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Massage with aromatherapy: effectiveness on anxiety of users with personality disorders in psychiatric hospitalization*

Massagem com aromaterapia: efetividade sobre a ansiedade de usuários com transtornos de personalidade em internação psiquiátrica

Masaje con aromaterapia: efectividad sobre la ansiedad de usuarios con trastornos de personalidad en hospitalización psiquiátrica

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ABSTRACT

Objective: To investigate the effectiveness of aromatherapy massage using the essential oils (0.5%) of *Lavandula angustifolia* and *Pelargonium graveolens* for anxiety reduction in patients with personality disorders during psychiatric hospitalization. **Method:** Uncontrolled clinical trial with 50 subjects submitted to six massages with aromatherapy, performed on alternate days, on the cervical and the posterior thoracic regions. Vital data (heart and respiratory rate) were collected before and after each session and an anxiety scale (Trait Anxiety Inventory-State) was applied at the beginning and end of the intervention. The results were statistically analyzed with the chi square test and paired t test. **Results:** There was a statistically significant decrease ($p < 0.001$) of the heart and respiratory mean rates after each intervention session, as well as in the inventory score. **Conclusion:** Aromatherapy has demonstrated effectiveness in anxiety relief, considering the decrease of heart and respiratory rates in patients diagnosed with personality disorders during psychiatric hospitalization.

DESCRIPTORS

Personality Disorders; Anxiety; Massage; Aromaterapy; Complementary Therapies; Psychiatric Nursing.

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INTRODUCTION

The clinical practices with aromatherapy have become an expanding area for nursing and considered one of the most popularly used complementary techniques. It is applied in various medical specialties, including oncology, gynecology, geriatrics and psychiatry, and despite the still contradictory results, the technique is promising. In Brazil, there is an incipient movement for inclusion of Alternative and Complementary Practices in Health (PACS - Práticas Alternativas e Complementares em Saúde) in the traditional health services, predominantly limiting it to specific actions of independent professional responsibility. The national scientific literature focuses on the discussion of medical rationale, the design and the knowledge of professionals about the PACS[1-5].

In general, within the field of Psychiatry, studies with aromatherapy investigate the effectiveness on the reduction of dementia symptoms in the elderly, and of anxiety in the healthy population, or in combination with other medical diagnosis such as cancer[6-10]. Therefore, studies showing the action of aromatherapy in the population carrier of psychiatric disorders are scarce.

With clinical practice, it is observed that anxiety during psychiatric hospitalization is expressed through psychological and physical components such as apprehension, fear, anguish, changes in vital signs and psychomotor agitation. These signs become more evident in the population diagnosed with personality disorders (PD) that, in general, is resistant to treatment and has little ability to deal with unfavorable situations and negative emotions[11].

This study aimed to investigate the effectiveness of aromatherapy associated with massage on the anxiety of patients with PD diagnosis during psychiatric hospitalization.

METHOD

This is an uncontrolled clinical trial carried out in a psychiatric ward of a general hospital in the interior of the state of São Paulo. The participants were 50 patients admitted between May and October 2013, with the medical diagnosis of Personality Disorders and Disorders of Adult Behavior[12]. This population was chosen taking into consideration the prevalence rate in the unit, the impact it causes on the health team and the perceived need to diversify the nursing care offered.

In addition to the diagnostic cohort, the other inclusion criteria were age over 18 years, signature of the Informed Consent Term (IC) by patients and a family member or person responsible for the participant. The exclusion criteria were the following: hypersensitivity to essential oils, pregnancy or signs suggestive of pregnancy, continuous use of antiarrhythmic drugs and cognitive impairment.

According to Resolution 196/1996 of the National Health Council (NHS), the study was approved by the Research and Ethics Committee of the Faculty of Medicine of Botucatu and of the Faculty of Medicine of Marília, under process number 241.082 and CAAE 11539313.5.0000.5411.

