

ผลของการสูดดมกลิ่นน้ำปรุงตำรับวังสวนสุนันทา (กลิ่นวีรสานถดู) ต่อการทำงานของระบบประสาทอัตโนมัติ Effects of Nam Prung Product in Suan Sunandha Palace (Vassana Scented Water) Inhalation on Autonomic Nervous System

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาผลของการสูดดมกลิ่นน้ำปรุงตำรับวังสวนสุนันทา กลิ่นวีรสานถดู ที่มีต่อการทำงานของระบบประสาทอัตโนมัติ ได้แก่ ความดันโลหิต (ทั้งซิสโตลิกและไดแอสโตลิก) อัตราการเต้นของหัวใจ อัตราการหายใจ วิธีการศึกษา: การวิจัยกึ่งทดลองมีกลุ่มเดียววัดก่อนและหลังการทดลอง โดยให้อาสาสมัครสุขภาพดีจำนวน 20 คน อายุ 18 - 40 ปี สูดดมกลิ่นน้ำมันอัลมอนด์ตามด้วยกลิ่นน้ำปรุงอย่างละ 10 นาที บันทึกผลค่าสัญญาณชีพทั้งสี่ขณะพัก ขณะสูดดมน้ำมันอัลมอนด์ และขณะสูดดมกลิ่นน้ำปรุง เปรียบเทียบค่าเฉลี่ยแต่ละสัญญาณชีพขณะพักกับขณะสูดดมน้ำมันอัลมอนด์ และขณะสูดดมกลิ่นน้ำปรุงโดยใช้ paired t-test ผลการศึกษา: พบว่าในขณะพัก ขณะสูดดมน้ำมันอัลมอนด์ และขณะสูดดมกลิ่นน้ำปรุงนั้น ความดันโลหิตซิสโตลิกเป็น 115.77, 115.28 และ 124.35 มม.ปรอท ตามลำดับ ความดันโลหิตซิสโตลิกเท่ากับ 74.43, 74.27 และ 80.28 มม.ปรอท ตามลำดับ อัตราการเต้นของหัวใจเท่ากับ 81.97, 81.73 และ 84.95 ครั้ง/นาที ตามลำดับ ส่วนอัตราการหายใจเท่ากับ 18.43, 18.46 และ 19.85 ครั้ง/นาที ตามลำดับ โดยค่าเฉลี่ยของความดันโลหิตซิสโตลิก ไดแอสโตลิก อัตราการเต้นของหัวใจ และอัตราการหายใจขณะสูดดมน้ำปรุงต่างจากค่าขณะสูดดมน้ำมันอัลมอนด์อย่างมีนัยสำคัญทางสถิติ (P -value = 0.002, 0.009, < 0.001 และ < 0.001 ตามลำดับ) สรุป: การสูดดมกลิ่นน้ำปรุงตำรับวังสวนสุนันทา (กลิ่นวีรสานถดู) ทำให้การเปลี่ยนแปลงทางระบบประสาทอัตโนมัติ คือเพิ่มความดันโลหิต อัตราการเต้นของ และอัตราการหายใจ

คำสำคัญ: น้ำปรุงตำรับวังสวนสุนันทา, ระบบประสาทอัตโนมัติ, น้ำหอมไทย, น้ำปรุง, การสูดดม

Abstract

Objective: To examine effects of Nam Prung product in Suan Sunandha Palace (Vassana scented water) inhalation on autonomic nervous system vital signs including blood pressure (both systolic and diastolic), heart rate and respiratory rate. Methods: This quasi-experimental research used the one-group pretest-posttest design. Twenty healthy volunteers with age of 18 – 40 years old were recruited. Volunteers were asked to inhale almond oil and later Vassana scented water for 10 minutes each. Each of the 4 vital signs were measured during while at rest, inhaling the almond oil and inhaling Vassana scented water. Mean values of each of the vital signs while resting and inhaling the almond oil, and while inhaling almond oil and Vassana scented water were tested using paired t-test. Results: It was found that while resting, inhaling almond oil, and inhaling Vassana scented water, systolic blood pressure means were 115.77, 115.28 and 124.35 mm. Hg, respectively; diastolic blood pressure means were 74.43, 74.27 and 80.28 mm. Hg, respectively; heart rate means were 81.97, 81.73 and 84.95 beats/min., respectively; and respiratory rate means were 18.43, 18.46 and 19.85 breaths/min., respectively. Means of blood pressure (both systolic and diastolic), heart rate and respiratory rate while inhaling Vassana scented water were significantly different from those while inhaling almond oil (P -value = 0.002, 0.009, < 0.001 and < 0.001, respectively). Conclusion: Inhalation of Vassana scented water increased vital signs of autonomic nervous system including blood pressure, heart rate and respiratory rate.

