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**Sports massage.**

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School of Integrated Health

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## ***SPORTS MASSAGE***

**Christine Salvary**

### **Abstract**

*The aim of this study was to investigate the efficacy of sports massage therapy (SMT) through the perceptions of users in a naturalistic setting and specifically to make a contribution to the literature of sport for persons with a disability by exploring its use by elite athletes with a disability in both competition and training.*

*This research investigated the perceptions of members of a team who competed in an IPC Athletics international competition, using questionnaires and semi-structured interviews, supported by competition treatment records.*

*A total of 19 athletes returned questionnaires, eight athletes representing all disability groups with physical disabilities were interviewed and treatment records were available for all 41 athletes who attended the competition.*

*Results showed that the majority of athletes surveyed believed that SMT was an important part of their training and had positive effects on their performance, primarily in terms of assisting with recovery, injury prevention, rest and relaxation. It was heavily used at the competition in training as well as pre- and post-event. Athletes stressed the importance of using a practitioner in whom they trusted and with whom they felt comfortable.*

*Previous studies have tended to concentrate on SMT as a short-term intervention to enhance a specific performance rather than investigating its cumulative effects in allowing the athlete to compete at a high level for a longer period of time.*

*Several areas worthy of further research are suggested, including a prospective longitudinal study on a national squad throughout training and competition cycles, research exploring new paradigms from mind/body medicine to provide explanations for the effects of sports massage therapy (SMT) and qualitative studies investigating the qualities inherent in the "excellent SMT practitioner".*

## **Introduction**

Having worked within elite sport for persons with a disability since 1994 the author's concern has been to bring sports massage therapy (SMT) to athletes with a disability and to educate them as to its potential benefits in enhancing their sporting performance. As the uptake of SMT has increased, especially at the international competitive level, so has the impetus to quantify and document its benefits.

The primary motivation for carrying out this study was the conviction that much of the existing research on the effects of SMT is unhelpful, as it is based on methodologically flawed studies that have little to do with SMT as it is currently practised (Field, 2000; Vickers, 1996). The secondary motivation was to make a contribution to the literature of sport for persons with a disability: the literature on massage for athletes with a disability is relatively sparse and tends to be anecdotal or descriptive (Clews, 1995; Salvary, 1995; Koopman, 1997; Leckie, 1998; Erdmanis, 1999; Milo, 2000; Schlossberg, 2002). There currently appear to be no research studies investigating the use of SMT by athletes with a disability. This study may therefore generate some valuable information that could be of use to both athletes and practitioners in the future.

## **Research Methodology**

The aim of this research was to elicit the views of a number of elite track and field athletes with a physical disability regarding their experiences and perceptions of the effect of SMT on their own physical and psychological ability to perform. The information was obtained retrospectively using a survey approach, primarily through postal or e-mail questionnaires and

semi-structured interviews, supported by data from competition treatment notes.

**THE OBJECTIVES OF THIS ENQUIRY WERE TO:**

- i. ascertain the use made of SMT up to, during and after competition and their perceptions of its effects on their performance. Information was collected through the use of a postal/e-mail questionnaire, designed according to standard questionnaire design methodology (Oppenheim, 1992) and sent to all athletes with a sensory disability (and their guides/escorts where applicable) who competed at a major International Paralympic Committee (IPC) Athletics World Championships for athletes with a disability in the summer of 2002.
- ii. explore athletes' experience and perceptions of SMT in greater depth through semi-structured interviews with eight athletes, representing each of the four physical disability groups and competing in a variety of track and field events,
- iii. ascertain the pattern of SMT provision throughout the duration of the competition through analysis of competition treatment records, and compare this data with that gained from the athlete questionnaires and interviews.

The subjects selected for this study were elite athletes with a physical disability who currently fall within the IPC competition criteria and who had been selected by UK Athletics (UKA) to represent Great Britain at a major IPC Athletics championships in the summer of 2002. The sample of athletes selected for interview was drawn from both track and field athletes from both power and endurance disciplines, in order to reflect the variety of athletic competition and performance. It was decided to include any guides/escorts involved in the competition as this would provide an "able-bodied" perspective that might be useful for purposes of comparison.

A purposive sampling strategy was used to select subjects for interview, allowing the exploration of a variety of perceptions and experiences from a range of athletes representing each of the four disability groups and competing in a variety of track and field events.

