

# Perception of Health Problems Among Competitive Runners

## A Qualitative Study of Cognitive Appraisals and Behavioral Responses

Sara Jelvegård,\* BS, Toomas Timpka,\*<sup>†</sup>§ MD, PhD, Victor Bargoria,\*<sup>‡</sup> MD, Håkan Gauffin,\* MD, PhD, and Jenny Jacobsson,\*<sup>†</sup> PT, PhD

*Investigation performed at the Athletics Research Center, Linköping University, Linköping, Sweden*

**Background:** Approximately 2 of every 3 competitive runners sustain at least 1 health problem each season. Most of these problems are nontraumatic injuries with gradual onset. The main known risk indicator for sustaining a new running-related injury episode is a history of a previous injury, suggesting that behavioral habits are part of the causal mechanisms.

**Purpose:** Identification of elements associated with purposeful interpretations of body perceptions and balanced behavioral responses may supply vital information for prevention of health problems in runners. This study set out to explore competitive runners' cognitive appraisals of perceived symptoms on injury and illness and how these appraisals are transformed into behavior.

**Study Design:** Cross-sectional study; Level of evidence, 3.

**Methods:** The study population consisted of Swedish middle- and long-distance runners from the national top 15 list. Qualitative research methods were used to categorize interview data and perform a thematic analysis. The categories resulting from the analysis were used to construct an explanatory model.

**Results:** Saturation of the thematic classification required that data from 8 male and 6 female runners (age range, 20-36 years) were collected. Symptoms interpreted to be caused by illness or injury with a sudden onset were found to lead to immediate action and changes to training and competition programs (activity pacing). In contrast, perceptions interpreted to be due to injuries with gradual onset led to varied behavioral reactions. These behavioral responses were planned with regard to short-term consequences and were characterized by indifference and neglect of long-term implications, consistent with an overactivity behavioral pattern. The latter pattern was consistent with a psychological adaptation to stimuli that is presented progressively to the athlete.

**Conclusion:** Competitive runners appraise whether a health problem requires immediate withdrawal from training based on whether the problem is interpreted as an illness and/or has a sudden onset. The ensuing behaviors follow 2 distinct patterns that can be termed "activity pacing" and "overactivity."

**Keywords:** competitive runners; lay health beliefs; qualitative research; behavioral change; prevention

§Address correspondence to Toomas Timpka, MD, PhD, Department of Medical and Health Sciences, Linköping University, SE-581 83 Linköping, Sweden (email: toomas.timpka@liu.se).

\*Athletics Research Center, Linköping University, Linköping, Sweden.

†Swedish Athletics Association, Stockholm, Sweden.

‡Department of Orthopaedics and Rehabilitation, Moi University, Eldoret, Kenya.

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Track and field (athletics) is a popular individual sport worldwide. However, numerous studies have shown that track and field athletes are heavily burdened by injuries and that most of these injuries occur as a consequence of sports overuse.<sup>6,7,13</sup> Middle- and long-distance running is 1 of 5 event groups in track and field and probably the event group that has increased most in popularity during recent decades.<sup>20</sup> Recent systematic reviews have reported that the main risk indicator for running-related injury is a history of previous injury,<sup>8,18,22</sup> suggesting that habits and overuse contribute to the set of causative factors. While the causal mechanisms leading to traumatic sports injuries are relatively well known, the corresponding mechanisms for overuse injuries have been less studied in sports. General

risk indicators for overuse injuries include the habits and methods of practicing the sport and the psychological characteristics of the athlete.<sup>2,5,10,21</sup> Interestingly, a recent study of risk indicators for overuse injury among track and field athletes extended to include their psychological profiles revealed that a training load index was displaced by a psychological measure reflecting the use of negative thinking as a component of coping behavior.<sup>14</sup> In other words, what seemed to matter in overuse injury causation was not the athletic load per se but the load applied in situations when the athlete's body was in need of rest and restoration. This observation suggests that factors associated with purposeful interpretations of body perceptions and balanced behavioral responses warrant further investigation if the causes of health problems among runners are to be properly understood. By "balance response," we mean a behavioral response that minimizes the risk for damaging long-term consequences while not negatively influencing the fulfilment of the athlete's other goals with participation in sports. The aim of this qualitative study was to outline competitive middle- and long-distance runners' cognitive appraisals of perceived symptoms on injury and illness and how these interpretations are transformed into behavior.

