

# The Immediate Effect of natural innovation product “Stress relief pillow” on Heart Rate Variability to stress relax massage and reduce pain

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## Abstract

Stress Relief Pillow develop from natural products of coconut shells of Innovation Products include the massage ball is a manually operated head and neck massage and used to Wisdom of Thai Traditional Medicine for developed of health product. This study was the Immediate Effect of natural innovation product “Stress relief pillow” on Heart Rate Variability to stress relax massage and reduce pain. This study was pilot study. A total of 10 participants, targeting ages more than 18 years, who were tested using the Self-Stress Assessment (SSA). Their level of tension is moderate to high. Participants were tested using Stress Relief Pillow for 10 minutes a day for five days. The tools for outcome measurement in this study consist of SSA, visual analog scale (VAS), and heart rate variability-HRV. Repeated measures ANOVA was used to assess the average score on the outcome measurement. The results show a statistically significant between time points ( $P < 0.05$ ) the following: decrease Immediate effectiveness in VAS were  $\bar{x}$  (SD) (4.70 (0.67), 3.70 (0.67)) significantly different in the comparison study before and after the result of VAS, it improves the function of the parasympathetic nervous system, reducing tension and the variables related with neck discomfort and stress in those who are stressed.

**Keywords:** Stress Relief Pillow, Innovation, natural products, coconut shells

## 1. Introduction

Stress is a prevalent mental health concern across all age groups, characterized by the physical, emotional, and behavioral responses of individuals to various internal and external pressures, which may include personal health issues, emotions, or unfamiliar situations and environments. (WHO, 2023). Common sources of stress can arise from challenges within family dynamics, workplace issues, harassment, and violence (Department of Mental Health, 2019). The traditional knowledge of local communities about alleviating stress through Thai massage has been practiced and shared with younger generations. This approach serves not only to treat ailments but also for overall wellness and beauty (The Foundation for the Promotion of Thai Traditional Medicine Ayurved School, 2005).

Nevertheless, when stress builds up without intervention, it may result in depression, mental health disorders, or have long-lasting detrimental effects on both the mind and body (Cooper, 2023). In examining stress levels, a survey conducted in England revealed that 49.0 percent of individuals aged 18-24 experienced significant stress, which is greater than in other age categories. Moreover, it found that 60.0 percent of this group felt stress due to the pressure to achieve (Mental Health Foundation, 2018). Additionally, the 2021 Gallup Global Emotion Survey, covering 122 countries worldwide, indicated that 41.0 percent of people reported experiencing stress, an increase from 40.0 percent in 2020 (Ray, 2022). Thus, addressing factors that contribute to stress is viewed as essential.

The traditional practices of local communities regarding the use of Thai massage for stress relief have been successfully passed down, emphasizing the sharing of knowledge and experiences with new generations. This method serves purposes beyond mere disease treatment, extending into areas of health improvement and beauty enhancement (The Foundation for the Promotion of Thai Traditional Medicine Ayurved School, 2005). Historically, local residents utilized familiar household items, such as a coconut shell, to create self-massage tools. This coconut shell was effectively employed for foot massages to alleviate pain, numbness, and physical tension. Although this technique has been utilized for quite some time, there is currently no research documenting its effectiveness in reducing stress. Consequently, the aim of this study is to evaluate the efficacy of self-massage with a Stress Relief Pillow in decreasing stress levels.

## 1.1 Objective

To determine the Immediate Effect of natural innovation product “Stress relief pillow” on Heart Rate Variability to stress relax massage and reduce pain

## 2. Materials and Methods

### 2.1 Design

This study was conducted at the Department of Health Promoting Hospital in Samut Songkhram Province, Thailand. It involved a Quasi Experimental Research design. The effectiveness of the innovative Stress Relief Pillow was tested using a before-after treatment approach. The research received approval from the Human Research Ethics Committee of Suan Sunandha Rajabhat University (COE.1-100/2022).

### 2.2 Participants

The study involved a sample of 10 volunteers, each aged 18 or older. Over the course of five days, they utilized the Stress Relief Pillow for daily sessions lasting 10 minutes. Before the trial commenced, all participants were evaluated through the Self-Stress Assessment (SSA), created by Thailand's Department of Mental Health (DMH). After this initial screening, the volunteers received treatment through a coconut shell massage facilitated by the pillow.

