ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Stress reduction by Phochong chanting indexed by Thai Stress Test

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Submitted: 25-01-2019 Revised: 29-07-2019 Published: 01-09-2019

ABSTRACT

Background: Stress is traditionally defined as either a bodily or mental tension resulting from factors that tend to alter an existent equilibrium or the process of appraising events of assessing potential responses, and of responses which may include not just physiological but also cognitive and behavioural changes. **Aims and Objective:** The purpose of this study was to examine the stress reduction after listening to Phochong chanting. **Materials and Methods:** Forty participants were participated in this study. They were divided into two groups; the control group who saw a spot on computer screen while listening to Phochong chanting for 10 minutes, and the target group who saw the Buddha image while listening to Phochong chanting for 10 minutes. The Thai Stress Test was used as a tool to examine the stress reduction. Frequency, percentage, mean, and standard deviation were used for descriptive data analysis. Paired sample t-test was also used to compare between before and after listening to Phochong chanting. **Results:** The percentage of participants in the target group who felt 'excellent mental health' was 20.0% and only 10% for the control one. The 55.0% in the target group felt 'normal mental health' while 45.0% was for the control one. About 25.0% of the target group felt 'mild stress' while 45.0% was in the control one. However, no participant showed 'sever stress (stressful)' in this study. The Thai Stress Test has adequate reliability, adequate construct validity, and sufficient discriminant power. **Conclusion:** By listening to Phochong chanting would help the stress level reduction.

Key words: Stress; Thai Stress Test; Meditation; Chanting; Phochong

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v10i5.22461
E-ISSN: 2091-0576
P-ISSN: 2467-9100

INTRODUCTION

According to the Webster's ninth new collegiate dictionary,[1] stress is defined as a bodily or mental tension resulting from factors that tend to alter an existent equilibrium. A stress response is the compensatory reaction the body makes to the disturbance caused by the stressor. In addition, Taylor mentioned that stress is defined as the process of appraising events (as harmful, threatening, or challenging), of assessing potential responses, and of responses which may include not just physiological but also cognitive and behavioural changes.[2]

In 2012, Sani and colleagues stated that stress and its psychological manifestations were inherent in the human life. Both stress and its psychological manifestations were also a major source of concern in the modern-day society.[3,4] Some previous studies had been demonstrated that stress in individuals is defined as anything that disrupts the normal person's physical or mental wellbeing. It arises due to the inability of an individual to meet the demands made on him. A mild form of stress may manifest as a bad mood while an extreme one may lead to an act of violence, burnout or suicide.[3,4] However, the overall impact of a stressor will

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depend on its features and the characteristics of those who have been affected. The perceived rather than the absolute quantities of a stressor determine its potential impact.[4]

Stress represents the wear and tear of the body. Stress can be positive or negative. Positive stress is named eustress and negative stress is distress. Eustress triggers the body alarm, and enhances attention, performance and creativity which has temporary effects only. On the other hand, the distress has negative effects on the body.[3] However, chronic stress can have serious effects on human health and behavior.[3] Stress is also known as a matter of perception, because not all are equally affected.[3,4] Internal individual factors such as gender, age, and chronic illness as well as external individual factors named newly added experience from the environment such as education, occupation, and income have an influence on stress.[5] Exploring the relationships, both of internal and external, of individual factors, is necessary. Both assessing our bodies, reacting to stress and how we think, feel and behave in stressful situation are increasingly attention. The emotional responses to stress may include such feelings an anxiety, irritability, anger, embarrassment, depression, and hospitality, respectively.[6]

Stress has been found to be associated with anxiety and depression,[7,8] interpersonal conflict,[9] sleep problems,[10] and lower academic and clinical performance.[11] In 1956, Selye described on organism's physiological responses to stress and formulated the general adaptation syndrome (GAS), composed of three phases including alarm, resistance, and exhaustion, respectively.[12] Thus, it is necessary to take into account the psycho-social-spiritual aspects of being human by mean of the interactions among all dimensions of humanness, especially the physical body and mind.[13-15]