## METHODS

The study was based on a qualitative research design using semistructured interviews for data collection. Qualitative research is performed to reveal a target group's range of behavior and the perceptions that drive specific behaviors with reference to defined topics or issues. It is a broad methodological approach that encompasses several methods for data collection and analysis, with the common approach being the use of in-depth studies of small numbers of individuals. This study employed a thematic analysis approach,<sup>3</sup> and reporting followed the recommendations for qualitative studies based on interview data communicated in the COREQ (Consolidated Criteria for Reporting Qualitative Research) protocol.<sup>19</sup>

### Ethical Considerations

This study was performed as an undergraduate student project at Linköping University, Sweden. According to Swedish legislation, undergraduate student projects are not subject to formal review by research ethics boards.<sup>9</sup> The project was approved by the undergraduate student project committee at the medical faculty of Linköping University and was planned and conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki (6th revision, 2008). Informed consent was obtained in writing before interview participation, which was completely voluntary. All study data were handled without breaching the integrity of individual athletes.

### Study Population

The primary study sample (N = 20) comprised adult middle- and long-distance runners competing at distances from 1500 m to marathon and ultramarathon; all athletes were

TABLE 1  
Six-Step Method Used for Thematic Analysis  
of the Interview Data

- 
1. Familiarization with data
  2. Initial codes were generated
  3. Searching for themes
  4. Reviewing themes
  5. Defining and naming themes
  6. Producing the report
- 

enrolled in a "dual career" program at a Swedish university. The inclusion criteria for the study were that the athlete had been ranked at the national top 15 list in their event the preceding year and that he or she was training at the campus (and not studying or competing abroad) at the time of the study. The head track and field coaches involved with the program were asked to list 20 athletes who fulfilled the selection criteria. The saturation principle was used, and athletes were approached for interviews from the list as long as new phenomena appeared in the collected data. The eligible athletes were approached using an informed consent procedure whereby the athletes were informed about the study and asked both orally and in writing about their willingness to participate. All approached athletes accepted to participate in the study.

### Data Collection

Semistructured interviews were used for data collection among the middle- and long-distance runners. An interview guide was used as a basis for the interviews. In addition to the main reasons for the study, there was scope for the interviewee to talk freely and for the interviewer to ask follow-up questions. The athletes were asked to think about the 3 most recent injury or illness episodes that resulted in a change in their workout and competition plan and then to talk about the shortest and the longest episodes. No formal diagnosis of the health problem was included in the analysis. The athletes were told to describe these 2 episodes in detail, how they started, their reaction and thoughts about the pain or bodily sensations, the injury process, actions taken resulting in improvement, and whether there were any actions resulting in degradation of the injury. Although the interviews were semistructured, the athletes were encouraged to talk freely. Follow-up questions were only asked by the interviewer when indicated by the interview guide. The interviews were documented using hand-written notes and supplementary audio recordings. The interviews were then transcribed verbatim.

### Data Analysis

A thematic analysis was conducted to generate understanding of how track and field athletes reason with injury and illness, according to the 6-phase model described by Braun and Clarke<sup>3</sup> (Table 1).

