

## Effect of Massage by Using Lavender and Chamomile Oils of Intact Skin on Outcomes of Moderately Burned Patients

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### Abstract

**Background:** Burn injury is considered as one of the most painful types of trauma that a patient can experience. Pain management is an integral component of nursing practice. Attention has been paid to the use of complementary and alternative therapies as non-pharmacological methods for reducing patient's pain and anxiety. **Aim of the study:** to assess the effect of massage by using lavender and chamomile oils of intact skin on pain and anxiety of moderately burned patients. **Research design:** A quasi-experimental research design was used to conduct the study. **Sample and setting:** The study was conducted on 60 burned patients at Burn Unit, Tanta Emergency University Hospital, Egypt; the sample was divided into two groups; control group who received routine hospital care and study group who received aroma therapy massage with lavender and chamomile oils. **Tools of data collection:** three tools were used: Tool (I) A structured interview schedule, it comprised of two parts; (part I) patient's sociodemographic data; (part II) Clinical data, Tool (II) Burns Specific Pain Anxiety Scale (BSPAS) and Tool (III) Beck Anxiety Inventory scale (BAI). **Results:** revealed a significant reduction in pain and anxiety level after implementation of aroma therapy massage with lavender and chamomile oils than pre intervention in study group compared to control group who didn't receive intervention. **Conclusion:** aroma therapy massage with lavender and chamomile oils can play an important role to control pain and anxiety among burned patients with combination of pharmacological treatment. **Recommendation:** Nursing staff must focusing on a standardized continuous pain and anxiety assessment and documentation as they are a cornerstone of pain and anxiety control, also application of aromatherapy massage with lavender and chamomile oils for burned patients as a protocol of nursing care to reduce burn pain and anxiety level.

**Key words:** Massage, Lavender and Chamomile Oils, Intact Skin, Moderately Burned Patients.

### Introduction

Burn injuries which continue to be an important health problem in many countries, are a special trauma type that occur when skin layers or organs opening outside of the body are exposed to factors such as high heat, chemical substances, electric current and radiation as a result of lack of attention and education, home and industry accidents (Sevgi, 2019; Girtler, 2018). Burns affect the victims both physically and psychologically and can lead to serious local and systemic complications that endanger the patient's life (Samir, 2020). Globally, burns are a serious public health problem, accounting that 11 million burn injuries of all types occur every year worldwide, 180,000 of which are fatal as stated by World Health Organization 2019 (World Health Organization. Burns, 2019; Marc, 2020). According to the American Burn Association (ABA), 500,000 people seeking medical treatment, 40,000 resultant hospitalizations, and 4000 deaths per year in the United

States. The American Burn Association (ABA) National Burn Repository 2019 reports that, overall, flame burns are still the majority of injuries in the USA (41%), with scalds second at 31%. Chemical (3.5%) and electrical burn injuries (3.6%) occur much less commonly (American Burn Association, 2019). In Egypt, a recent National Statistics recorded that burn injuries and their sequels are estimated to be approximately 4.2 per 100,000 annually and 85 burn victims were admitted in the year 2020 in Tanta University Hospital (National Statistical center in Egypt, 2019; Statistical Records in Tanta University Hospital, 2020.)

A major effect from burn injury is the severe pain. Burn pain is one of the most intense and prolonged types of pain in clinical setting. From the first moments of a burn injury, as well as throughout the entire period of treatment, pain affects the patient not only as a symptom but also as a difficult medical issue (Helen, 2019). Pain arises both from the burns and their management, the

latter including dressing changes, surgical procedures, and physical and occupational therapy. Undertreated pain in burn patients can result in non-compliance with hospital treatment, interrupted care, development of chronic pain disorder, and increased risk of anxiety (Smeltzer,2019). The immediate pain that follows a burn injury is due to trigger of skin nociceptors that respond to heat (thermoreceptors), mechanical alteration (mechanoreceptors) and a selection of stimuli including chemical stimuli exogenous (e.g. hydrofluoric acid) and endogenous (e.g. inflammatory mediators, notably histamine, serotonin, bradykinin, leukotrienes and prostaglandins). Nerve endings that are entirely destroyed will not transmit pain, but those that remain undamaged and exposed will create pain throughout the time and the course of the treatment (Laura, 2021; Forough, 2019; Daniels, 2017). Pain related to procedures of pain management and its related anxiety result in damaging impact on patients including fears, post-traumatic stress, metabolic and immunologic disturbances and sleep disorders. Also it can interfere with patient' compliance and result in less cooperation to health care providers. Finally, pain would cause deferral in wound healing and recovery course. As a result, creative strategies should be considered for reducing anxiety, distress and pain related to burn wound care for enhancing the overall well-being of patients (Kevin, 2021; Tahereh, 2017). In the delivery of holistic patient care, the use of non-pharmacologic pain and anxiety interventions must not be overlooked. One of the non-pharmacological methods for relieving burn pain and anxiety is aromatherapy. Aromatherapy refers to an application of essential oils to generate a balance in the body and improve health. These oils are aromatic and volatile organic mixtures that are obtained by the procedure of refinement from the root, flower, leaves, skin, and seeds of several plants. It is used to reduce pain, anxiety, depression, sleep disturbance, fatigue, bronchial asthma, and increase self-confidence and inspiration .The aroma can be useful in various forms, such as skin massage and inhalation, by direct and indirect application (Forough, 2018; Ali, 2016; Hamid, 2019).One of the volatile aromatic plant oil that has many uses in aromatherapy is lavender oil. Lavender is a plant with sedative, calming, antiseptic, analgesic, antispasmodic, and healing effects. The main constituents of lavender are linalool and linalyl acetate (Azim, 2019). Among the other aromatic oils is chamomile oil. German chamomile due to its chamazulene component has a strong anti-inflammatory and analgesic effect. Chamomile improves the immune system and can be used through massage (Forough, 2019; Eva ,2021). Effleurage technique is the selective procedure of massage and creates a simple, gentle stroking movement using the whole hand. This method improves the absorption of aromatic oils without deep

muscle excitement, constantly pushing the blood towards the heart, thus stimulating venous return. This stroke help muscle relaxation and soothes the nerve endings (Forough, 2019; Poppy,2021).