Several Eastern methods have been used for balancing the dimensions of one's humanness,[16] for instance, one such method is Buddhist mediation, which has been shown to be effective in treating mild to moderate hypertension.[17] Engaging in Buddhist meditation cultivates concentration and positive mindfulness that can facilitate a decrease in the sense of suffering and an increase in a sense of calm.[18] Positive mindfulness thus appears to stimulate the parasympathetic nervous system, which, in turn, leads to a decreased heart rate, dilation of the peripheral blood vessels and improved blood flow.[19] These factors contribute to reduction in one's blood pressure.[20,21] Previous studies showed that meditation decreases systolic and diastolic blood pressure,[22-26] heart rate,[24,25] stress[22,23] and the use of antihypertensive medications,[26] respectively. Thus, the aim of this study was to investigate self-perceived stress among participants those who had listen to Phochong chanting at the School of Anti-Aging and Regenerative Medicine, Bangkok, Thailand. It was hoped that the chant would help participants to relief the stress level.

MATERIALS AND METHODS

Participants

A total of forty participants were participated in this study. They were equally divided into two groups; one was a control group (20 participants) and the other was the target one (20 participants). The mean age of participants was 35.85 years (SD = 3.46) for both groups.

Instruments

The questionnaires used was the Thai Stress Test[6].According to Phattharayuttawat's study,[6] the Thai Stress Test consists of 24 questions that described psychological reactions (both positive and negative) in relation to events occurring in daily life of Thai people. All 24 questions in the Thai Stress Test was used to assess one's feelings and thoughts (positive and negative) over the past month. Examples of the questions were: "Do you feel lonely?"; "Do you feel bored and discouraged about doing anything?"; "Do you feel proud about yourself?"; and, "Do you feel pleased about your life?", respectively. Possible responses to each questions were: "Never" = 0; "Sometimes" = 1; and "Often" = 3. Responses to questions assessing negative feelings (items 1-12) and positive feelings (items 13-24) were separately summed, with both having a possible range of 0 to 36. To obtain an index scores, results of the two scores were simultaneously compared to the Thai Stress Test matrix table. The index score obtained, according to the Thai Stress Test matrix table, was used to determine the individual's level of stress (good mental health, normal, mild stress or severe stress). Based on the Phattharayuttawat's study,[6] the Thai Stress Test has both constructive validity and reliability: the total reliability coefficient for the Alpha, which was 0.84, and value, of the two scales ranged from 0.83 to 0.86. The total split half was 0.88, with the Alpha ranging from 0.85 to 0.91. Each question could be rated on a three-point scale: 'never', 'sometimes' and 'often'. The participants were asked to put a tick (√) in the column corresponding to the feeling that has applied best to them after listening to Phochong chanting. To calculate scores, positive and negative scores were combined separately. Weights of 0, 1 and 3 are assigned to represent 'never', 'sometimes' and 'often' respectively, then stress indicator was categorized by using the matrix table of the Thai Stress Test, shown in Table 1.

The four stress levels were divided into excellent mental health, normal mental health, mild stress, and Stressful, respectively. That is, all four stress levels were divided into four groups: one group with stress (people indicating severe stress (stressful); one group with mild stress (people indicating mild stress); one group with normal (people who have normal mental health); and the other without stress (people who have excellent mental health), respectively, shown in Table 2.

Procedures

Participants were divided into two groups; the target group saw the Buddha image on the computer screen in front of them while listening to Phochong chanting for 10 minutes long and the other control group saw the spot on the computer screen in front of them while listening to Phochong chanting for 10 minutes long. Both groups did all activities at Brain Science and Engineering Innovation Research Unit, School of Anti-Aging and Regenerative Medicine, Mae Fah Luang University, Bangkok, Thailand. The procedures were as follows: (a) Step I: Focus group discussions were carried out by the authors to obtain qualitative information about sources of stress during the past months, (b) Step II: The questionnaires were sent to participants after listening to Phochong chanting.

