

# Coconut Shells as the Alternative Equipment for Foot Reflexology

Nichanant Sermsri, Chananchida Yuktirat

**Abstract**—This research was the experimental research. Its purpose was to find out how coconut shells can be adapted to be equipment for foot and calf reflexology. The sample group was 58 female street vendors in Thewet Market, Bangkok, selected by selection criteria and voluntary. The data collecting tool was the Visual Analogue Scale. The massaging tool made from coconut shells was the key equipment for this research. The research team assessed the level of exhaustion and heart rate among sample group before and after the massage, then analyzed the data by mean, standard deviation and paired sample t-test.

We found out from the research that

1. The level of exhaustion decreased 4.529 levels after the massage and the standard deviation was 1.6195. The heart rates went down 11.67 times/minute and the standard deviation was 6.742.
2. The level of exhaustion and heart rate after the massage decreased with the statistically significance at 0.01

**Keywords**—Coconut Shells, Foot Massage, Foot Reflexology, Massaging Plate.

## I. INTRODUCTION

**M**ASSAGING is the rubbing and kneading of muscles and joints of the body with the hands, esp. to relieve tension or pain. It is the valuable folk wisdom inherited for a long time in Thai society. It has been an alternative way of health treatment from the past to present [1]. Foot massage is part of traditional Thai massage with the purpose of stimulating the whole body and makes it in balance and work effectively. The sole of foot has the zones that connect to each part of the body [2], [3].

Therefore, foot reflexology helps the whole body to work properly. Besides, foot massage helps with blood circulation and can relieve the pain and numbness on the feet [4], [5].

There are 2 popular ways of foot massage. The first way is to get it from the masseurs who will press on each zone of the foot. The other way is to perform the self massage by using the massaging tool. Most of the tools are the adaptation of local product: in this case, the coconut shells. The research team cut the coconut shells in half and put them on the floor. People can step on them and start rolling their feet as a start of self-massage [6].

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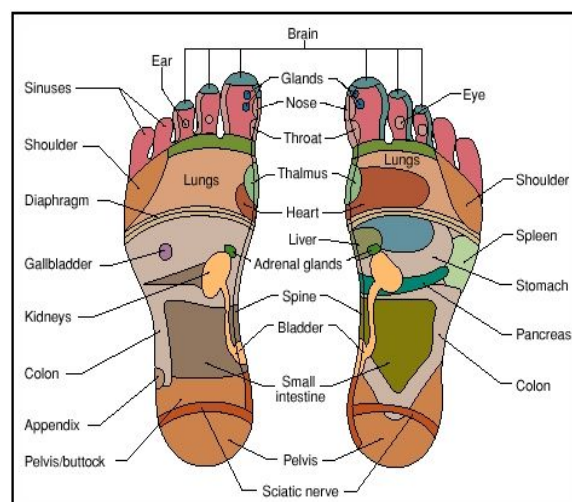


Fig. 1 The zones on the foot

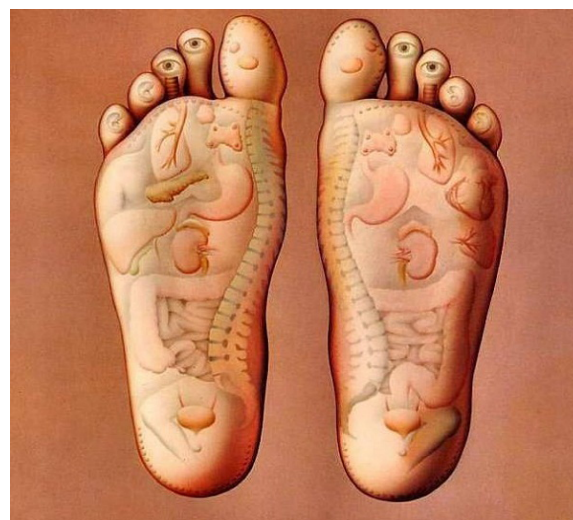


Fig. 2 The sole of foot that connect to each part of the body

The record of street vendors in Bangkok in 2012 stated that there were 21,084 people selling on the street [7]. These people regularly park their carts for selling goods along the street and stand all day. They hardly sit down because of the limited space on the sidewalk where they have to share with other vendors and pedestrians. Thus, standing up for too many hours everyday causes muscle pain, especially on calves and feet. Many vendors cure the pain by taking painkiller. Some go to use massage service.