#### Significance of study

Pain related to burn injuries is one of the most troublesome pain intensity. Due to the limited studies on the effectiveness of massage with aromatic oils on the anxiety and pain intensity of burn patients, this study was done to determine the effect of massage using lavender and chamomile oils on intensity of back ground pain and anxiety of patients with burns.

#### Aim of the Study:

Evaluate the effect of massage by using lavender and chamomile oils of intact skin on pain and anxiety of moderately burned patients.

#### Research hypothesis:

Post implementation of massage with lavender and chamomile oil, study group will exhibit less pain than control group who receive routine hospital care.

Post implementation of massage with lavender and chamomile oil, study group will exhibit less anxiety than control group who receive routine hospital care.

#### Subjects and method

A quasi- experimental descriptive research design with pre and post-test was used to conduct the present study. The study was conducted at Burn Unit at Tanta Emergency University Hospital affiliated to Tanta University, the unit composed of 4 wards each ward contain 5 bed with different burn degree patients.

**Subjects:** Purposeful sample of (60) burned patients in the above previously mentioned setting. The sample size was calculated based on Epidemiological Information Program, based on the total number of admitted burned patients per year according to review of Tanta Main University Hospital statistical Records. Inclusion criteria: study subjects include patient with age ranging from 18 to 60 years old, both sexes, burns with second degree and their percentage of total body surface area between 10% -45% documented in patients' records, free from history of asthma and allergies to plants, septicemia symptoms according to patients' records, physical disability, self-inflicted burn, and pregnant women.

They were divided into two groups; each group was consisted of (30) patients as following:

**Group (1):** Control group, it was consisted of (30) patients who received the routine hospital care by nursing staff.

**Group (2):** Study group, it was consisted of (30) patients who received the routine hospital care and massage with lavender and chamomile oils implemented by the researcher. The routine hospital care was giving

medications (as Nalufin and Paracetamol), wound dressing and distraction.

**Tools of the study:** Three tools were used to conduct the study, as follow:

**Tool I: A structured interview schedule.**

A structured interview schedule which was developed by the researcher after reviewing of the related literature (Tahereh, 2017; Hamid, 2019). It comprised two parts:

**Part I: patient's sociodemographic data:**

This part includes patient's pertinent data about the study subjects such as: age, sex, marital status, educational level, place of residence and occupational status.

**Part II: Clinical data which include:**

Past medical and surgical history, date of admission, previous hospitalization, history of hospitalization due to burn injury, causes, total body surface area (TBSA), burn degree and burn parts of the body.

**Tool II: Burns Specific Pain Anxiety Scale (BSPAS):**

BSPAS is a nine item self-report scale for the assessment of pain related and anticipatory anxiety in burned patients. BSPAS was developed by (Taal and Faber, 1997), it is adapted by the researcher and translated into Arabic language. BSPAS evaluates pain and anxiety manifestations related to painful situations for burned patient, such as wound dressing, bathing, debridement and skin grafting, which occur while the patient is hospitalized.

The scale, which consists of nine items, contains a visual analogue scale ranging from 0 to 10, with two reference points. The reference points are identified by the expressions "not at all" (0) and "the worst imaginable pain" (10), using the numbers indicated. The total score of the scale is calculated by adding up the scores of all items, minimum score being 0 and the maximum being 90. Higher total scores correlate with greater pain and anxiety levels regarding painful treatments during patient hospitalization; the obtained scores are categorized as follow:

Mild pain and anxiety: 0-29, Moderate pain and anxiety: 30-59, severe pain and anxiety: 60 – 90

**Tool III: Beck Anxiety Inventory scale (BAI):**

The Beck Anxiety Inventory (BAI) is created by (Beck, 1988) and was adapted by Talaat (2020) and was translated into Arabic language and used by the researcher for measuring the severity of anxiety. The Beck Anxiety Inventory (BAI) consists of 21 items with a Likert scale ranging from 0 to 3 and raw scores ranging from 0 to 63. BAI was adopted by the researcher. The questions used in this measure ask about common symptoms of anxiety that the subject has had during the past week such as numbness and tingling, sweating not due to heat, and fear of the worst happening.

**Scoring system:**

Subjects were asked to report the extent to which they have been bothered by each of the 21 symptoms in the

week preceding their completion of the BAI. Each symptom item has four possible answer choices:

Not at All (0), Mildly (1) Moderately (2) and Severely (4)

The values for each item are summed up for all 21 symptoms that can range between 0 and 63 points. A total score of: 0 - 7 is interpreted as a "Minimal" level of anxiety, 8 - 15 as "Mild", 16-25 as "Moderate" and 26 - 63 as "Severe" anxiety level.

**Method**

**1. Obtaining approval:** An official permission to conduct the study was obtained from the responsible authorities.

**2. Ethical and legal considerations:**

An informed consent was obtained from all study subjects after providing appropriate explanation about the aim of the study, moreover; consent of ethical committee was obtained. Each participant was informed that he has the right to withdraw from the study at any time. Confidentiality and privacy were put into consideration regarding the collected data.

**3. Developing the study tools**

A-The tools of the study were developed after review of related literature.

B-The study tools were presented to a jury of (5) experts in the area of medical surgical nursing professors and medicine professors to check content validity and clarity of questionnaire.

C-The suitable statistical tests were used for testing questionnaire reliability.

D- A pilot study was conducted on (10%) of patients to test the feasibility and applicability of the tools and to determine any obstacles that may be encountered with the researcher during the period of data collection, accordingly, needed modifications were done.

E-The pilot sample was included in the main study sample since no major modifications were done on the study tools.

**5- Reliability:** reliability was tested by using alpha Cronbach's factor as follow: Cronbach's Alpha for tool I is 0.824, 0.872 for tool II, 0.775 III and 0.812 for the sheet in total.

**6- To conduct the study;** tool I part I and II were used before administration of the intervention while tool II and III were used before, during and after follow up for both control and study group.