The questionnaire consisted of two parts: (a) Part I: Demographic data and personal information including gender, age, and educational level, (b) Part II: Thai Stress Test questionnaire to measure stress levels. Participants were then asked to rate their stress level for each particular event ranking from 0 = 'no stress at all' to 4 = 'severely stressful'.

Prior to implementation, the study and its procedure were reviewed and approved by the Institutional Review Board (IRB) of the primary investigator's (PI) academic institution (Mae Fah Lung University, Thailand). All participants were informed about (a) the purpose of the study, (b) voluntary participation, (c) what study involvement entailed, (d) confidentiality and anonymity issues, and (e) the right to withdraw from the study anytime without repercussions, accordingly. All participants were given information about the study, and completed informed consent sent with the questionnaires. Both written and verbal consents to participate were also obtained from those agreeing to take part in the study.

Data collection and analysis

Descriptive statistics were used to describe the demographic data and stress levels, and mindfulness levels, respectively. Data were entered and analyzed using the statistical software. A comprehensive score was derived from the twenty four questions of the Thai Stress Test as an outcome variable. Descriptive statistics (mean, standard deviation, and percentages) were used for summarizing the outcome variables.

RESULTS

Data were collected from participants, shown in Table 3. A total of 40 participants participated in this study. They were equally divided into two groups; one was a control group (20 participants) and the other was the target one (20 participants). The sample comprised unequal number of male to female participants; a number of male (15%) and female (85%) participants in the target group whereas a number of male (5%) and female (95%) subjects in the control one. The mean age of participants was 35.85 years (SD = 3.46) for both groups. A total of 60.0 percent had an undergraduate educational level in both control (60%) and target (60%) groups.

Table 1: Matrix table for the index of the Thai Stress Test

Negative Scales Score (Sum of Items 1-12)	Positive Scales Score (Sum of Items 13-24)				
	12-36	9-11	6-8	3-5	0-2
0–1	1	2	3	4	5
2–3	2	3	4	5	6
4–5	3	4	5	6	7
6–7	4	5	6	7	8
8–36	5	6	7	8	9

Table 2: Distribution of the sample of the index of the Thai Stress Test

Score Group	Stress Indicator (Level of Stress)
1	Excellent Mental Health
2,3,4	Normal Mental Health
5,6	Mild Stress
7,8,9	Stressful

Table 3: Demographic data of the sample (*n*=40)

Factors	Control Group (*n*=20)		Target Group (*n*=20)	
	Number	Percent	Number	Percent
Gender				
Male	1	5.00	3	15.00
Female	19	95.00	17	85.00
Age				
Less than 25 years	2	10.00	3	15.00
26–30 years	4	20.00	5	25.00
31–35 years	2	10.00	2	10.00
36–40 years	6	30.00	2	10.00
41–60 years	6	30.00	8	40.00
Education				
Prathom 6	1	5.00	1	5.00
Mathayom 3	1	5.00	1	5.00
Mathayom 6	1	5.00	1	5.00
Vocational diploma	2	10.00	2	10.00
Undergraduate	12	60.00	12	60.00
Graduate	3	15.00	3	15.00

Phochong chanting in control group

Table 4 shows the comparison between before and after listening to Phochong chanting in the control group. There were statistical significance differences between before and after listening to Phochong chanting ($t(39) = 2.63$; $p = 0.02$). The stress indicator after listening to Phochong chanting

(2.05±0.69) showed lower compared to before listening (2.45±0.61) (Figure 1). Matrix table of the Thai Stress Test index between before and after listening to Phochong chanting in the control group is also shown in Table 5.