The intervention consisted of eight meetings held during psychiatric hospitalization. The first meeting was the initial contact of the researcher with the study subjects, which occurred no later than a day after the patient's admission to the unit, when the study was exposed, explained and the IC was signed. The aromatic solution was also applied on the antecubital fossa to check irritating or allergenic signs after 24 hours (sensitivity test). The second meeting served for collection of demographic data and application of the State-Trait Anxiety Inventory, State subscale (STAI-State). Then, the first massage session with aromatherapy was held and the heart rate (HR) and respiratory rate (RR) were measured before and after the procedure. Finally, the days and times of upcoming sessions were scheduled. From the third until the seventh meeting, massage sessions with aromatherapy and measurement of HR and RR were held on alternate days. On the eighth meeting, which was a day after the last session of aromatic massage, the STAI-State was applied again.

The aromatherapy intervention was characterized by the application of essential oils in six massage sessions in the muscle regions of the trapezius and back chest with duration of 20 minutes, three times a week, every other day for 2 weeks, totaling six sessions held in the patients' room in the sitting position.

The massage technique selected among those presented in the scientific literature was the smoothing or *effleurage*. It consists on the application of light and continuous superficial movements, performed with the entire palmar surface and multi-directed movements. This method was chosen due to its consecration in the literature of aromatherapy since its early times, because it promotes greater dermal absorption of essential oils and does not stimulate acupuncture points[13].

The essential oils of lavender (*Lavandula angustifolia*) and geranium (*Pelargonium graveolens*) were elected given their high concentration of ester, providing soothing and calming action, both indicated for anxiogenic situations. The essential oils at 0.5% concentration were diluted in neutral gel for application during the massage. This choice was due to the chemical neutrality and the pleasant sensory aspects they provide[13-14].

The analysis of the intervention effectiveness was carried out in two steps. The first consisted of measuring the HR and RR before and immediately after each aromatherapy massage session. These vital signs were used because they are easily measured, do not represent additional costs to the project, represent physiological signals that indicate a state of relaxation or anxiety and for having already been used in other international studies in this area. Therefore, the digital pulse oximeter (Universal Medical Products®) was used to detect the HR. The RR was measured manually with the aid of a clock[15].

The second part of the data collection was the application of the STAI-State, an international scale, nationally validated and widely used for patients and the general population. Given the objective of this study, the questionnaire on evaluation of the status of patients included in the

sample population was applied in two stages: before and after the intervention. The questionnaire consists of 20 self-assessed statements, and is intended to investigate transient emotional aspects marked by the experience of anxiogenic feelings. Each statement receives a score ranging from 1 to 4 points, and the sum classifies the status of users as low (20-34 points), moderate (35-49 points), high (50-64 points) and very high (65-80 points)[16-17].

The data were initially presented according to references of descriptive statistics and later, of analytic statistics. The first allowed identifying the measurements of position or central tendency, such as mean and median, and also the variability measurements, for example, range, variance, standard deviation (SD) and quartile. Graphical and numerical resources were used to represent the measurements in an organized way and provided with logical sense[18].

The second part of the data processing was performed according to the bivariate analysis with the purpose of revealing any existing association between two variables. The software used was the Statistical Package for Social Sciences (SPSS), version 17.0.

The paired t test was performed to compare the means of HR and RR before and after the sessions, and to compare the categories of the STAI-State before and after the intervention. The chi-square test (χ^2) was used to verify the evidence of associations between the two independent variables (sociodemographic characteristics) and dependent variables (HR, RR and pre-intervention STAI-State). In both tests, the analyzes considered a confidence interval of 95 % (95% CI) and p value of 0.5[18].

RESULTS

Among the 50 subjects who participated in the study, 39 (78%) were female. The mean age among men was 30.54 years (18-48 years), while the mean age of the female population was higher: 35.74 years (18-60 years). The mean age of the study population was 34.60 years (18-60 years).

The predominant diagnosis subtype in the population was the Emotionally Unstable PD (F60.3), representing 71.8% of women and 45.5% of men (n = 28 and n = 5, respectively), followed by the PD diagnosis of Histrionic (F60.4), with seven female subjects and three males. Other diagnostics belonging to the group were found, namely: Dependent PD (F60.7) in three patients; Paranoid PD (F60.0) in two; Antisocial PD (F60.2) in a patient, and finally, a patient with Schizoid PD (F60.1)[12].

