

TRE FOR ATHLETES

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ABSTRACT

The use of vibration as a means for enhancing athletic performance is well documented. Vibration training is based on an external drive that stimulates the neuromuscular system of a subject through the use of a vibratory platform. However, the human body possesses the inherent ability to self-generate vibrations/tremors. Initiating a self-directed tremoring process is the goal of TRE® (Tension, stress, and trauma Releasing Exercises). TRE method is not known among the athletes in Slovenia. Therefore, the aim of our study was to investigate whether; (1) TRE providers around the world use TRE for athletes; and (2) how they find it beneficial. Our findings suggest that TRE can represent a valuable and effective exercise intervention for enhancing performance in athletes. TRE induced tremors are capable of relaxing physical tension patterns in the body as well as reducing psycho-emotional stress and anxiety. However, to adequately assess the effects of TRE on athletes more research is needed.

Keywords: TRE, vibrational training, athletes, sports performance, tremor

INTRODUCTION

TRE® (Tension, stress, and trauma Releasing Exercises) is a simple set of exercises that assist the body in releasing deep muscular patterns of stress, tension, and trauma. TRE is based on Dr. Berceli's observation that the human body often tremors or shakes before, during or after stressful or dangerous situation. This vibrating mechanism is inherent in the human body and is the response of the autonomic nervous system to down-regulate itself.

Tremors

Tremor, defined as an unintentional, rhythmic, oscillation of one or more parts of the body is a readily apparent motor phenomenon (Elias & Shah, 2014; McAuley & Marsden, 2000). Tremor results from contractions of agonist and antagonist muscles entrained by a signal originating from an oscillator in the central nervous system (Verhagen, 2017).

One of the main problems is that current physiological and psychological research identifies tremors primarily as a pathological expression of the neurophysiology of the human body (Berceli, 2015a). However, all adults have varying degrees of tremor, for example, muscle fatigue induced tremors or chattering of the teeth that is experienced in cold temperatures or during fearful events. These tremors are considered as physiological types of tremor, in contrast to pathological kinds which are associated with neurological disorders (Cassiani Ingoni, 2015). While some pathological tremors appear to arise as a distortion of central or peripheral components of physiological tremor, others arise anew, such as parkinsonian tremor (McAuley & Marsden, 2000). The latter is often experienced as an uncontrollable shaking of the hands and legs.

The etiology of tremor is diverse; it may result from metabolic diseases (such as hyperthyroidism and hypoglycemia); neurological disorders (essential tremor and Parkinson disease); and toxins (mercury, lead, etc.). Tremors could also be drug-induced: drugs that cause or exacerbate tremors are caffeine, β -adrenergic agonists, selective serotonin reuptake inhibitors and tricyclic antidepressants, as well as steroids, antiarrhythmic drug amiodarone, and psychotropics, including lithium, valproate, and

dopamine-blocking antipsychotics (Kaufman & Milstein, 2013; Morgan & Sethi, 2005). Furthermore, some tremors may originate in psychogenic disorders.

DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) lists tremoring as part of various pathologies, such as Social Anxiety Disorder (Social Phobia) and Post Traumatic Stress Disorder (PTSD). However, tremors occur not only in mental disorders but also in stage fright (performance anxiety). Thus, Kaufman & Milstein (2013) wrote that those tremors probably originate in excessive adrenergic system activity. Their understanding is close to recognition of tremors in TRE.

The premise of TRE is that those tremors represent deliberate activation of the Autonomic Nervous System to down-regulate an overexcited state (Berceli, 2015a). Hence, tremors are seen as a natural, neuro-physiological response of the body to reduce its stress and restore a sense of well-being (TRE for ALL Inc., 2017). Some of the reported benefits of using TRE are better sleep, less worry and anxiety, more energy and endurance, reduced muscle and back pain, increased flexibility, healing of old injuries as well as greater emotional resiliency (Berceli, 2015b; TRE for ALL Inc., 2017).

Although the use of tremors to improve psychological well-being is very recent, its use to enhance physiological functions has a longer history in sport, medicine, and rehabilitation.

Tremors in sport

Vibration training (VT), also known as biomechanical stimulation, biomechanical oscillation, and whole body vibration is becoming frequently used to improve muscle strength, power, and flexibility as well as coordination. Consequently, VT can be found in wellness, fitness, rehabilitation and medical centers. Various professional sports clubs, such as AC Milan (football) and elite athletes, such as Lance Armstrong and Herman Maier have included vibration sessions into their training schedules (Albasini & Rembitzki, 2010).

VT originates from observation of Jean-Martin Charcot, a French neurologist in the 19th century, that patients with Parkinson's disease were more comfortable and slept better after a train or carriage ride. He believed that the symptoms had improved as a result of the vibrations produced by transportation. Therefore, he replicated this experience by having patients undergo daily 30-minute sessions in the automated vibratory chair that he developed (Goetz, 2009; Tsukahara et al., 2016).

Charcot was one of the first to report a positive effect of vibration application. However, others soon followed him. The immediate predecessor of modern vibration training is Rhythmic Neuromuscular Stimulation that dates back to 1960 when William Biermann described the positive effects of cyclical vibrations (Berceli, 2015a).

