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Effect of Thai traditional massage on “craving” response in individuals receiving alcohol dependency treatment in rehabilitation stage at Thanyarak Institute

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Chernchujit N, Kalayasiri R. Effect of Thai traditional massage on “craving” response in individuals receiving alcohol dependency treatment in rehabilitation stage at Thanyarak Institute. Chula Med J 2014 Mar – Apr;58(2): 125 - 41

- Research Purpose** : *Thai traditional massage (TTM) can mitigate drug craving such as cigarette. Nevertheless, further finding is required in order to investigate the effect of massage on alcohol craving.*
- Objective** : *To study alcohol craving in subjects receiving TTM*
- Setting** : *Thanyarak Institute*
- Research Design** : *Cross-over experimental design*
- Population sample** : *18 males hospitalized for alcohol dependency treatment in rehabilitation stage*
- Research Methodology** : *Data was obtained by having patients completed computerized-self-evaluation forms comprising of Penn Alcohol Craving Scale, Visual Analog Scale and blood pressure / pulse rate while they were stimulated by video of alcohol consumption. The samples undertook the evaluation forms in 3 days including the day with no activity, the day with TTM, and the day with reading newspapers. The latter two activities were randomly assigned alternately. The data were analyzed by Generalized Estimating Equations (GEE).*

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- Finding** : *Alcohol craving level in the day with TTM was lower than reading activity and no activity ($p < 0.01$). There was no difference of alcohol craving level between reading activity and no activity ($p = 0.4$). In addition, TTM reduced the stimulated, anxious, hungry, high, paranoid, tongue-tied and bad feelings ($p < 0.01$). However, there was no effect of TTM on restlessness. TTM also lowered systolic/diastolic blood pressures and pulse rate ($p < 0.01$).*
- Conclusion** : *TTM reduced alcohol craving, other feelings as well as blood pressures and pulse rate of the subjects who were stimulated with pictures of alcohol consumption.*
- Keywords** : *Thai traditional massage, craving, alcohol dependence, rehabilitation stage, Thanyarak Institute.*

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เข้ารับการบำบัดการติดแอลกอฮอล์ในระยะฟื้นฟู ณ สถาบันธัญญารักษ์. จุฬาลงกรณ์เวชสาร
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- เหตุผลของการทำวิจัย** : การนวดแผนไทยสามารถลดความอยากเสพสารเสพติด เช่น บุหรี่ ได้อย่างไรก็ตาม ยังไม่เคยมีการศึกษาผลของการนวดแผนไทยต่อความอยากแอลกอฮอล์มาก่อน
- วัตถุประสงค์** : เพื่อศึกษาเปรียบเทียบความอยากแอลกอฮอล์ขณะที่ได้รับและไม่ได้รับการนวดในผู้ที่เข้ารับการบำบัดการติดแอลกอฮอล์ในระยะฟื้นฟู
- สถานที่** : ณ สถาบันธัญญารักษ์
- ประชากรตัวอย่าง** : ชาย 18 คน ที่เข้ามารับการบำบัดการติดแอลกอฮอล์ในระยะฟื้นฟู
- วิธีการศึกษา** : เก็บรวบรวมข้อมูลโดยใช้แบบประเมินตอบด้วยตนเองบนหน้าจอคอมพิวเตอร์ ซึ่งประกอบด้วยแบบประเมินความอยากแอลกอฮอล์ Penn Alcohol Craving Scale (PACS) ฉบับภาษาไทย แบบประเมินความรู้สึกรู้สึก Visual Analog Scale (VAS) และวัดสัญญาณชีพ ขณะถูกกระตุ้นความอยากแอลกอฮอล์ โดยใช้วิธีทัศน์ภาพแอลกอฮอล์ โดยกลุ่มตัวอย่างจะทำแบบประเมินดังกล่าวทั้งหมด 3 วัน คือ วันที่ไม่ได้รับกิจกรรมใด ๆ วันที่ได้รับการนวด และวันอ่านหนังสือพิมพ์ จากนั้นทำการสลับวันที่ได้รับการนวดหรือวันอ่านหนังสือพิมพ์แบบสุ่ม นำข้อมูลที่ได้มาวิเคราะห์ด้วยสถิติ Generalized Estimating Equations (GEE)
- ผลการศึกษา** : ความอยากแอลกอฮอล์ในวันที่ได้รับการนวดแผนไทยต่ำกว่าวันที่ไม่ได้รับการทำกิจกรรมใด ๆ และวันอ่านหนังสือพิมพ์ ($p < 0.01$) ทั้งนี้ความอยากแอลกอฮอล์ในวันที่ไม่ได้รับกิจกรรมใด ๆ ไม่มีความแตกต่างกันกับวันอ่านหนังสือพิมพ์ ($p = 0.4$) นอกจากนี้ การนวดแผนไทยยังมีผลลดระดับความรู้สึกด้านต่าง ๆ ได้แก่ ความรู้สึกถูกกระตุ้น กังวล หิว อารมณ์พุ่งสูง หวาดระแวง พุดไม่ออก แยก ขณะถูกกระตุ้นด้วยภาพแอลกอฮอล์ ($p < 0.01$) แต่ไม่มีผลต่อความรู้สึกกระสับกระส่าย นอกจากนี้ การนวดยังมีผลลดระดับ ความดันโลหิต systolic ความดันโลหิต diastolic และระดับชีพจร ($p < 0.01$)

