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Effect of Inhalation Aromatherapy with Lavender and Rose Damascene Essential Oil on the Fatigue of Emergency Nurses.

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ABSTRACT

Background: Nurse fatigue can cause burnout, then it is effective on quality of patient care. So this study with the goal of determination of the effect of inhalation aromatherapy with lavender and Rose damascena essential oil on the fatigue of emergency nurses was accomplished.

Method: This quasi-experimental study was done on 37 nurses working in emergency department which were selected based on convenience sampling method. The interventions were 2 minutes inhalation of distilled water in the first week, 2 minutes inhalation of pure lavender oil in the second week, and 2 minutes inhalation of pure Rose damascena oil in the third week. The tools were demographic questionnaire and Brief Fatigue Inventory which were filled before and after the interventions. Data analysis was done by SPSS version 20 and $\alpha = 0.05$ was considered.

Results: Before the intervention, there was no significant difference among the means of fatigue rates in the three groups ($P=0.856$). But after the intervention, a significant difference was seen among the means of fatigue rates in

the three groups ($P=0.031$). It showed that the means of fatigue rates in the lavender (36/5) and Rose damascena (42/2) groups were lower than that in the distal water group(47/3). There was no significant difference between the means of fatigue rates in the distal water group before and after the interventions. But there was a significant difference between the means of fatigue rates in the lavender group (36/5) ($P\leq 0.001$) and the Rose damascena group (42/2) ($P\leq 0.001$) before and after the interventions. There was no significant difference between the means of fatigue rates in the lavender and the Rose damascena groups ($P=0.162$).

Conclusion: The fatigue rates of the nurses have reduced by inhalation aromatherapy with lavender and Rose damascena essential oils. So using these oils for lowering the nurses' fatigue rates in work environments is recommended.

Key words: Fatigue, Lavender, Nurses, Rose damascena

INTRODUCTION

One of the most dangerous places for occupational activity are hospitals. Hospital staff are subjected to multiple adverse biological, physical, and mental factors. Due to being involved in patients' care, nurses are among those members of a health care team who are subjected to a large number of adverse factors [1,2]. Factors which may cause occupational dangers are inappropriate job conditions, night-shift work, occupational stress, long working hours, fatigue, sleep disorders, etc [3]. Nursing is one of the stressful jobs. American Nurses Association has declared that the major concern regarding nurses' health (70%) is related to stress one of the main causes of which is fatigue at the end of the shift [4]. Nursing is a job closely related to people's health [5].

In many cases, nurses face incurable patients and diseases and experience intense mental stress [6]. These factors can cause fatigue in long run and have adverse effects on the process of professional activity of the nurses [7,8]. Fatigue in nurses, as a common form, is directly related to occurrence of nursing errors [6]. Fatigue is an unpleasant mental feeling which includes a spectrum from weakness to burnout and interferes with capability of fulfilling personal roles and activities [9]. Nurses who experience fatigue start to feel that they cannot face the patients and working with patients is made difficult for them; sometimes this leads to a feeling of failure and lowered self-confidence in them [10]. Continued feeling of fatigue decreases the individual's spiritual power so that they feel a form of apathy accompanied by extreme indifference toward the patient and their own profession. Lowered self-confidence, decreased or lack of job satisfaction, not taking organizational responsibilities, increased turnover, and resignation are among consequences of fatigue [11,12]. As nurses' fatigue and in turn occupational burnout influence the quality of patients care, removing the fatigue in nurses is necessary [6]. Since a long time ago in the far past, using