The sample size was originally dictated by the size of the team taken to this particular IPC competition but it was sufficient to

yield some useful results as well as sufficient respondents from which to extract a sample for interviews. It could be seen as a small-scale study that might act as a pilot for a larger scale survey in the future.

The following athletes were selected for interview:

Athlete no. A01 Male, amputee, track athlete

Athlete no. A02 Male, visually impaired, track/road racer

Athlete no. A03 Male, spinal cord injury, wheelchair field athlete (discus)

Athlete no. A04 Male, cerebral palsy, track athlete

Athlete no. A05 Female, spinal cord injury, wheelchair track athlete

Athlete no. A06 Female, spinal cord injury, wheelchair track/road racer

Athlete no. A07 Female, cerebral palsy, field athlete (javelin)

Athlete no. A08 Male, guide runner

### **ETHICAL CONSIDERATIONS**

Approval for this research was granted by the University of Westminster's School of Integrated Health Ethics Committee on the assurance that athletes would be contacted in accordance with the provisions of the Data Protection Act 1998. All athletes received a letter regarding the purpose and scope of the research, including issues of anonymity and confidentiality, seeking informed consent prior to participation and explaining that they could withdraw from the study at any time.

### **Results**

The following summary highlights the most significant results obtained from the questionnaires, interviews and competition treatment data.

### **RESULTS FROM QUESTIONNAIRES**

There were 41 athletes in the British team who competed in the event under study. A total of 19 questionnaires were received and analysed for this research (46% of the whole team). The responses were analysed using the SPSS for Windows Version 11 statistical package. Percentages have been rounded up to the nearest whole number.



***Demographic Data***

Of the 19 athletes who responded, 12 were male (63%) and seven were female (37%). Six athletes had a spinal cord injury (SCI), four were amputees (Amp), four had cerebral palsy (CP) and four had a visual impairment (VI). The other athlete was a guide runner. All of the female athletes had a congenital or hereditary disability but of the males, four had acquired their disability. One of these had a visual impairment, one had a spinal cord injury and two had upper extremity amputations through accidents.

The majority of athletes were track or road racers (74%) consisting of wheelchair racers (N=6), ambulant track athletes (N=6) or ambulant road racers (N=2). Of the field athletes, three were ambulant and one was a wheelchair user, while one athlete competed in both track and field events.

The greatest number of athletes were aged between 31- 35 years (N=7) with only one athlete being older. Just two athletes were aged between 15 - 20 years, while five were between 21- 25 and four were between 26 - 30 years old.

**EXPERIENCE OF SPORTS MASSAGE THERAPY PRIOR TO THE COMPETITION**

All except one athlete with a spinal cord injury had received SMT prior to the competition in summer 2002 and of those, 14 (74%) had received therapy in the previous six months. Most of these received SMT quite regularly, with 50% receiving it all year round. Of those athletes who received SMT once a month or more, 12 out of the 18 (67%) used it as an integral part of their training programme.

The most common reason by far for receiving SMT during the six months prior to the competition was to help the muscles recover after training or competition (12 out of 17 respondents or 71%). The second most popular reason was for rest and relaxation (four athletes i.e., 24%).

**EXPERIENCE OF SPORTS MASSAGE THERAPY AT THE COMPETITION**  
All of the respondents received SMT at the competition. Athletes identified both general and competition-specific reasons for

seeking SMT. Of the general reasons, the most popular were for relaxation (32%) and to help recover from the journey (21%).

Of the competition-specific reasons for receiving SMT, the most popular was to relieve tight muscles or aches and pains (47%). Almost equal numbers used it to relieve stress and anxiety before competition (26%). Massage was used by athletes pre-event (26%), inter-event (26%) and post-event (32%).

The majority of athletes felt that the SMT they received at the competition had a positive effect on their performance (N=14, 74%), while two athletes felt it had had no effect on their performance. No athletes stated that it had hindered their performance.

Athletes were asked how they recognised that it was the SMT that affected their performance. In response, 13 answers were received which were grouped into four categories, two of which were physical (pain was relieved and muscles were more relaxed) and two more psychological (mentally relaxed and increased confidence in condition).

