

Efficiency of Chamomile Essential Oils on Sleeping Quality of First-year University Students

Pongsak Jaroengarmsamer¹, Kittikan Pajongsaleepanya¹, Phannee Rojanabengjakun¹, Jatuporn Ounprasertsuk¹, Tipvarin Benjanirat¹, Sasipen Krutchangthong¹, Sunatcha Choawai¹

¹Lecturer, Department of Medical and Public Health Secretary, College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkram Province, Thailand

Abstract

Objective: This is the quasi-experimental research proposed to study the efficiency of chamomile essential oils on sleeping quality of the first-year university student.

Methods: The sample was selected on 20 students with poor sleeping quality. The study was done weekly in 2 weeks, intervened with chamomile essential oil. Research tools were the 3-parts questionnaires including personal information, quality of sleep and environmentally influencing sleep. Data were analyzed in statistically parameters.

Results: The sleeping quality of the 1st year university students in chamomile group, compare mean and standard deviation of experimental group found that the mean pre-test sleep quality was $M = 80.20$, $SD = 6.65$, with poor sleep quality overall and after 2 weeks of trial participation $M = 55.65$, $SD = 10.32$, which had moderate sleep quality. In experiment with the experimental group, it was found that after 2 weeks of using chamomile essential oil, the sleep quality of the experimental group improved. According to statistical comparison, $t = 2.494$, $p\text{-value} = .022$.

Conclusion: This study uses of chamomile essential oil showed an improvement in the sleep effect of the experimental group. To be concluded that chamomile essential oils improved the sleeping quality significantly as the well-known lavender essential oils. However further study in larger group is recommended.

Key words; chamomile oils, sleeping quality, mental health, university students.

Introduction

Sleeping is necessary for life. Inadequate sleep is one of the most common health problems. It can be found in all age group. The cause may be illness, stress or environmental problem. Some patient needs medication for sleep.¹ Inadequate sleep may affect to physical and mental of the patient and increase the risk of cardiovascular diseases, diabetes, cancer, depression

and obesity.² The leading factors related to health care behaviors were health care knowledge, attitudes, towards health care and perception of the benefits of health care sleep and rest refreshed body, joyful mind.^{3,4}

There are many herbals reported as sleep assisting effect. McKenna et al⁵ reported Chamomile (*Chamaemelum nobile*) was use as herbal for thousands of years since Egypt, Greek and Roman empire. It is popular in Europe to reduce stress, gastric irritation, dysmenorrhea, muscle spasm, inflammation and promote wound healing.⁶ Chamomile in essential oil is used to relieve stress and improve sleep. It composed if many compounds as flavonoid, coumarin, phenolic acids, gamma aminobutyric acid and volatile oils. The component of each plant is different depend on the place and climate but remaining their properties.⁷ Some

Corresponding Author:

Dr. Pongsak Jaroengarmsamer

Lecturer, Department of Medical and Public Health Secretary, College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkram Province, Thailand, Email: pongsak.ja@ssru.ac.th

reported the allergic reaction of Chamomile as skin irritation or allergy. However, it was minimal.

Chamomile is a medicinal plant widely used as tisane or oil thanks to its anti-inflammatory and calming

effects. Hence, two researcher teams have tried to evaluate the inhibition action of chamomile (*Matricaria recutita*) aqueous extract on mild steel corrosion in HCl solution.^{8,9} On the other hand,⁹ confirmed that the extract was a mixed-type inhibitor with predominantly anodic behavior.



Figure 1 Chamomile

Essential oil needs diffuser as volatile inducers, it can stimulate the human's sensory as smell to the olfactory bulb in the nose and reflex as emotional calm down.¹⁰

It is not yet known exactly why or what mechanisms we need to spend a third of our lives asleep.¹¹ About 8 hours and 15 minutes per night¹² shows the importance of a good night's sleep. While sleeping although the body has reduced movement reduce energy metabolism, but the control system of important organs such as the hormonal system and the central nervous system work increases.¹¹ The sleep cycle is formed by two main mechanisms that work together:

1. Circadian rhythm is like the life clock of the human body. This system is under the control of the hypothalamus that regulates the secretion of the hormone melatonin. External factors such as light and darkness determine or alter the functioning of the body's clock,¹³ observed when traveling across countries where time differences may cause the body to adjust to it, there may be insomnia.