The stress level assessed by the Thai Stress Test of all twenty participants in the control group were compared between before and after listening to Phochong chanting. Five participants were found to have lower number in the mild stress level after listening to Phochong chanting compared to their stress level scores before listening to Phochong chanting (seven participants). In addition, one participant went from 'normal mental health' to 'excellent mental health,' while three participants were found to have higher number in the 'excellent mental health' (Table 6, Figure 2 and Figure 3).

Table 7 compared the stress indicator between before and after seeing the Buddha image while listening to Phochong chanting in the target group. There were statistical significance differences of stress indicator comparing between before and after seeing the Buddha image while listening to Phochong chanting (t(39) = 3.20; p = 0.005). The stress indicator after seeing the Buddha image while listening to Phochong chanting (2.35±0.67) showed lower level compared to before seeing the Buddha image while listening to Phochong chanting (2.70±0.47). Matrix table of the Thai Stress Test index between before and after seeing the Buddha image while listening to Phochong chanting in target group is also shown in Table 8 and Figure 4.

The stress level assessed by the Thai Stress Test of all twenty participants were compared between before and after seeing Buddha image while listening to Phochong chanting in the target group. Five participants were found to have lower number in the mild stress level after seeing the Buddha image compared to their stress level before seeing Buddha image (fourteen participants). In addition, two participants went from 'normal mental health' to 'excellent mental health,' while three participants were found to have higher number in the 'normal mental health' (Table 9, Figure 5 and Figure 6).

Table 4: Stress indicator before and after listening to Phochong chanting

Stress Indicators	*n*	Mean	SD	t	*p*
Before Listening	20	2.45	0.61	2.63	0.02*
After Listening	20	2.05	0.69		

* *P*<0.05

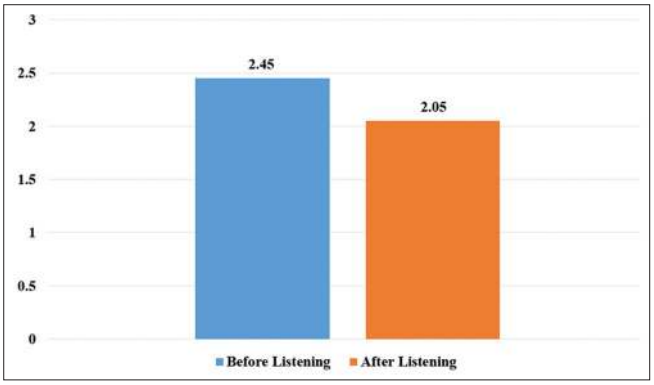

Figure 1: Stress indicator comparing between before and after listening to Phochong chanting in the control group

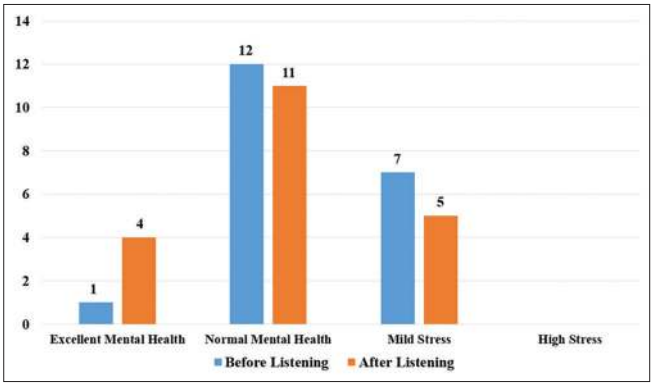

Figure 2 : Stress indicators assessed by Thai Stress Test comparing between before and after listening to Phochong chanting