#### EXPERIENCE OF SPORTS MASSAGE THERAPY SINCE THE COMPETITION

Since the competition 14 athletes (74%) reported that they are receiving regular SMT ie, once a month or more, two (11%) are having it occasionally and only three have not had any SMT at all. All of those who have not received any sports massage, and one of those who is an occasional user, comment that the main reason for this is a lack of finance and/or time.

It is interesting that 12 athletes (63%) say that they would have regular SMT even if they had to pay for it themselves while six (32%) state that they would only have it if they received funding for that purpose. Only one athlete would not have regular SMT. An overwhelming majority of athletes (N=17, 89%) believe that regular SMT is important to them as elite athletes.

The athletes were asked to list in descending order three of the reasons why they believe SMT is important. The reasons given fell into seven broad categories: all of the athletes' responses were

placed into one of these categories and a crude scoring mechanism was used to rank them: the first named reason scored three points, the second, two, and the last named reason scored one point. This allowed the seven categories to be ranked in overall order of importance (see Table 1).

*Table 1. Reasons for receiving sports massage therapy in descending order of importance*

Rank	Reasons for receiving sports massage therapy	Total points scored
1	to assist recovery	26
2	to help prevent injury	22
3	for relaxation	15
4	to improve the condition of the muscles	12
5	to identify problem areas	11
6	to help with mental preparation/confidence	7
7	for general well-being	5

## RESULTS FROM COMPETITION TREATMENT DOCUMENTATION

The competition treatment documentation was analysed using the statistical package SPSS for Windows Version 11 to gain an overall picture of the use of SMT by the whole team. The records were full and complete: the sports massage practitioner and physiotherapists completed their records every night to ensure that entries were accurate and up-to-date.

### *Demographic Data*

There were 41 athletes in total including five guide runners. 29 athletes (71%) were male and 12 (29%) female. The majority of athletes were in the age range 21 to 30 years (N=22, 54%) while 17 (41%) were 31 and over. Just two athletes were aged between 15 to 20 years old.

The majority of athletes were ambulant track or road athletes (N=22, 54%). There were six wheelchair racers (15%), three (7%) wheelchair field athletes (throws) and nine ambulant throwers (22%) with the remaining athlete competing in both track and field events (sprints and long jump).

### *Analysis of Treatment Data*

Members of the British team tended to arrive in groups anything up to a week before the start of competition, although some might arrive only the day before (usually the marathon runners as this event is traditionally the last one of the championships). Some athletes had to arrive early to attend for classification (which is held several days before the start of competition), especially if this was their first international event. A number of athletes might therefore have around a week during which they would still be training.

All athletes except one track athlete with a visual impairment had some form of treatment at the competition. Four athletes (10%) had SMT only, seven (17%) had physiotherapy only, while the rest (71%) used both SMT and physiotherapy.

During the competition a total of 126 treatments were given by the sports massage therapist, with the majority (N=48, 38%) being given as part of training in the lead-up to competition. Pre-event treatments numbered 30 (24%) and post-event 24 (19%) while 16 (13%) of treatments were specifically to deal with injuries. It should be noted that in addition 14 pre-event and 12 post-event massages were carried out by the physiotherapists, particularly during busy periods when the sports massage therapist was already working on another athlete.

The 29 males on the team received a total of 91 treatments during competition (an average of 3.1 treatments each). The 12 females received 35 treatments (an average of 2.9 treatments each). Thus there is no significant difference in uptake of treatment between males and females (see Table 2).

*Table 2. Number of treatments received at competition by type of treatment, gender and type of disability*

		Type of Treatment Received at Competition						
Gender of athlete	Type of disability	Post-travel	Training	Pre-event	Inter-event	Post-event	Injury treatment	Total
	SCI		6	4		3		13
	CP	1	8	9		6	6	30
Male	VI	1	4	4	1	3	1	14
	Amp/other	2	9	7		3	5	26
	None - guide runner		6			2		8
	total	4	33	24	1	17	12	91
	SCI	1	7	2		3		13
	CP	1	7	4		2	1	15
Female	VI		1			1	3	5
	Amp/other				1	1		2
	total	2	15	6	1	7	4	35
Total treatments		6	48	30	2	24	16	126

By far the heaviest users of SMT were the ambulant track athletes ( $N=13$ , 32% of the team) who received 67 treatments (53% of total treatments given). This probably reflects the fact that there is a stronger tradition of using SMT among track athletes compared to field event athletes (see Table 3).