The criterion of previous hospitalization was predominant among women, since 24 mentioned it and, among men only three did so, which corresponds to 61.5% and 36.4%, respectively. However, both genders behaved similarly in the criterion of prior treatment, with 34 female patients and seven males. The totality of these patients has been taking medications for anxiety (benzodiazepines and selective serotonin reuptake inhibitors) for over 15 days. During hospitalization, the treatment regimen was reorganized with redistribution and/or increase of the dose and according to the severity of the case, including other classes of drugs, such as antipsychotics or anticonvulsants.

In relation to tobacco dependence, there was slight predominance in both genders. During hospitalization, the patients smoked at predetermined times, totaling eight cigarettes/day. The intervention was carried out an hour after the patient had smoked, in order to minimize the smoking influence on vital signs. The analysis of the vital signs of these patients pointed to an increase in HR and RR rates, without statistical significance when compared to the non-smoking population rates. The average difference between the HR and RR values before and after the intervention remained similar to the non-smoking population.

Table 1 shows the sociodemographic, diagnostic and clinical characteristics of patients who comprised the study sample.

Table 1 – Sociodemographic, diagnostic and clinical characteristics of patients undergoing intervention of massage with aromatherapy during psychiatric hospitalization - Marília, SP, Brazil, 2013.

	Female		Male	
	n	%	*n*	%
	39	78	11	22
Age range				
18 - 37 years	23	58.9	9	81.9
38 - 57 years	13	33.3	2	18.1
58 - 62 years	3	7.8	0	0
ICD-10				
F60.0	1	2.56	1	9.09
F60.1	1	2.56	0	0
F60.2	0	0	1	9.09
F60.3	28	71.8	5	45.5
F60.4	7	17.92	3	27.27
F60.7	2	5.12	1	9.09
Prior hospitalization				
Yes	24	61.5	3	36.4
No	15	38.5	8	63.6
Previous treatment				
Yes	34	87.2	7	72.7
No	5	12.8	4	27.3
Smoking				
Yes	23	59	6	54.5
No	16	41	5	45.5

Table 2 shows the mean and SD of the HR and RR before and after each massage session with aromatherapy. Note that between the first (S1) and the sixth (S6) session, both variables behaved similarly, with decreased averages and statistical significance ($p < 0.001$).

Table 2 – Mean and standard deviation of the cardiac and respiratory frequencies before and after each intervention session (S1 to S6) of massage with aromatherapy in patients with personality disorders during psychiatric hospitalization - Marília, SP, Brazil, 2013.

	S1	S2	S3	S4	S5	S6
Heart rate						
Before	91.0 ± 12.2§	89.8 ± 11.3§	86.3 ± 12.5§	89.3 ± 12.8§	88.4 ± 12.6§	89.7 ± 12.1§
After	75.6 ± 10.5§§	74.8 ± 9.7§§	71.1 ± 10.8§§	73.0 ± 10.2§§	73.4 ± 11.0§§	73.3 ± 10.2§§
Difference	15.4 ± 8.8	15.0 ± 7.8	15.2 ± 7.0	16.3 ± 8.4	15.0 ± 8.2	16.4 ± 8.3
Respiratory rate						
Before	18.8 ± 3.8§	18.5 ± 4.1§	18.1 ± 4.5§	19.2 ± 4.7§	19.2 ± 4.9§	18.9 ± 4.1§
After	15.6 ± 3.5§§	15.4 ± 2.8§§	15.1 ± 3.1§§	15.1 ± 2.9§§	15.3 ± 2.8§§	14.6 ± 2.1§§
Difference	3.2 ± 3.2	3.1 ± 3.4	3.0 ± 3.1	4.1 ± 3.4	3.9 ± 4.5	4.3 ± 3.9
p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

§-§§ Means followed by different symbols had statistical differences among each other through the t test (p < 0.05).

Regarding the numerical results presented by the STAI-State scale, the average of this study population before the intervention was 44.1 points (SD ± 5.9). There was a difference of 7.7 points (SD ± 6.3), a statistically significant decrease (p < 0.001) according to the paired t test.