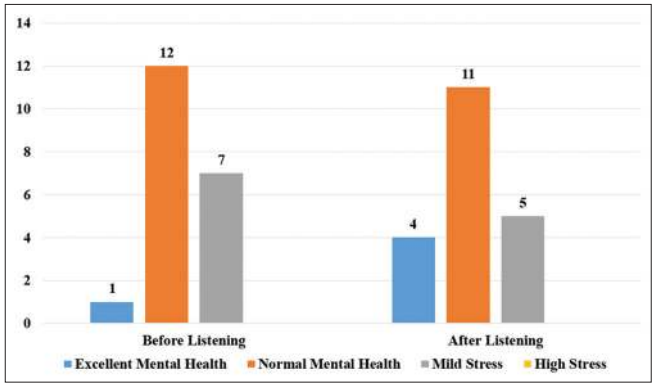

Figure 3: Stress indicators assessed by Thai Stress Test comparing between before and after listening to Phochong chanting in target group

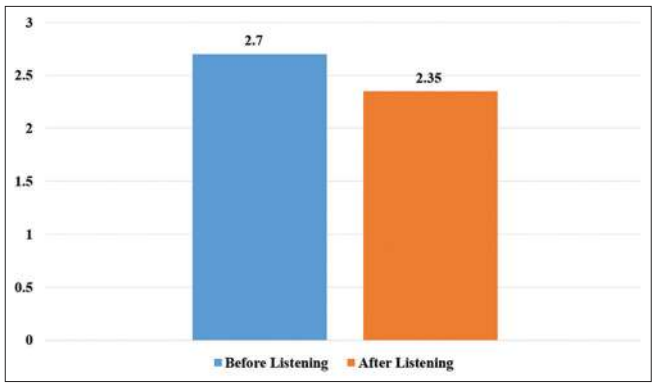

Figure 4: Stress indicators comparing between before and after seeing Buddha image while listening to Phochong chanting in the target group

Table 5: Matrix table of the Thai Stress Test index

Subjects	Before listening				After listening			
	Positive Scale	Negative scale	Score group	Stress indicator	Positive scale	Negative scale	Score group	Stress indicator
1	36	3	2	Normal	36	1	1	Excellent
2	34	2	2	Normal	34	1	1	Excellent
3	30	8	5	Mild stress	36	1	1	Excellent
4	20	9	5	Mild stress	28	3	2	Normal
5	17	6	4	Normal	24	2	2	Normal
6	30	7	4	Normal	28	7	4	Normal
7	20	2	2	Normal	16	0	1	Excellent
8	14	14	5	Mild stress	16	13	5	Mild stress
9	26	3	2	Normal	24	3	2	Normal
10	26	2	2	Normal	28	3	2	Normal
11	11	18	6	Mild stress	14	11	5	Mild stress
12	32	4	3	Normal	36	2	2	Normal
13	20	12	5	Mild stress	34	12	5	Mild stress
14	28	6	4	Normal	32	6	4	Normal
15	22	4	3	Normal	32	2	2	Normal
16	30	4	3	Normal	31	2	2	Normal
17	7	8	7	High stress	23	6	4	Mild stress
18	30	5	3	Normal	30	5	3	Normal
19	26	12	5	Mild stress	22	7	4	Normal
20	24	10	5	Mild stress	26	10	5	Mild stress

Table 6: Stress indicators assessed by Thai Stress Test comparing between before and after listening to Phochong chanting

Stress indicator	Before listening	After listening
Excellent mental health	1	4
Normal mental health	12	11
Mild stress	7	5
High stress	-	-

Table 7: Stress indicator comparing between before and after seeing the Buddha image while listening to Phochong chanting of the target group

Stress indicator	*n*	Mean	SD	t	*p*
Before seeing	20	2.70	0.47	3.20	0.005**
After seeing	20	2.35	0.67		

