

Opinion

The science of enduring pain. What can athletes and chronic pain patients learn from each other?

Michael G Serpell*

Department of Anaesthesia, Queen Elizabeth University Hospital, Glasgow, UK

“It isn’t the mountains ahead to climb that wear you out; it’s the pebble in your shoe.” Muhammad Ali

What mind strategies can an endurance athlete use to get their body that bit further or faster, to be a finisher? At “top-level” sport, some say it’s all in the mind!! When we push ourselves to the limit, we experience adversity. How and if we overcome that, will define us, and our achievements.

“Adversity causes some men to break; others to break records.” William A. Ward (Inspirational Writer)

Pain is not only a physical experience, it is an emotional one as well. This is encapsulated in the very definition of pain by the International Association for the Study of Pain [1].

Pain

An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. The structures within the brain that process pain are also involved in the processing of emotions such as fear, anxiety and depression. Therefore it is entirely logical that pain and emotions will interrelate with, and affect each other [2]. There are well established facts about pain processing. Pain Threshold (the point at which pain is felt) varies slightly due to genetics and demographics such as sex, age and obesity. However it is fairly standard amongst all of us. Pain Tolerance (the maximum level of pain that a person is able to tolerate) is different. It varies widely amongst individuals, and can also vary within the same individual on a day to day basis. Pain tolerance is affected by mood, the weather, sleep deprivation, context (beliefs and expectations), cognition (distraction, hypervigilance etc), culture, ethnicity, to name just a few!![3]. Unsurprisingly then, this is where the psychological make-up of the pain patient or athlete, and therefore the use of psychology techniques can make a big difference to the endurance of pain. It has been clearly demonstrated, by a systematic review of all the scientific literature, that athletes have a higher Tolerance of

More Information

Submitted: 01 July 2019

Approved: 10 July 2019

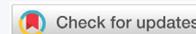
Published: 11 July 2019

How to cite this article: Serpell MG. The science of enduring pain. What can athletes and chronic pain patients learn from each other? *J Sports Med Ther.* 2019; 4: 043-045.

DOI: 10.29328/journal.jsmt.1001041

Copyright: © 2019 Serpell MG. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

ISSN: 2573-1726



experimentally induced pain (but the same Pain Threshold) than non-athletes [4]. The exact mechanism for this however, still remains unclear.

A study which interviewed 9 former successful Olympic cyclists about their strategies for coping with pain concluded with six statements [5].

- 1) The degree of pain was purely a perception
- 2) Pain varied depending upon the satisfaction the athlete received from the experience when all physiological variables were held constant
- 3) Cognitive skills such as goal setting, imagery, and positive self-talk were routinely used
- 4) The mind and body were viewed as a dualism when performing
- 5) Pain was a positive experience and part of sport and an individual’s identity
- 6) Riding in a position of control tended to lessen the perception of pain.

A myriad of cognitive strategies were used to cope with pain while training and competing, and interestingly all of them attended to the pain rather than attempting to ignore it. Another study analysed the coping strategies used by 12 Olympic champions from a mix of sports [6]. They summarised the general stressor and modes of coping as seen in figure 1. Their two bottom line conclusions were as follows;

- 1) Pre-race anxiety is normal, simply because sport performance is by its very nature uncertain. Try to change that feeling into a positive one of excitement!

*Address for Correspondence: Michael G Serpell, Department of Anaesthesia, Queen Elizabeth University Hospital, Glasgow, UK, Tel: +07931465412; Email: mgserpell@cheerful.com