Table 3 shows the pre and post-intervention categories of the STAI-State scale distributed in absolute numbers. Note that 41 subjects were categorized as *Moderate* before the intervention; of these, 15 (36.6%) decreased the score, reaching the category *Low* after the intervention. In turn, nine subjects were in the category *High* before and after the intervention, and seven (77.8%) decreased the score reaching the lowest categories of the scale.

Table 3 – Distribution of the study subjects according to the STAI-State category before and after the intervention - Marília. SP. Brazil, 2013.

	STAI	
STAI-State categories	**Before intervention**	**After intervention**
Low	0	16
Moderate	41	32
High	9	2
Total	50	50

Comparing the category *High* with *Moderate*, proportionally there was a greater reduction in the former. Among the study population, 63.4% of users categorized as *Moderate* before the intervention kept the same category after the intervention, a statistically higher value than the one presented by patients who were previously categorized as *High*.

The associations between HR, RR and STAI-State of the first measurement with the variables of smoking, previous treatment and prior hospitalization were analyzed. There was a strong association between HR and prior hospitalization (p = 0.0307), which means that the share of the study population who reported prior hospitalization showed higher HR. There was also a strong association (p = 0.0011) between the pre-intervention categories of STAI-State and the previous treatment. This indicates that 82.9% of patients in the category *Moderate* did not undergo prior treatment and 77.8% of patients in the category *High* had already had previous treatment. Table 4 shows these associations.

Table 4 – Association of heart rate, respiratory rate and STAI-State with the variables of smoking, previous treatment and prior hospitalization of patients with personality disorders undergoing intervention of massage with aromatherapy in psychiatric hospitalization - Marília. SP. Brazil, 2013.

	Smoking		Previous treatment		Prior hospitalization	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**
Heart rate						
68-80	4	9	3	10	7	6
81-90	6	6	8	4	11	2
91-100	7	7	9	5	12	1
101-114	6	5	7	4	11	0
Total	23	27	27	23	41	9
P value	0.6358		0.0790		0.0307	
Respiratory rate						
12-16	7	10	14	3	11	6
17-21	10	12	20	2	11	11
22-27	6	5	7	4	5	6
Total	23	27	41	9	27	23
P value	0.7846		0.1574		0.5354	
STAI-State						
Moderate	19	22	7	34	18	23
High	4	5	7	2	5	4
Total	23	27	14	36	23	27
P value	0.7903		0.0011		0.7903	

DISCUSSION

Few studies have investigated the relationship of anxiety as a symptom in people with mental disorders and the use of aromatherapy. Some studies with different populations showed similar results to this study. There was a decrease of HR and RR with statistical significance in children with first-degree burns (applying the essential oils of *Lavandula angustifolia*. *Matricaria recutita*. *Citrus aurantium* through massage) and in the area of aesthetics (using essential oil of *Lavandula angustifolia* with inhalation) in patients undergoing elective cosmetic use of Botox®[16,19].

In Taiwan, 67 women were randomized in a control group and in an intervention group, observing improvement in sleep patterns and decrease of HR. The intervention

group underwent 12 sessions with inhalation of lavender essential oil once a week, while the control group did not undergo any procedure. A decrease in parasympathetic activity was detected in the first 20 minutes after the beginning of sessions[7].

The reduction of anxiety was observed in patients diagnosed with generalized anxiety disorder (GAD) by using an oral preparation with lavender essential oil known as Silexan administered at a dose of 80 mg/day. The intervention group of these studies pointed to a decrease in restlessness, sleep disorders and somatic complaints, and influenced the improvement of general well-being and quality of life. Another finding of this oral solution showed that 80mg/day of Silexan is equivalent to the therapeutic effects of 0.5 mg/day of Lorazepam[20-21].

A study on anxiety and stress with teachers and administrative support staff in a school of tertiary education using inhalation of bergamot essential oil (*Citrus bergamia*) for 10 minutes weekly showed similar results to this research, corroborating the statistical decrease in RR[22].