2. Homeostasis is an equilibrium system of the body such as blood pressure, body temperature. By this system

will cause drowsiness and the number of hours we sleep each night will depend on this system. Studies have shown that the neurotransmitter adenosine is a stimulant to this equilibrium. For example, if the body is fatigued, tired from all day activities this system will drive drowsiness faster than usual,^{14,15} these mechanisms that the body needs rest. No one man can sleep for more than a few days.¹⁵

Sleep time the body releases important hormones that affect the circulatory system, cardiovascular system, immune system such as prolactin, insulin, and others especially during periods of deep sleep. The pituitary gland produces and secretes the Growth Hormone (GH) many times more. Therefore, having an important effect on growth body metabolic processes and stimulate the production of proteins to repair cells to function normally.^{16,17}

The preliminary research was interviewed 20 first year university student and found most of them had sleep problem including environmental disturbance and anxiety of the class. It effects to the study as they were sleeping in the class and cannot get the knowledge, reflex to the examination score. So, we interested in

the efficiency of Chamomile essential in relaxing and promoting sleep quality with less side effect. It can be applied to other preparation such as spray, balm or vapor oil for any kind of usage.

Objective

To study the efficiency of Chamomile essential oils on sleeping quality.

Methods

This is the quasi-experimental design on two groups with pre-test and post-test evaluation. The demographic data were gender, age underlying disease, religious, department, and monthly income. The population was 159 first-year university students in College of Allied Health Sciences, Suan Sunandha Rajabhat University, Samut Songkram Education Center. The study was performed in January to September 2020. The sample

was purposively selected of 20 students with insomnia and without underlying disease or allergy to the essential oil. Data were collected by 3-part questionnaire; demographic data, sleeping quality, and factors disturbing sleep.

The population had 28 items questionnaire to evaluate sleeping quality scoring 1-4 in each item. Pre-test evaluation was performed. The sleeping quality has 20 items with 4 levels evaluation as minimal, mild, moderate and strongly agree. The factor disturbing sleep has 8 items with the same evaluation choices. The criteria for measuring the quality of sleep were in which is divided according to the following criteria 1 - 28 points are considered good sleep quality, 29 - 56 points were considered moderate sleep quality, 57 - 84 points were considered poor sleep quality and 85 - 112 points were considered severe poor sleep quality.



Figure 2: Chamomile in essential oil

Chamomile in essential oil 30 ml is the product of Panita Prouct Co., Ltd. It composed of 95% ethyl alcohol and pure essential oil. Five pieces of wood stick were put in for five minutes then reverse them up. The bottle was placed within one meter from the bed in room temperature for two weeks in the test group. The control group had Lavender in essential oil in the same manner. Post-test was performed at the end of first and second week.

The questionnaire had content validated by three experts with Index of item-objective congruence (IOC) over 0.5. Data were collected and analyzed by paired

sample t-test and independent t-test with 95% confident, $p < 0.05$.

Results

Part 1 Demographic data

The sample of 20 university students, all are female, mostly Buddhism in the age group of 18-22 years. Medical secretary and Thai Traditional Medicine are the majority of 22.5% each and over the half has monthly income less than 5,000 THB as showed in Table 1.

Table 1 Demographic data

Demographic data	Experimental group (n = 20)	
	N	%
Female	20	100.0
18–22 (yeas old)	20	100.0
Religious		
Buddhism	19	95.0
Christian	1	5.0
Monthly income (THB)		
< 5,000	11	55.0
5,001-10,000	9	45.0
Major of study		
Medical secretary	4	20.0
Thai Traditional Medicine	5	25.0
Public health	2	10.0
Child care	2	10.0
Elderly care	0	0.00
Beauty care	5	25.0
Health promotion	0	0.00
Chinese medicine	2	10.0

Part 2 Pre and post-test of Chamomile essential oil

The comparison of pre-test, a week and 2 weeks later. The average score of sleeping quality in pretest was $80.2 + 6.65$ (mean + *S.D.*). After 2 weeks of using Chamomile essential oil, the average score of sleeping

quality decreased to $55.65 + 10.32$ (mean + *S.D.*). The comparing showed statistically significant decreasing of the sleeping quality score with $p < 0.05$. From the experiment, the experimental group found that after 2 weeks of using chamomile oil, the sample group had improved sleep quality, 15 people accounted for 75% and 5 were the same sleep quality accounted for 25%.