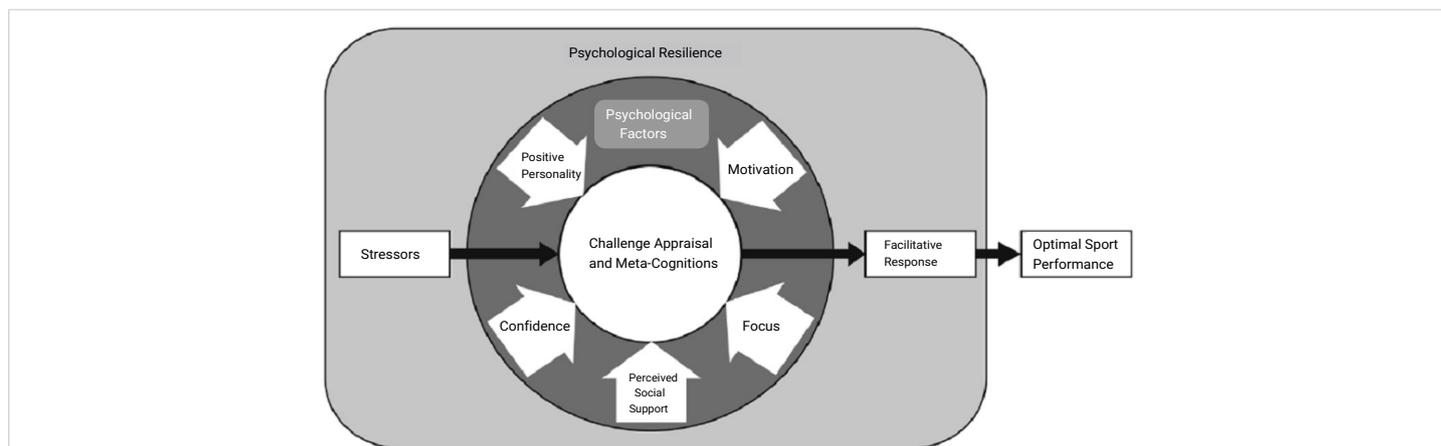


Figure 1: A grounded theory of psychological resilience and optimal sport performance.

2) All athletes will feel fatigue, but successful ones feel fatigue and happiness simultaneously. The ones who do not cope so well tend to feel fatigue, depression and anger at the same time, all negative emotions.

So the common theme from these two studies is that it is best to make the pain experience positive and to have some control over it.

This process requires Emotional Control, which is the ability to turn negative feelings into positive ones. The good news is that with practice, it can be developed. You can not turn a cart-horse into a race-horse simply by using psychological techniques, but they can make both go faster. Psychological preparation is best done on a background of tough physical training which will invoke the feelings of fatigue that you will experience on race day. What psychological techniques can be used? There has been extensive research in the field of chronic pain about coping strategies. There are many, and the trimodal system of pain management classifies coping strategies in to three groups [7].

- a) Cognitive (involving thoughts, private events etc)
- b) Behavioral (involving actions, behaviors etc)
- c) Physical (involving body relaxation, breathing etc).

Each of these categories can be further sub-divided. For a more detailed account, I recommend you to read the original paper [7]. All of these can be used for pain management, there is no single best technique. Often the best technique is what works for you, the one that suits you and your capabilities. However the real answer probably lies in being able to use several techniques. One study of coping strategies used by athletes compared to non-athletes, revealed that athletes used more coping strategies. In particular, it was also noted that endurance athletes used more strategies than sprint athletes. This ability allows you to change to another strategy when one is not working, or when you become fatigued using it. Researchers from Wolverhampton have studied endurance

athletes from several disciplines and have recommended the following coping techniques [8].

Visualisation

Become familiar with your Competitive Environment. Take time out to relax and immerse your-self. In short episodes of up to a minute, visualise what it looks like, sounds like, smells like, ultimately what it feels like. Imagine what success feels like. Also imagine episodes of adversity, what you feel like, and how you would cope. Design solutions for the problems you might face during the different phases of the race.

Self-talk

Rehearse scripts you may need to use during a race. For example, if your legs are tired and you are feeling fatigued, don't say "my legs are done, I need to stop". Be positive and constructive. Say "my legs are feeling tired, so I will concentrate on my technique to make it more efficient". You can focus your efforts inward (associative) to be more efficient (concentrate on breathing, rhythm and pace for example). You can also use distraction (dissociative) to distance yourself from the feeling of fatigue. Practice these techniques regularly, design training days which push you physically and mentally to your limit. Practice them on "bad" days, when you will need them most. Practice them in as many aspects of your daily life as possible. It should become a way of thinking, a way of living!

I'll finish with some words from arguably the world's greatest ever athlete.

"Champions aren't made in the gyms. Champions are made from something they have deep inside them-a desire, a dream, a vision."-Muhammad Ali

References

1. Definition of pain. <http://www.iasp-pain.org/Taxonomy> accessed 8/5/2019
2. Tracy I. British Journal of Anaesthesia 2008; 101: 32-39.



3. Wall and Melzack's Textbook of Pain, 6th Edition. Elsevier
4. Tesarz J, Schuster AK, Hartmann M, Gerhardt A, Eich W. Pain perception in athletes compared to normally active controls: Pain. 2012; 153: 1253-1262. **PubMed**: <https://www.ncbi.nlm.nih.gov/pubmed/22607985>
5. Kress JL. A Naturalistic Investigation of Former Olympic Cyclists' Cognitive Strategies for Coping with Exertion Pain during Performance. Journal of Sport Behavior. 2007; 30: 428-452.
6. Fletcher D, Sarkar M. A grounded theory of psychological resilience in Olympic champions. Psychology of Sport and Exercise. 2012; 13: 669-678.
7. Fernandez E. A Classification System of Cognitive Coping Strategies for Pain. Pain. 1986; 26:141-51. **PubMed**: <https://www.ncbi.nlm.nih.gov/pubmed/3531980>
8. Sports Psychology: endurance training. <http://www.pponline.co.uk/encyc/sports-psychology-endurance-training>