scents of flowers and fragrant plants and their extracts and essential oils and using other aromatic natural materials have been common in large civilizations and even small communities and primitive tribes for maintaining health and physical and spiritual strength and also exerting dominance and influence on humans and nature forces [13]. Today, this therapy has been introduced as a part of holistic nursing by State Board of American Nurses Association [14]. This kind of therapy is considered as an accepted part of nursing interventions in UK. Nurses in over 30 countries have the permission to use complementary medicine including aromatherapy in holistic nursing cares [15]. The exact mechanism by which aromatherapy influences the people is not completely known, it is assumed, however, that the aroma activates the neurons and stimulates the limbic system. Depending on the type of the aroma, different neurotransmitters are released. These neurotransmitters include enkephalin, noradrenaline, and serotonin. Therefore, scents and aromas can change the human's feelings [16]. In addition, the major actions are pain, anxiety, learning, memory, attention, arousal, relaxation, sedation, and sleep effects [17]. Some of essences or essential oils which are currently used in aromatherapy include those of lemon, chamomile, Bergamot orange, rose damascene [18], mint, boswellia, rosemary, and lavender [19].

One of the most widely used fragrant plants is lavender [20]. This plant is native to the Mediterranean area and is widespread across Europe and grows in sandy or gravelly soils. Lavender is a perennial plant, half of a meter high, with narrow, green, woolly opposite leaves. Its flowers are purple and in the form of ears. Lavender essential oil which is extracted from distillation of the flowers and flowery spikes of this plant is a greenish yellow liquid with a pleasant smell mainly used in perfume industry [21]. Studies on benefits of smell of lavender have shown that linalool and linalyl acetate found in this plant can stimulate parasympathetic nervous system. In addition, linalyl acetate has narcotic effects and linalool also has relaxing effects. Some of the studies have suggested that lavender may have some effects like benzodiazepines so that it can increase the effects of gamma-aminobutyric acid and in turn acts as a sedative [22].

Rose damascene is both one of the most important types of roses in the world and one of the most famous plants in the gardening history [23]. Constituents of this flower include: vitamins C, A, B1, B2, B3, K, malic and citric acid, pectin's, tannins, carotenoids, and flavonoids [24]. Scent of rose damascene is a familiar fragrance in Iranian plateau. Scent of this flower has special medical effects and has been long used as rose water in Iran and other parts of the world. Essential oil and aroma of this flower contains esters, ketones, aldehydes, and terpenes. These compounds exert many mental effects by stimulating the brain's smell-recognizing center. The scent of this flower is useful for relieving postpartum depression, rheumatoid arthritis pain, menstrual cramps, stress, and psychosomatic problems, and for enhancing memory performance [17].

In general, it should be said that complementary therapies, unlike medical therapies and while being economic, are without any serious complications and drug interaction in nearly all cases and are easily applicable and accepted by the patients. Decreased mental and physical health of nurses plays a role in qualitative and quantitative decrease in work efficiency and is related to the

quality of their performance in patients' care. As decreased job performance causes many mental and physical problems for nurses and leads to occupational burnout over time, the researchers attempt to promote methods of controlling nurses' fatigue by investigating the effect of aromatherapy with lavender and rose damascene essential oils on the fatigue of emergency nurses. Considering comparison of the results before and after the aromatherapy in this study, the researchers hope to encourage other hospitals to employ this method to control fatigue of nurses if revealed successful. Therefore, the present study was conducted to investigate the effect of aromatherapy with lavender and rose damascene essential oils on lowering the rate of fatigue in emergency nurses.

METHODS

The present study is an applied quasi-experimental and interventional research. All the nurses working in emergency departments (women's hospitalization emergency unit, men's hospitalization emergency unit, ambulatory emergency care unit, and triage) of Vali-e-Asr Hospital who were qualified in terms of the research criteria were selected through purposive sampling.

The following inclusion criteria were used to select the samples:

- being in a mental and physical condition suitable for answering the questions
- being personally interested in participating in the research
- having no history of allergy and respiratory diseases
- not being affected by lung diseases (asthma, obstructive pulmonary diseases)
- having no allergy to plant medicines
- having no history of addiction to drugs, cigarette, and alcohol
- experiencing fatigue at some rate
- Willingness to participate in the study

Ethical considerations

The proposal of this research was approved by the research council affiliated with Arak University of Medical Science, regarding ethical considerations. The samples were informed about the purpose and method of the study. They were assured that they could withdraw from the study at any time without being penalized. Lastly, written informed consent was obtained from the nurses who willingly declared their participation in the study.