** *P*<0.001

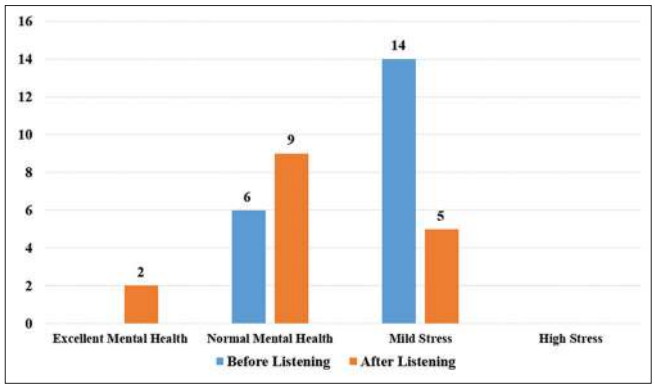

Figure 5: Stress indicators assessed by Thai Stress Test comparing between before and after seeing the Buddha image while listening to Phochong chanting

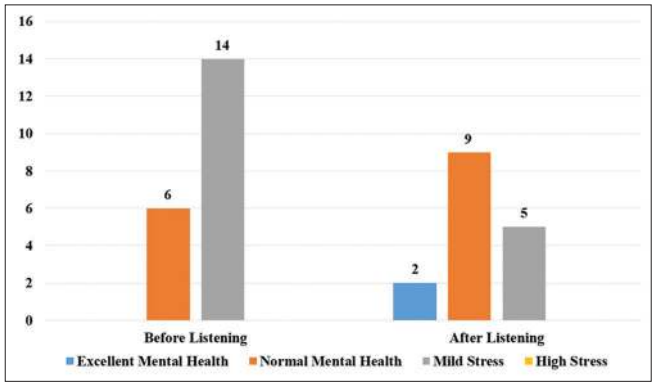

Figure 6: Stress indicators assessed by Thai Stress Test comparing between before and after seeing the Buddha image while listening to Phochong chanting

The results of the Thai Stress Test scores of both control and target groups after listening to Phochong chanting showed that eleven participants (55%) felt normal mental health, five participants (25%) with mild stress, and four participants (20%) at an excellent mentalhealth, respectively. The number of participants with excellent mental health was highest among the target group (20%) (Table 10).

DISCUSSION

In this study, all participants were asked to rate their subjective feelings, which reflected only their current level of stress assessed by the Thai Stress Test. The Thai Stress Test was chosen as the instrument to measure stress level in this

Table 8: Matrix table of the Thai Stress Test index comparing between before and after seeing the Buddha image while listening to Phochong chanting in the target group

Participants	Before seeing image				After seeing image			
	Positive scale	Negative scale	Score group	Stress indicator	Positive scale	Negative scale	Score group	Stress indicator
1	13	9	5	Mild stress	14	9	5	Mild stress
2	29	2	2	Normal	36	1	1	Mild stress
3	28	9	5	Mild stress	22	9	5	Mild stress
4	22	10	5	Mild stress	32	12	5	Mild stress
5	34	7	4	Normal	36	4	3	Normal
6	36	8	5	Mild stress	36	4	3	Normal
7	28	7	4	Normal	23	7	4	Normal
8	25	8	5	Mild stress	22	9	5	Mild stress
9	20	11	5	Mild stress	22	11	5	Mild stress
10	16	8	5	Mild stress	23	5	3	Normal
11	23	10	5	Mild stress	26	6	4	Normal
12	30	6	4	Normal	32	6	4	Normal
13	28	12	5	Mild stress	30	3	2	Normal
14	28	8	5	Mild stress	24	7	4	Normal
15	22	11	5	Mild stress	30	12	5	Mild stress
16	34	12	5	Mild stress	36	12	5	Mild stress
17	30	16	5	Mild stress	28	16	5	Mild stress
18	21	4	3	Normal	25	2	2	Normal
19	28	2	2	Normal	34	1	1	Excellent
20	30	13	5	Mild stress	22	11	5	Mild stress

Table 9: Stress indicator assessed by Thai Stress Test comparing between before and after seeing the Buddha image while listening to Phochong chanting