*Table 3. Number of treatments received by athletes, by event type and gender*

		Type of Treatment Received at Competition						
Gender of athlete	Event type	Post-travel	Training	Pre-event	Inter-event	Post-event	Injury treatment	Total
	wheelchair racer		5	4		3		12
	ambulant track	1	22	18	1	13	12	67
Male	ambulant road	1	4	1		1		7
	wheelchair field		1					1
	ambulant field	2	1	1				4
	total	4	33	24	1	17	12	91
	wheelchair racer	1	8	3		4		16
	ambulant track	1	4	3	1	2	4	15
Female	wheelchair field							
	ambulant field		2			1		3
	ambulant track and field		1					1
	total	2	15	6	1	7	4	35
Total treatments received		6	48	30	2	24	16	126

- COMPETITION PERFORMANCES

Competition performances were extremely creditable, leading to Great Britain finishing top of the medal table with 13 gold, 12 silver and 11 bronze medals, in an event that attracted competitors from all over the world. More than two thirds (67%) of the team (excluding guide runners whose performances do not count towards final totals) gave medal-winning or personal best performances.

### ***Analysis of Interview Data***

Each interview commenced with a general question asking about training progress, which served as an 'ice-breaker', before moving on to the questions outlined in the interview schedule, and ended with the athlete being offered the chance to add any other comments.

### **IMPORTANCE OF SMT WITHIN TRAINING**

All athletes considered SMT to be an important part of their training with five of them indicating that they use it once a week for a variety of reasons including: identifying problems and potential injuries (A01, A02, A07); relieving aches and pains (A01, A02, A03); relaxation and recovery after heavy sessions and preparing for the next week's work (A03, A05, A06, A08); and keeping loose and flexible and maintaining the muscles in good shape (A03, A04, A07). The regularity of SMT seemed to be important in terms of its cumulative effects.

### **FACTORS NECESSARY FOR GOOD PERFORMANCE**

All athletes recognised that there are a multiplicity of factors influencing good performance, including the external environment, nutrition, hydration and sleep. They were unanimous in affirming that they needed to feel physically fit and well and mentally relaxed and positive in order to compete at their best.

Two athletes stressed the importance of having good support systems in place with therapists in whom they could trust and with whom they were familiar: '*I think it's important obviously if you've got masseurs that you've worked with they're there, they know your body...that's the most important thing*' (A01). Similarly A06 stated that '*the people closest to you have a massive impact on how you compete*': in the competition situation this is often the therapists who ideally should '*get to know the idiosyncrasies of each person...and its really stupid things like whether you'd like to be talked to when you're being treated or whether you don't want to be talked to...*'

### **ROLE OF SMT IN INFLUENCING GOOD PERFORMANCE**

Several athletes felt that SMT could help them train better by helping to prevent injuries (A01, A03, A07) and by picking up and alleviating niggles (A01, A02, A03, A04).

Relaxation was cited as another benefit of SMT (A01, A04, A05, A06, A08): '*if you're tense, your attitude is affected, you're tight*' (A04) while another athlete described how SMT '*relaxes me and then it makes me...maybe more focused on what I have to do*' (A08). These athletes seemed to agree that if they felt relaxed and well this could reduce the psychological pressure, removing the distraction of physical discomfort thereby allowing them to concentrate on other aspects of training and competition.

Several athletes reported that they felt SMT could help in '*mentally preparing yourself for exercise and training and competition*' (A07) as well as in physical preparation: '*You're gonna (sic) be more able to, you know, use your stride patterns correctly because you're keeping supple. You're keeping nice and loose*' (A07).

- RECOGNITION THAT SMT IS RESPONSIBLE FOR EFFECTS

Some athletes pointed to the physical effects they experience after massage, particularly the reduction of stiffness or aches and pains, enabling them to feel better and carry on training at the same level (A01, A02, A03, A06): '*if I have got problems or if there's aches and pains and they're taken away with the massage then I have total belief in it really*' (A02).

Two athletes stated that they could see a direct effect on their performance: '*It's been proven from other events that I've been to when I've had sports massage that I can actually run faster when I've actually had a good course of it*' (A05) and '*I think it's from being at competitions where we haven't had a massage therapist and then just knowing how it gets my training. Especially when I'm training really hard, it means that I can keep going and I don't get sore or stiff in the same way*' (A06). Another felt that his performances in training and competition started to improve after SMT since this was the only new factor he had introduced into his training (A03).