**7-Duration of data collection:** Data of the study were collected over a period of 6 months through four main phases:

**1-Assessment phase:**

Assessment of the patient baseline data that was carried at burn unit from patients and their medical records using tool I part I and II for both control and study groups before implementing the intervention. Assessment of both study and control patients using tool I included patients age, sex, marital status, level of

education, occupation, residence, data about past medical and surgical history, history of hospitalization due to burn injury, cause of current burn, total body surface area (TBSA), burn degree, and burned parts of the body.

Assessment for background pain and anxiety was performed using tool II to determine intensity of pain and anxiety for both control and study group. It was used three times; before, 30 minutes and one week after applying of the massage. Assessment of anxiety was performed using tool III to determine severity of anxiety for both control and study group. It was used three times; before, 30 minutes and one week after implementing the intervention of the study group.

### 2-planning phase

A designed intervention was developed after reviewing of the related literature. The objective of this study was to reduce pain and anxiety of patients with burn.

The planning phase includes; preparing of the environment, provide lavender and chamomile oils, maintain proper patient position.

Prepare the environment to ensure patient's privacy during the intervention in addition to; maintain good ventilation as much as possible.

Lavender and chamomile oils were obtained from the national research center in Cairo, then 2 drops of pure lavender essence and 2 drops of pure essential oil of chamomile diluted in 30 ml of grapeseed base oil and used for the massage.

### 3-Implementation phase

Massage with lavender and chamomile oils was carried out by the researcher for each patient individually for three times within one week. Duration of each massage time ranged from 20-30 minutes.

At the first day; the researcher assessed patient skin's sensitivity to lavender and chamomile oils by; rubbing small amount of the oils over the intact areas of the skin; the next day, before changing of the dressing, the site was assessed for signs of allergic reactions such as redness, inflammation and pruritus. There was no any patient who suffers from lavender and chamomile oils sensitivity.

### Massage intervention:

The study group received massage using lavender and chamomile oils by the researcher for 20 min in addition to daily routine care. The patients were asked to assume prone or side-lying position or a sitting position. The researchers cleaned the intact skin of the massaged areas (legs or back) by a wet towel for better absorption of the oils. After washing hands, the researcher poured 5mL of oil into their palms and rubbed their palms to warm it and performed massage on the intact areas of the patient's skin.

The massage intervention was done using effleurage technique. Effleurage movement is a relatively slow and

smooth continuous strokes using the flat of the hand, this method improves the absorption of the oils without deep muscle excitement. The massage was performed in a comfortable position for patient from shoulders to toes and vice versa on only intact portions of the body and within one inch of dressing. The massage was applied towards the direction of the patients' heart, the researcher provide stable speed, depth and pressure of the hands as much as she can. The patients in the control group received the routine hospital care offered by the nursing staff.

### 4- Evaluation Phase:

It aimed to reassess patients after intervention phase to identify progress in term of differences in patients' level of response from baseline. Every patient in both studied groups was assessed three times, pre the intervention by using Tool I, II and III, 30 min and one week after implementation of massage using Tool II and III.

### Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version 26. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test ( $\chi^2$ ). For comparison between means of two variables in a group, paired samples t-test was used. For comparison between means for variables during three periods of intervention in a group, or for more than two variables, the F-value of analysis of variance (ANOVA) was calculated (Gerstman,2008).

### Result

The results reveals that less than half (40%) and (46.67%) were in age group of 30 -< 40 years, more than half 60% and 63.33% were male of control and study group respectively while majority of them were married, and less than half 36.67% and 40% has secondary education, while 43.33% and 50% have manual work of control group study group respectively.

### Table (1): Percent distribution of clinical data among the studied groups

This table demonstrates that majority and more than half of the total sample have no medical or surgical history respectively, more than half and same percent (70%) of the total sample stayed in the hospital for 1-3 days and more than third of them 63.33% and 60% of control and study group respectively have no previous stay history in the hospital from any disease.

Only one patient of control group compared to none of study group have previous hospitalization due to burn injury, in addition; it was observed that more than two third 70% of control group and 63.33% of study group were burnt by flame or fire with (46.67%) compared to

30% of control and study group respectively have burn TBSA between 30-45% with no significant difference between the two groups in relation to TBSA since  $P=0.183$ , also majority 80% of the control group and all study group have burn in the arm.

**Table (2): Percent distribution of Burns Specific Pain Anxiety level among the studied groups throughout periods of study**

This table demonstrates that majority of the control group (76.67%) have severe pain and anxiety in the first day, which has been increased to 80% post 30 min and decreased to 50% one week post the routine hospital nursing care.

On the other hand, the majority of the study group patients (80%) have severe pain and anxiety before implementing the intervention in the first day which has been decreased dramatically to 13.33% and 10% post 30 min and one week after implementation of massage respectively.

Moreover; the table shows that there was a high statistical significant difference between study and control group in relation to BSPAS since  $P=0.000$  and there was a statistical significant difference between each group throughout the period of the study since  $P=0.017$  and  $0.000$  for control and study group respectively.

**Table (3): Percent distribution of the level of Beck Anxiety Inventory (BAI) among the studied groups throughout periods of study**

This table illustrates that majority and same percent of the control group 76.67% have severe anxiety level before 30 min which has been decreased to 46.67% one week post routine hospital care. On the other hand, majority of the study group (80%) have severe anxiety level in the first day before implementation of the massage intervention which has been decreased dramatically to 13.33% 30 min and to 10% one week after implementation of the massage intervention.

Finally, this table shows that there was a high statistical significant difference between study and control group in relation to (BAI) since  $P=0.000$  and there was a statistical significant difference between each group throughout the period of the study since  $P=0.049$  and  $0.000$  for control and study group respectively.

**Table (4): Relation between total mean score of Burns Specific Pain Anxiety of the studied groups and their clinical data throughout periods of study**

This table revealed that the lowest mean score of Burns Specific Pain Anxiety of control group was  $62.67 \pm 17.954$ , which has been slightly increased to  $64.50 \pm 11.030$  then decreased to  $51.0 \pm 19.235$  in the

pre, immediately and one week after the routine hospital nursing care respectively for the hypertensive patient and that difference was statistically significant where  $P=0.001$  both in the pre, immediately after the routine hospital nursing care respectively.