When familiarizing with the data, the transcribed interviews were read through repeatedly. The data were compiled using the study aims as a guide. The most significant parts of the informants' manifest statements were

TABLE 2  
Overview of Health Problems Reported

|  |
|--|
| Illnesses  |
| Common cold  |
| Iron deficiency  |
| Injuries   |
| Stress fracture  |
| Shin splints   |
| Runner's knee  |
| Other knee injuries/pain                                 |
| Achilles tendinitis                                      |
| Plantar fasciitis  |
| Traumatic ankle injury                                   |
| Hamstring muscle strain                                  |
| Hip overexertion   |
| Calf overexertion injury                                 |
| Foot overload injury (ankle, plantar fascia, toe joints) |
| Overtraining fatigue                                     |
| Nerve pain (leg)   |

identified and sorted into categories. The data were also condensed, whereby individual responses were shortened to identify the most central parts. Meaning units were defined in the sorted data as sentences containing aspects of relevance for the aim of the study through their content and context. The meaning units were then coded by assigning them 1 or 2 keywords that highlighted their essence. The codes could be abstract or concrete and were used to facilitate understanding and to compare meaning units denoting alternative interpretations of a phenomenon. The codes were then interconnected by themes, which included several coded meaning units. The themes were identified at a semantic level rather than a latent level. After reviewing the themes again and changing some of them, the themes were named using an explanatory word or sentence.

For the next part of the analysis, the researchers (all with backgrounds in sports medicine or physical therapy) searched the literature for theories that could help structure the final part of the data analyses. Theoretical concepts were introduced to identify associations between elements of the athletes' perceptions, cognitive processes, and behavior. Finally, the preliminary results from the analyses were presented for a subset of participants, comments were documented, and revisions made according to the comments. The final results were presented as competitive middle- and long-distance runners' interpretations of perceived symptoms on injury and illness and how these interpretations are transformed into behavior.

## RESULTS

Data from 14 athletes (8 men, 6 women) aged 20 to 36 years were collected before saturation was reached. The reported health problems represented a wide variety of injuries and illnesses that caused an absence from sports ranging from 2 days to 18 months (Table 2). During the initial familiarization with the data, it was found that the athletes expressed that they had 2 choices when recognizing a health problem: to act immediately (change their running schedule) or to continue as planned. In the ensuing analyses, this

choice was represented in terms of the cognitive appraisals made by the athletes when they tried to explain this choice to themselves and the emotional responses reported.

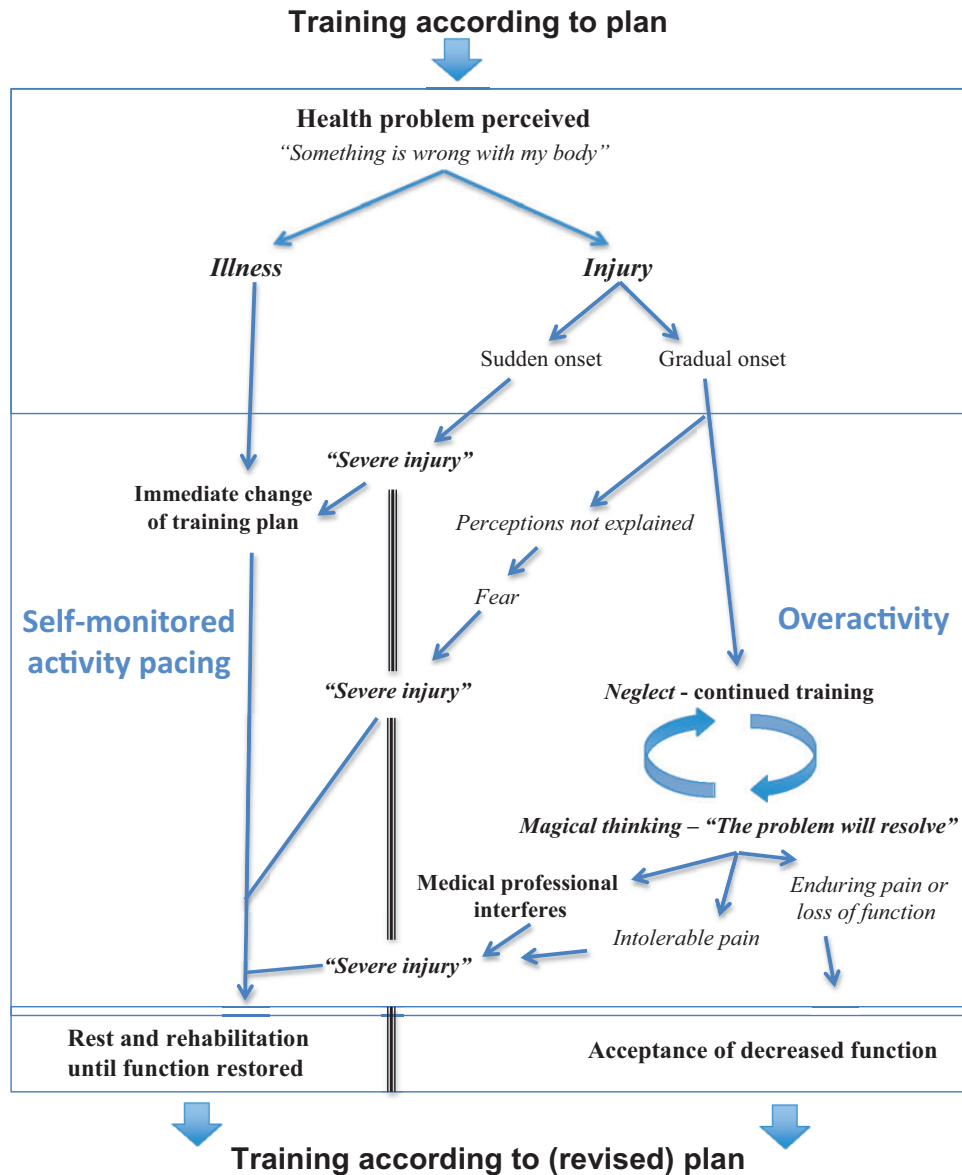
## Runners' Appraisals of Health Problems