The guide runner was also asked whether he noticed any particular effects in the athletes he guides when they have had massage. He immediately stated that for two athletes '*psychologically I think it definitely prepares them too for exercise*' (A07). He also described how one runner can find his stride affected adversely when he trains on a treadmill, which then means that guiding him can be more difficult because they are less co-ordinated in their stride patterns: SMT is one strategy they use to combat this: '*I can't explain it any other way than he gets like a, a treadmill stride. Because some of his training is on a treadmill....it's like a thumping stride. It's really strange to explain. It's not a natural relaxed stride. And the way in which we try and alleviate that is reduce his time on the treadmill, get his legs nice and loose by going to a masseur and then ... spend more time on the roads and the cross country with myself*' (A07).

#### FINDING A GOOD SPORTS MASSAGE PRACTITIONER

Some athletes reported that they would use personal recommendation or word of mouth to find a practitioner (A01, A02, A07) while others said they relied on advertising (A03, A04, A05, A08). Another reported that it was '*complete trial and error... Just trying lots and lots of different people until I found one that I felt worked for me*' (A06). Six of the athletes (A01, A03, A05, A06, A07, A08) stressed that it was vital to find someone that they trusted and felt comfortable with, and that they would keep searching until they found the person whom they felt was right for them.

#### USE OF SMT IN COMPETITION

Five athletes reported that they use both pre- and post-event massage: its purpose pre-event being to release tension, relieve minor pains, stretch out the muscles, aid relaxation and generally prepare for competition, and post-event to find problems, deal with tiredness and muscle soreness and ease out stiffness (A02, A04, A05, A06, A07). One stated that he would not usually have pre-race massage unless it was to deal with a specific problem, because he would not want to rely on it as part of his preparation and then be negatively affected if some mishap meant that he could not have it (A01). One said that he would have a massage two days before competition to ease out any minor pains and to relax psychologically (A03) while another

said that she would not normally have a pre-event massage because her event generally starts early in the morning, leaving her too little time to collect her equipment, warm up and have massage as well (A08).

Athletes were also asked whether they would have massage in between heats or rounds (inter-event massage): a recent study on massage and DOMS suggests that massage might weaken and thus adversely affect the muscles in this type of situation (Farr et al, 2002) so their responses to this were of particular interest. Four athletes had experienced this situation and were unanimous in agreeing that they would use inter-event massage to loosen off the muscles and '*shift all the rubbish*' (A07). One commented on how useful it had been to have inter-event massage: '*Just as well I think because I've had events where I haven't had a huge amount of time between each so I wouldn't have necessarily had time to do a complete full warm down and then warm up again. So sometimes it's a bit of a careful balance so I've used a therapist to sort of just stretch me out and help me get ready for the next race*' (A06).

#### NEGATIVE EFFECTS OF SMT ON PERFORMANCE

Seven of the eight athletes reported that they had not experienced SMT actually hindering their performance, although three (A01, A06, A08) quoted occasions when they had received massage, which they did not enjoy or feel comfortable with eg, '*it wasn't deep enough*' (A08). One gave an example of having massage as part of a warm-up for a steeplechase and being left in pain after it because the massage was too deep (A07).

#### SMT 'IN A NUTSHELL'

Athletes were asked to sum up 'in a nutshell' what they felt SMT does for them. The following are 'nuggets' supplied by each athlete:

- '*it's preventative in the fact obviously it keeps your body working, it's keeping everything relaxed there...[and] in the fact that they are picking up on things*' (A01)
- '*it gives me the confidence to know that there's no little niggles or aches and pains there*' (A02)
- '*it just makes me feel better and it certainly keeps me (sic) body in shape*' (A03)

- '*it relaxes me, relaxes my body, my legs, my muscles and it's good preparation for a race*' (A04)
- '*it just really prepares my body to be able to run at its optimum level. Which in turn then prepares my mind psychologically to think positively*' (A05)
- '*it's about keeping me in the best shape that I can possibly be in...and it's making sure that I compete at the best level that I can*' (A06)
- '*it prepares your body for exercise. It prepares you mentally and physically*' (A07)
- '*it relaxes the body and...takes all the badness out of the muscles and gets my muscles ready for the next week's training. I think it just relaxes the body and...maintains it to prevent injuries*' (A08).