In 1970, Vladimir Nazarov developed a vibration training as an effective method to enhance the performance of Soviet athletes. He observed a substantial increase in flexibility and strength after the application of vibrations (Albasini & Rembitzki, 2010). Over time vibrational therapy evolved into the most recent form known as whole-body vibration (WBV).

Many reviews have been published about the use of WBV to improve physical conditions and enhance performance in athletes (Cardinale & Bosco, 2003; Cochrane, 2011; Fagnani, Giombini, Di Cesare, Pigozzi, & Di Salvo, 2006; Morel et al., 2017; Wang et al., 2014). Moreover, some research was done specifically on gymnasts, for example, Despina et al. (2014), George, Kaimakamis, Mellos, & Paradisis (2012), Dallas, Kirialanis, & Mellos (2014). Chmielewska et al. (2014) concluded that WBV could safely be used as a part of athletic training.

WBV training is based on an external drive that stimulates the neuromuscular system of a subject through the use of an oscillating/vibratory platform. Today, various platforms are used: Galileo, Vibrafles, NEMES, Power Plate, Pneu Vibe, etc. However, the human body possesses the inherent

ability to self-generate vibrations/tremors. Initiating a self-directed tremoring process is the goal of TRE.

METHODS

Since the use of vibration as a means for enhancing athletic performance is widely accepted, and TRE is a method for initiating body vibration, the aim of our study was to investigate whether; (1) TRE providers around the world use TRE for athletes; and (2) how they find it beneficial.

Sample

The study included 94 TRE Providers from 26 countries (Table 1). There were 76% of female and 24% of male participants, with the majority in age groups 51-60 (37%) and 41-50 years (34%).

Country	Sent (N)	Answerd (N)	Country	Sent (N)	Answerd (N)
Australia	12	3	New Zeland	7	2
Austria	16	1	Norway	17	3
Belgium	17	2	Philippines	1	0
Canada	28	6	Poland	15	1
Croatia	8	2	Portugal	1	0
Czech Republic	1	1	Romania	4	2
Denmark	21	3	Scotland	3	1
Finnland	14	1	Singapore	9	1
France	7	2	South Africa	62	11
Germany	22	4	Spain	44	6
Indonesia	4	0	Sweden	8	1
Ireland	5	0	Switzerland	13	3
Israel	5	0	Thailand	6	4
Italy	9	1	UAE	2	0
Mexico	3	0	UK	33	6
Netherlands	30	1	USA	295	26
TOTAL	722	94	TOTAL	722	94

Table 1. The number of sent and answered questionnaires by country.

Almost half the participants (46%) had 1-3 years of experience whereas 2% was having more than 10 years of experience working as a TRE provider (Figure 1). Forty-eight respondents (51%) provided TRE for athletes.

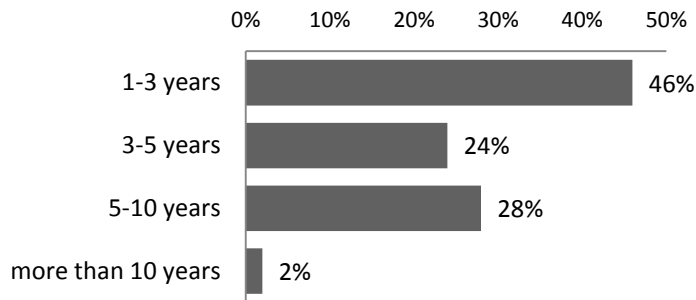


Figure 1. Years of experience as a TRE provider.

Procedure and Data analysis

For the purpose of this study, we prepared an online questionnaire in an open-source application 1ka. The questionnaire consisted of 10 questions (with a mixture of open-ended questions and given answers), provided in order as followed:

1. Do you have any experience providing TRE for athletes?
2. If you answered YES, what kind of sports were they playing?
3. Why did they want to learn TRE? Reasons for trying TRE?
4. From which country were they?
5. Based on your experience, how is TRE helpful for athletes?
6. Any comments or information that you find useful and important to present at the Conference?
7. How long have you been a TRE provider?
8. Your country of residence
9. Your age
10. Sex

The link to the online questionnaire was sent to 722 TRE providers from 32 countries, listed on the official TRE site (table 1). The data were collected over 17 days (5.11. - 23.11.2017) and analyzed using Microsoft Excel 2016. Since this is an informative study, only descriptive statistics were used.

RESULTS

TRE providers (48) who had experience working with athletes indicated that their athlete clients came from various disciplines: athletics, gymnastics, football, basketball, volleyball, cycling, rugby, curling, martial arts, ballet, dancing, horse riding (show jumping), weightlifting, marathon running and iron man, swimming, kite-surfing, rock climbing, skiing, and snowboarding. Elite athletes (at top national and Olympic level) were included.