Same table proved that there was a high significant difference between mean score of Burns Specific Pain Anxiety for both groups related to duration of the hospitalization / days where  $p= <0.005$  throughout the study period except one month after the implementation of the massage intervention for the study group since  $P=0.090$ . Regarding burn total body surface area; it is obvious that there was a significant difference between mean score of Burns Specific Pain Anxiety for both groups and total body surface area for both groups throughout the study period except one week after the implementation of the massage intervention for the study group since  $P=0.208$ .

On the other hand, there was no significant difference between mean score of Burns Specific Pain Anxiety for both groups related to; surgical history, duration of hospital stay, previous hospitalization for burn, causes of current burn or burned parts of the body since  $P= >0.05$ .

**Table (5): Relation between total mean score of Beck Anxiety Inventory of the studied groups and their clinical data throughout periods of study**

The present table reveals that there was a significant difference between total mean score of Beck Anxiety Inventory and medical history of control group patient in the pre and immediately post routine hospital care where  $P=0.003$  and  $0.002$  respectively, in addition; there was a significant difference between total mean score of Beck Anxiety Inventory and duration of hospitalization/days of both groups throughout the study period since  $P=< 0.05$ , also there was a significant difference between total mean score of Beck Anxiety Inventory and total body surface area for the control group throughout the study period and for the study group in the pre massage application where  $P=< 0.05$ .

On the other hand; same table demonstrated that, there was no significant difference between total mean score of Beck Anxiety Inventory and surgical history, duration of hospital stay or burned parts of the body where  $P= >0.05$ .

**Table (1): Percent distribution of the studied patients according to their clinical data among the studied groups**

Clinical data	The studied patients (n=60)				$\chi^2$ P
	Control group (n=30)		Study group (n=30)		
	N	%	N	%	
<b><u>Medical history</u></b>					
▪ None	23	76.67	26	86.67	1.984 0.371
▪ Diabetes	3	10.00	3	10.00	
▪ Hypertension	4	13.33	1	3.33	
<b><u>Surgical history</u></b>					
▪ None	19	63.33	18	60.00	9.361 0.498
▪ Appendectomy	2	6.67	2	6.67	
▪ Caesarean	1	3.33	3	10.00	
▪ Cholecystectomy	2	6.67	2	6.67	
▪ Discectomy	1	3.33	2	6.67	
▪ Hemorroidectomy	1	3.33	0	0.00	
▪ Internal fixation	0	0.00	1	3.33	
▪ Kidney stone removal	2	6.67	0	0.00	
▪ Skin graft	1	3.33	0	0.00	
▪ Splenectomy	0	0.00	2	6.67	
▪ Splenectomy & appendectomy	1	3.33	0	0.00	
<b><u>Duration of current hospitalization (in days)</u></b>					
▪ (1-3)	21	70.00	21	70.00	2.485 0.478
▪ (4-6)	4	13.33	7	23.33	
▪ (7-9)	4	13.33	2	6.67	
▪ More than 9	1	3.33	0	0.00	

<b>Range</b>	<b>(1-20)</b>		<b>(1-9)</b>		t=0.262
<b>Mean ± SD</b>	<b>3.47±0.821</b>		<b>3.07±0.929</b>		P=0.611
<b><u>Previous stay in the hospital</u></b>					
▪ Yes	11	36.67	12	40.00	FE
▪ No	19	63.33	18	60.00	0.791
<b><u>Duration of previous stay (in days)</u></b>					
▪ None	19	63.33	18	60.00	
▪ (1-3)	7	23.33	7	23.33	
▪ (4-6)	1	3.33	5	16.67	5.694
▪ (7-9)	2	6.67	0	0.00	0.223
▪ ≥9	1	3.33	0	0.00	
<b>Range</b>	<b>(1-14)</b>		<b>(1-6)</b>		t=1.477
<b>Mean ± SD</b>	<b>4.64±0.722</b>		<b>3.17±0.850</b>		P=0.238
<b><u>Previous stay in the hospital due to the burn injury</u></b>					
▪ Yes	1	3.33	0	0.00	FE
▪ No	29	96.67	30	100.00	0.313
<b><u>Cause of the previous burn</u></b>					
▪ Chemical	1	100.00	0	0.00	-
<b><u>Degree of the previous burn</u></b>					
▪ Second & third	1	100.00	0	0.00	-
<b><u>Cause of the current burn</u></b>					
▪ Hot liquids	4	13.33	6	20.00	0.501
▪ Flame / fire	21	70.00	19	63.33	0.779
▪ Chemicals	5	16.67	5	16.67	

<b><u>Total body surface area (TBSA (%))</u></b>					
▪ (10-<15)	0	0.00	2	6.67	
▪ (15-<20)	1	3.33	2	6.67	4.016
▪ (20-<25)	8	26.67	7	23.33	0.404
▪ (25-<30)	7	23.33	10	33.33	
▪ (30-45)	14	46.67	9	30.00	
	<b>Range</b>	<b>(18-40)</b>	<b>(14-40)</b>		t=1.813
	<b>Mean ± SD</b>	<b>28.00±2.136</b>	<b>25.87±2.135</b>		P=0.183
<b><u># Burn parts of the body</u></b>					
▪ Arm	24	80.00	30	100.00	
▪ Leg	20	66.67	15	50.00	3.256
▪ Front of the body	22	73.33	19	63.33	0.521
▪ Back	5	16.67	2	6.67	
▪ Head and face	10	33.33	16	53.33	

FE: Fisher's Exact test

Table (2): Percent distribution of the studied patients regarding Burns Specific Pain Anxiety level among the studied groups throughout periods of study

