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**Psychological Demands Experienced by Recreational Endurance Athletes**

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**Psychological Demands Experienced by Recreational Endurance Athletes**

This study aimed to identify psychological demands that are commonly experienced by endurance athletes so that these demands could inform the design of performance-enhancing psychological interventions for endurance athletes. Focus group interviews were conducted with 30 recreational endurance athletes of various sports (running, cycling, and triathlon), distances, and competitive levels to explore the psychological demands of training, competition preparation, and competition participation. An inductive thematic analysis was used to identify psychological demands that were experienced across sports, distances, and competitive levels. Seven themes captured demands that were commonly experienced away from the competitive environment (time investment and lifestyle sacrifices, commitment to training sessions, concerns about optimising training, and exercise sensations during training), preceding an endurance event (pre-event stressors), or during an event (exercise sensations, optimising pacing, and remaining focused despite adversity). Interventions that could be delivered to recreational athletes, who do not typically have access to a sport psychologist, are suggested. Experimental research examining the efficacy of interventions that help endurance athletes to cope with the reported psychological demands is encouraged.

Keywords: cycling, focus groups, qualitative research, running, stressors, triathlon

Through this research, we aim to contribute to the design of performance-enhancing psychological interventions for endurance athletes by increasing the understanding of the psychological demands commonly encountered by endurance athletes. Sport psychology professional practice guidelines (Birrer & Morgan, 2010; Simons, 2012; Taylor, 1995) encourage practitioners who are designing a performance-enhancing psychological intervention to target the psychological demands of the sport, in order to optimise the efficacy of the intervention. Although the prominent psychological demands experienced in specific endurance events vary (e.g., Dosil, 2006), there may be demands that are commonly experienced across various endurance sports, competitive distances, and competitive levels. Research examining the efficacy of interventions aimed at improving endurance performance could target these common demands, which would provide an evidence base for practitioners working with endurance athletes who compete in various endurance events. In other words, efficacious interventions that target common psychological demands could have a wide application.

Psychological demands relate to stressors in transactional theories of stress (e.g., Fletcher, Hanton, & Mellalieu, 2006; Lazarus, 1999). Contemporary transactional theories in sport psychology propose that stress is “an ongoing process that involves individuals transacting with their environment, making appraisals of the situations they find themselves in, and endeavouring to cope with any issues that might arise” (Fletcher et al., 2006, p.329). From a transactional perspective, *stressors* refer to encountered environmental demands (events, situations, and conditions), and *strain* refers to negative psychological, physical, and behavioural responses to stressors (Fletcher et al., 2006). Fletcher and colleagues’ (2006) meta-model of stress, emotions, and performance provides a useful framework for explaining the effects that stressors can have on an athlete’s performance. According to this meta-model, athletes appraise the significance of their relationship with an encountered stressor to their personal wellbeing. This process of appraisal involves an evaluation of whether the encounter is relevant to their goals, values, beliefs, and situational intentions (primary appraisal) and an evaluation of their coping options (secondary appraisal). The athlete’s appraisals determine the emotions, and associated somatic and cognitive symptoms, that the athlete experiences in response to the stressor (Martinent & Ferrand, 2015; Uphill & Jones, 2007). Following the emotional response, it is proposed that the athlete evaluates whether the emotion is relevant to their performance (tertiary appraisal) and their options for coping with the emotion (quaternary appraisal). The athlete’s perceived ability to control and cope with their emotional response is proposed to determine whether the athlete perceives it as facilitative or debilitative to their performance. For example, negatively-toned emotions such as anxiety can be appraised as being detrimental or facilitative to performance through their effects on psychological factors such as concentration and effort (Neil, Hanton, Mellalieu, & Fletcher, 2011). Finally, an athlete’s actual ability to cope with the stressors and their responses to them is proposed to determine the outcomes of the stress process, with sub-optimal wellbeing and performance suggested to reflect an inability to cope. Indeed, research examining the stress process has shown that an athlete’s appraisals of encountered stressors influence their emotional responses and that, depending on the athlete’s coping, these emotional responses influence performance-related behaviours (Miles, Neil, & Barker, 2016; Neil, Bowles, Fleming, & Hanton, 2016). The stressors encountered by endurance athletes could therefore influence their performance, depending on how the athlete appraises the stressors and elicited emotions and depending on the effectiveness of their coping strategies.

Research has demonstrated that athletes encounter a wide range of stressors (for a review, see Sarkar & Fletcher, 2014). These stressors can be broadly categorised as being associated with competitive performance (referred to as “competitive stressors”), the sport organisation that athletes operate within (referred to as “organisational stressors”), and personal life events outside of sport (referred to as “personal stressors”). Competitive stressors include preparation, injuries, pressure to perform well, underperformance in competition, performance expectations, self-presentation, and rivalry. Organisational stressors include leadership and personnel issues, cultural and team issues, logistical and environmental issues, and performance and personal issues. Personal stressors include the work–life interface, family issues, and the death of a significant other (Arnold & Fletcher, 2012; Sarkar & Fletcher, 2014). Some stressors, such as pressure to perform well, are experienced by many samples of athletes (McKay, Niven, Lavallee, & White, 2008; Noblet & Gifford, 2002; Thelwell, Weston, & Greenlees, 2007). Other stressors, however, are more prominent in certain samples of athletes, such as certain types of sport (McKay et al., 2008), competitive levels (Fletcher, Hanton, Mellalieu, & Neil, 2012), and playing positions (Thelwell et al., 2007).