Keywords: Nam Prung Product in Suan Sunandha Palace, scented water, Thai perfume, autonomic nervous system, inhalation

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Introduction

Nam Prung Product in Suan Sunandha Palace¹ (Vassana Scent) inhalation is Thai traditional scented water made of mixed volatile oils. The product is considered a Thai traditional medicine. This product has 9 medicinal properties including the heat or warmth effect² and other therapeutics³ including wind element defect, bloating, gass passing defect, colic, and

fire element defect, and as perspiration stimulant and digestive aids. The Vassana scented water product is made of various volatile oils to serve specific purposes, for example, certain products are for comfort in the hot and humid atmosphere.⁷

According to Thai traditional medicine, three seasons are categorized as summer, rainy season, and winter based on

Ayurvedic medicine of India.⁴ Based on Thai traditional medicine, in rainy season, the cold effect is related to the rain, therefore medicines for illnesses in this season should offer heat or warmth.⁵ Medicinal materials and plants that could offer such heat and warmth include the three-hot combination consisting of black pepper, *Piper longum*, and dried ginger.⁶ These heat or warmth effects could stimulate body function such as blood circulation. Vassana scented water contains these medicinal plants so it could potentially offer heat and warmth effects and suitable for the use in the rainy season.

There has been a study on effects of inhaling volatile oils on autonomic nervous system such as blood pressure, respiratory rate and heart rate.⁸ Lavender oil was tested for effects on autonomic nervous system and moods.⁷ However, there have been no studies testing such effects of Thai traditional scented water products consisting of mixed volatile oils.

To be more accepted among users, most Thai traditional medicinal products have to show their benefits based on international standards such as modern medicine. Since Vassana scented water has been used as a Thai traditional medicine, there is a need to examine its effects based on modern medicine specifically autonomic nervous system. The findings could be useful in promoting the use of Vassana scented water for therapeutic benefits among a larger population. Specifically, this study aimed to examine effects of Vassana scented water inhalation on autonomic nervous system including blood pressure, heart rate, and respiratory rate compared with almond oil inhalation. It was hypothesized that blood pressure, heart rate, and respiratory rate after inhaling Vassana scented water were different from those after inhaling almond oil which was used as the control substance.

Methods

In this quasi-experimental research, a one-group pretest-posttest design was used.⁹ The experiment was conducted from September to October 2021. Study population was 781 individual who were students and employees of the main campus of Suan Sunandha Rajabhat University and students and employees of the Faculty of Allied Health Sciences of Suan Sunandha Rajabhat University-Samutsongkram Campus. Study sample was 20 healthy volunteers who were eligible and willing to participate in the study.¹⁰ Inclusion criteria were those who were willing and providing consent to

the study, healthy with no chronic illnesses, no complications from respiratory diseases, and with normal body mass index (or less than 23.00 kg/m²).¹¹ They also had to have normal vital signs including systolic blood pressure of less than 140 mmHg and diastolic blood pressure of less than 90 mmHg, heart rate of 60 – 100 beats per minute, and respiratory rate of 16 – 20 breaths per minute. However, those who were current smokers or past smokers of less than 1 year, or had allergy history of perfume, volatile oil, medications or plastic products were excluded. For women, those with menstruation on the experiment date were also excluded. In addition, volunteers could withdraw from the study at any time. Those who were sleep-deprived, weak, or sleepy on the experiment day were discontinued from the study. Those who drank caffeine beverages such as coffee, tea, power drinks, or alcohol on the experiment date were also discontinued from the study.

Participant protections

This study was approved by the Ethics Committee for Human Study of Suan Sunandha Rajabhat University (approval number: COA.1-046/2020). After approval, the researcher approached the prospective participants to introduce and provide objectives, steps, and voluntary nature of the study. The participants were able to withdraw or discontinue from the study at any time. Their data were kept in secured place and only summary data, not individual data, were presented. Eligible individuals who provided written informed consent were included in the study.