BSPAS Level	The studied patients (n=60)													
	Control group (n=30)						$\chi^2$ P	Study group (n=30)						$\chi^2$ P
	Pre care		Immediately		One week post			Pre care		Immediately		One week post		
N	%	N	%	N	%	N	%	N	%	N	%			
▪ Mild	0	0.00	0	0.00	4	13.33	<b>12.105</b> <b>0.017*</b>	0	0.00	6	20.00	23	76.67	<b>71.81</b> <b>0.000*</b>
▪ Moderate	7	23.33	6	20.00	11	36.67		6	20.00	20	66.67	4	13.33	
▪ Severe	23	76.67	24	80.00	15	50.00		24	80.00	4	13.33	3	10.00	
<b>Range</b>	<b>(49-87)</b>		<b>(50-88)</b>		<b>(14-80)</b>		<b>F=14.04</b>	<b>(49-88)</b>		<b>(25-80)</b>		<b>(8-63)</b>		<b>F=96.04</b>
<b>Mean ± SD</b>	<b>76.30±12.075</b>		<b>77.77±12.170</b>		<b>60.03±18.129</b>		<b>P=0.000*</b>	<b>73.87±12.596</b>		<b>48.43±12.249</b>		<b>22.30±15.225</b>		<b>P=0.000*</b>
<b>Group1 VS Group 2</b>														
$\chi^2$	FE		<b>27.824</b>		<b>24.637</b>									
P	1.00		<b>0.000*</b>		<b>0.000*</b>									

\* Significant at level P &lt; 0.05

Table (3): Percent distribution of the level of Beck Anxiety Inventory (BAI) among the studied groups throughout periods of study

Total BAI Level	The studied patients (n=60)													
	Control group (n=30)						$\chi^2$ P	Study group (n=30)						$\chi^2$ P
	Pre care		Immediately		Post a week			Pre care		After a week		After 2 weeks		
N	%	N	%	N	%	N	%	N	%	N	%			
▪ Minimal	0	0.00	0	0.00	1	3.33	<b>12.62</b> <b>0.049*</b>	0	0.00	0	0.00	10	33.33	<b>75.73</b> <b>0.000*</b>
▪ Mild	0	0.00	0	0.00	3	10.00		0	0.00	6	20.00	13	43.33	
▪ Moderate	7	23.33	7	23.33	12	40.00		6	20.00	20	66.67	4	13.33	
▪ Severe	23	76.67	23	76.67	14	46.67		24	80.00	4	13.33	3	10.00	
<b>Range</b>	<b>(22-60)</b>		<b>(22-60)</b>		<b>(7-50)</b>		<b>F=16.38</b>	<b>(19-60)</b>		<b>(12-45)</b>		<b>(4-28)</b>		<b>F=77.48</b>
<b>Mean ± SD</b>	<b>45.30±13.207</b>		<b>47.03±13.309</b>		<b>29.63±12.372</b>		<b>P=0.000*</b>	<b>43.43±13.480</b>		<b>22.87±8.966</b>		<b>11.41±6.626</b>		<b>P=0.000*</b>
<b>Group1 VS Group 2</b>														
$\chi^2$	FE		<b>25.630</b>		<b>24.731</b>									
P	1.00		<b>0.000*</b>		<b>0.000*</b>									

\* Significant at level P &lt; 0.05

Table (4): Relation between total mean score of Burns Specific Pain Anxiety of the studied groups and their clinical data throughout periods of study

Clinical data	The studied patients (n=60) Total BSPAS score (Mean ± SD)					
	Pre care	Control group Immediately	Post a week	Pre care	Study group Immediately	Post a week
<b>Medical history</b>						
▪ None	80.48±8.251	<b>82.00±8.219</b>	<b>63.35±16.500</b>	73.96±13.074	48.31±15.709	<b>22.88±16.115</b>
▪ Diabetes	<b>62.67±17.954</b>	63.00±18.358	46.67±25.658	71.00±11.533	46.33±15.308	18.33±9.018
▪ Hypertension	62.50±11.030	64.50±11.030	51.00±19.235	<b>80.00±0.000</b>	<b>58.00±0.000</b>	19.00±0.000
<b>F , P</b>	<b>9.265 , 0.001*</b>	<b>9.465 ,0.001*</b>	1.789 ,0 .186	0.186, 0.831	0.214, 0.809	0.136, 0.874
<b>Surgical history</b>						
▪ None	75.05±12.686	76.42±12.898	58.11±19.134	75.17±12.468	49.50±14.638	21.94±15.795
▪ Appendectomy	83.00±4.243	86.00±1.414	67.50±16.263	72.50±10.607	48.50±13.435	17.00±2.828
▪ Caesarean	57.00±0.000	59.00±0.000	28.00±0.000	84.67±4.163	55.67±3.215	28.33±8.083
▪ Cholecystectomy	82.50±3.536	84.50±3.536	66.00±9.899	58.50±0.707	28.50±0.707	11.50±3.536
▪ Discectomy	79.00±0.000	79.00±0.000	58.00±0.000	80.00±8.485	62.50±20.506	41.50±27.577
▪ Hemorrhoidectomy	83.00±0.000	84.00±0.000	56.00±0.000	-	-	-
▪ Internal fixation	-	-	-	50.00±0.000	25.00±0.000	10.00±0.000
▪ Kidney stone removal	86.50±0.707	87.50±0.707	80.00±0.000	-	-	-
▪ Skin graft	84.00±0.000	85.00±0.000	79.00±0.000	-	-	-
▪ splenectomy	-	-	-	68.50±13.435	45.50±23.335	19.50±16.263
▪ Splenectomy & appendectomy	56.00±0.000	58.00±0.000	49.00±0.000	-	-	-
<b>F , P</b>	1.166, 0.364	1.121, 0.389	0.974, 0.482	1.964, 0.113	1.542, 0.209	0.924, 0.496
<b>Duration of hospitalization (in days)</b>						
▪ (1-3)	81.38±6.607	82.76±7.006	67.05±11.660			
▪ (4-6)	61.00±15.055	62.50±15.416	31.50±19.296	<b>78.90±9.027</b>	<b>54.43±12.671</b>	<b>26.24±16.541</b>
▪ (7-9)	63.25±12.527	64.75±11.529	48.50±15.330	65.29±12.079	36.71±11.898	13.71±5.024
▪ More than 9	<b>83.00±0.000</b>	<b>86.00±0.000</b>	<b>73.00±0.000</b>	51.00±1.414	26.50±2.121	11.00±1.414
<b>F , P</b>	<b>9.441, 0.000*</b>	<b>9.115, 0.000*</b>	<b>9.524, 0.000*</b>	<b>11.276, 0.000*</b>	<b>8.895, 0.001*</b>	2.633, 0.090
<b>Duration of stay (in days)</b>						
▪ None	75.05±12.686	76.42±12.898	58.11±19.134	75.17±12.468	49.50±14.638	21.94±15.795
▪ (1-3)	79.71±10.388	81.57±10.130	61.57±18.119	76.57±10.706	50.57±12.435	23.43±8.561
▪ (4-6)	86.00±0.000	88.00±0.000	80.00±0.000	65.40±14.415	41.60±21.721	22.00±22.528
▪ (7-9)	67.50±16.263	68.50±14.849	53.50±6.364	-	-	-
▪ >9	84.00±0.000	85.00±0.000	79.00±0.000	-	-	-