Study measurements

Demographic questionnaire: It consisted of 12 questions about gender, age, marital status, level of education, work experience, second job experience, type of work shift, employment condition, working hours, and overtime.

Brief Fatigue Inventory (BFI): which determines fatigue severity through 10 questions. The first question shows presence or absence of unusual fatigue in the past week by answering yes or no. The subsequent questions ask about current fatigue rate, usual fatigue rate in the past 24 hours, the highest rate of fatigue experienced in the past 24 hours, the effect of fatigue experienced in the past 24 hours on overall performance, mood, walking, interaction with others, and enjoying the life, each measured by a scale from 0 to 10. The score 0 represents the best status and no fatigue and the score 10 represents the worst mode of fatigue. Finally, overall fatigue of each individual is obtained as sum of the scores of questions 2 to 10 (9 questions) divided by 9. The result 0 shows lack of fatigue, 1-3.9 mild fatigue, 4-6.9 average fatigue, 7-9.9 sever fatigue, and 10 very severe fatigue. This scale is a standard one which has been used in different studies [25]. Many studies have confirmed the validity of this questionnaire ($r > 90\%$) in Iran and other countries [26-28]. To determine the reliability of BFI, test-retest method was used. In this way, the questionnaire was filled by 10 people similar to the subjects (other than the groups participating in the study). Then, the questionnaires were filled again by the same people after one week and confidence level of 95% was obtained each time. By Cronbach's alpha test, $\alpha = 0.90$ was obtained.

Intervention: fatigue rates of the nurses were investigated in three work shifts. Before the intervention, Brief Fatigue Inventory was filled by the nurses. In the first week, the nurses in the control group (inhaling distilled water) had 2 drops of distilled water on their palms (using a dropper) and were asked to hold the hands in front of their noses and inhale it by ten deep breath for 2 minutes. In the second week, the nurses in the experimental group 1 (inhaling lavender essential oil) had 2 drops of lavender essential oil 100% on their palms (using a dropper) and were asked to hold the hands in front of their noses and inhale it by ten deep breath for 2 minutes.

In the third week, the nurses in the experimental group 2 (inhaling rose damascene essential oil), had 2 drops of rose damascene essential oil 100% on their palms (using a dropper) and were asked to hold the hands in front of their noses and inhale it by ten deep breath for 2 minutes. After the intervention, Brief Fatigue Inventory was filled again by the nurses. The obtained data were then analyzed by SPSS v.20 using descriptive statistics, paired t-test, independent t-test, and ANOVA in a significance level of $P < 0.05$.

RESULTS

The results showed that 37 nurses from those working in the emergency department of Vali-e-Asr Hospital in Arak, Iran participated in this study. In this research, the subjects were mostly female. Average age of the nurses was 28.3 ± 3.9 years. Average work experience was 3.8 ± 3.04 years. Most of the nurses had a B.A., were married, work shifts, had no second job, and were contract employees. The results showed that according to ANOVA test, there was no significant difference among the means of fatigue severity before the intervention in the three groups ($P=0.856$). In this study, means of fatigue severity of the nurses was assessed before the intervention in lavender (48.7), rose damascene (46.4), and distilled water groups (47.4). According to the same test, there was a significant difference among the means of fatigue severity after the intervention in the three groups ($P=0.031$). In this way, fatigue severity mean after the intervention was obtained in lavender (36.5), rose damascene (42.2), and distilled water groups (47.3) (Table1).

In addition, according to the paired t-test, there was no significant difference between the means of fatigue severity in the distilled water group before and after the intervention ($P=0.160$). However, according to the same test, there was a significant difference between the means of fatigue severity before and after the intervention in the lavender and rose damascene groups ($P \leq 0.001$) (Table 2). In general, fatigue severity has been reduced in the lavender and rose damascene groups after the intervention compared to that in the distilled water group.