สรุป : การนวดแผนไทยสามารถลดความอยากแอลกอฮอล์ และสามารถลดระดับความรู้สึกด้านต่าง ๆ และสามารถลดระดับความดันโลหิต และระดับชีพจรได้ ในผู้ติดแอลกอฮอล์ที่ถูกระตุ้นด้วยภาพแอลกอฮอล์

คำสำคัญ : การนวดแผนไทย, ความอยาก, การติดแอลกอฮอล์, ระยะฟื้นฟู, สถาบันธัญญารักษ์.

Craving refers to the need for substance which results from repetitive use of the substance affecting both physical and mental wellness. As a result, the subjects would have developed a substance seeking behavior.⁽¹⁻⁴⁾ The severity of this depends on the level of craving of particular individuals^(5,7) or how much they have been addicted to the substance.⁽⁶⁾ Craving level varies depending on the different varieties of the drugs such as cocaine, heroin, cigarette, caffeine and amphetamine.^(7 - 10) Alcohol is also considered one of the strong addictive narcotics resulting in a top death rate of the world population.^(11, 12) It also has been proven that alcohol can stimulate a great deal of craving level.⁽¹³⁾

Currently, researches on alcohol craving have not yet been widely published⁽¹⁴⁾ while the fact that alcohol dependence has been proven significant in Thailand. Based on information provided by Thanyarak Institute, the numbers of alcoholic inpatients in 2009 were 1,047 while the outpatients one was 143.⁽¹⁵⁾ There were 17.6 million American citizens who have been reported alcoholic.⁽¹⁶⁾ In February 2011, the World Health Organization (WHO) reported that 73.6 million of the world population has misused the alcohol while 2.5 million have died from the use of alcohol⁽¹⁶⁾ accounted for 4% of the world population.⁽¹²⁾ Alcohol dependence has also a strong link with violent crimes^(17, 18) resulting in social problems such as divorce and drunk driving.⁽¹⁹⁾ In addition, this also affected health problems including neurocognitive impairment⁽²⁰⁾ and psychosis.⁽²⁾ Alcohol and cigarette are not considered to be an illegal substance⁽²¹⁾ resulted in its wide use^(22, 23) for teenagers and working adults.^(16, 24) Thailand has also been ranked by the WHO as the 5th country in the

world with high rate of liquor consumption.⁽²⁴⁾

Thai traditional massage (TTM) is a local wisdom derived from the ancient time based on the concept of family support. This is for the grandson or granddaughter in the family to massage their grandparents to mitigate soreness and pain and later it has become customary.⁽²⁵⁾ Massage with moderately slight pressure can activate a parasympathetic nervous system⁽²⁶⁾ and also allows an endorphin, a substance to reduce stress level and anxiety as well as to calm the body, to be released. Also, the massage has been proven to alleviate the smoking craving.⁽²⁸⁾

This research was conducted to study the effect of TTM on alcohol dependence subjects for patients at Thanyarak Institute to investigate further its significance and interrelation to enhance future studies on the subject.

Research Methodology

Population and Sample

The subjects in this research were more than 18 years old who had alcohol dependence based on DSM IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition) and Semi-Structured Assessment for Drug Dependence and Alcoholism (SSADDA) Section E. The subjects were in the recovery period and were able to be induced by cues to increase level of alcohol craving. They were capable of reading, writing and understanding Thai language and perfectly conscious. The exclusion criteria were having depression, disorientation, hallucination and having restriction to massage including wound, cancer, skin disease, and having addiction to other narcotic besides alcohol. The research strictly prohibited volunteers to use inhalant and balm or

massage each other from the 1st day to the 5th day of the experiment. Although exclusion criteria did not mention about being female to be excluded from the study, no female subject was screened/included in the study because there was no female subjects at the study site during study period. The researchers conducted a random sampling ⁽²⁹⁾ with half of the samples were massaged and another half were asked to read newspapers on the first experiment day. Then, all subjects received the other treatment on the 5th day.