## **Discussion**

The results of this study, although based on a fairly small sample, suggest that the approach of previous studies exploring the efficacy of SMT and its influence on sporting performance may not be wholly appropriate, as they tend to limit themselves by using specific measures (usually physiological) to explore the effects of massage on a single performance or small number of short term performances.

This study suggests that there are particular benefits that accrue from having regular SMT in terms of cumulative effects that can keep an athlete performing at a high level over a long period e.g., a number of years during a competitive career. It certainly goes some way to refuting the claims of researchers such as Callaghan (1993) that there is little evidence that SMT is beneficial, and of Hemmings et al (2000) who suggested that SMT might be of psychological benefit but that its use for physiological restoration and repeated sports performance was questionable. In particular it suggests that the approaches taken by previous studies may not have been appropriate, particularly in their use of clinical laboratory settings and of standardised, non-naturalistic applications of both the performance under study and the intervention. In the field, particularly a competition setting, there are so many factors that can affect performance, of which SMT is only one. This suggests that it may not be valid to think that results gained in a clinical laboratory

setting, where these other factors are eliminated, should be generalised to a real-life sporting context.

In a naturalistic setting the practitioner would not be constrained by a standard simplistic massage routine, but would make use of a variety of soft tissue techniques used specifically according to the sportsperson's expressed needs at that particular time, based on the requirements of their event and their perceptions of their current mental, emotional and physical state.

Furthermore, and possibly crucially, all of the aforementioned studies fail to state whether or not their subjects have ever received massage: it is the author's contention that most practitioners of massage, and many athletes, would suggest that if SMT is received on a regular basis one's response to it may change over a period of time and that its effects are probably cumulative. Therefore if subjects have never previously experienced massage it may not be possible to extrapolate these results to studies of athletes who are regular users. It may be that SMT is more appropriately considered in the context of maintaining a high level of sporting performance over a period of time, rather than as a single immediate factor affecting a specific performance activity.

Although the athletes in this study were very successful as a group in this particular competition, it is not possible to infer causality: the athletes may have performed well because they used SMT, but equally they may have used SMT because they were successful and well-trained athletes.

The majority of athletes in this study believe that SMT is an essential part of their training and that it has positive effects on their performance through its perceived ability to enhance recovery, prevent injury and encourage relaxation. It is used for both its prophylactic and remedial capabilities and seems to be valued for its holistic approach.

Most athletes were using SMT regularly as an integral part of their training programme, primarily to aid muscle recovery. Some used it to aid rest and relaxation. All respondents used it during the competition, with the most popular reason being to ease

tight muscles or aches and pains. It was also used to ease pre-competition stress and anxiety and was used pre-, inter- and post-event. Interestingly, only two respondents regarded it as important in dealing with problems specific to their disability: this may be an indicator of the athletes' perceptions of themselves as elite athletes first and foremost, rather than as persons with a disability.

The results of the questionnaire are broadly supported by the analysis of competition treatment data that showed that athletes used SMT during the training period prior to actual competition and for pre- and post-event treatment. An overwhelming majority of respondents stated their belief that regular SMT was important to them as elite athletes, with 63% of them affirming that they would have regular SMT even if they had to fund it themselves. The most important reasons given for regular use of SMT were to assist recovery; to help with injury prevention; and for relaxation. These findings support those of Ball (2001) who found that the athletes she surveyed used SMT primarily for recovery from injury; for injury prevention and for recovery from exertion. These results were confirmed and expanded upon in the interviews, where athletes quoted examples drawn from their own lived experience of how they felt massage could affect them and influence their performance, particularly in terms of being able to continue training and competing at a high level without adverse effects. SMT is thus used as both a prophylactic and remedial intervention.

It has been said that top-level competition is the time between injuries (Craig, 1996). If this is so, and if a significant number of athletes perceive that massage can help to prevent injury, then this suggests that massage can help athletes to increase the amount and quality of their top-level competition. This is of particular relevance given the prevalence of musculoskeletal injuries, particularly overuse injuries, as outlined in the existing literature (Reynolds et al, 1994; Taylor and Williams, 1995; Williams and Taylor, 1995; Ferrara and Peterson, 2000; Ferrara et al, 2000; Nyland et al, 2000). A significant factor emerging from the interviews was the athletes' insistence that they needed to find the massage practitioner who was right for them. The athlete/practitioner relationship is clearly very important and

can be a major influence in the competition context in particular. It would be interesting to conduct further research on the characteristics and qualities necessary in a good sports massage practitioner.