However, this same study showed the lavender essential oil had irritant effect for some research subjects[22]. The literature review of this study and the data that emerged from the intervention have not confirmed this finding. The good tolerance of lavender and geranium scents and the security of not developing allergic reactions were unanimous in this study, as well as in the articles referred in the review[23].

A pilot study was carried out with a population of nursing workers in a teaching hospital using essential oil of *Cananga odorata*. Participants were randomized into three groups: those using aromatherapy by inhalation, those using aromatherapy via skin contact with essential oil, and those who used the essence and represented the placebo group. Considering the variable of self-esteem, there was a statistical decrease for the three groups, assessed by a nationally validated instrument, and there were no significant changes for the variables of anxiety, body temperature and blood pressure[24].

In a controlled clinical study using inhalation of *Citrus aurantium* essential oil at 8% concentration in primigravidae during labor, was observed a statistically significant decrease in the level of anxiety in the intervention group compared to the control group during 3-4 cm and 6-8 cm of uterine dilation[25].

Patients hospitalized in an intensive care unit with coronary artery disease who underwent hemodynamic intervention were given an aromatic preparation of *Lavandula angustifolia, Chamaemelum nobile* and *Citrus aurantium amara* essential oils at concentrations of 6, 2 and 0.5% respectively, by inhalation, to test the effect of aromatherapy on anxiety, sleep and blood pressure. The results pointed to a statistically significant decrease of anxiety level (assessed through the STAI), associated with improved sleep quality and stability in the diastolic pressure[26].

Studies on the chemical composition of *Lavandula angustifolia* and *Pelargonium graveolens* essential oils indicate the presence of substances such as linalyl acetate, linalool, lavandulol, limonene, geranyl acetate, menthone and citronellol. There is scientific evidence for detection of plasma linalyl acetate and linalool after 19 minutes of dermal application. Protective actions of the central nervous system have been associated to these two substances, which act as inhibitors of cholinergic action by modifying the functioning of ionic channels in neuromuscular junctions, and as inhibitors of the central nervous system tone by interacting in the action of the GABA neurotransmitter and the dopaminergic system[27].

According to the results presented by the STAI-State in this study, 77.8% of subjects who reported previous treatment for PD were classified in the category *High* of the scale. Note that 82.9% of subjects who reported no previous treatment for PD were in the *Moderate* category. This expressive association draws the attention, including its statistical significance, which is an indication that prior knowledge about the experience of hospitalization is an anxiety-promoting factor in this population.

Regarding the STAI-State results before and after the intervention, there was a statistically significant decrease in relation to the difference of mean scores. However, the decrease of category did not show the same characteristic. It appears that the time of questionnaire application after the intervention and the instrument properties in relation to specificity and sensitivity have been confusion biases that influenced the outcomes of anxiety reduction, taking into account the psychological traits.

A study involving patients undergoing cancer treatment corroborates this finding of the present study because there are no statistically significant results for the anxiety, nausea and pain outcomes[28]. Another study using the same essential oils of this study at the same concentration was carried out with higher education students in the health area and it found evidence of decreased level of anxiety, even though without statistical significance[14]. The STAI-State results also remained unchanged in patients who would undergo the first elective Botox® application after attending aromatherapy sessions with *Lavandula angustifolia* essential oil[19].

The STAI-State results were not convergent in two studies involving students of Brazilian Higher Education. Both studies used the aromatherapy inhalation method and different essential oils than those used in this study - *Citrus aurantium amara* 10%. *Lavandula angustifolia* 50%, *Cananga odorata* and *Cedrus atlantis* 20% each[29] and *Citrus aurantium sinensis* at 2.5, 5 and 10% concentrations[30]. The results before and after the intervention show the decrease in the STAI-State scale with statistical significance and also include the energy restorative effect subjectively reported by the participants[29-30].