Research Tools

Research tools used in this study are below:

1. Penn Alcohol Craving Scale (PACS) by Flannery and colleagues⁽³⁰⁾ with 5 sets of questions including frequency, intensity, and extremity of alcohol craving as well as the possibility of resistance to drinking in various levels within 1 week was used. The questions comprised of 6 different scales ranging from 0 to 6 with the reliability of 0.92. The researchers translated PACS to Thai language and used it with those who were addicted to volatile matter. The accuracy was verified by the 3 experts and tested with the reliability of 0.83.⁽³¹⁾ The subjects also answered all the questions on the computer themselves.
2. Visual Analog Scale (VAS) to measure the 9 aspects of feeling of before, during and after watching the video of alcohol consumption to stimulate the craving. VAS was adapted from subjective-effect measures by W.J. Lynch and the team.⁽³²⁾ The result from test-retest reliability revealed the stimulated 0.68, anxiety 0.78, hunger 0.70, high 0.70, paranoid 0.75, tongue-tied 0.83, bad 0.66, restless 0.89 and craving 0.69. In addition, the samples completed the

computerized evaluation form of VAS to measure their feelings of all aspects as mentioned above.

As the subjects were hospitalized and were not engaged with any use of alcohol, the researchers therefore performed the experiment with cues exposure to ignite cue-induced substance craving. This method has been proven to effectively stimulate alcohol craving of the subjects. The experimental procedure began with the subjects watching a set of picture video of alcohol consumption as a stimulator for 1 minute x 3 times. After each set of video, the researchers measured the level of craving and feelings based on the said evaluation form as well as to monitor their vital signs. Before the actual implementation, the researchers tested this procedure with the volunteers. Those with 50% increase of alcohol craving level and with PACS score of at least 5 were invited to undertake a full experiment.

Experimental Procedure

The Royal Thai massage or traditional Thai massage (TTM) ^(33 - 36) is well known for its remedy effect and relaxation of the body by rubbing 2 sides of the shoulders and 2 spots on the back of the head as well as the 2 spots on the neck. The experimental procedure was conducted with 3 stages in Day 1, Day 2 and Day 5 (Figure 1).

Stage 1: Stimulation of craving with cue (Day 1)

- 1) Subjects were evaluated for their craving level before doing the cue with VAS and PACS as well as the vital signs for 4 minutes.
- 2) The subjects started to watch a set of 12 different pictures of alcohol consumption for 1 minute as a cue for 3 separated times and did the pre-, during and

post evaluation of alcohol craving with VAS and PACS after each set of the pictures. They were also measured their vital signs after watching the picture videos.

3) Subjects then watched a set of 12 different natural view videos for 1 minutes \times 3 times. Their levels of alcohol craving during the time were evaluated with VAS and PACS appeared on the computerized screen after each set of watching natural pictures. Their vital signs were also measured after each set of the pictures.

Stage 2: Experimentation (Day 2)

1) Subjects' feelings and the level of alcohol craving were evaluated through VAS and PACS. Their vital signs were also measured as a pre-test. This step lasted for 4 minutes.

2) Subjects received TTM or read the newspaper for 30 minutes depending or randomly drawn lots.

3) Subjects watched a video of alcohol consumption as a cue and then watch a natural view video. This step was identical to step 2 and 3 in Stage 1.

After this stage subjects had a break for 2 days when no experimentation was conducted on Day 3 and Day 4.

Stage 3: Cross-over experimentation (Day 5)

This stage run in the same manner like stage 2 but changed the subjects who received TTM on Day 2 to reading newspapers on Day 5 and vice versa.

This experimentation has been approved by the Ethics Committee of the Faculty of Medicine, Chulalongkorn University. The researchers realized that the stimulation of alcohol craving might have an impact on the subjects and so watching video on natural views after the experimentation was conducted to ease their anxiety and make them

relaxed. Nevertheless, all subjects had a normal score of craving after 5 minutes once the experiment was completed.

Data Analysis

Primary outcome of the study is level of alcohol craving as measured by PACS and VAS. Secondary outcomes are levels of other feelings, including stimulated, anxious, hungry, high, paranoid, tongue-tied, bad, restless feelings and blood pressure and pulse rate. Descriptive statistics including frequency, percentage, mean, and standard deviation was used for describe general information of the subjects and both primary and secondary outcomes. Data were analyzed by Generalized Estimating Equations (GEE) to determine correlation between outcomes (i.e., activities (TTM), cues (time), subjective feelings (craving, high, anxious, etc.).