DISCUSSION

The results of this research showed that fatigue severity mean in nurses before the intervention in lavender, rose damascene, and distilled water groups is 48.7, 46.4, and 47.4 respectively. This shows the overall fatigue severity of nurses at an average level during the past week. The results of ANOVA test showed that there was no significant difference among the means of fatigue severity before the intervention in the three groups ($P=0.856$). Similarly, study of Varvani et al. (2012) showed that the most prevalent occupational injuries in the past year in the work environment of the nurses in Arak have been chronic fatigue, stress, and back pain in order 27. Also, the results of the study of Sanjari (2009) showed that most prevalent occupational injury among the nurses in Tehran has been chronic fatigue (76.5%) [3].

Given the prevalence and severity of fatigue in nurses, continued feeling of fatigue decreases the individual's spiritual power so that they feel a form of apathy accompanied by extreme indifference toward the patient and their own profession. Lowered self-confidence, decreased or lack of job satisfaction, not taking organizational responsibilities, increased turnover, and resignation are among consequences of fatigue [11,12]. As nurses' fatigue and in turn occupational burnout influence the quality of patients care, removing the fatigue in nurses is necessary [6].

The results of the present study show that before and after the intervention, there was no significant difference in fatigue severity means in the distilled water group ($P=0.160$ in paired t-test). However, there was a significant difference between the fatigue severity means before and after the intervention in the lavender ($P\leq 0.001$ in paired t-test) and rose damascene groups ($P\leq 0.001$ in paired t-test). These findings reveal the effectiveness of lavender and rose damascene essential oils on reducing the fatigue in nurses. Similarly, Bahrainy et al. (2011) found similar findings regarding the effects of massaging by lavender essential oil on the fatigue severity of women with multiple sclerosis in Isfahan 28. Also, the results of the study of Bayat et al. (2004) suggested that administrating choline and common sage supplements can reduce fatigue and increase power of football players [29].

In the present study, the results of ANOVA test show that there was a significant difference among the fatigue severity means after the intervention in the three groups ($P=0.031$). Fatigue severity mean after the intervention was obtained in the lavender (36.5), rose damascene (42.5), and distilled water groups (47.3). This shows the effectiveness of the aromatherapy with lavender and rose damascene essential oils in a short time on reducing the fatigue of nurses. In the same way, Sakamoto et al. (2005) in Japan showed that using lavender fragrance causes tranquility during the breaks, prevents accumulating fatigue, and avoids performance to become worse in the next working sessions [30,31]. In addition, no significant difference was seen between the fatigue severity in the two interventions (lavender group and rose damascene group) ($P=0.162$) using independent t-test in the present study. Although fatigue severity mean in the lavender group was a little higher than that in the rose damascene group, this difference was not statistically significant. It seems that it is due to linalool and linalyl acetate found in the lavender which can stimulate parasympathetic nervous system. In addition, linalyl acetate has narcotic effects and linalool also has relaxing effects. Some of the studies have suggested that lavender may have some effects similar to benzodiazepines so that it can increase the effects of gamma-aminobutyric acid and in turn acts as a sedative.

LIMITATIONS

Given the limitation of the present study as the small size of the sample and conducting the interventions just once, aromatherapy (lavender and rose damascene essential oils) in a longer period of time for other nurses of different wards is recommended for the future studies to determine the effectiveness of this practice more. To avoid information to be biased, the study was double-blind. Collecting the questionnaires was done by the researcher's assistant and the statistician was not aware of the groups and the data were analyzed as variables of x_1 , x_2 .

CONCLUSION AND IMPLICATIONS

The results of the present study showed that severity of nurses' fatigue decreased in the two groups inhaling lavender and rose damascene essential oils compared to that inhaling the distilled water. These results represent the effectiveness of aromatherapy (lavender and rose damascene essential oils) in reducing the fatigue of nurses in a short time. Therefore, it is recommended that

aromatherapy by different methods of inhaling (using spray, oil, etc.) is used in the break rooms or changing rooms to remove the fatigue of nurses.

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