Research has illuminated psychological demands experienced during training and events within specific endurance sports (Buman, Omli, Giacobbi, & Brewer, 2008; Hollander & Acevedo, 2000; Holt, Lee, Kim, & Klein, 2014; Kress & Statler, 2007; Nicholls, Levy, Grice, & Polman, 2009; Samson, Simpson, Kamphoff, & Langlier, 2015; Schumacher, Becker, & Wiersma, 2016). For example, channel swimmers have reported many demands including wildlife encounters, weather and tidal conditions, swimming into the dark, loneliness, uncertainty about the duration of the swim and finishing, and a range of uncomfortable experiences (cold, cramping, pain, aching, hunger, fatigue, mouth swelling, and vomiting) (Hollander & Acevedo, 2000; Schumacher et al., 2016). In addition, ultramarathon runners reported that muscle cramping and injuries, gastrointestinal problems, and thoughts about quitting were key stressors during a 125-kilometre ultramarathon (Holt et al., 2014). Furthermore, elite-level cyclists reported that exertion pain is the greatest psychological demand (Kress & Statler, 2007), and many recreational marathon runners report “hitting the wall” (Buman et al., 2008). Anecdotally, endurance athletes in various sports and distances also experience some common psychological demands (e.g., Taylor, 1995; Tuffey, 2000). For example, Tuffey (2000) argued that endurance athletes experience three broad psychological demands: 1) long and repetitive training sessions that can undermine motivation; 2) pain, discomfort, and fatigue experienced in training and competition; and 3) preparation for competition, including planning for pain and discomfort and developing and committing to a race plan. There is a lack of research, however, that has included athletes of different endurance sports, distances, or competitive levels and examined demands that are commonly encountered by these athletes.

Identifying psychological demands encountered by endurance athletes who compete recreationally, rather than professionally, could inform educational content and psychological support provided to athletes who do not typically have access to a sport psychologist. These athletes may learn about sport psychology through online media or group workshops where the delivered content is unlikely to be personalised. Understanding the demands commonly encountered by recreational endurance athletes could therefore help to maximise the relevance of delivered content within the constraints of group-based delivery. In particular, identified demands could inform the psychological support provided by “psyching teams” before, during, and after endurance events such as marathons. Psyching teams provide support using online media such as webpages and webinars, workshops, written handouts, dinner speeches, and brief conversations with athletes before, during, and after the endurance event (Meijen, Day, & Hays, 2016).

Research to date has illuminated demands experienced by athletes competing in a wide range of sports, including specific endurance events. Some demands are commonly encountered across sports, playing positions, and competitive levels, but others are particularly prominent in certain samples of athletes. To date, no studies have included athletes of different endurance sports, distances, or competitive levels and examined whether any psychological demands commonly affect endurance athletes. The aim of the present study was to increase understanding of the psychological demands commonly encountered by endurance athletes, in order to inform the design of performance-enhancing psychological interventions for endurance athletes. Research demonstrating the efficacy of psychological interventions that target common demands would provide an evidence base that practitioners working with endurance athletes could consider. This study also aimed to draw attention to common psychological demands that relate to wellbeing instead of performance, such as sport enjoyment, to support holistic psychology practice.

**Methods**

***Research Philosophy***

The primary researcher held a pragmatic research philosophy and attempted to provide useful data for researchers and practitioners interested in performance enhancement in endurance sports (Giacobbi, Poczwardowski, & Hager, 2005). Throughout the study, data collection and analysis strategies were chosen based on their suitability for identifying psychological demands that are commonly experienced across various endurance sports, distances, and competitive levels.

***Research Design***

Focus group interviews were used to collect data. Focus groups offer a tool to identify areas of consensus and disagreement between participants’ experiences, and they can generate rich data by capitalising on group interaction such as discussion, debate, exchange of anecdotes, and use of humour (Kitzinger, 2006; Patton, 2002).

***Participants***

Maximum variation sampling (Patton, 2002) was chosen, and participants of different sports, distances, competitive levels, ages, and genders were included. The researchers assumed that they would identify unique themes in each focus group that would shed light on demands experienced by specific groups. Nevertheless, the researchers were primarily interested in common psychological demands identified in spite of this variation that could represent central, shared experiences that characterise participation in endurance sports (Patton, 2002).

Participants were 30 British, recreational endurance athletes. Interviews were conducted with the following groups: runners (*n* = 10) who competed at distances ranging from 800 metres to half marathons, including cross country; cyclists (*n* = 6) who competed in time trials, road races, or both; triathletes who competed at distances ranging from sprint to long distance (*n* = 10); and triathletes who predominantly competed in long-distance events (*n* = 4). Focus group composition and participant characteristics are summarised in Table 1. Participants also estimated, using a fixed range of values, the number of events they had participated in during the previous year (median = 6-10) and in total (median = 21-50).