Average age of the subjects was 41 ± 8 years (min = 29, max = 55). Out of 18 subjects, 8 (44%) were married, 7 (39%) were single and the rest were divorced (n = 3, 17%). Sixty-one percent of the subjects were graduated with average income from 0 - 15,000 baht. The shortest period of alcohol dependence was 1 year while the highest one was 20 years (mean = 10 years). The last time that the subjects met criteria for alcohol dependence was 5 months (min = 2 months, max = 9 months). The average maximum of drinking within 24 hours was 62 glasses (min = 26, max = 102 glasses).

Score for alcohol craving and the 9 aspects of feeling included the stimulated, anxious, hungry, high, paranoid, tongue-tied, bad, restless and craving as well as vital signs on the day without activity had the highest scores followed by the day with reading newspapers while the day with TTM produced the lowest scores as illustrated in Figure 2.

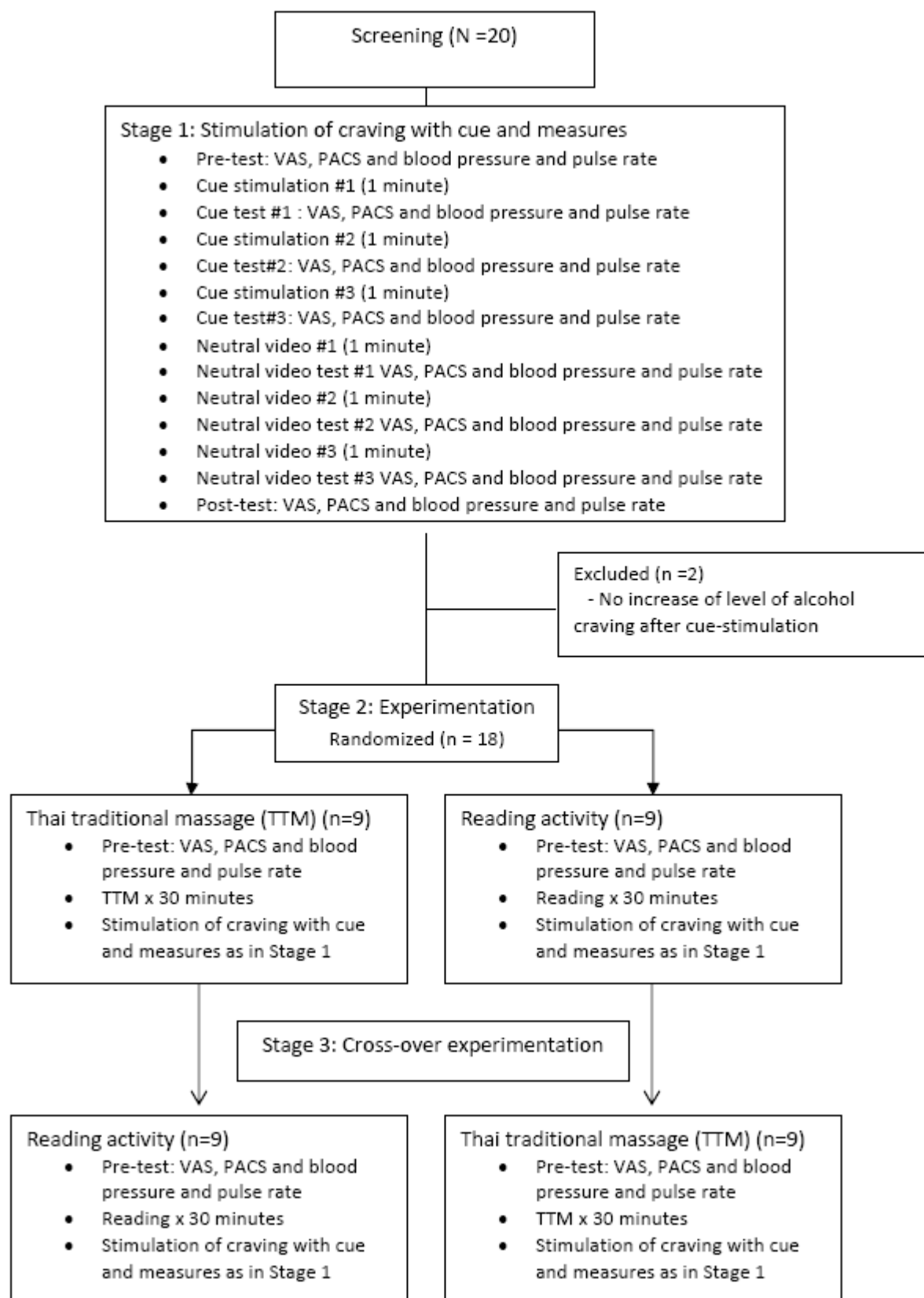


Figure 1. Shows sample size and experiment / measurement in the two treatment arms including Thai traditional massage (TTM) and reading activity. No drop out was observed in the study after beginning experiment but two individuals were excluded before the experiments due to unable to have increase level of alcohol craving after cue stimulation.