Research instruments

The intervention was the inhalation of the two products namely Vassana scented water and almond oil as the control. Almond oil or sweet almond oil was used as the control for scent inhalation test because it is odorless or has slight or mild odor. It has been widely used as the control to compare with other volatile oils.⁹ The place for the experiment was private, quiet, well-lit, with the temperature set at 24 – 26 °C and controlled humidity of 40 – 60%. Participants were directed to sit on a chair to relax for 10 minutes. Equipments included vital sign monitors (Multi-Parameter Patient Monitor, M700 model), oxygen tank, oxygen mask for adult, computer for data collection, and chairs with backrest.

Experiment and data collection procedure

The experiment was conducted from September to October 2021 at the main campus of Suan Sunandha Rajabhat University and students and employees of the Faculty of Allied Health Sciences of Suan Sunandha Rajabhat University-Samutsongkram Campus. The experiment procedures were as follows. The participants were attached with the vital sign monitor (Multi-Parameter Patient Monitor, M700 model) and allowed to rest for 10 minutes on the chair. Vital signs at rest were measured as follows: blood pressure was measured every 5 minutes for 10 minutes; heart rate was measured every 1 minute for 10 minutes; and respiratory rate was measured every 1 minute for 10 minutes. All data were recorded into computer.

Once all vital signs were measured and collected, inhalation interventions were given to the participants. First, the participants were asked to inhale the almond oil for 10 minutes through oxygen supply of 2 L/minute pressure. While inhaling the almond oil, vital signs were measured as follows: blood pressure was measured every 5 minutes for 10 minutes; heart rate was measured every 1 minute for 10 minutes; and respiratory rate was measured every 1 minute for 10 minutes. All data were recorded into computer. The participants were allowed to rest for 10 minutes. Finally, the participants were asked to inhale the Vassana scented water for 10 minutes through oxygen supply of 2 L/minute pressure. While inhaling the Vassana scented water, vital signs were measured with the same procedure as previously done with almond oil inhalation and the data were collected in the computer accordingly. For each participant, all measures for each vital signs in each phase (i.e., at rest before inhalation, inhaling almond oil, and inhaling Vassana scented water) were averaged.

Data analysis

Descriptive statistics including mean with standard deviation (S.D.) and frequency with percentage were used to present demographic characteristics and measures of vital signs¹² For each of vital signs, mean value at rest before inhalation was compared with that while inhaling almond oil using paired t-test. Mean value while inhaling almond oil was compared with that while inhaling Vassana scented water using paired t-test. Statistical significance was set at a type I error of 5% (or P -value < 0.05). Statistical analysis was conducted using SPSS for Windows Version 21.0

Results

Of the 20 participants, there were equal numbers of men and women and in the age range of 18 to 35 years old with an average of 29.10 ± 5.20 years old.

It was found that systolic blood pressure at rest before inhalation was 115.77 ± 11.55 mmHg (Table 1). While inhaling almond oil, systolic blood pressure 115.28 ± 12.02 mmHg, which was comparable with that at rest with no statistical significance (P -value 0.576). However, systolic blood pressure while inhaling Vassana scented water (124.35 ± 8.01 mmHg) was significantly higher than that while inhaling almond oil (P -value 0.002).

The changes of diastolic blood pressure were similar to those of systolic blood pressure where those while resting and while inhaling almond oil were comparable with no statistical significance (74.43 ± 9.10 and 74.27 ± 8.87 mmHg, respectively, P -value = 0.261) and that while inhaling Vassana scented water (80.28 ± 6.96 mmHg) was significantly higher than that while inhaling almond oil (P -value = 0.009).

In terms of heart rate, similar changes over 3 phases were similar to those in blood pressure. Heart rates while resting and while inhaling almond oil were comparable with no statistical significance (81.97 ± 6.21 and 81.73 ± 6.29 beats/minute, respectively, P -value = 0.194) and that while inhaling Vassana scented water (84.95 ± 6.04 mmHg) was significantly higher than that while inhaling almond oil (P -value < 0.001).

Table 1 Mean vital signs at each phase (N = 20).