<b>F , P</b>	0.688, 0.607	0.758, 0.562	0.677, 0.615	1.428, 0.257	0.598, 0.557	0.023, 0.977
<b><u>Previous stay in the hospital due to the burn injury</u></b>						
▪ Yes	84.00±0.000	85.00±0.000	79.00±0.000	-	-	-
▪ No	76.03±12.199	77.52±12.307	59.38±18.086			
<b>t , P</b>	0.412, 0.526	0.357, 0.555	1.138, 0.295	-	-	-
<b><u>Cause of the current burn</u></b>						
▪ Hot liquids	75.25±13.574	76.25±12.868	53.25±27.195	68.00±14.900	41.67±13.633	13.67±4.803
▪ Flame / fire	74.86±12.966	76.43±13.231	57.76±16.950	74.68±12.129	50.37±16.757	25.53±17.843
▪ Chemicals	83.20±2.588	84.60±2.074	75.00±6.205	77.80±11.692	49.20±10.134	20.40±7.301
<b>F , P</b>	0.980, 0.388	0.942, 0.402	2.349, 0.115	0.930, 0.407	0.736, 0.488	1.477, 0.246
<b><u>Total body surface area (TBSA (%))</u></b>						
▪ (10-<15)	-	-	-	57.00±11.314		12.50±4.950
▪ (15-<20)	49.00±0.000	50.00±0.000	25.00±0.000	67.00±21.213	31.50±9.192	13.50±2.121
▪ (20-<25)	65.00±12.095	66.88±12.822	43.50±15.250	67.71±11.514	39.00±15.556	17.00±6.733
▪ (25-<30)	78.71±9.844	79.43±9.761	62.71±17.547	74.70±10.904	41.29±13.487	21.20±15.901
▪ (30-45)	83.50±2.624	85.14±2.349	70.64±8.837	83.00±7.681	48.40±13.826	31.78±18.647
					59.89±12.820	
<b>F , P</b>	12.954, 0.000*	12.080, 0.000*	9.728, 0.000*	3.614, 0.019*	3.214, 0.029*	1.591, 0.208
<b><u># Burn parts of the body</u></b>						
▪ Arm	77.00±11.840	78.42±11.953	60.88±15.391	-	-	-
▪ Leg	80.50±8.751	82.05±8.684	64.60±17.488	78.67±10.452	53.40±14.961	27.27±16.118
▪ Front of the body	76.59±12.512	77.86±12.669	62.05±19.561	75.58±12.258	49.95±14.924	22.26±15.863
▪ Back	76.80±11.946	78.40±11.845	64.00±12.186	86.50±0.707	58.50±0.707	25.50±10.607
▪ Head and face	71.20±12.682	72.60±12.903	52.50±11.993	70.63±13.366	46.31±16.700	21.56±16.496
<b>F , P</b>	2.529,0.479	2.577, 0.504	1.705, 0.340	2.106, 0.130	1.108, 0.265	0.727, 0.521

Table (5): Relation between total mean score of Beck Anxiety Inventory of the studied groups and their clinical data throughout periods of study

Clinical data	The studied patients (n=60)					
	Total BAI score (Mean ± SD)			Study group		
	Control group			Pre care	Immediately	Post a week
	Pre care	Immediately	Post a week	Pre care	Immediately	Post a week
<u>Medical history</u>						
None	49.52±9.917	51.43±9.510	31.65±11.468	43.77±13.828	23.23±9.459	11.50±6.953
Diabetes	32.67±17.616	34.00±18.248	23.00±14.933	37.67±12.503	19.00±4.583	9.67±4.933
Hypertension	30.50±13.026	31.50±13.675	23.00±15.253	52.00±0.000	25.00±0.000	14.00±0.000
F , P	7.234 , 0.003*	8.059 , 0.002*	1.343 , 0.278	0.467, 0.632	0.313, 0.734	0.172, 0.843
<u>Surgical history</u>						
None	44.00±13.524	45.74±13.703	28.89±11.818	45.39±12.848	23.44±8.631	11.11±6.305
Appendectomy	51.00±8.485	56.00±2.828	31.50±12.021	42.50±13.435	21.50±4.950	10.50±4.950
Caesarean	23.00±0.000	24.00±0.000	10.00±0.000	52.67±3.055	22.33±3.786	16.00±2.646
Cholecystectomy	51.50±4.950	52.50±3.536	31.00±11.314	24.00±1.414	13.50±2.121	4.00±0.000
Discectomy	44.00±0.000	45.00±0.000	22.00±0.000	50.00±12.728	32.50±17.678	18.50±13.435
Hemorroidectomy	54.00±0.000	56.00±0.000	23.00±0.000	-	-	-
Internal fixation	-	-	-	20.00±0.000	14.00±0.000	6.00±0.000
Kidney stone removal	58.50±2.121	58.50±0.707	48.00±2.828	-	-	-
Skin graft	56.00±0.000	58.00±0.000	47.00±0.000	-	-	-
splenectomy	-	-	-	37.50±17.678	24.00±15.556	11.00±8.485
Splenectomy & appendectomy	24.00±0.000	25.00±0.000	17.00±0.000	-	-	-
F , P	1.288, 0.302	1.340, 0.278	1.545, 0.201	1.968, 0.112	0.924, 0.496	1.215, 0.334
<u>Duration of hospitalization (in days)</u>						
(1-3)	50.86±8.199	52.48±8.292	33.90±10.535	48.71±9.804	26.14±8.639	13.38±6.771
(4-6)	30.00±15.341	32.25±15.174	14.25±7.136	33.86±13.862	15.86±3.485	7.29±3.450
(7-9)	31.25±14.523	32.00±14.674	21.25±11.927	21.50±2.121	13.00±1.414	5.00±1.414
More than 9	46.00±0.000	52.00±0.000	35.00±0.000	-	-	-