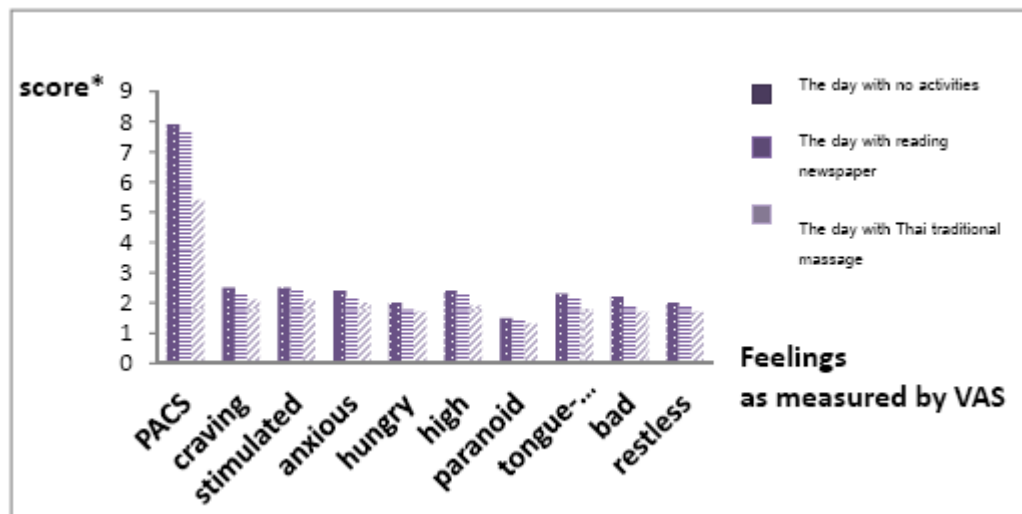


Figure 2. Illustrates average scores for craving and other feelings based on Penn Alcohol Craving Scale (PACS) and Visual Analog Scale (VAS) when watching alcohol cue on the day with Thai traditional massage, the day with reading activity, and the day without any activities. *Full score for PACS is 30 while VAS is 10.

In all the three days, scores of craving level and the 9 aspects of feeling after watching each set of video of alcohol consumption (cue-1, cue-2, cue-3) was higher than those at pre-test and those after watching each set of video of natural view (neutral-1, neutral-2, neutral-3). Score still continued to reduce after the experimentation has completed (post-test) (Table 1).

With respect to vital signs, systolic / diastolic blood pressures and pulse rate after watching each set of video of alcohol consumption (cue-1, cue-2, cue-3) were higher than those at pre-test only in the days with no activities or reading activity. However, on the day receiving TTM, all the vital signs after stimulation by cues were lower than pre-test (Table 2).

According to the analysis based on GEE, significant effects of cues/neutral video ($p < 0.01$; PACS ($B = -0.541$, $S.E.(b) = 0.039$), VAS ($B = -0.263$, $S.E.(b) = 0.017$)) on the level of alcohol craving were

observed. TTM, but not reading newspaper, had a significant effects on reducing alcohol craving ($p < 0.01$; PACS; $B = -1.271$, $S.E.(b) = 0.220$, VAS; $B = -0.299$, $S.E.(b) = 0.098$).

Also based on the analysis of GEE, cue/neutral video had significant effects on the feelings of stimulated, anxious, hungry, high, paranoid, tongue-tied, bad, restless, and systolic and diastolic blood pressures ($p < 0.01$), but not pulse rate. TTM also had a significant effect on reducing the feelings of stimulated, anxious, hungry, high, paranoid, tongue-tied, bad, and systolic / diastolic blood pressures and pulse rate ($p < 0.05$), but not restless feeling. No effect of reading newspaper on any of these feelings and vital signs was observed ($p > 0.05$).

Conclusion and Recommendations

The main purpose of this research was to study the effect of TTM on alcohol craving in those who were stimulated by video cues of alcohol

Table 1. Average and standard deviation of the alcohol craving score and the 9 aspects of feeling as a function of time on the day with Thai traditional massage, the day with reading activity, and the day without any activities.