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| Table 1  *Overview of Participant Characteristics* | | | | | | | | |
| Focus group | Gender | Age | Competitive level | Yearly training (weeks) | Weekly training (hours) | | Years competing at the sport | Years competing at main distance |
| Runners | m = 7, f = 3 | 21 ± 3 | n = 4, r = 4,  u = 2 | 50 ± 4 | 9 ± 2 | 7 ± 4 | | 4 ± 3 |
| Triathletes | m = 7, f = 3 | 41 ± 11 | a = 6, l = 4 | 48 ± 4 | 13 ± 6 | 10 ± 7 | | 6 ± 3 |
| Cyclists | m = 6 | 50 ± 17 | a = 1, l = 5 | 48 ± 3 | 11 ± 2 | 10 ± 13 | | 9 ± 13 |
| LD triathletes | m = 4 | 45 ± 4 | v = 4 | 47 ± 5 | 13 ± 7 | 5 ± 2 | | 3 ± 2 |
| Overall | m = 24, f = 6 | 37 ± 15 |  | 48 ± 4 | 11 ± 5 | 8 ± 8 | | 5 ± 7 |
| *Note*. a = age-group national or international; f = female; l = local; LD = long-distance; m = male; n = national;  r = regional; u = university; v = pursuing personal bests in various countries; ± = mean ± standard deviation. | | | | | | | | |

***Procedure***

Following ethical approval from the department ethics committee, gatekeepers (e.g., coaches, committee contacts) at endurance sport clubs in South East England were contacted by email. Three gatekeepers hosted a focus group with members of their club, and a fourth focus group (three of four participants were from the same club) was held at the researchers’ university. Using pre-existing groups had the advantages that participants were comfortable talking to one another, they related to each other’s contributions, and they offered different perspectives on specific examples (Kitzinger, 1994). Each focus group involved athletes from one sport so that shared familiarity of the sport would facilitate in-depth discussion. Before the first focus group, the facilitator conducted a pilot focus group with recreational runners to practise using the interview guide and to test the relevance of questions. The questions were well received and judged by the researchers to be appropriate for further use. Before each focus group, the facilitator (who had not competed in an endurance sport) reflected in writing on topics of discussion that were expected based on familiarity with sport psychology literature and personal assumptions, themes they hoped would emerge (e.g., pain and discomfort are demands in competition, boredom is a demand in training) and would not emerge (notably, anxiety plays a key role in performance), and questions they perceived to be more important or more interesting (e.g., “I am more interested in the demands faced during competition. I therefore risk rushing through the questions about the demands experienced before competition”). The main purpose of this activity was to raise awareness of assumptions and expectations about the demands experienced by particular groups of endurance athletes and the researcher’s own biases so that, during the focus group, the facilitator could self-question choices that could influence the results (e.g., choice of probing questions, decision to move on to a new question).

*Main Focus Groups*

A semi-structured interview guide was prepared following the guidance of Patton (2002). The facilitator began each focus group by describing what a focus group involves. The facilitator then set ground rules (e.g., no interrupting) and introduced the topic. Specifically, the researcher explained that he was interested in learning about the mental demands that endurance athletes experience before and during competition. A demand was defined as a typical aspect of the sport that makes the sport difficult. The researcher also specified that he wished to talk about the thoughts and feelings that the participants experienced when training, preparing for competition, and competing. Participants were encouraged to think about specific, relevant experiences that they could remember well before answering each question. Four main questions addressed psychological demands of training (“What do you feel are the mental demands that you face, if there are any, when you are training for your sport?”), psychological demands experienced during the build-up to a competition, psychological demands experienced during a competition, and mental characteristics needed to excel. The facilitator also asked whether pre-competition demands change as a competition draws closer and whether demands vary during different stages of a race. Participants were encouraged to talk about experiences that endurance athletes might take for granted. The facilitator used detail, clarification, and elaboration probes, compared and contrasted responses, summarised content, and asked for examples throughout (Patton, 2002). The facilitator also invited less-vocal participants to contribute, and he moved on from each question when probing no longer led to the discussion of new material. Before concluding, participants were given an opportunity to discuss experiences that were not covered. Focus groups lasted between 85 and 115 minutes, and they were audio recorded.

***Data Analysis***

The interviews were transcribed verbatim by the primary researcher, producing 213 pages of double-spaced text. Features that could influence data interpretation, such as laughter and pauses in speech, were included. The transcripts were analysed in NVivo using a thematic analysis that involved six phases: familiarisation with data (reading and re-reading the data, noting down initial ideas); generating initial codes (systematically coding interesting features of data, collating data relevant to each code); searching for themes (collating codes into potential themes, gathering all data relevant to each potential theme); reviewing themes (checking if the themes work in relation to coded extracts and the entire data set); defining and naming themes (refining specifics of each theme and the overall story the analysis tells, generating clear definitions and names for each theme); and producing the report (selecting vivid, compelling extract examples, relating the analysis to the research question and literature) (Braun & Clarke, 2006). Each theme was judged to capture “something important about the data in relation to the research question, and represents some level of *patterned* [original emphasis] response or meaning within the data set” (Braun & Clarke, 2006, p.82). An inductive (i.e., data-driven) thematic analysis was chosen, and themes were identified in the explicit or surface meanings of the data, so that the themes reflected participants’ accounts of experienced demands. As this study is interested in psychological demands that are experienced across endurance sports, themes were identified across (rather than within) focus groups, and the themes provide an overall description of the demands faced by the endurance athletes (rather than focusing on a small number of themes). The second author, who studied all transcriptions, acted as a “Devil’s advocate”, critically challenging the primary researcher’s interpretation of the data (Krane, Andersen, & Strean, 1997). Critical discussion led to the addition of one theme (concerns about optimising training) and refinement of the other six themes.