F , P	7.671, 0.001*	7.749, 0.001*	5.076, 0.007*	9.599, 0.001*	6.581, 0.005*	3.855, 0.034*
<u>Duration of stay (in days)</u>						
None	44.00±13.524	45.74±13.703	28.89±11.818	45.39±12.848	23.44±8.631	11.11±6.305
(1-3)	48.86±12.509	50.86±12.199	29.71±13.708	45.14±12.226	22.43±7.323	12.86±5.398
(4-6)	57.00±0.000	58.00±0.000	46.00±0.000	34.00±16.062	21.40±13.465	10.40±10.015
(7-9)	34.00±14.142	35.00±14.142	19.50±3.536	-	-	-
>9	56.00±0.000	58.00±0.000	47.00±0.000	-	-	-
F , P	0.885, 0.487	0.928, 0.463	1.343, 0.282	1.523, 0.236	0.106, 0.900	0.230, 0.796
<u>Previous stay in the hospital due to the burn injury</u>						
Yes	56.00±0.000	58.00±0.000	47.00±0.000	-	-	-
No	44.93±13.282	46.66±13.380	29.03±12.140	-	-	-
t , P	0.671, 0.420	0.695, 0.412	2.117, 0.157	-	-	-
<u>Cause of the current burn</u>						
Hot liquids	45.00±15.684	46.25±15.064	26.50±14.271	39.00±15.608	18.00±5.477	8.67±4.082
Flame / fire	43.57±13.880	45.38±14.232	27.19±11.609	44.00±13.296	24.47±10.432	12.42±7.676
Chemicals	52.80±5.541	54.60±3.847	42.40±6.189	46.60±13.183	22.60±2.793	10.80±3.962
F , P	0.986, 0.386	0.975, 0.390	3.822, 0.035*	0.461, 0.635	1.208, 0.314	0.743, 0.485
<u>Total body surface area (TBSA (%))</u>						
(10-<15)	-	-	-	25.50±9.192	17.50±6.364	8.00±2.828
(15-<20)	22.00±0.000	25.00±0.000	12.00±0.000	39.00±22.627	18.00±8.485	6.50±3.536
(20-<25)	32.00±12.660	34.00±14.412	17.88±6.556	33.86±11.216	17.29±4.424	8.00±3.464
(25-<30)	47.71±11.772	49.14±11.510	30.43±10.596	46.00±11.421	23.40±8.422	11.40±7.090
(30-45)	53.36±3.895	55.00±3.088	37.21±9.760	53.00±8.139	28.89±10.068	15.89±7.026
F , P	11.717, 0.000*	10.096, 0.000*	8.718, 0.000*	4.529, 0.007*	2.428, 0.074	2.217, 0.096
<u># Burn parts of the body</u>						
Arm	46.00±12.765	47.83±13.017	29.50±11.755	-	-	-
Leg	50.30±10.204	52.00±9.819	33.45±12.072	47.80±12.399	25.60±9.402	13.53±6.865
Front of the body	45.91±13.413	47.41±13.340	31.55±12.798	46.21±13.361	23.58±9.233	11.79±6.933
Back	45.60±13.126	47.00±13.509	29.20±11.167	54.00±2.828	24.50±0.707	14.50±3.536
Head and face	38.60±13.672	40.30±14.803	21.50±6.451	40.88±13.971	23.00±10.066	11.06±7.122
F , P	3.321, 0.452	3.219, 0.474	3.397, 0.405	1.657, 0.150	0.675, 0.480	0.817, 0.406

## Discussion

Burn injuries are associated with painful and distressing experiences due to trauma, hospitalization, and therapeutic procedures. Severe burn pain is the worst due to inflammatory responses to wound care such as cleansing, debridement and dressing (**Daneshpajooh, 2019**). Anxiety is considered one of the most psychological effects of burns that increase pain severity (**Najjar, 2020**). Nurses play an important role in managing pain and anxiety for burned patients by assessing their pain and anxiety and using of non-pharmacological techniques (**Najjar, 2020**).

**The findings of the present study revealed that** less than half of the total sample aged between 30-40 years, third of them were male, this finding is justified by the fact that this age group is the age of working and stress, and high exposure of males to industrial and recreational burns, in addition to fire causing activities as smoking and careless handling of inflammable materials (**Blom,2019**).

This finding is in agreement with **Forough (2020)**, who mentioned that the highest percentage of the study group were 31-40 years and about two third of them were men, also this finding was in line with **Tahereh (2017)** and **Young et al (2020)**, who found that most of the studied sample were in age group between 26-40 years, these result also was consistent with result of **Blom (2018)** and **Ibrahim(2021)**, who found that about two third of burned patients were male. On the other hand; this finding was contradicted with **Hemeda (2018)** , who found that incidence of burn was common among age group 18-30 years and females were higher than males.

**As regard to marital status**, the present study showed that majority of the total sample were married because the married people are over loaded or preoccupied with

their life problems, responsibilities or have less of concentration when contacting with dangerous substances as increasing of burn hazard, also this study represents that less than half of the control and study group had secondary education, thus there is lack of knowledge regarding safety precautions that increase risk of burn injury.

This result was similar with **Ahmed (2019)** , who found that the highest percentage of the studied patients was married and had secondary education. This result was in contrast with **Shabana (2021)**, who reported that the majority of burned subjects were single; this result was in contrast with **Lotfi (2018)**, who stated that most burned patients were with high school education and diploma.

**According to current cause of burn**, the present study revealed that more than two third of the total sample were burnt by flame/fire, this can be justified as the majority of patients were burnt by gas explosion and gasoline flame which may be associated with the fact of these substances are widely used as domestic fuels in Egypt (**Hu,2021**).