	Pre-test Mean \pm SD	Cue-1 Mean \pm SD	Cue-2 Mean \pm SD	Cue-3 Mean \pm SD	Neutral-1 Mean \pm SD	Neutral-2 Mean \pm SD	Neutral-3 Mean \pm SD	Post-test Mean \pm SD
Alcohol craving (PACS) score = 30								
Day with no activities	4.2 \pm 1.4	7.3 \pm 1.1	7.7 \pm 1.0	8.6 \pm 1.0	4.8 \pm 1.4	4.5 \pm 1.2	3.8 \pm 1.3	1.7 \pm 0.9
Day with TTM	4.1 \pm 1.6	4.9 \pm 1.9	5.5 \pm 2.0	5.8 \pm 2.3	4.0 \pm 1.6	3.7 \pm 1.5	3.2 \pm 1.2	1.3 \pm 1.2
Day with reading	4.3 \pm 1.3	7.2 \pm 1.5	7.5 \pm 1.0	8.5 \pm 0.9	4.5 \pm 1.2	4.1 \pm 1.2	3.5 \pm 1.2	1.5 \pm 0.9
-Craving								
Day with no activities	2.3 \pm 0.6	2.5 \pm 0.5	2.4 \pm 0.7	2.6 \pm 1.0	1.6 \pm 0.5	1.2 \pm 0.5	1.1 \pm 0.7	0.5 \pm 0.6
Day with TTM	1.9 \pm 0.6	2.1 \pm 0.8	2.0 \pm 1.5	2.1 \pm 1.2	1.4 \pm 1.0	1.1 \pm 0.4	0.8 \pm 0.4	0.3 \pm 0.5
Day with reading	2.1 \pm 0.5	2.2 \pm 0.9	2.4 \pm 1.4	2.3 \pm 1.3	1.5 \pm 1.2	1.2 \pm 0.6	1.1 \pm 0.3	0.4 \pm 0.5
-Stimulated								
Day with no activities	2.2 \pm 0.7	2.7 \pm 0.5	2.3 \pm 1.0	2.5 \pm 1.2	1.5 \pm 0.6	1.1 \pm 0.2	1.0 \pm 0.0	0.5 \pm 0.5
Day with TTM	1.9 \pm 0.6	2.1 \pm 1.0	2.0 \pm 0.8	2.2 \pm 0.8	1.2 \pm 0.6	0.9 \pm 0.4	0.7 \pm 0.5	0.2 \pm 0.4
Day with reading	2.1 \pm 0.4	2.5 \pm 1.0	2.2 \pm 0.7	2.3 \pm 0.8	1.4 \pm 0.8	1.0 \pm 0.3	0.9 \pm 0.4	0.3 \pm 0.5
-Anxious								
Day with no activities	2.1 \pm 0.7	2.2 \pm 0.7	2.4 \pm 0.7	2.5 \pm 1.3	1.4 \pm 0.9	0.8 \pm 0.7	0.7 \pm 0.5	0.5 \pm 0.5
Day with TTM	1.8 \pm 0.6	1.9 \pm 0.6	2.0 \pm 1.1	2.1 \pm 1.0	1.1 \pm 0.7	0.6 \pm 0.5	0.4 \pm 0.5	0.3 \pm 0.5
Day with reading	2.0 \pm 0.7	2.1 \pm 0.8	2.2 \pm 1.0	2.3 \pm 0.8	1.2 \pm 0.9	0.7 \pm 0.7	0.5 \pm 0.5	0.3 \pm 0.5
Hungry								
Day with no activities	1.5 \pm 0.7	2.3 \pm 0.7	1.9 \pm 0.9	1.7 \pm 0.6	1.1 \pm 0.7	0.8 \pm 0.4	0.6 \pm 0.5	0.4 \pm 0.5
Day with TTM	1.3 \pm 0.7	1.8 \pm 0.6	1.5 \pm 1.4	1.9 \pm 0.7	0.9 \pm 0.4	0.6 \pm 0.5	0.4 \pm 0.5	0.3 \pm 0.5
Day with reading	1.4 \pm 0.7	2.1 \pm 0.3	1.7 \pm 1.1	1.5 \pm 0.6	1.0 \pm 0.6	0.7 \pm 0.6	0.5 \pm 0.5	0.3 \pm 0.5
High								
Day with no activities	2.2 \pm 0.7	2.4 \pm 0.7	2.5 \pm 1.2	2.3 \pm 0.6	1.4 \pm 0.6	1.2 \pm 0.8	0.7 \pm 0.5	0.4 \pm 0.5
Day with TTM	1.7 \pm 0.7	1.8 \pm 0.8	1.9 \pm 1.2	1.8 \pm 0.7	1.2 \pm 0.4	1.0 \pm 0.5	0.5 \pm 0.5	0.2 \pm 0.4
Day with reading	2.1 \pm 0.5	2.2 \pm 0.8	2.4 \pm 0.9	2.2 \pm 0.7	1.3 \pm 0.5	1.1 \pm 0.7	0.6 \pm 0.5	0.3 \pm 0.5
-Paranoid								
Day with no activities	1.2 \pm 0.4	1.3 \pm 0.5	1.7 \pm 1.0	1.7 \pm 0.7	1.3 \pm 0.7	0.9 \pm 0.7	0.6 \pm 0.6	0.4 \pm 0.5
Day with TTM	1.1 \pm 0.8	1.4 \pm 1.0	1.2 \pm 1.2	1.3 \pm 0.7	0.8 \pm 0.8	0.6 \pm 0.5	0.4 \pm 0.5	0.3 \pm 0.5
Day with reading	1.2 \pm 0.7	1.3 \pm 0.8	1.5 \pm 1.2	1.4 \pm 1.0	1.2 \pm 0.8	0.7 \pm 0.5	0.5 \pm 0.5	0.4 \pm 0.5
-Tongue-tied								
Day with no activities	2.0 \pm 0.6	2.4 \pm 1.2	2.2 \pm 0.9	2.3 \pm 0.9	1.6 \pm 0.9	1.4 \pm 0.7	0.8 \pm 0.5	0.5 \pm 0.6
Day with TTM	1.6 \pm 0.7	1.9 \pm 1.0	1.7 \pm 0.8	1.8 \pm 0.9	1.4 \pm 0.7	1.1 \pm 0.3	0.6 \pm 0.5	0.3 \pm 0.5
Day with reading	1.8 \pm 0.6	2.2 \pm 1.0	2.1 \pm 0.7	2.3 \pm 0.9	1.5 \pm 0.8	1.3 \pm 0.7	0.7 \pm 0.5	0.4 \pm 0.5
Bad								
Day with no activities	1.8 \pm 0.6	2.2 \pm 1.0	2.1 \pm 0.7	2.3 \pm 0.9	1.5 \pm 0.8	1.3 \pm 0.7	0.7 \pm 0.5	0.4 \pm 0.5
Day with TTM	1.5 \pm 0.7	1.8 \pm 0.8	1.7 \pm 0.9	1.6 \pm 0.8	1.1 \pm 0.5	0.9 \pm 0.2	0.5 \pm 0.5	0.2 \pm 0.4
Day with reading	1.6 \pm 0.7	1.9 \pm 0.8	1.8 \pm 0.8	2.1 \pm 1.0	1.2 \pm 0.9	1.0 \pm 0.6	0.6 \pm 0.6	0.3 \pm 0.5
-Restless								
Day with no activities	1.5 \pm 0.6	1.8 \pm 0.6	2.2 \pm 0.9	1.9 \pm 0.7	1.5 \pm 0.6	0.9 \pm 0.6	0.8 \pm 0.6	0.3 \pm 0.5
Day with TTM	1.5 \pm 0.7	1.6 \pm 1.0	1.8 \pm 0.9	1.7 \pm 1.0	1.4 \pm 0.6	0.9 \pm 0.6	0.6 \pm 0.5	0.2 \pm 0.4
Day with reading	1.6 \pm 0.7	1.9 \pm 1.2	2.0 \pm 0.8	1.8 \pm 0.8	1.5 \pm 0.9	0.8 \pm 0.6	0.7 \pm 0.5	0.4 \pm 0.5