Related to this are issues of information about, and access to, appropriately trained practitioners, as well as the allocation of funding for their services, and the resulting implications for sports at the governing body or national association level. Currently most sports massage practitioners operate on a freelance basis or out of private sports injury clinics rather than being a part of National Health Service (NHS) provision.

Training is based on overloading the athlete's body through various types of activities (stressors) in order to facilitate specific adaptation to imposed demand (SAID) thus improving strength, speed, endurance etc. (Brukner and Khan, 1993; Chaitow and DeLany, 2002). Treatment itself can be regarded as a stressor, and it may be that the athlete's body will adapt to continued treatment over a period of time, just as it does to training. However, there must be a fine balance between overloading for training gain and excessive overloading which may cause overtraining and/or overuse injuries. In addition to causing biomechanical stress, overtraining can adversely affect the balance of the endocrine and immunological systems (Bird et al, 1997; Chaitow and DeLany, 2002).

Manual therapy, including SMT, could be used to address these issues as it can influence autonomic and neuroendocrine pathways, resulting in the recipient responding at three levels of organisation: local tissue, neurological and psychophysiological (Lederman, 1997). The emerging science of psychoneuroimmunology (PNI) within mind/body medicine suggests that our various systems of organisation are interlinked (e.g., stress inhibits cytokine production thus delaying healing) and communicate with each other in ways that are as yet not fully understood (Watkins, 1997; Pert, 1999; Evans et al, 2000). It is therefore likely that the effects of SMT are occurring at other levels than the purely biomechanical ones on which most previous studies are based. An understanding of recipients'

perceptions of the effects of SMT may help to inform the direction of future investigations.

Traditional biomedical models tend to try to explain events through linear relationships of causality e.g., "SMT applied prevent influences or causes an improvement (or not) in performance". Chaitow and DeLany (2002:155) suggest another model, that of "biological synchronicity", where events are seen as "part of a complex continuum...linked by a synchronistic connective principle". This seems a far more appropriate model to apply to SMT in the context of its effect on sporting performance and allows for a multiplicity of complex factors of which SMT is but one.

The problem of potential bias because of the author's pre-existing relationship with the athletes may also be a strength, in that it facilitates trust, the ability of the researcher to fit into the research setting and to have an empathetic understanding. There is a consistency of approach through one therapist using a variety of massage techniques, in a real-life setting, based on their assessment of the individual's needs.

It was considered that the potential pitfalls of practitioner-researcher-interviewer bias were outweighed by the opportunity to gain quality data from a naturalistic setting and were counteracted by the use of such strategies as reflective diaries, audit trails and participants' confirmation of data accuracy.

### **Practical Implications**

Injury prevention is to a certain extent a concept that defies measurement: however, a potentially useful research strategy might be to conduct a prospective longitudinal study on a group of athletes with a disability (say, a national squad) over a number of years (e.g., the four year Paralympic cycle). Individual members of the squad could be tracked in detail to follow their training programmes, injuries sustained and treatment received as well as their competitive progress. Certain ethical issues would need to be resolved, such as treatment versus non-treatment.

The results of this study have practical implications for both the sporting and healthcare professions on a wider level, particularly

in relation to information on, access to, and funding for SMT. It could also be fruitful, and beneficial for athletes, to develop stronger links between SMT, physiotherapy and other disciplines.

The psychological mechanisms operating through SMT have not been fully explained and would be a useful area for further study, particularly given the importance of psychological factors in the sporting setting. It may be helpful to investigate, using models of mind/body medicine, such as PNI, or the model of biological synchronicity rather than causality, whether the psychological effects of massage can override the physiological state of the tissues, or the athlete's perception of their physiological state.

The qualities of the sports massage practitioner and the nature of the therapeutic relationship are important factors in the overall perception of the efficacy of SMT. A useful qualitative study could be conducted to investigate the qualities inherent in the "excellent practitioner" in order to discover what athletes value most in their therapist and what constitutes a successful therapeutic relationship.

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