The competitive runners spent long hours every week on their sport. In consequence, any health problem forcing them to abstain from training was a significant life event. One runner explained: "When an injury [or illness] strikes you, it also affects other things, for instance mood, because running is such a [central] part of your life." Accordingly, a personal everyday routine could be discerned that essentially underpinned runners' accounts of their health behaviors. This routine was initiated when training as usual was interrupted by perception of an unexpected bodily sensation. After having interpreted the sensation, the athlete faced the possibility of having to act.

At the highest level of thought, the athletes' interpretations of the new bodily sensation were found to differ based on whether the health problem was judged to be an illness or an injury. Several runners provided direct comparisons between their behaviors in association with illnesses and injuries. One runner described her self-management of symptoms on infection: "I would say I think differently when injured and ill. When I am ill, I am a coward. Well, coward is maybe the wrong word, but I act rather cowardly with regard to workouts. I prefer to wait and rest an extra day before starting to exercise. But when I am injured I go on anyway. I guess it is because you were warned when you were young about pericarditis and such stuff, and I suspect that the caution [with regard to illness] comes from that." In consequence, the competitive middle- and long-distance runners' interpretations of perceived symptoms are divided with regard to whether the health problem is interpreted as an illness or injury. While the behaviors associated with illness were uniform, the responses to injury symptoms showed a more complex pattern. The reasoning and behaviors associated with perceptions of health problems among runners are further illustrated in Figure 1 and the supplementary materials (see the Appendix).

## Self-Monitored Activity Pacing

When taking action on a perceived bodily symptom, the athlete changed their running schedule, reduced training load, changed to alternative training, or completely refrained from exercise. When the health problem was interpreted as an illness, the athletes changed their training immediately. This behavior is labeled *self-monitored activity pacing*. The justification provided for this behavior was that the runners believed that there was firm evidence that training when ill leads to negative consequences. In other words, when the athlete realized that an illness was developing, they seemed to be convinced that allowing the body to rest from running to recuperate was the best response. However, activity pacing could also be used early on when the health problem was interpreted as an injury, but then followed more complex reasoning. For instance, immediate training adjustments were made when the



**Figure 1.** Overview of competitive runners' appraisals and behaviors related to health problems.

indication of injury had a sudden onset and when a gradually developing indication could not be explained by previous experiences and caused fear of a severe injury.