Table 2. Average and standard deviation of systolic and diastolic blood pressure and pulse rate as a function of time on the day with Thai traditional massage, the day with reading activity, and the day without any activities.

	Pre-test Mean \pm SD	Cue-1 Mean \pm SD	Cue-2 Mean \pm SD	Cue-3 Mean \pm SD	Neutral-1 Mean \pm SD	Neutral-2 Mean \pm SD	Neutral-3 Mean \pm SD	Post-test Mean \pm SD
<u>Vital signs</u>								
-Systolic blood pressure								
Day with no activities	116.6 \pm 4.8	119.7 \pm 4.9	120.7 \pm 5.1	122.9 \pm 5.5	119.6 \pm 5.1	117.7 \pm 5.0	116.4 \pm 4.9	116.8 \pm 4.6
Day with massage	120.4 \pm 3.6	115.6 \pm 4.4	115.3 \pm 5.1	115.2 \pm 4.9	114.6 \pm 5.1	114.2 \pm 4.2	113.9 \pm 4.2	113.4 \pm 4.6
Day with newspaper	115.9 \pm 4.7	118.6 \pm 5.3	118.8 \pm 4.7	121.2 \pm 5.7	119.9 \pm 2.8	118.3 \pm 2.8	118.0 \pm 2.6	115.6 \pm 5.0
-Diastolic blood pressure								
Day with no activities	76.6 \pm 5.5	76.7 \pm 6.4	76.1 \pm 6.3	77.1 \pm 5.7	75.7 \pm 6.1	75.4 \pm 7.1	74.5 \pm 5.9	74.3 \pm 6.4
Day with massage	75.1 \pm 5.0	74.4 \pm 4.6	73.5 \pm 5.4	72.9 \pm 5.0	72.8 \pm 4.1	71.9 \pm 3.8	71.3 \pm 5.2	71.0 \pm 4.0
Day with newspaper	73.8 \pm 6.1	74.6 \pm 5.5	75.4 \pm 5.5	75.5 \pm 5.7	77.0 \pm 5.1	75.2 \pm 6.3	76.6 \pm 3.7	74.2 \pm 6.2
-Pulse rate								
Day with no activities	68.5 \pm 8.0	70.1 \pm 6.3	70.3 \pm 6.8	70.6 \pm 6.9	68.4 \pm 7.7	68.3 \pm 6.5	68.2 \pm 8.1	68.1 \pm 6.3
Day with massage	69.8 \pm 6.7	67.1 \pm 6.6	66.2 \pm 6.5	66.6 \pm 8.4	66.5 \pm 6.8	66.4 \pm 7.6	65.8 \pm 8.0	65.7 \pm 7.2
Day with newspaper	65.8 \pm 8.0	67.7 \pm 9.2	67.9 \pm 8.9	68.6 \pm 10.8	69.6 \pm 9.5	69.1 \pm 6.8	69.4 \pm 8.1	66.8 \pm 6.9