### 2.3 Intervention

The selected volunteers would receive a 10-minute coconut shell massage Stress Relief Pillow for 5 consecutive days. They were assessed both before and after the treatment. The

volunteers would lie in a supine position, with the coconut shell massage Stress Relief Pillow placed on both the left and right sides of the splenius muscle at the back of their heads.

## 2.4 Measurement Instruments

The measurement instruments included Self-Stress Assessment (SSA), and subjective stress, and pain perception respectively. visual analog scale (VAS) and Heart Rhythm Scanner PE (Biocom Technologies, USA) for measurement the heart rate variability (HRV).

### Statistical Analysis

The volunteers' demographic was used to analyze the characteristic of the volunteers focusing on mean and standard deviation. Additionally, the paired t-test was used to analyze the variables to compared the means before and after. An analysis of Repeated Measures ANOVA of the treatment with 0.95 level of significance ( $P < 0.05$ ).

## 3. Results

This is the Immediate Effect of natural innovation product “Stress relief pillow” on Heart Rate Variability to stress relax massage and reduce pain. The participants are a group of ten persons over the age of 18 who were tested using the Self-Stress Assessment (SSA) created by Thailand's Department of Mental Health (DMH). Their level of tension is moderate to high. For five days, the volunteers used a stress relief pillow for ten minutes each time.

The results show a statistically significant decrease in visual analog scale (VAS) pain intensity for the coconut shell stress relief pillow a repeated Measures ANOVA with a Greenhouse-Geisser correction determined that mean VAS differed statistically significantly between time points ( $P < 0.001$ ).

*Table 1 Outcome repeated measures at visual analog scale (VAS) assessment time points during the baseline, Immediate, Short-term day 1 and Effectiveness day 5 after final treatment (Repeated Measures ANOVA) outcome*

Outcome	Treatment group	Greenhouse-Geisser Correction		
	$\bar{x}$ (SD)	$F_{(df_{repeat}, df_{residual})}$	p-value	Effect size
Baseline	4.70 (0.67)	$F_{(1.85, 16.64)} = 64.64$	<0.001	0.878
Immediate effectiveness	3.70 (0.67)			
Short-term effectiveness day 1	3.20 (0.42)			
Effectiveness after day 5 of treatment	2.60 (0.52)			

Note.  $P < 0.05$  is statistically significant differences as compare between before and after the treatment from baseline.

## 4. Discussion and Conclusion

The findings of the level of pain perception resulting from the massage as revealed by a decreased VAS suggested that this innovation could efficiently reduce pain. This result was consistent with that from a previous study of Damapong et al. (Damapong, et al., 2015).

which found the effectiveness of court-type traditional Thai massage in patients with chronic tension-type headache.

Effects of a decrease of the level of pain by coconut shell massage could be described as the physiological effect that massage provided pressure through skin and muscle which affected to increase the circulation of blood and lymph. The increased blood circulation might have an effect of stimulating the parasympathetic nervous system to affect vasomotor relaxation and removal of waste product from the congested soft tissues. Thus, this treatment may indirectly decrease the inflammation, edema and pain (Eungpinichpong, W., 2008). The effects on parasympathetic activity of this treatment also supported by the increased HRV immediately after the treatment. This was consistent with the study of Boonjang N. and Fakkham S. (Boonjang N, 2019)

The findings on decrease VAS in all directions suggest relaxation effect of the massage. This phenomenal could be described that Thai massage would stretch the muscle, decrease the muscle fascia and increase the muscle flexibility.

Additionally, the SDNN and RMS-SD were significantly ( $P<0.05$ ) different in the comparison study before and after the result of heart rate variability. It appears that the participants experienced less stress after using the innovative natural innovation product “Stress relief pillow”. The innovative coconut shell massage pillow, it may be assumed, can help to reduce tension and neck stiffness. Besides that, it improves the function of the parasympathetic nervous system, reducing tension and the variables related with neck discomfort and stress in those who are stressed. People with neck discomfort and tension had a positive change.

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