Stress indicator	Before Listening	After Listening
Excellent mental health	-	2
Normal mental health	6	9
Mild stress	14	9
Stressful	-	-

Table 10: Stress indicators assessed by Thai Stress Test after listening to Phochong chanting

Stress indicator	Control group	Target group
Excellent mental health	2	4
Normal mental health	9	11
Mild stress	9	5
Stressful	-	-

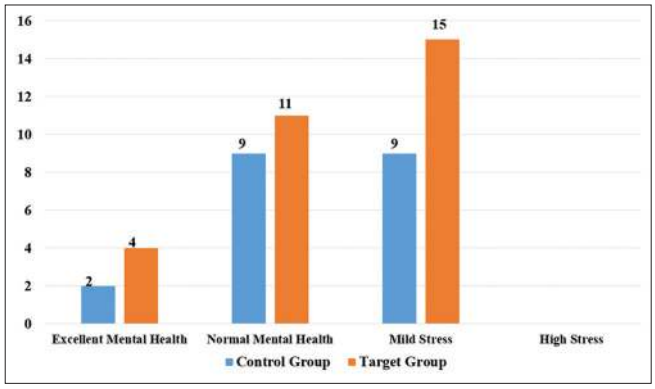

Figure 7: Stress indicators assessed by Thai Stress Test after listening to Phochong chanting

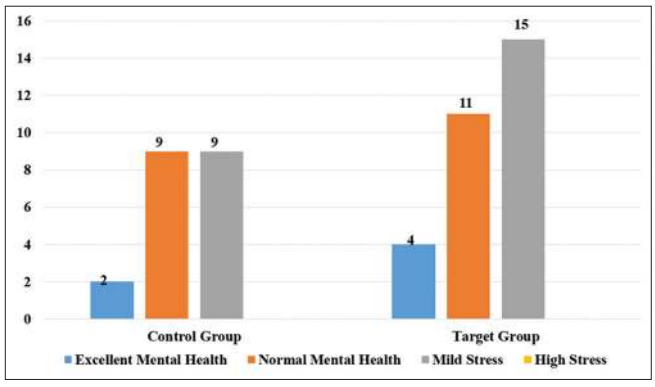

Figure 8: Stress indicators assessed by Thai Stress Test after listening to Phochong chanting

study. The main reason in choosing this instrument, although it is a relatively new and still a not widely used instrument, was to reduce problems concerning cultural and language barriers, since the instrument was developed specifically to measure stress in Thai people.[6] The Thai Stress Test is thus a screening instrument for stressed people, so it is probable that a higher percentage of participants with stress detected in this study than in other studies. In addition, the Thai Stress Test has adequate reliability, adequate construct validity, and sufficient discriminant power. The result assessed by the Thai Stress Test in this study will then be a more direct and meaningful application to detect mental health illness.[6]

Stress is the psychological and physical state that results when the resources of the individual are not sufficient to cope up

with the demands and pressure of the situation.[27] It usually results in negative thoughts and perceptions which affects even their day to day life. Similar to a previous study,[18] the framework upon which this research was based Buddhist doctrine. According to the previous studies, Buddhism views illness as an imbalance between the body and mind.[15,18,20,28,29] This imbalance can lead to suffering (i.e., discomfort or stress) and a decreased sense of peacefulness.[16] Buddhist meditation then appears to serve as a catalyst for self-healing by restoring and balancing the interaction between one's mind and body.[18,30] When stress begins, muscles constrict and the respiratory rate increases, consuming metabolic energy.[18] Moreover, Buddhist meditation had an influence on the stress levels and blood pressure readings of the hypertensive participants.[18] Saelo and colleagues stated that the peacefulness experienced by these individuals, as a result engagement in Buddhist meditation, may have been the result of beta endorphin production in the hypothalamus.[18] In addition, beta endorphins have a morphine-like characteristic that can have a positive effect on mood (i.e., peacefulness and calmness).[20] A peaceful state of mind (i.e., reduced stress) can stimulate functioning of the parasympathetic nervous system which results in a decrease in heart rate, dilation of the peripheral blood vessels and improvement in blood flow.[20-21] All of these factors can finally lead to a reduction of one's blood pressure.[18]

