Optimal Temperature and Duration for Dabbing Customers with the Massage Compressed Packs Reported from Customers’ Perception

Wichan Lertlop, Boonyarat Chaleephay

Abstract—The objective of this research was to study the appropriate thermal level and time for dabbing customers with the massage compressed pack reported from their perception. The investigation was conducted by comparing different angles of tilted heads done by the customers together with their perception before and after the dabbing. The variables included different temperature of the compressed packs and different dabbing duration. Samples in this study included volunteers who got massage therapy and dabbing with hot compressed packs by traditional Thai medical students. The experiment was conducted during January to June 2013. The research tool consisted of angle meters, stop watches, thermometers, and massage compressed packs. The customers were interviewed for their perceptions before and after the dabbing. The results showed that:

1. There was a difference of the average angles of tilted heads before and after the dabbing.
2. There was no difference of the average angles at different temperatures but constant duration.
3. There was no difference of the average angles at different durations.
4. The customers reported relaxation no matter what the various temperatures and various dabbing durations were. However, they reported too hot at the temperature 70°C and over.

Keywords—Massage, Therapy, Therapeutic Systems and Technologies.

I. INTRODUCTION

With the fast pace of everyday life, the effect is on muscle strain resulting in muscle ache. This can be relaxed by getting massage or thermal therapy treatment. Thermal therapy treatment can cause muscles and blood vessels expand making better blood circulation and relaxation [1]. Moreover, it helps with the muscle flexibility and reduction of blood viscosity [2]. Traditional Thai medicine has realized the benefit of thermal therapy on muscles has invented a massage compressed pack consisting of Thai herbs for releasing muscle pain [3]. The massage compressed pack must be heated by steaming before dabbing on the painful body parts [4].

However, there has been no study on the optimal temperature and duration of the dabbing to relief the pain. So, the researcher investigated which temperature and which duration that made the best effect on muscle relaxation. The

II. OBJECTIVES OF THE STUDY

The objective of this research was to study the appropriate thermal level and time for dabbing customers with the massage compressed pack reported from their perception.

III. RESEARCH METHODOLOGY

A. Population and Sampling Group

Samples in this study included volunteers who got massage therapy and dabbing with hot compressed packs by traditional Thai medical students. The experiment was conducted during January to June 2013.

B. Research Tools

The research tool consisted of angle meters, stop watches, thermometers, and massage compressed packs. The customers were interviewed for their perceptions before and after the dabbing. The researcher conducted the structure interview which was validated by 3 specialists to check the reliability of structure and contents.

C. Research Procedure

1) Inform the volunteers and ask for their cooperation.
2) Train traditional Thai medical students for the dabbing skills, angle measuring skills, timing, and recording.
3) Set the sitting posture of the volunteers straight and upright position with their backs against the wall along with the defined lines.
4) Measure the angles of the volunteers’ tilted heads against the defined line before dabbing.
5) Dab the volunteers with the massage compressed packs heated at various temperatures and at various durations.
6) Measure the angles of the volunteers’ tilted heads against the defined line after dabbing.
7) Interview the volunteers for their perceptions on the relaxation feeling at various temperatures.

D. Research Experiment

1) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 5 minutes.
2) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 10
minutes.

3) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 15 minutes.
4) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 5 minutes.
5) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 10 minutes.
6) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 15 minutes.
7) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 5 minutes.
8) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 10 minutes.
9) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes.
10) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes.
11) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 10 minutes.
12) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 15 minutes.
13) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 50°C.
14) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 60°C.
15) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 70°C.
16) Interview the volunteers for their perceptions on the relaxation feeling at various temperatures and various durations.

IV. DATA ANALYSIS

The data could be divided into 2 parts. The 1st part was analyzed by measuring the tilted head angles which were calculated by SPSS in the following comparison.

1) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 5 minutes. Find t value (t-test)
2) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 10 minutes. Find t value (t-test)
3) The comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 15 minutes. Find t value (t-test)
4) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 5 minutes. Find t value (t-test)
5) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 10 minutes. Find t value (t-test)
6) The comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 15 minutes. Find t value (t-test)
7) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 5 minutes. Find t value (t-test)
8) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 10 minutes. Find t value (t-test)
9) The comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes. Find t value (t-test)
10) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes. Find F value (F-test)
11) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 10 minutes. Find F value (F-test)
12) The comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 15 minutes. Find F value (F-test)
13) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 50°C. Find F value (F-test)
14) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 60°C. Find F value (F-test)
15) The comparison of the average changing angles of tilted head with the change of the duration at 5, 10 and 15 minutes at the temperature of 70°C. Find F value (F-test)
16) In the part of interview, the data were analyzed by content analysis.

V. RESULTS OF THE STUDY

The analyzed data can be presented in the table below.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>x</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>13</td>
<td>32.0769</td>
<td>7.0292</td>
<td>6.364</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>13</td>
<td>39.1538</td>
<td>9.7026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table I presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 5 minutes with t value (t-test) that sig value = 0.00 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 50°C for 5 minutes showed the significant difference at 0.05.
Table II presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 10 minutes with t value (t-test) that sig value = 0.001 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 50°C for 10 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>13</td>
<td>36.2308</td>
<td>8.5553</td>
<td>4.472</td>
<td>0.001</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>13</td>
<td>41.7692</td>
<td>6.8939</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table III presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 50°C for 15 minutes with t value (t-test) that sig value = 0.007 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 50°C for 15 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>13</td>
<td>38.5385</td>
<td>9.4394</td>
<td>3.249</td>
<td>.007</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>13</td>
<td>43.6154</td>
<td>6.2388</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table IV presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 5 minutes with t value (t-test) that sig value = 0.000 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 60°C for 5 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>18</td>
<td>29.2857</td>
<td>8.9841</td>
<td>7.043</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>18</td>
<td>35.9048</td>
<td>8.4197</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table V presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 10 minutes with t value (t-test) that sig value = 0.000 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 60°C for 10 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>21</td>
<td>32.5238</td>
<td>9.8773</td>
<td>7.047</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>21</td>
<td>40.1429</td>
<td>7.4181</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table VI presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 60°C for 15 minutes with t value (t-test) that sig value = 0.000 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 60°C for 15 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>21</td>
<td>35.6190</td>
<td>10.7447</td>
<td>5.897</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>21</td>
<td>43.8571</td>
<td>7.5649</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table VII presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 5 minutes with t value (t-test) that sig value = 0.000 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 70°C for 5 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>18</td>
<td>31.0556</td>
<td>10.3040</td>
<td>5.190</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>18</td>
<td>38.4444</td>
<td>12.1472</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05

Table VIII presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 10 minutes with t value (t-test) that sig value = 0.000 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 70°C for 10 minutes showed the significant difference at 0.05.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>S.D.</th>
<th>t</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>18</td>
<td>32.7778</td>
<td>9.3780</td>
<td>6.031</td>
<td>.000</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>18</td>
<td>41.6111</td>
<td>10.4608</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha = 0.05
The temperature of 70°C for 15 minutes showed the significant average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes with \( t \)-value (t-test) that sig value = 0.001 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes showed the significant difference at 0.05.

Table IX presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes with \( t \)-value (t-test) that sig value = 0.001 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes showed the significant difference at 0.05.

 TABLE IX  
<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>X</th>
<th>S.D.</th>
<th>( t )</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>The angle before dabbing</td>
<td>18</td>
<td>34.611</td>
<td>9.121</td>
<td>4.061</td>
<td>.001</td>
</tr>
<tr>
<td>The angle after dabbing</td>
<td>18</td>
<td>44.444</td>
<td>10.595</td>
<td>4.061</td>
<td>.001</td>
</tr>
</tbody>
</table>

Table IX presents the comparison of the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes with \( t \)-value (t-test) that sig value = 0.001 which was less than alpha value = 0.05. This means that the average angles of tilted head before and after dabbing at the temperature of 70°C for 15 minutes showed the significant difference at 0.05.