**Results**

Seven themes captured psychological demands that were commonly experienced across endurance sports, distances, and competitive levels. These demands were commonly experienced away from the competitive environment (time investment and lifestyle sacrifices, commitment to training sessions, concerns about optimising training, and exercise sensations during training), preceding an endurance event (pre-event stressors), or during an event (exercise sensations, optimising pacing, and remaining focused despite adversity). Table 2 summarises each theme. To help the reader judge the relative prominence of each theme across and within focus groups, Table 2 also states the number of participants in each focus group whose verbal contributions were coded within each theme (note, however, that non-verbal behaviours could not be coded, and “uh huhs” could not be attributed to specific participants). The themes are presented in the order that they might be experienced during the build-up to and during an event; training-related themes are presented first, followed by preparation and competition themes, respectively.

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| Table 2  *Overview of Themes and Sub-Themes* | | | | |
| Theme | Sub-theme | Essence of the theme/sub-theme | Participants coded within the theme/sub-theme |
| Time investment and lifestyle sacrifices | Time investment to participate | The endurance athlete struggles to find time to train. | C = 3, R = 2, LDT = 3, T = 7  Subtheme total = 15 |
| Sacrifices made for the sport | The athlete and their family make sacrifices so that the athlete can participate in the sport. | C = 3, R = 6, LDT = 3, T = 4  Subtheme total = 16  Theme total = 21 |
| Commitment to training sessions |  | Remaining committed to training is difficult, particularly when training alone in bad weather. | C = 5, R = 8, LDT = 2, T = 10  Theme total = 25 |
| Concerns about optimising training |  | The athlete is concerned about doing insufficient, inappropriate, or substandard training. | C = 0, R = 3, LDT = 1, T = 5  Theme total = 9 |
| Pre-event stressors | Logistical stressors and worries | Pre-event logistics are stressful, and the athlete worries that something might go wrong before the event start. | C = 0, R = 0, LDT = 3, T = 7  Subtheme total = 10 |
| Something goes wrong | Something goes wrong before the event start, and it has a negative effect on the athlete’s mental state. | C = 4, R = 1, LDT = 1, T = 0  Subtheme total = 6  Theme total = 15 |
| Exercise sensations | Exercise sensations during training | Training is hard work and painful. | C = 6, R = 5, LDT = 0, T = 2  Subtheme total = 13 |
| Exercise sensations during an event | The athlete experiences exertion, pain, fatigue, and discomfort during the event. | C = 3, R = 5, LDT = 4, T = 7  Subtheme total = 19  Theme total = 23 |
| Optimising pacing during an event | Pushing yet pacing | The athlete finds it difficult to judge how hard they can push their self during an event. | C = 0, R = 2, LDT = 4, T = 8  Subtheme total = 14 |
| Effect of other competitors on pacing | The athlete has to make pacing decisions based on the behaviour of their competitors. | C = 4, R = 5, LDT = 0, T = 3  Subtheme total = 12  Theme total = 21 |
| Remaining focused despite adversity during an event |  | The athlete finds it difficult to re-focus and remain motivated after encountering a stressor. | C = 5, R = 6, LDT = 4, T = 7  Theme total = 22 |
| *Note*. C = Cyclists (out of 6); R = Runners (out of 10); LDT = Long-distance triathletes (out of 4);  T = Triathletes (out of 10). | | | |

***Time Investment and Lifestyle Sacrifices***

Training for endurance events required a substantial time investment from the endurance athletes. As they also had family, employment, university, and social commitments, athletes in each focus group struggled to find the time to train. Some athletes found this stressful, and they described experiencing negatively-toned emotions such as frustration and anxiety.

Long-distance triathlete (LDT) 1: Especially if you’ve got, like you say, I’ve got no kids, but I’ve got a wife and trying to keep her happy and not be training all the time, working, you know, trying to juggle that, it can be mentally straining in itself. It’s just trying to juggle everything so you’re doing enough training and then the frustration of, “I don’t feel as if I’ve done enough training” and then the worry, “I need to do more”, but physically I can’t do anymore because I’ve not got any time.

Triathlete (T) 1: The half-Irons and the long, long distances that you have to spend hours and hours and hours on a bike, you can’t get away from spending a minimum of spending six hours on a bike at a time just because your race will involve it, and then you have to do that probably twice a week on each discipline that you’re doing, so you’ve got six training sessions for every little rest and that impacts. (His wife) T2’s done practically no events this year because it was kind of my turn to do a race, whereas next year, I don’t know quite what we’re going to do because we’re both racing. Anyone else want some children?

