagues from the audience that also boosts up the morale of the individual at that particular point of time while facing the situation. So the research study research studies have proven that a preventive psychological intervention should focus more on the cognitive aspect and the timing generally should vary from one to six sessions, and each session should last at least up to 60 minutes, so that you find the individual's exact requirement, and address the issue and carried over seven to twelve weeks, and these are generally incorporated as part of their micro cycle, and they're found to reduce injuries and also to decrease the time loss from training as well because of injuries.

So, let's see another case scenario so Mr. Nilesh Patil is a decathlon athlete, and he's very dedicated and disciplined. Recently he did not fare well in his college exams, his parents were furious on that, and they were worried that he didn't fare well in the exam; however he also has all India university games to qualify. Obviously naturally it's there, he seems worried about sparing more time for sports practice and qualifying for the games, and he also has history of previous injury to his time during sprint, so if the question arises is what psychological steps will you take as a trainer to prevent injury considering the dilemma he is presently facing. So let's analyze this: he has personal factor of a strong proven factor of previous history of injury, is there he definitely has an academic life stress situation, college exams are there for which his parents are kind of worried, so obviously he has low support from his parents for the concentration towards the games. That's a social factor; university games is the potential you know sports specific situational stressful situation, and he's a type-A personality, that's why he's been able to be dedicated and disciplined, able to manage both games as well as studies. The cognitive appraisal part is that the individual is worried that whether you will be able to spend time for adequate practice and qualifying the games. The intervention that would suit here as per me would be social support; obviously you will have to speak with their parents you know make them understand or probably if they can also kind of give some support, also speak with the athlete so that you can give some amount of time towards his academics as well, and give a motivational advice as a coach to the individual so that you get boost up. Goal setting is important here, another important psychological intervention that i would undertake wherein take the entire goal into small minor milestones and then give them as part of goal setting and that could be achieved over a period of time. Cognitive behavior therapy; if you have a psychologist support where cognitive behavior therapy can be instituted in this individual and

also teach some muscle relaxation technique to improve the coping resources; probably a progressive muscle relaxation on a brief control technique can be taught in this case.

So, to summarize this; we saw what are the reason sports injury and rehabilitation for the various psychological aspects to be considered, we saw about various psychological models, we dealt in detail with the stress injury model, the bio psycho and social model. We saw how the integrated model uh you know kind of integrated the personal factors the social factors and the key psychological factors of cognitive appraisal the emotional response and the behavior response. We also dealt in brief about the various psychological aspects in terms of injury prevention with certain case scenarios and applied the stress injury model in this case, and we briefly went through certain psychological interventions that are commonly used to prevent injuries. So, for those of you who are interested in in-depth learning, you can refer to these resources in your leisure time. Thank you.