Table 2 Sleeping quality score pre-test, a week and 2 weeks later of Chamomile essential oil (N=20)

No.	Pre-test		1 week later		2 weeks later		Summary Sleep quality
	score	Sleep quality	score	Sleep quality	score	Sleep quality	
1	92.00	severe poor	75.00	poor	58.00	poor	better
2	93.00	severe poor	73.00	poor	56.00	moderate	better
3	75.00	poor	78.00	poor	62.00	poor	same
4	78.00	poor	74.00	poor	55.00	moderate	better
5	88.00	severe poor	72.00	poor	44.00	moderate	better
6	75.00	poor	80.00	poor	55.00	moderate	better
7	74.00	poor	79.00	poor	82.00	poor	same
8	80.00	poor	77.00	poor	71.00	poor	same
9	91.00	severe poor	73.00	poor	61.00	poor	better
10	76.00	poor	69.00	poor	66.00	poor	same
11	76.00	poor	70.00	poor	47.00	moderate	better
12	73.00	poor	80.00	poor	55.00	moderate	better
13	79.00	poor	75.00	poor	56.00	moderate	better
14	84.00	poor	80.00	poor	63.00	poor	same
15	71.00	poor	84.00	poor	56.00	moderate	better
16	85.00	severe poor	76.00	low	41.00	moderate	better
17	74.00	poor	81.00	low	43.00	moderate	better
18	77.00	poor	72.00	low	44.00	moderate	better
19	82.00	poor	71.00	low	44.00	moderate	better
20	81.00	poor	65.00	low	54.00	moderate	better

Compare mean and standard deviation of experimental group found that the mean pre-test sleep quality was $M = 80.20$, $SD = 6.65$, with poor sleep quality overall and after 2 weeks of trial participation $M = 55.65$, $SD = 10.32$, which had moderate sleep quality as shown in Table 3.

Table 3 Mean (M) and standard deviation (SD) sleeping quality score pre-test, and 2 weeks later of Chamomile essential oil. (n = 20)

Experimental group	M	S.D.
pre-test	80.20	6.65
2 weeks later	45.78	10.32

In experiment with the experimental group, it was found that after 2 weeks of using chamomile essential oil, the sleep quality of the experimental group improved. According to statistical comparison, $t = 2.494$, $p\text{-value} = .022$. This study used of chamomile essential oil showed an improvement in the sleep effect of the experimental group as shown in Table 4.

Table 4 Sleeping quality score pre-test, and 2 weeks later of Chamomile essential oil (N = 20)

Experimental group	M	S.D.	t	p-value
			2.49	.022*
pre-test	80.20	6.65		
2 weeks later	45.78	10.32		

Discussion

This is a quasi-experimental research with quasi-equivalent control group design to study the efficiency of Chamomile essential oil on sleeping quality of the first-year university student. The study was performed during January to November 2020. The sleeping quality was scored and evaluated as bad, low, moderate and good quality.

The population were screened for their sleeping quality and 20 sample with poor sleeping quality were selected. Pre-test evaluation by questionnaire were performed. The questionnaire was evaluated and approved by three experts. A weeks and two weeks post-test were followed. Data were analyzed by descriptive statistic, paired sample t-test.

This research found that experimental group found that the mean pre-test sleep quality was poor sleep quality overall and after 2 weeks of trial participation which had moderate sleep quality. And chamomile essential oil showed an improvement in the sleep effect of the experimental group. Chamomile belongs to the

daisy family (Asteraceae) and is characterized by white petals and yellow stamens in the center. It will bloom and smell good in early summer from March to April. And will bloom until the end of June.¹⁸ With this fragrance, chamomile flowers are dried and used to make tea, essential oil and the extract from chamomile flower is widely used. A research study in a group of female volunteers found that the scent of chamomile oil has a beneficial effect on calming comfort. In addition, clinical studies have been performed in groups with anxiety disorders by consuming chamomile extract for 8 weeks, there was a significant reduction in anxiety. Chamomile has the potential to promote better sleep. Chamomile flowers contain the active ingredient apigenin, which helps calm the central nervous system and reduce anxiety and helps to fall asleep easily at night, helps to relax like a sleeping pill reduce the compression of the muscles, reduces nervousness, refreshes the body and makes it more comfortable to sleep. So, it can be said that chamomile essential oil it certainly contributes to sleep.

Conclusion

Lack of sleep or poor quality can lead to feeling tired. Not refreshed, in a bad mood, easily irritated, feeling drowsy in the afternoon of the day if this accumulated sleep deprivation continues until it can affect other health problems that follow. Quality sleep will depend on the number of hours and the right time to go to bed. Deep sleep is when the brain and body work in a systematic relationship to restore the body and maintain good health. Eastern medicine has long been using herbs for relaxation and sleep. Chamomile has a long history of use dating back to the ancient Greco-Roman period. The apigenin in chamomile has a calming effect. Relieve anxiety and helps to sleep soundly a good night's sleep takes care of your physical and mental health from within. Will help you wake up with a cheerful mind and helps keep the body healthy.

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