The athletes described the sacrifices that they made so that they could train and compete, which included other sports, hobbies, employment opportunities, social opportunities, and spending time with family. The athletes were also aware of the sacrifices that their families made for them to train and compete, and they recognised that they needed their family’s support. Some athletes were willing to prioritise training and competing over other opportunities and commitments, and they planned their days around training and competing. Four athletes with families even stated that athletes need to be selfish to excel in their sport. Nevertheless, the sacrifices made by family were sometimes a source of negatively-toned emotions such as guilt.

Cyclist (C) 1: And I feel, to a point sometimes, a bit, a bit guilty, it’s come up before about, sort of the amount of time I’m away from my wife, she’s very understanding, all the rest of it, but there is that sort of that nagging “Maybe I shouldn’t be doing this, I should be at home doing some painting or I should be going out with her”.

***Commitment to Training Sessions***

Athletes in each focus group reported a lack of motivation to start a training session and a willingness to miss training sessions. This was particularly the case when they were training alone and when the weather was cold or wet. Although numerous reasons were given for this lack of motivation, such as not having an incentive like an upcoming event, a particularly common reason was that the training was not enjoyable. Making arrangements to train with others (e.g., squad training, organising to train with friends) helped the athletes commit to attending training sessions and to work hard in those training sessions.

Runner (R) dialogue:

R1: Once you start, it’s ok. It’s actually getting up and out of the house.

R2: On my own, that’s definitely the case. If I’m going down to train with people, then it’s not an issue, not at all.

R3: For example, like for the Tuesday and Thursday sessions, a lot of us obviously enjoy them because we go down and there’s a big group there and we all do the session together, but probably if all of us had to do the Tuesday and Thursday sessions on our own, half of us probably wouldn’t do them.

T3: I have to focus on the thing that I’m weakest at (cycling) because... that’s the biggest chunk in half-Ironman, that’s the most amount of time (pause) but, like T2, I couldn’t go out and do it on my own, I’d need company (laughs)... It’s like when people say, “Oh, it’s fun”. It’s not fun to me. I have to make myself.

***Concerns About Optimising Training***

Runners and triathletes described concerns about the quantity, appropriateness, or standard of their training. This theme manifested differently across the focus groups. Dialogue between three runners, who frequently trained together in a group, suggested that they were critical of substandard performances in single training sessions and focused on these performances rather than their longer-term progress, they compared their training performances to other runners despite differences in training objectives, and they worried about taking rest days because they did not want to lose fitness. The triathletes, on the other hand, described examples where they lacked confidence that they were doing the right training or worried about getting the right balance between the three disciplines.

Triathlete dialogue:

T4: You think, “Oh, am I concentrating on that sport too much?”

T5: Or am I getting enough miles on the bike or

T6: Well, it’s juggling, isn’t it. (T5: Yeah) You’re concentrating more on one, you’re losing off the other, don’t you?

T5: Exactly.

***Exercise Sensations During Training***

The athletes described experiences of pain and exertion during training. These experiences were particularly prominent among the runners and cyclists, who trained at high intensity. The athletes recognised that they need to push through discomfort to achieve the physiological adaptation necessary to improve their performance.

C1: It’s incredibly painful for me. When I go out with certain people (laughing) and we do a hard session, I mean it’s maximal for me, when you’re riding with people who can stretch you, it is absolutely flat out, I’m putting myself into pain zones that I’ve never been in to before and would never do but, but for the fact that I’m trying to push the performance envelope.

T2: You know that you’ve got to push your body beyond what is comfortable in order for it to adapt— it’s the principle of training. If you just sit there at a speed that’s comfortable in whatever discipline, you’re not going to adapt, you’re not going to improve, so you know you’ve got to get over that mental barrier, somehow going beyond what’s physically comfortable.

***Pre******-Event Stressors***

Cyclists and triathletes described substantial event preparation, which included packing their bag and equipment, checking their bike, and learning the event route. They also described difficult logistical aspects encountered on the day of an event, including waking up early, driving to an event with closed roads and congestion, finding parking, registering at the event, and setting their bike in the swim-cycle transition and memorising its location. As a consequence, some of the athletes reported feeling stressed before the event, and they worried that something might go wrong. The athletes also described unexpected disruptions to these pre-event activities, which included arriving late to the event and forgetting a piece of equipment. These disruptions led to the athlete feeling agitated, annoyed, or distracted.

C2: If I forget one thing, it might be something minor that doesn’t make a lot of difference but it ruins me mentally… It leaves me flustered, yeah. And I want to be on the start line with a clear head, and it doesn’t give me that. I’m fretting.

***Optimising Pacing During an Event***

The athletes wanted to pace themselves optimally to finish an event, to achieve a time, or to place well in the standings. The athletes balanced pushing themselves to their limit with avoiding premature exhaustion. Some of the athletes reported feeling uncertain about their pace and questioned whether they were pushing hard enough. This demand appeared particularly relevant to athletes who participated in longer events, especially triathlons.

T1: I always, yeah worry, “Am I going fast enough?” because it feels a bit too comfortable.

T7: I think that’s the difficult part, saying “How fast can I really go and still just about make it across the finishing line?”

LDT2: I find it mentally quite challenging balancing the three disciplines because, you know, you turn up to the run, you’ve overcooked it on the bike, guess what, Armageddon. You overcook it on the swim, Armageddon... There’s this line, you know, if you push it by 2%, you’re going to get away with it... it’s going to get you that PB (personal best), it’s going to get you in that top whatever number it is (in the standings) that you’re looking to achieve. You push it, you know, that 1% over, dog-doo, you’re dead.