Table X presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.117 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 5 minutes was not statistically significant difference at 0.05.

Table X presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.117 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 5 minutes was not statistically significant difference at 0.05.

Table XI presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 10 minutes at the temperature of the massage compressed pack at 50°C by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.808 which was higher than alpha at 0.05 meaning that the change of time at 5, 10, and 15 minutes at the temperature of the massage compressed packs at 50°C was not statistically significant difference at 0.05 based on the volunteers’ perceptions.

Table XI presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 10 minutes at the temperature of the massage compressed pack at 50°C by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.808 which was higher than alpha at 0.05 meaning that the change of time at 5, 10, and 15 minutes at the temperature of the massage compressed packs at 50°C was not statistically significant difference at 0.05 based on the volunteers’ perceptions.

Table XII presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 15 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.218 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 15 minutes was not statistically significant difference at 0.05.

Table XII presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 15 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.218 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 15 minutes was not statistically significant difference at 0.05.

Table XII presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.117 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 5 minutes was not statistically significant difference at 0.05.

Table XII presents the comparison of the average changing angles of tilted head with the change of the temperature at 50, 60, and 70°C for 5 minutes by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.117 which was higher than alpha at 0.05 meaning that the change of the temperature at 50, 60, and 70°C for 5 minutes was not statistically significant difference at 0.05.
Table XV presents the comparison of the average changing angles of tilted heads at the change of time at 5, 10, and 15 minutes at the temperature of the massage compressed pack at 70°C by the analysis of One-way analysis of variance and One-way ANOVA. It was found that the sig. value was 0.527 which was higher than alpha at 0.05 meaning that the change of time at 5, 10, and 15 minutes at the temperature of the massage compressed packs at 70°C was not statistically significant difference at 0.05 based on the volunteers’ perceptions.

Table XVI showed the volunteers’ perceptions on the dabbing of 50°C massage compressed pack at different durations. At the first 5 and 10 min, the temperature was at the right level making them relax.

Table XVII showed the volunteers’ perceptions on the dabbing of 60°C massage compressed pack at different durations. Most of the volunteers said that the packs were rather hot but made them relax.

Table XVIII from the above table, it can be seen that most volunteers reported very hot at the beginning but it made them feel relax and comfortable.

VI. CONCLUSION
The results showed that:
1) There was a difference of the average angles of tilted heads before and after the dabbing.
2) There was no difference of the average angles at different temperatures but constant duration.
3) There was no difference of the average angles at different durations.
4) The customers reported relaxation no matter what the various temperatures and various dabbing durations were. However, they reported too hot at the temperature 70°C and over.

VII. DISCUSSION
The volunteers could tilt their heads at different angles when comparing before and after dabbing. This showed that human muscles responded with the heat in relaxation way no matter what the various temperatures and various dabbing durations were. Thermal therapy treatment can cause muscles and blood vessels expand making better blood circulation and relaxation. Moreover, it helps with the muscle flexibility and reduction of blood viscosity. However, there was no significant difference at various temperatures. It might be due to the too small difference of the temperatures that could not make the difference on the muscles’ expansion.

There was no statistical difference of the volunteers’ perceptions on the difference of dabbing durations because the temperature was lower as the time passed. This had no effect on the muscle flexibility. To see the difference in muscle flexibility, the temperature of the massage compressed pack should have been at the constant point.

Most volunteers reported relaxation when being dabbed no matter at what temperatures. This supported the idea that thermal therapy treatment can cause muscles and blood vessels expand making better blood circulation and relaxation. However, some volunteers said that the temperature was too high while some said it was comfortable. As a result we cannot define the optimal temperature of the massage compressed pack.

ACKNOWLEDGMENT
This research was support by Suan Sunandha Rajabhat University. Special thanks also extended to student of SSRU who helped and Support this research.

REFERENCES