### Overactivity

In situations when the athlete continued to run, the unexpected bodily sensation had not been further appraised and thereby fearful thoughts were avoided or had been explained with reasons compatible with the idea that rest was not necessary. When repeated habitually, this conduct can be termed *overactivity*. Examples of high-level thought patterns associated with overactivity were neglect ("This sensation does not indicate a health problem") and magical thinking ("The pain will go away by itself even though I continue running"). Arguments used to defend overactivity

included not knowing the cause of the bodily sensation and thus not being able to address the underlying problem, important competitions coming up, and not wanting to lose good running conditions. Noticeably, overactivity was observed only after the runner had interpreted the health problem as an injury with gradual onset. Eventually, however, athletes displaying overactivity behaviors were forced to abstain from running. Typical motives for the decision to change schedule at a later stage were that pain had increased to an intolerable level or strong recommendations were received from medical professionals or coaches.

### DISCUSSION

This qualitative study set out to outline competitive middle- and long-distance runners' interpretations of symptoms of

injury and illness and how these perceptions are transformed into behavior. The results display patterns in the athletes' cognitive appraisals associated with the decision to continue training according to plan or to make changes. When experiencing illnesses or perceiving injury symptoms with sudden onset, the interpretations and behaviors were uniform: The immediate action was to rest and enter a rehabilitation process. When returning to the normal training program after a confirmed injury or illness, the behaviors were unvarying and reflected conservative conduct. This careful behavior is referred to as *self-monitored activity pacing*. However, when the perceptions indicated development of a gradual-onset injury, a variety of delayed behaviors were observed, with emotional responses to the perception playing an important discriminating role. These behaviors were characterized by an overactivity pattern.

The behavioral responses to the perceptions that "something is wrong with my body" were thus preceded by more or less discernible categories of cognitive appraisals among runners. Most previous qualitative studies of how athletes experience sports injuries have investigated athletes after injuries have been confirmed and after the ensuing rehabilitation process (return to play).<sup>16,17</sup> This implies that the stage at which the athlete decides whether he or she has a health problem or not has been left out. A recent phased model of athletes' psychosocial responses to injury suggests that such postinjury appraisals are initially associated with negative emotions.<sup>4</sup> After diagnosis, the appraisals change to a reaction-to-rehabilitation phase, in which athletes experience mixed appraisals and report frustration as the predominant emotional response. When returning to sport, athletes reflect on the lessons learned while they simultaneously deal with doubts related to their ability to return to play. This phased model corresponds, in the main, with our observations of the self-monitored activity pacing pattern (ie, with the appraisals and responses after the bodily perception had been explained as an illness or sudden-onset injury). However, the phased model differs meaningfully from our observations associated with gradual onset injuries. This difference can be explained using the affective adaptation model by Wilson and Gilbert,<sup>23</sup> which describes how people respond to self-relevant, unexplained events. According to this model, affective responses to perceptions are weakened after repeated exposures. Such adaptation processes can explain the situation when runners experience a gradually developing bodily sensation; it is initially an unexplained event, but if the runner succeeds in temporarily explaining the sensation, it will progressively generate weaker affective reactions and gain decreased attention. Such adaptation could thus explain why athletes continue training when experiencing a new sensation that conceivably indicates bodily harm even when the factual level of pain or discomfort slowly increases.

We thus found that overactivity constituted an important type of response to perceptions indicative of gradual-onset injuries among runners. One possible explanation of this observation is that myths and different forms of magical thinking are prevalent among competitive runners ("You can 'run through' tendinitis") that are not supported by scientific evidence. These myths can greatly affect the behavior of athletes in association with perceived health problems.