Competitive athletes who raced head-to-head described the tactical pacing decisions that they made in relation to other competitors. They had to decide whether to adjust their pace to catch, shake off, or fall behind a competitor, or whether to trust their own pace.

R4: So like if somebody comes past you in a race, it’s having the confidence that you will still beat them in the end, which happened to me in a couple of races where someone’s come past and I’ve managed to still get them at the end. You’ve got the choice of whether to believe when they go past you, if you’re going to let them go, stay with them, if you think that you are quicker than them, still believe in yourself.

Tactical decisions were particularly important to road-race cyclists who raced for finishing positions and not times. Indeed, Cyclist 3 described racing as a “moving game of chess” because of the constantly-changing tactical elements of racing. The cyclists reported constantly monitoring performance cues (e.g., positions of other cyclists, environmental and road conditions), and they reacted to the behaviours of other cyclists.

***Exercise Sensations During an Event***

A demand consistently reported across focus groups was the exertion, pain, fatigue, and discomfort experienced during events. Words such as “pain”, “hurt”, and “suffering” captured a range of unpleasant exercise-induced sensations that typically became more prominent as the event progressed and were greatest at the end. The athletes described a desire to stop or slow down, and they described unhelpful self-talk that was persuading them to not continue.

Runner dialogue:

Facilitator: If you take out male and female, if you take out teenager versus someone in their twenties, if you take out the distance, what do you think are the typical demands of running that will always be there?

R5: Well, you’re going through physical Hell and you’ve got to finish it as well as you can…

R6: It’s probably one of the only sports where, the goal of it is to push yourself through as much physical pain as you can, and that’s basically the goal… push yourself to your maximum. That’s it.

R7: Getting to the bell (in a 1,500-metre race) and then realising that you’ve still just got to do this 400 metres to make it, I think, in my mind, everything’s hurting, everything’s in pain, but somebody’s saying “It’s only 400 metres, it’s only 400 metres”, but somebody else is saying “You’re dead, you’re not going to be able to make it”— you’re always fighting against your head in a race.

LDT3: If you’re not thinking about anything (i.e., distracting yourself), all you’re going to think about is your feet hurt, your ankles hurt (LDT4: Yeah. My knee hurts), everything hurts, you just think about all the bits that hurt, all the reasons why it’s madness to keep on putting one foot in front of the other, “You should just stop”.

***Remaining Focused Despite Adversity During an Event***

The athletes reported a wide range of stressors that were encountered during endurance events. These included unfavourable environmental conditions, being overtaken, substandard performance, collisions, bike punctures, nutritional mistakes, and dropping food or a water bottle. Athletes in each focus group reported occasions where these stressors had a detrimental effect on their mental state. Specifically, the athletes often reported responding with unconstructive self-talk statements and experiencing negatively-toned emotions such as discouragement and frustration. Further, they described difficulty re-focusing on their performance and remaining motivated.

Cyclist dialogue:

C3: Head winds can have an even worse effect because all of sudden you cannot go faster, and you forget the fact that it’s the same for everyone else as well, you know, it’s not just you...

C2: It still feels very personal at the time…

C3: Especially on the time trial, you’re convincing yourself that you’re the only one feeling like that in these conditions, be it rainy and you’re going slow, or your disk wheel’s getting hit by sidewind, you think that’s not happening to anyone else and it’s just you, and you’re looking down at your dock, “I’m 30 seconds off what I should be”, you know, “disaster”.

C4: When you’re really going well, you look good, you know, and it’s all coming together and the adrenaline’s flowing, you know, ppheeww, you’re on fire. When things start to go wrong, that’s when it’s a very difficult mental position to be in, I think, and that’s the hardest thing to try to learn, how to overcome that “Oh shit, what a terrible day this is”.

LDT4: I had my PB up by probably half an hour on a good course and missing one bottle, just literally, just flipped out my hand, scuppered the lot (laughing), took it out completely. And that’s it, you’ve then got to go for the rest of the race thinking, (numerous laughing) “I’ve buggered up all that training”, and now a year’s worth of training, six months of dedicated commitment, (laughing) and it’s all gone to pot.

**Discussion**

This study aimed to increase understanding of the psychological demands commonly encountered by endurance athletes, particularly to inform the design of performance-enhancing psychological interventions for endurance athletes. Seven themes captured demands that were experienced away from the competitive environment, preceding an event, or during an event (Table 2). These demands were perceived to affect motivation and concentration and therefore have implications for performance. The demands were also perceived to affect outcomes related to wellbeing, such as the emotions experienced before, during, and after events. Interventions that help endurance athletes to cope with these psychological demands could therefore encourage desirable outcomes related to both performance and wellbeing.