Achterberg and colleagues[29] additionally stated that according to a Buddhist perspective, mankind confronts distress at all times because of the 'Three Characteristics of Existence' (*tilakkhana*): impermanence (*anicca*); suffering (*dukha*); and, no-self (*anatta*), respectively.[18] However, humans can decrease or eliminate their suffering or distress by practicing Buddhist meditation.[18] It helps establish cheerfulness (*pramod*), joy (*piti*), pleasure (*sukha*) and concentration (*Samadhi*), all which appear to stimulate the parasympathetic nervous system.[18] Previous studies showed that stimulation of the parasympathetic nervous system could lead to a decrease in heart rate, dilatation of peripheral blood vessels and improvement in blood flow, which, subsequently, causes a decrease in blood pressure.[18,20,21] Engaging in Buddhist meditation cultivates concentration and positive mindfulness that can facilitate a decrease in the sense of suffering and an increase in a sense of calm. Positive mindfulness appears to stimulate the parasympathetic nervous system, which, in turn, leads to a decreased heart rate, dilation of the peripheral blood vessels and improved blood flow.[19] These factors, subsequently, contribute to reduction in one's blood pressure.[20,21] The fact that Buddhist meditation had an influence on the stress levels and blood pressure readings of the hypertensive participants is consistent with prior findings. Regardless of the type of meditation practice used, prior studies have found when meditation is performed, for 10 to 45 minutes at least once to twice daily for six weeks or more, there tends to be a decrease in both the systolic and diastolic blood pressure readings,[23-26,31] and levels of stress.[23,31] Prior research has found that meditation decreases systolic and diastolic blood pressure,[23-26,31] heart rate,[24,25] stress,[23,31] and the use of antihypertensive medications.[26]

However, the present study had limitations that need to be taken into consideration. This limitation is quite difficult to avoid because that is the way most stress measurement is designed. Therefore, the stress status measured should represent the natural level of stress of the participants. Additionally, all participants were Buddhists and had a low to middle socio-economic level. This experimental design may not be applicable to individuals from other religions, cultures or socio-economic levels. Because of the small number of participants, no inferential statistics could be done to demonstrate if any of the changes in stress levels or mindfulness levels were statistically significant. Thus, the findings of the evaluation of stress level must be used with great caution. Using a much larger participant sample size is recommended for future study. In addition, a sufficient number of measurements regarding stress, mindfulness and blood pressure need to be obtained so that inferential statistics can be used in the determination of whether Phochong Chanting actually has a statistically significant impact on one's stress level, mindfulness and blood pressure. Finally, this study did not investigate participants' coping mechanisms.

Future research should be conducted on the implementation and evaluation of the using a much larger participant sample size. In addition, future studies need to obtain a sample from other chanting, similar to the one used in the present study; for example, Chinabunchorn Chanting. Finally, with future implementation and evaluation studies, that use other Chanting, a sufficient number of measurements regarding stress, mindfulness and blood pressure need to be obtained so that inferential statistics can be used in the determination of whether Chanting actually has a statistically significant impact on one's stress level and mindfulness and blood pressure.

CONCLUSION

Findings of this study indicated that psychological morbidity was common in all participants. By listening chanting during any activities would help the stress level reduction. Further studies based on larger sample sizes are recommended to explore consequences and describe this phenomenon.

DISCLOSURE

The authors report no conflicts of interest in this work.

ACKNOWLEDGEMENT

We thank all of the participants who involved in this study as main data provider.

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Authors Contribution:
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Source of Support: Brain Science and Engineering Research Group, Mae Fah Luang University (MFU-Grant), Thailand. **Conflict of Interest:** None.