Clinical approaches to behaviors associated with perceptions of body malfunction have been reported from management of patients with long-term pain. Here, *overactivity* has been designated as behaviors associated with pain and discomfort that adversely affect an individual's daily functioning. In current therapeutic pain management focused on explaining pain, careful and intentional observations and strategic and constant communication about safety are highlighted.<sup>11</sup> Conventional pain management emphasizing clinical interventions is being replaced by a biopsychosocial approach that allows clinicians to empower patients with the knowledge, understanding, and skills needed to reduce both their pain and disability. However, in a recent study, only a few patients with chronic pain succeeded in changing behavior when trying to alter their overactivity behavior solely by educational support from health professionals.<sup>1</sup> Thus, providing education only to runners who repeatedly experience gradual-onset injuries and habitually engage in overactivity may not be sufficient. Attachment and mindfulness-based cognitive therapy have been reported to aid patients with chronic pain who fail to benefit from conventional pain treatment to initiate behavioral change.<sup>12</sup> Incorporating such acceptance and commitment therapy to address psychological inflexibility may support runners at verified high risk of gradual-onset injuries to make lasting changes in their behavior. To support lasting changes, key factors that runners themselves believe contribute to the maintenance of their overactivity behavior must be identified and addressed.

This study has both strengths and weaknesses that need to be taken into account when interpreting the results. As in most qualitative studies, the study group was relatively small. On the other hand, care was taken to make sure that recruitment of patients was continued long enough to reach saturation in the data collection. Moreover, it should be remembered that no attempt was made in this study to have actual medical confirmation of the reported diagnoses. In addition, because the study was performed using qualitative methods, it is not possible to quantify the results. For instance, there are likely to be differences in the proportions in how the different subtypes of overactivity behaviors are enacted among runners, but this study cannot quantify these proportions. There are also, with certainty, large individual variations. It is also not possible, based on the present data, to predict whether individual runners will apply any particular behavior and the role played by coaches in this process. It is therefore important to develop instruments and self-reporting systems for recording of individual athletes' perceptions associated with injuries and pain<sup>15</sup> and apply these in longitudinal studies. Furthermore, as every running community has its own characteristics and needs, there is probably no such thing as "1 model that fits all." Generalization to other contexts have thus to be made cautiously. For example, the study only included track and field athletes at the highest level of competition, and the findings may not be applicable to other groups of runners such as high school athletes and recreational distance runners. Finally, the extent to which increasingly well-informed runners might stimulate creative dialogues remains to be explored, whether these take place between runners and medical teams or among runners themselves, with the aim of

attaining coherent views and prevention of significant health problems. For future research, studies that take into account the runners' views on different interventions as well as the views of coaches and medical teams are warranted.

## CONCLUSION

We found that perceptions interpreted as being caused by an illness or an injury with sudden onset led to a self-monitoring activity pacing pattern while perceptions interpreted as injuries with gradual onset were followed by an overactivity behavior. The latter pattern can be explained by an adaptation to stimuli that are presented progressively. The results of this study highlight the importance of developing monitoring systems for athlete self-reporting of data associated with injuries and pain adapted to their experiences and reasoning. The results also provide an incentive for clinical efforts to increase health literacy and psychological flexibility among competitive runners.

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## APPENDIX

### Illness Episodes

When first interpreting the health problem as an illness, the immediate reactions were fairly consistent among the runners (Table A1). The athletes were aware of the risks associated with training when ill, for example, that heart and lung complications can follow infections. One female runner explained:

If I feel pain I still may train, but I never train if I have caught a cold. Colds are much easier that way: sore throat—no training, fever—no training, otherwise

training. But with pain and other sensations it is more like: Can I run with this? Will it get worse? What is it? Will it heal...?

There was no difference when experiencing other symptoms of illness; actions were still taken early by the athletes:

It had gone very well on that training camp, and then I came home and ran twice and on the third training I didn't have any energy at all... I went to the doctor and got the blood count measured and that confirmed an iron deficiency.

TABLE A1  
Summary of Runners' Behavioral Patterns  
in Self-Management of Illness

---

|   |
|---|
| Influential factors and action at perception of illness:        |
| Stops training early  |
| Knowledge about danger of workout when ill                      |
| Factors influencing decision to resume running after an illness |
| No pain, "listen to the body"                                   |

---

Also, when returning to normal running practice after an illness, the caution was obvious and described as a habitual behavior:

I felt well and I used my pulse watch to check that my pulse wasn't abnormally high.