The results of this study draw attention to stressors that are commonly encountered by recreational endurance athletes. The endurance athletes reported a range of competitive stressors (e.g., being overtaken), as well as personal stressors related to time demands and lifestyle sacrifices and organisational stressors related to pre-event logistics. These stressors endangered goals such as finishing a long-distance triathlon, achieving a personal best time, or placing well in the standings. Consistent with transactional theories of stress, these stressors were often associated with negatively-toned emotions, such as guilt, frustration, discouragement, and anxiety. Stressors and associated negatively-toned emotions were also perceived as having detrimental effects on the athletes’ motivation for training and competition, as well as affecting their attention and concentration (Lazarus, 2000). Previous research has demonstrated that some stressors are commonly experienced across many samples of athletes (e.g., McKay et al., 2008), whereas others are particularly prominent in specific samples of athletes, such as certain types of sport (McKay et al., 2008) and competitive levels (Fletcher et al., 2012). Endurance athletes in the present study reported some demands that are commonly experienced across sports, whereas other demands appear particularly prominent in endurance sports. For example, the time investment and lifestyle sacrifices, the demand of optimising pacing, and the experienced exercise sensations appear to characterise performing in endurance sports at the recreational level. In contrast, some themes, such as pre-event stressors and remaining focused despite adversity, reflect demands that are experienced in a range of sports (e.g., Dugdale, Eklund, & Gordon, 2002; Mellalieu, Neil, Hanton, & Fletcher, 2009). Independent of whether the themes highlight demands that are unique to endurance sports, these demands are often experienced by endurance athletes and could therefore inform the design of interventions for endurance athletes.

A demand that is prominent among recreational endurance athletes relates to time demands and lifestyle sacrifices. Participants estimated that they trained for an average of 11 hours each week (Table 1). This is a substantial time investment for people who compete recreationally, rather than professionally. A substantial training investment is necessary, however, because participating and excelling in endurance sports requires a high level of aerobic fitness. Other studies have similarly highlighted that ultramarathon runners (Simpson et al., 2014) and masters cyclists (Appleby & Dieffenbach, 2016) dedicate a substantial amount of time to training, which can come at the expense of other activities such as socialising with friends. Although balancing competing time demands, making personal sacrifices, and knowing that family have made sacrifices are recognised stressors for elite-level athletes in other sports (e.g., McKay et al., 2008; Noblet & Gifford, 2002; Scanlan, Stein, & Ravizza, 1991), the substantial time investment and sacrifices associated with participation in endurance sports are unusual for recreational-level sports.

A second demand particularly prominent in endurance sports relates to exercise sensations (exertion, pain, fatigue, and discomfort) experienced during training sessions and events. This broad demand manifests differently in different endurance events. For example, injury-related pain, such as hurting feet and knees, is a prominent exercise sensation for athletes competing over longer distances such as ultramarathons (Holt et al., 2014), and intense exercise-induced muscle pain is a prominent exercise sensation for athletes who train and compete at high intensity (Kress & Statler, 2007). Unpleasant sensations indicate that an athlete is pushing their self, and participants recognised that they need to persevere to achieve physiological adaptation from training or a desired outcome from an event. Psychological skills training strategies that help athletes to persevere despite high levels of perceived effort (Blanchfield, Hardy, de Morree, Staiano, & Marcora, 2014) and pain (Whitmarsh & Alderman, 1993) in training and in events could help endurance athletes to achieve these desired outcomes. In the present study, athletes reported difficulties remaining committed to training sessions, and the exercise sensations experienced during training could be a contributing factor. Research demonstrates that exercise becomes less pleasurable when the intensity exceeds the lactate and ventilatory thresholds, and exercise becomes unpleasant when the intensity reaches maximal oxygen consumption (Ekkekakis, Parfitt, & Petruzzello, 2011). The lack of pleasure experienced from exercising in an endurance activity, combined with cold and wet weather and a lack of social interactions when training alone, may mean that some training sessions are less enjoyable and, as a consequence, the athletes may be less committed to these training sessions (Williams, 2013).

An additional prominent demand related to pacing. Some athletes felt uncertain about whether they should increase their pace, or they worried that they were not pushing hard enough. These self-reports of pacing uncertainty may be attributed to the athletes’ inability to accurately predict how their perceived effort would increase during the rest of the event. The endurance athletes might therefore have been cautious in how hard they pushed their selves so that they avoided premature exhaustion (Marcora & Bosio, 2007; Marcora, 2010). Competitive athletes who raced head-to-head also described pacing decisions that were influenced by the behaviours of competitors. For example, they reported occasions where they had to decide whether to trust their own pace or adopt the pace of a faster competitor, which involves the risk of premature exhaustion. These head-to-head pacing decisions are difficult for endurance athletes, because the performance environment is constantly changing, there are a lot of relevant cues to consider, athletes do not know the current physiological capacity of their competitors, and decisions often need to be made quickly and under pressure (Renfree, Martin, Micklewright, & St Clair Gibson, 2014). Therefore, it has been recommended that research should focus on helping endurance athletes to use the most relevant cues to make fast decisions that optimise their performance (Renfree et al., 2014).

***Intervention Design and Applied Implications***

This study aimed to inform the design of performance-enhancing psychological interventions for endurance athletes. A range of psychological interventions were recently shown to improve endurance performance (McCormick, Meijen, & Marcora, 2015), but few of these interventions appeared to target the demands of the particular endurance sport or the demands of endurance events in general. The potential benefits of targeting the demands reported in this study include performance enhancement, but they also extend to valuable outcomes related to wellbeing, such as enjoyment and satisfaction. Many sport psychology practitioners aspire to help athletes to achieve these wellbeing-related outcomes (e.g., Brady & Maynard, 2010). Experimental research examining the effects of interventions that target some of the highlighted psychological demands is encouraged.