Answers to the question »Why did athletes want to learn TRE? Reasons for trying TRE?« were classified into 11 categories:

Categories	f	%
due to stress, for relaxation, wellbeing	16	33
sports injuries, pain, rehabilitation	14	29
to relief tension, tight muscles	12	25
for faster recovery (after training), soreness	8	17

due to performance anxiety	6	13
out of curiosity, recommendation	4	8
for better performance	4	8
for better body awareness	3	6
for better concentration, focus	2	4
as part of a curriculum	2	4
to improve flexibility	2	4

Table 2. Categories of answers to the question »Reasons for trying TRE«.

Above mentioned categories are almost the same as the given options on the next question »Based on your experience, how is TRE helpful for athletes?«. Those options were defined based on literature review.

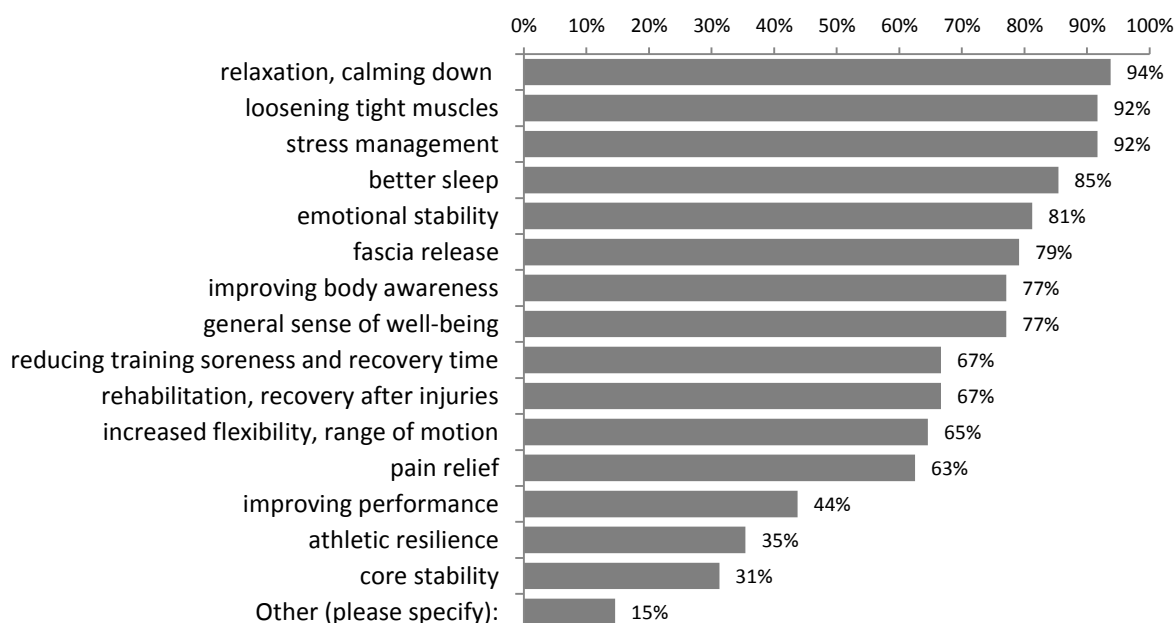


Figure 2. TRE providers' experience what are the benefits of using TRE for athletes.

As »other« TRE providers listed: increased breathing capacity, lowered heart rate, better focus during the performance due to a relaxed state, motivation, inspiration, flexibility (psychological), self-regulation - how much is too much, and better (riding, skiing) technique.

DISCUSSION

The results of our study show that (1) TRE providers from different countries use TRE for athletes and (2) they find it beneficial, both physically (e.g., increased flexibility, reduced workout soreness, pain relief) and psychologically (e.g., decreased performance anxiety, stress management, emotional stability).

TRE providers' experience and observations are in accordance with the literature, demonstrating a wide range of positive physiological effects of vibration (in general and athlete population) including improvements in flexibility (George et al., 2012; Osawa & Oguma, 2013 - meta-analysis), decreased muscle soreness (Broadbent et al., 2010), reduced chronic lower back pain and other types of pain (Rittweger, 2010), improved balance (Dallas, Mavvidis, Kirialanis, & Papouliakos, 2017; Ritzmann, Kramer, Bernhardt, & Gollhofer, 2014) and enhanced muscular strength (Cardinale & Bosco, 2003; Cardinale & Wakeling, 2005; Cochrane, 2011; Issurin, 2005; Marín & Rhea, 2010 - meta-analysis; Morel et al., 2017; Ritzmann et al., 2014). Costantino, Gimigliano, Olvirri, & Gimigliano (2014) in their analysis conclude that vibration can be an effective training stimulus.

Furthermore, the findings of this study are also in accordance with the goal of TRE which is to start a self-directed tremoring process that leads to releasing stress reactions (physiological and psychological). Berceli (2015b) stated that TRE induced tremors are capable of relaxing physical tension patterns in the body as well as reducing psycho-emotional stress and anxiety.

To conclude, literature review and our findings suggest that TRE can represent a valuable and effective exercise intervention for enhancing performance in athletes. However, to adequately assess the effects of TRE on athletes, studies implementing TRE in training regime are needed. Moreover, athletes' feedback should be gathered and thoroughly evaluated.

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