After illness and colds I used to think: as long as I am feeling ill, feeling the typical sore throat symptoms or feeling sick or tired, I do not workout. I start again when the symptoms have disappeared and I feel well.

### Injury Episodes

In comparison, when the health problem was initially interpreted as being caused by an injury, self-management varied greatly (Table A2). At first, some runners neglected pain and other discomforting sensations and tried to continue running. Here, rationalization could be used to diminish the problem: "it was just a little sensation" and "not too bad." However, 1 athlete explained his thinking in more detail:

I began to feel pain when training and took it a little easier during the rest of the session. I kept training because it was just a feeling in the foot, which made me continue practicing the following days too. Since everything else felt so good with the running shape, I went on and ignored the pain.

Another initial strategy to manage the situation was to explain the health problem by external factors and try different pragmatic measures to address these factors. The pain could be kept at a tolerable level and the athlete could keep on running:

First, I thought the pain could be explained by bad shoes. Then it became worse and worse but I was still able to keep it at an acceptable level.

Eventually, the downplay and neglect of symptoms could extend to the active use of painkillers and anti-inflammatory drugs to decrease the pain. Not feeling the pain made it possible to believe that the underlying injury was not there:

Some time, I believe that I also took Voltaren (anti-inflammatory medicine) when having that pain in the Achilles tendon, but I do not think it made it any better.

I would probably advise against that actually. I used it a few times, during the summer, on quality workouts and competitions then. It was just a few times, but I believe it got worse because of it, and then I went on training instead of resting. I should maybe not have done that, and the result was not very good either. So in the long run, it is almost entirely negative.

In addition, willingness to participate and perform at competitions motivated athletes to press on with running. Competitiveness could almost make the athletes blind to the long-term health consequences of participation. The need to compete was too strong to react easily by changing goals or withdrawing entirely.

Before the half marathon, since the trip already was booked and I had been looking forward to that competition for such a long time . . . So it was more like going there and giving it a try. First, the plan was to make it good enough until the competition, and after the competition, I didn't have a lot of plans, I didn't plan anything, so then it was more like, it will take the time it needs to heal.

This type of neglect was not only associated with specific competitions but also with exploiting the general benefits of being in good shape:

It was like extra difficult or boring mentally because it had been a very good season. I had won the Junior National Championship and it had actually done well at the Nordic championships too.

Nonetheless, other runners described how they changed their plans immediately when perceiving pain or an unusual sensation indicative of an injury. One typical situation was when the injury had a sudden onset:

Then I landed badly after taking a hurdle, so the ankle got a real bang. I could not walk or run okay for a few days.

For some athletes, a factor that further increased the inclination to immediately disrupt the planned program was that the athlete could not recognize the pain or sensation:

After the indoor season, I felt strangely tired and run down. I was running a half marathon, but halfway through the competition I felt something in the hip. I then reduced my training load and intensity before it got worse. I also changed to running more on softer surfaces.

Such lack of plausible explanations led to anxiety and fear of possible long-term consequences of the health problem. Not knowing the reason for the pain and not knowing the consequences of continued running made some athletes

react immediately by resting from running to avoid the risk of long-standing negative consequences:

During an interval session, when running downward, I felt a sensation of stabbing pain go through my leg. I plainly had to stop the training session. I didn't run any more intervals, instead I jogged home. Actually I stopped in the middle of an interval. I felt that I could not press hard anyway. To not run more intervals were more of a precaution because something felt not like it should. But it was not really the pain that stopped me; rather, I realized I would make it worse if I continued running with it.

However, athletes who tried to run through the pain or sensation eventually also had to change their training program. The reasons behind this decision varied. One reason was that it was impossible to continue running:

It was plainly because I could not run; it hurt too much to run.

Then I developed a stress fracture. It began to hurt a little bit, and then it hurt more and more, and then it hurt a lot. And then I didn't run anymore.

At times, some athletes had to be told to stop by a coach or a medical professional (eg, a physical therapist, physician, naprapath, or chiropractor).

I believe it was the physiotherapist who said it could result in a stress fracture if it hadn't already become one, and that it was a must to rest, I had to rest to let it heal.

