



SINGLE BLIND RANDOMISED CONTROLLED TRIAL

Acute effects of traditional Thai massage on cortisol levels, arterial blood pressure and stress perception in academic stress condition: A single blind randomised controlled trial



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KEYWORDS

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Summary Traditional Thai massage (TTM) has been applied widely to promote relaxation. However, there is little evidence to support its efficacy on academic stress. A randomised controlled trial was performed to examine the acute effects of TTM on cortisol level, blood pressure, heart rate and stress perception in academic stress. This prospective trial included 36 physiotherapy students with a self perceived stress score of between 3 and 5. They were randomly allocated into the TTM (18 people) group or the control group (18 people). Saliva

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cortisol level, blood pressure, heart rate and stress perception rating were measured before and after the intervention. Both groups showed a significant reduction in cortisol level and heart rate when compared with baseline ($p < 0.001$). There were no significant differences in cortisol level between the two groups. The results suggest the need for further study into other possible physiological effects on stress of TTM.

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Introduction

Stress is the disruption to homeostasis caused by psychological experiences or physiological perturbations (Peddicord, 1991). It signals an inequality between what is optimal and what actually exists (Herbert, 1997). Currently, stress affects any individual across all age ranges and even those with a healthy life style continuously experience a variety of stressors in their daily life (Moraska et al., 2010). Thus, it seems that stress is an unavoidable factor of modern life.

There are two main forms of stress which can be distinguished by the cause; somatic stress and psychological stress (Murray et al., 2004). Academic stress is a form of psychological stress which is commonly found in students at university level because they are mostly taught by active learning (Stewart et al., 1999). If they can't cope with stress properly, they could face many stress-related symptoms such as migraine, hypertension and depression (Samuels-Dennis, 2006; Scocco et al., 2006). The body responds to stress by activating the sympathetic branch which results in the stimulation of the hypothalamus–pituitary adrenocortisol (HPA) axis (Armario, 2006; de Rooij et al., 2006). This consequently activates the release of stress related hormones such as cortisol, amylase and catecholamine in both serum and saliva (Moraska et al., 2010; Kirschbaum and Hellhammer, 2000). The measurement of the concentration of cortisol in saliva is non-invasive, simple to perform and as reliable as serum cortisol (Gozansky et al., 2005). It is also independent from the rate of saliva production which varies between individuals (Kirschbaum and Hellhammer, 2000). Therefore, saliva cortisol seems to be an appropriate measurement to indicate stress and has been applied in many stress studies (Field et al., 2005; Takai et al., 2004; Fujita et al., 2006; Whelan et al., 2002).

Recently, there has been an increase in non-pharmacological treatments to relieve stress such as aromatherapy, music therapy, relaxation techniques and Swedish massage. Among these, Swedish massage seems to provide evidence of a decrease in stress in both somatic and psychological stresses, such as breast cancers (Hernandez-Reif et al., 2004), HIV positive patients (Ironson et al., 1996), migraine (Lawler and Cameron, 2006), hypertension (Field et al., 2005; Hernandez-Reif et al., 2000), sexual abuse victims (Field et al., 1997a), job stress (Field et al., 1997b) and anorexia nervosa (Hart et al., 2001). However, it has been reported by Moyer (2009) that many of these previous studies are weakened by methodological flaws and misinterpretation of the results. Ultimately, it is still

unclear whether there is any effect on saliva cortisol following massage. Similarly to Swedish massage, Traditional Thai massage (TTM) has become popular not only in Thailand but also in other countries around the world. Unfortunately, there have been no controlled studies reporting the effectiveness of TTM on stress hormones. Therefore, this randomized controlled study was performed with the aim of determining the effect of TTM on cortisol hormone levels to provide the first scientific evidence of TTM on academic stress in comparison with rest in the supine position.

Methods

Design

This study was a single blinded, randomized controlled study carried out at the Division of Physical Therapy, Khon Kaen University, Thailand. The ethical committee of Khon Kaen University approved the protocol of this study. This trial was performed in accordance with ethical standards on human experimentation and with the Helsinki Declaration of 1975, as revised in 1983. All participants provided written informed consent prior to the experiment.

Participants

Third-year physiotherapy students with self perceived stress score equal to or greater than 3 on a 5-point scale (rated by 1 = not stressed at all and 5 = extremely stressed) (Ng et al., 2003) were randomly assigned to either TTM or rest in supine position in block allocations of 2, 4 and 6. The STATA software was used to run the randomization to ensure that the sample size in both groups was equal. The main variable was saliva cortisol and was investigated by one of the authors who was blinded to the experiment. Other inclusion criteria were 1) no history of depression 2) no history of mental disorders 3) no signs or symptoms of cardiovascular disorders and 4) no history of hormonal diseases. Participants were excluded if they had one of the following conditions: 1) menstruation 2) pregnancy 3) body temperature of $>38.5^{\circ}\text{C}$ on the day of the experiment 4) a history of acute trauma, surgery or infection and 5) any individual considered unable to commit to the full course of the treatment. All participants were asked not to consume food or drink any alcohol or other drinks except water for at least 1 h prior to the intervention.

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