This finding was accepted with **Hu (2021)**, who stated that most of the subjects were burned by flame, also this finding was similar to **Ahmed (2019)**and **Tian(2018)**,who showed that causes of burn among majority of the total sample was flame followed by scalds, moreover, **Faris (2019)** mentioned that more than two third of patients were burnt by flame and less than one third were burnt by hot fluids. This finding was in contrast with **Guanilo(2017)**,who reported the scald was the most common cause of burn followed by flame among studied burned patients and also the current result contradicted with **Hemeda (2018)**,who showed that the major cause of burn was electrical injury among study subjects.

**Regarding to the Total Body Surface Area**, the current study showed that majority of studied sample had burn TBSA between 30–45%, this finding is congruent with **Tian(2018)**,who reported that most patients had a TBSA of greater than 30%. This finding contradicted with **Guanilo(2017)**,who revealed that majority of burned patients had less than 20% of TBSA and this finding contradicted with **Abd Elalem(2018)**,who found that about two third of burned patients had TBSA between 10-25%.

**Concerning to Burn parts of the body**, the present study showed that majority of the total studied sample have burn in the upper limbs followed by trunk , chest and lower limbs, this can be illustrated by; the majority of subjects were burnt by flame or gas explosion and the first part come in contact with burn agents is the upper extremity and upper body parts (**Harorani ,2019**),this finding in line with **Chen(2021)**and **Odondi (2020)**. This finding is in contrast with **Taha (2018)** who noticed that head was the most frequent area affected with burn in all study groups.

**In relation to Burns Specific Pain Anxiety Scale (BSPAS)**, the present study revealed that majority of studied sample had severe pain and anxiety level before implementation of massage with lavender and chamomile oils, this can be justified by patient expectations and concern for painful management procedures that played an important role in increasing level of anxiety<sup>(26)</sup>, while these results found that there was a significant improvement of BSPAS after implementation of aromatherapy massage with lavender and chamomile oils in study group compared to control group who received the routine hospital nursing care. This result is congruent with **Saberi (2021)**and **Sevgi (2019)**, who stated that patients hospitalized for burn injuries experience severe pain and anxiety on a daily

basis, in addition **Alaa Eldin (2016)** and **Daneshpajoooh (2019)** reported that the burned patients had the highest level of pain and anxiety with daily performance of therapeutic procedures ,also this finding is similar with **Azim (2019)** and **Forough (2018)** ,who found significant reduction in pain and anxiety level in the study group who received aromatherapy massage with lavender and chamomile oils compared to control group who didn't receive intervention. In addition **Harorani (2019)** mentioned that the burned patients who received aromatherapy with lavender essential oil had lower level of pain and anxiety than those who didn't receive.

**Concerning to Beck Anxiety Inventory Scale (BAI)**, the finding of present study showed that majority of studied sample had severe anxiety before implementation of massage with lavender and chamomile oils, this can be justified by ineffective pain control, decline of body integrity, impaired of functions, hospitalization, lack of social support, and the idea of losing independence are the factors increasing the anxiety level(**Najjar,2020**), also this result showed that there was a significant improvement of BAI after implementation of the massage with lavender and chamomile oils in study group compared to control group.

**This result was supported with Ayhan(2021)**and **Jain (2017)**,who stated that burned patients have high level of anxiety and distress, also this finding was in line with **Forough(2020)** and **Ebrahimi (2021)**, who found that the use of aromatherapy massage with lavender and chamomile oil was effective in reducing the anxiety of burn survivors. Controversy ; the finding is in contrast with **Nilsson (2019)**,who found that the study sample scores for anxiety was rated low, and comparable to those rated in the reference group.

**In relation to Relation between total mean score of Burns Specific Pain Anxiety of the studied groups**

**and their clinical data throughout periods of study,** this result showed that the highest mean scores of change of total Burns Specific Pain Anxiety (BSPAS) was seen in burned patients who have previous hospitalization , with chemical burn , whose total body surface area between 30-45% and who had burn in back, also this result observed a highest improvement in the study group among these patients after application of massage therapy with lavender and chamomile oils compared to control group who received routine hospital care, this result was in agreement with **Ghezeljeh(2020)**,who found that highest level of pain and anxiety was seen among burned patients with previous hospitalization , burned by chemicals , with total body surface area more than 25% and with many burn parts especially in the back.

**Concerning the Relation between total mean score of Beck Anxiety Inventory of the studied groups and their clinical data throughout periods of stud,** the current study showed that the highest mean scores of change of total Beck Anxiety Inventory (BAI) was found among burned patients who stayed in the hospital from 1-3 days , with a history of previous hospitalization, suffer from chemical burn and whose total body surface area between is between 30-45%,also this result observed a highest improvement in the study group among these patients after application of aromatherapy massage with lavender and chamomile oils compared to control group, this result was supported with **Jain (2017)**,who reported that burned patients who recently admitted to the hospital from 1-3 days, with previous hospitalization , burned by chemicals and with greater than 20% total body surface area were more experienced higher levels of anxiety.

### **Conclusion**

Based on the finding of the present study: it can be concluded that there was a statistical significant difference between the study and control group in relation to pain and anxiety level throughout the period of the study for control and study group as there was a highly improvement in the study group after application of massage with lavender and chamomile oils compared to the control group who didn't receive intervention. So, using of aromatic oils with lavender and chamomile during massage can help to reduce pain and anxiety levels in patients with burn.

### **Recommendations**

**Based on the findings of the current study, the following recommendations are suggested:**

#### **1- Recommendation for nurses:**

-Nursing staff must focus on a standardized continuous pain and anxiety assessment and documentation as they are a cornerstone of burn pain and anxiety control.

-Application of aromatherapy massage with lavender and chamomile oils for burned patients as a protocol of nursing care to reduce burn pain and anxiety.

#### **2- Recommendation for administrative policy of the hospital:**

-Assessment of pain and anxiety associated with burn must be included in written policy and guidelines in the burn unit in the hospital.

-Development of in-service education program for all nurses working in burn units about different types of burn pain and the role of aromatherapy massage with lavender and chamomile oils on minimizing pain and anxiety associated with burn.

#### **3- Recommendation for further research:**

-Further research must be focusing on educational program for nurses about the importance of aromatherapy massage with lavender and chamomile oils to control pain and anxiety in burned patients.

-Period of follow up must be increased to 1-2 months.  
 -The study should be replicated on large sample and different hospitals setting in order to generalize the results.

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