Fig. 3 The street vendors in Thewet Market

As we are concerned with the fact above, the research team decided to make a massaging tool made from coconut shells with the same method with foot reflexology. We hope that it can be an alternative way to relieve the muscle stiffness naturally and reduce chemical treatment.

## II. OBJECTIVES

1. To study the performance of the massaging tool made from coconut shells.
2. To compare the stiffness before and after using the coconut shells massaging tool.

## III. METHODOLOGY

This research is the experimental research. The duration of the research was 1 month. The sample group was a group of 58 female street vendors in Dusit, Bangkok, selected by selection criteria and voluntary. Each person in sample group was given the coconut shells massaging tool (designed and produced by the research team). The massage technique was taken from Granny Wirun's "step on the shell" massage routine [8]. Sample groups were asked to stand on the coconut shells massaging tool and massage their sole on both feet with full instruction from the researcher. The massage time was 15 minutes per each person. Data collecting tools in the research was the visual analogue scale. The research team assessed the level of exhaustion and heart rate among sample group before and after the massage, then analyzed the data by mean, standard deviation and paired sample t-test.



Fig. 4 The massaging tool made from coconut shells

## IV. RESULTS

We can see that the level of exhaustion of the sample group (58 females) before using the coconut shells massaging tool was averagely 6.182 and the standard deviation was 1.5446. The exhaustion level after using the coconut shells massaging tool was averagely 1.653 and the standard deviation was 1.2480. Before the massage, the heart rate was 71.11 times/minute and the standard deviation was 11.236. After the massage, the heart rate went down to 59.44 times /minute and the standard deviation was 9.587 as shown in Table I.

TABLE I  
MEANS AND STANDARD DEVIATION OF EXHAUSTION AND HEART

Item	N	$\bar{X}$	S.D.
Exhaustion before massage	58	6.182	1.5446
Exhaustion after massage	58	1.653	1.2480
Heart rate before massage	58	7111.	11.236
Heart rate after massage	58	5944.	9.587

The statistical significance of the exhaustion and heart rate level before and after the massage was reduced by .01. The level of exhaustion reduced 4.529 levels after the massage and the standard deviation was 1.6195. The heart rate level was 11.67 times / minute and the standard deviation was 6.742 as shown in Table II.

TABLE II  
THE RESULT OF EXHAUSTION LEVEL AND HEART RATE BEFORE AND AFTER MASSAGE

Item	$\bar{X}$	S.D.	t
Exhaustion level before and after massage	4.529	1.6195	26.089**
Heart rate before and after massage	11.67	6.742	11.157**

\*\*The statistically significance at 0.01

## V. CONCLUSION

The result of coconut-shell massaging tool adaptation to foot reflexology can be summarized into:

The comparison of exhaustion and heart rate level in terms of before and after using the self-massaging tool made from coconut shells shows significant result. The statistical significance of this reduced by .01, which indicated the relaxation gained among the sample group.

It agrees with the foot reflexology theory of Thailand Traditional Medicine Research Institute that when the blood circulation works better, the level of pain can be reduced.

It is also related to the research of Renu Meechana [9] that massage could change the difference of heart rate in statistical significance. Besides, the research of Wilai Udompityasan [10] has the same result with this research, saying that heart rate among the volunteers had less bpm. The level of exhaustion of this research is related to the work of Charoonlak Pongcharoen [11] and Urai Nitrotnan [12] that the level of pain among the sample group reduced in statistical significance after the massage.

## VI. SUGGESTIONS

According to the satisfying outcome in this research, the coconut-shell massaging tool should be an alternative way of

foot reflexology.

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