I followed the doctor's advice to not run or strain it, only do alternative training that didn't hurt. Return to running was then under doctor's orders.

With regard to what the runners took into consideration when deciding to return to normal training after an injury, the thinking and reflections were similar between runners regardless of the initial strategy. One important explanation was that "the pain was gone and it felt good." A valuation emphasized by the athletes was that the health problem did not worsen after a workout session. "[I returned] when it felt good. When I could do a hard workout without worsening the injury again" one runner explained, and another athlete confirmed this: "It was a lot about the pain disappearing more and more... and above all that I could trust it wouldn't come back after the workout."

Medical professionals and coaches could play an important part in making the decision to return to normal participation. Some athletes based this decision on consultation with coaches and receiving positive feedback from medical professionals:

That it worked, the foot worked, it felt steady again. I decided in consultation with my coach.

When I got the answers from the doctors, after looking at the MRI images.

TABLE A2  
Summary of Runners' Behavioral Patterns  
in Self-Management of Injury

| Continue as Planned  | Change Schedule   |
|--|---|
| <ul style="list-style-type: none"> <li>• Insidious onset, no obvious pain event</li> <li>• Negligence of long-term consequences</li> <li>• Benefits of continued running highlighted (eg, good shape, competitions coming up)</li> <li>• Drug-induced pain ignorance ("felt OK")</li> <li>• Rationalizations (eg, "just a little feeling," "not too bad")</li> <li>• Pain is tolerable</li> <li>• Competitions stress</li> </ul> | <ul style="list-style-type: none"> <li>• Sudden onset</li> <li>• Cannot recognize perceptions (injury fear)</li> <li>• Earlier experience frightens</li> <li>• Does not want to be injured for a long period ("injury fear")</li> <li>• Better to skip the workout 1 day now than several weeks later</li> <li>• Impossible to run or walk</li> <li>• Not enough to just reduce or change the running workout plan</li> <li>• Someone else says stop</li> </ul> |
| <p>Factors influencing decision to resume running after an injury</p> <ul style="list-style-type: none"> <li>• No pain</li> <li>• Consultation with medical professional</li> <li>• Tests with increasing load do not make problem recur</li> </ul>  |   |

Nonetheless, other athletes used their own pragmatic methods to test their ability to return safely and slowly to avoid adversity:

When it stopped hurting, when doing alternative workouts, it was gradual, I began to run about 1 minute of 10 and then walk in between, and then increase until running as long as I wanted again.

It felt good and I had tried some different things, like a jumping test with my feet, tried some hinder running and so on. And I saw and felt that it was ok.

In previous studies of athletes, the athletes reported experiencing soreness or pain in the affected area before the injury event more often for injuries with gradual onset compared with injuries with sudden onset.<sup>2</sup>

In team sports, studies of behavioral responses to perceived health problems have identified a number of mechanisms that may aggravate bodily harm. For instance, the formal structure of the sport may create a context in which athletes consistently adjust to withstand health problems, for example, rules of play limiting player substitution in team sports.<sup>1</sup> Furthermore, the informal social environment may give a grounding to young athletes to learn when they are expected to keep training and compete



through pain.<sup>3</sup> As these mechanisms combine to affect the individual athlete, the motivation for continued participation despite experiencing a health problem can be represented as individual thresholds with more or less habitual marginal extensions. To enhance the effectiveness of injury prevention measures, these mechanisms and thresholds need to be analyzed among runners and other athletes to identify the factors affecting decisions about training and competition when perceiving a health problem.

The model described by Wilson and Gilbert<sup>4</sup> can also be used for positive events, which is a possible explanation for less reflection of positive events. In the running situation, for example, it could be that when training is going according to plan and there is no pain, they do not think about it because it is part of their usual habits. However, when returning to a normal training program after an injury, training creates a lot of reflections and thoughts at the

beginning, but after a while, being able to train according to plan is part of the everyday routine and they do not reflect on it or what makes them keep being able to do it; they think less about it the more time that passes after an injury.

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