3 phases	Vital signs		P -value*
	mean	S.D.	
Systolic blood pressure (mmHg)			
Rest before inhalation	115.77	11.55	
Inhaling almond oil	115.28	12.02	0.576 [†]
Inhaling Vassana scented water	124.35	8.01	0.002 [‡]
Diastolic blood pressure (mmHg)			
Rest before inhalation	74.43	9.10	
Inhaling almond oil	74.27	8.87	0.261 [†]
Inhaling Vassana scented water	80.28	6.96	0.009 [‡]
Heart rate (beats/minute)			
Rest before inhalation	81.97	6.21	
Inhaling almond oil	81.73	6.29	0.194 [†]
Inhaling Vassana scented water	84.95	6.04	< 0.001 [‡]
Respiratory rate (breaths/minute)			
Rest before inhalation	18.43	1.87	
Inhaling almond oil	18.46	1.75	0.846 [†]
Inhaling Vassana scented water	19.85	1.29	< 0.001 [‡]

* paired t-test.

[†] Comparison of mean at rest before inhalation with that while inhaling almond oil.

[‡] Comparison of mean while inhaling almond oil with that while inhaling Vassana scented water.

Regarding respiratory rate, average rates while resting and while inhaling almond oil were comparable with no statistical significance (18.43 ± 1.87 and 18.46 ± 1.75 breaths/minute, respectively, P -value = 0.846) and that while inhaling Vassana scented water (19.85 ± 1.29 mmHg) was significantly higher than that while inhaling almond oil (P -value < 0.001). According to all hypotheses for each of all 4 measures, systolic blood pressure, diastolic blood pressure, heart rate and respiratory rate while inhaling Vassana scented water were significantly different and higher from those while inhaling almond oil.

Discussions and Conclusion

In this quasi-experimental study, Vassana scented water increased vital signs of autonomic nervous system significantly when compared with almond oil. These included blood pressure both systolic and diastolic, heart rate and respiratory rate. The results implied that such increases were also significantly different from those at rest. Our findings were consistent with the effects of the inhalation of oil of Buddha's fingers (Buddha's hand or Fingered citron) (*Citrus medica* L.) on autonomic nervous system and moods.¹³ Buddha's fingers are herbs that have heat or warmth¹⁴ effects which increase the activity of autonomic nervous system.

Our findings were also consistent with Thai traditional medicine where medicines with heat or warmth¹⁵ effects should be used in the rainy season.^{16,17} Vassana scented water contains medicinal materials that offer heat or warmth effects based on Thai traditional medicine compendia.¹⁴ These materials contain volatile oils that offer pleasant scent and remedial benefits for discomforts faced during the rainy season.^{16,17} Thai scented water is usually made of various volatile oils which is relatively similar to Thai traditional medicines where various medicinal materials including herbs are added in the formula for Thai traditional remedies. This Vassana scented water could raise blood pressure, heart rate and respiratory rate significantly. Our finding was consistent with the study of Sayorwan on various individual volatile oils in Thailand.¹⁸ The study found that the scent of these individual volatile oils with heat or warmth effects could stimulate moods and autonomic nervous system.¹⁸

This study on the effects of Vassana scented water was the first study of scented water which is the combinations of volatile oils in a given formula. Most studies of volatiles were

mostly on individual volatile oils. In our study, the use of almond oil as a control was advantageous since it could enhance validity of the study. Almond oil or sweet almond oil is odorless or with slight odor. It has been used as a reliable control in experiments on various volatile oils.

However, the study had a limitation. Since the experiment was conducted from September to October 2021, the temperature was not stable during that period. Therefore, the researcher needed to strictly control the room temperature. The heat or warmth effects of the Vassana scented water as the Thai traditional remedy for discomforts in the rainy season could then be measured reliably.

In terms of applications, this Vassana scented water as the Thai traditional remedy with heat or warmth effects could offer therapeutic for discomfort or illnesses in the rainy season based on Thai traditional medicine. The improvement in autonomic nervous system could be used in promoting its popular use with more confidence. Regarding future research, experiments with a larger sample size should be conducted to yield more statistically powerful results. Experiments with more rigorous control on other confounding factors potentially affecting autonomic nervous system should also be conducted. These factors including temperature control, brightness, and humidity should be rigorously controlled to be consistent with the seasons according to Thai traditional medicines (summer, rainy, and winter).

In conclusion, Vassana scented water which is considered similar to a Thai traditional remedy with heat or warmth effects could increase blood pressure, heart rate and respiratory rate. It could be used for discomforts and illnesses related to rainy season based on the Thai traditional medicine.

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