Fletcher et al.’s (2006) meta-model of stress, emotions, and performance proposes that efforts to manage the stress process in athletes can occur at three levels (primary, secondary, tertiary). Primary interventions aim to eliminate or at least reduce the quantity, frequency, or intensity of stressors, secondary interventions aim to modify sport performers’ psychological responses to stressors, and tertiary interventions aim to minimise the damaging consequences of stressors by helping athletes to cope with reduced performance or wellbeing that result from strain (Fletcher et al., 2006). Applied suggestions are offered for each level. Psychological support that can be provided using online media such as webpages and webinars, workshops, written handouts, dinner speeches, and brief conversations with endurance athletes at an event (Meijen et al., 2016) could be particularly valuable for recreational athletes, because recreational athletes do not typically have access to a sport psychologist.

For recreational endurance athletes, many competitions are mass-participation events, and the findings of this study indicate that logistical and environmental organisational stressors (Arnold & Fletcher, 2012) related to travel (e.g., congestion, closed roads), rules and regulations (e.g., required arrival times), and distractions (e.g., locating toilets) are prominent. As an example of a primary intervention, practitioners could provide guidance on preparing to attend an upcoming endurance event through online media and pre-event workshops. For example, endurance athletes could reduce pre-event stressors by creating a packing checklist, researching anticipated road and car-park congestion, and preparing a timetable to arrive at the event early. Indeed, there are computer and phone applications available that help with packing for an endurance event (e.g., <http://triathlon.racechecklist.com>).

As an example of a secondary intervention, endurance athletes could use implementation intentions, or “if-then plans”, to prepare for stressors that could occur before or during an endurance event. Specifically, athletes could identify detrimental inner states (e.g., unconstructive thoughts or emotions) and obstacles that they might encounter (e.g., a tyre puncture), and plan cognitive (e.g., motivational self-talk statements, adjustment of goals) or behavioural (e.g., repairing a puncture, change of pace) responses (Achtziger, Gollwitzer, & Sheeran, 2008). Endurance athletes could also visualise implementing these responses, or they could actually practise them (e.g., taking goggles on and off during a swim). For experimental research, problems encountered by endurance athletes, such as being overtaken by another athlete or losing time to an uncontrollable factor (e.g., random puncture time penalties) could be simulated in controlled laboratory conditions. In addition to implementation intentions, sport psychologists could deliver cognitive-restructuring interventions based on cognitive-behavioural therapy principles that help endurance athletes to perceive their emotions as facilitative, rather than debilitative, to performance (Neil, Hanton, & Mellalieu, 2013).

Recreational endurance athletes may experience performance decrements and reduced wellbeing because of stressors such as injury or having limited time to train due to family and work commitments. Tertiary interventions can be used to help athletes to cope with these performance decrements and reduced wellbeing. As an example, sport psychologists may be present at an endurance event as part of a psyching team. As part of the structure of a psyching team, sport psychologists may be present at the end of the event in locations such as the medical tent, and can help athletes to manage thwarted performance expectations (Meijen et al., 2016).

Finally, endurance athletes dedicate a substantial amount of time to training, even at the recreational level. It can be difficult for endurance athletes to find time to train because of family, work, and other commitments, and endurance athletes and their families make sacrifices so that the athlete can train and compete. When designing an intervention, practitioners and researchers should consider the restricted time that endurance athletes have available. Practitioners should also be aware that demands outside of sport, such as time and family stressors, can affect an endurance athlete’s experiences during training and events. Practitioners working with an endurance athlete are therefore encouraged to adopt a holistic approach to service delivery and to consider the interplay between the athlete’s different life domains (e.g., Friesen & Orlick, 2010).

***Limitations***

This study aimed to identify psychological demands that are commonly experienced by endurance athletes. Covering a broad range of demands related to training, competition preparation, and competition participation was useful for informing psychological interventions for endurance athletes, but it meant that individual demands were not explored in depth. Future research could build on these findings by focusing on a narrow range of demands. An additional limitation of this study is that it focused on the demands experienced by endurance athletes, and it did not examine the full stress process including appraisals, emotions, and coping (cf. Miles et al., 2016; Neil et al., 2016). Future research that is informed by a transactional theory of stress could shed greater light on the complete stress process in endurance athletes. The presented data indicates that research informed by transactional theories could inform the application of psychology in endurance sports to support valuable outcomes related to both performance and wellbeing.

**Conclusion**

This study aimed to increase understanding of the psychological demands commonly encountered by endurance athletes, in order to inform the design of performance-enhancing psychological interventions for endurance athletes. Identified themes shed light on psychological demands that are commonly encountered away from the competitive environment (time investment and lifestyle sacrifices, commitment to training sessions, concerns about optimising training, and exercise sensations during training), preceding an endurance event (pre-event stressors), and during an event (exercise sensations, optimising pacing, and remaining focused despite adversity). Psychological interventions that help endurance athletes to cope with these psychological demands could encourage desirable outcomes related to both performance in endurance sports and wellbeing. Experimental research examining the efficacy of such interventions is encouraged.

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