The STAI is the main Brazilian instrument for measuring anxiety, with high levels of internal consistency using the Cronbach's alpha statistical test already used in numerous studies. However, relatively little is known about its psychometric standards, and such a test has been the target of questioning for not bringing items related to somatic manifestations in its construct, an aspect that differs from its own theoretical basis. As the STAI- State is

a self-report scale that depends on the conscious reflection of subjects at their time of anxiety and thus, varies according to the psychological pressure at different intensity levels, it does not differentiate between positive and negative experiences[16-17]. This limitation may have acted on the STAI results after the intervention, because the present study data were collected near hospital discharge, which can be considered an anxiogenic situation for the hospitalized subject.

The statistical analysis of the difference of the STAI-State averages before and after the intervention suggests that among the study population, the portion identified in the category *High* before the intervention showed a higher percentage of category change in the second application of the STAI-State. This data can be used in future researches for selecting the study subjects.

CONCLUSION

The intervention of massage with aromatherapy during psychiatric hospitalization for patients diagnosed with PD was effective for the reduction of anxiety, considering the parameters of HR and RR, as well as in relation to the STAI-State, where there was a statistically significant decrease in the average of scores obtained before and after the intervention.

In addition to the scarcity of studies on aromatherapy applied in the care of individuals with mental disorder, there are other limitations of this study in relation to its small sample size, the lack of a control group and of sample calculation. It is worth mentioning the lack of standardized concentration of essential oils and their application forms (olfactory and dermal) as bias of aromatherapy. Therefore, further studies are needed with more developed methodology, significant population sample, randomized and controlled.

RESUMO

Objetivo: Investigar a efetividade da massagem com aromaterapia utilizando óleos essenciais de *Lavandula angustifolia* e *Pelargonium graveolens* (0,5%) para diminuição da ansiedade de pacientes com Transtornos de Personalidade durante a internação psiquiátrica. **Método:** Ensaio clínico não controlado com 50 sujeitos submetidos a seis massagens com aromaterapia, realizadas em dias alternados, na região cervical e torácica posterior. Foram coletados dados vitais (frequências cardíaca e respiratória) antes e após cada sessão e foi aplicada uma escala sobre ansiedade (Inventário de Ansiedade Traço-Estado), no início e término da intervenção. Os resultados foram analisados estatisticamente com o teste *t* pareado e qui-quadrado. **Resultados:** Houve diminuição estatisticamente significativa (p<0,001) das médias das frequências cardíaca e respiratória após cada sessão da intervenção, assim como na pontuação do inventário **Conclusão:** A aromaterapia demonstrou ser efetiva no alívio da ansiedade, considerando a diminuição das frequências cardíaca e respiratória em pacientes diagnosticados com transtornos da personalidade durante a internação psiquiátrica.

DESCRITORES

Transtornos da Personalidade; Ansiedade; Massagem; Aromaterapia; Terapias Complementares; Enfermagem Psiquiátrica.

RESUMEN

Objetivo: Investigar la efectividad del masaje con aromaterapia utilizando aceites esenciales de *Lavandula angustifolia* y *Pelargonium graveolens* (0,5%) para la disminución de la ansiedad de pacientes con Trastornos de Personalidad durante la estancia en hospital psiquiátrico. **Método:** Ensayo clínico no controlado con 50 sujetos sometidos a seis masajes con aromaterapia, realizados en días alternados, en la región cervical y torácica posterior. Fueron recogidos datos vitales (frecuencias cardiaca y respiratoria) antes y después de cada sesión y se aplicó una escala sobre ansiedad (Inventario de Ansiedad Estado-Rasgo), en el inicio y término de la intervención. Los resultados fueron analizados estadísticamente mediante la prueba *t* pareada y de chi cuadrado. **Resultados:** Hubo disminución estadísticamente significativa (p<0,001) de los promedios de las frecuencias cardiaca y respiratoria tras cada sesión de intervención, así como en el puntaje del inventario. **Conclusión:** La aromaterapia demostró ser efectiva en el alivio de la ansiedad, considerando la reducción de las frecuencias cardiaca y respiratoria en pacientes diagnosticados con trastornos de la personalidad durante la hospitalización psiquiátrica.

DESCRIPTORES

Trastornos de la Personalidad; Ansiedad; Masaje; Aromaterapia; Terapias Complementarias; Enfermería Psiquiátrica.

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