consumption. The alcohol cues used in this study could successfully induce alcohol craving, consistent with previous studies of drug-induced craving^(40 - 43), and activate several aspects of the feeling and systolic and diastolic blood pressures, but not pulse rate. The study revealed that TTM could reduce cue-induced alcohol craving. It also reduced several aspects of the feeling including stimulated, anxious, hungry, high, paranoid, tongue-tied, bad, and vital signs such as systolic and diastolic blood pressures. This was true except for the case of restlessness which TTM had no effect on it.

The massage procedure mainly involves touching. Touching affects the level of hormone through tactile receptors that connect to myelinated or non-myelinated tactile neurons. This also linked with parts of the brain called insular and limbic system.^{(44,}

⁴⁵⁾ Massage is assumed to produce similar outcome

like touching which affects the emotion and feeling through free nerve ending, hair end organ, and Pacinian corpuscle which are stimulated by the movement of the nerve and thus creating a small delta type A called anterolateral pathway to ultimately reach the part of brain called cortex, insular and limbic system.^(44 - 46) The massage with moderately slight pressing activates parasympathetic nervous system making relaxation of the body and mind.

Alcohol is a central nervous system (CNS) depressant with an effect on glutamatergic neurotransmission particularly NMDA receptor and endogenous opioid neuropeptides as part of the reinforcement effect which also relates to GABA receptor.⁽²⁾ Therefore, the effect of massage and alcohol consumption yield similar result that they both relax the body and the mind. However, when a person has craving for alcohol, sympathetic nervous system

is activated. Previous studies also reported an increase of blood pressure, heart rate, and cerebral blood flow in limbic system of individuals who were watching video cues that induced craving for drug.⁽³⁷⁻

³⁹⁾ Alcohol craving also related to other negative responses including insomnia, soreness, dizziness, aggressive behavior, depressed feeling, and anxiety which might be mitigated by massage.⁽⁴⁷⁻⁶⁷⁾ Applying massage, an activity that has a calming effect, in persons who were stimulated by alcohol cues, may reduce craving and other responses via activating parasympathetic nervous system. However, mechanism of the effect of TTM to ease alcohol craving required further investigation.

Surprisingly, the study revealed that watching alcohol cues could induce positive feeling, including “high” or euphoria which was also reduced by TTM. It might be possible that TTM might have a normalized effect since it could reduce both positive (i.e., high) and negative (i.e., anxious, bad) feelings. However, further investigation of the effect of alcohol cue and TTM on this positive affect is needed before making further conclusion.

Several limitations deserve mentioned. With sample of 18 subjects, this research would be much accurate if the number could be increased. In addition, the study did not include female samples since there was no female subject during study duration. However, previous research has indicated that females could be stimulated with cues to have craving more than males.⁽⁶⁸⁾ Finally, this study only focused on subjects on the recovery period and so the result might not be best to minify the outcomes. Future study is to involve female subjects and subject at various stage of treatment or at other institutions to be able to generalize the results to general population.

In summary, this research has revealed the fact that TTM could mitigate craving level while the subjects were watching video of alcohol consumption and thus affecting the stimulated, anxious, hungry, high, paranoid, tongue-tied, bad feelings. The finding from this research provides an insight for non-pharmacological treatment of TTM for alcohol dependence and offers improvement in the treatment for symptoms related to alcohol addiction leading to better rehabilitation and thus promoting better quality of life. The study also confirmed a strong stimulation effect of inducing craving from watching an alcohol cues. Therefore, avoiding alcohol cues in persons with alcohol problems is highly recommended to avoid craving for drinking.

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