Biomedical & Pharmacology Journal Vol. **10**(1), 159-164 (2017)

The Effect of Orange Essence Aromatherapy on Anxiety in School-Age Children with Diabetes

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http://dx.doi.org/10.13005/bpj/1093

(Received: February 14, 2017; accepted: March 03, 2017)

This study aimed to determine the effect of orange essence aromatherapy on anxiety in school-age children with diabetes, as anxiety reduction would be expected to have a positive impact on health in this population. This clinical trial enrolled 60 children with diabetes, who were randomized to either the experimental or the control group (30 in each group). For the children in the experimental group, two drops of orange essence were poured on to a strip of gauze inside an open box, which was then held at a 5-cm distance from the child's nose. The children were then asked to breathe deeply for a span of 2 minutes. The control group received only routine care for diabetes. Data were collected using the Spielberger State-Trait Anxiety Inventoryand the Revised Children's Manifest Anxiety Scale. Data were analyzed using SPSS version 19 to perform descriptive and analytical statistical tests. No significant difference was observed between children's anxiety inthe experimental and control groups (P>.05) prior to the use of orange essence aromatherapy. After the therapeutic intervention, the anxiety of the experimental group significantly decreased compared to that before the intervention (P<.05). Orange aromatherapy, which is non-pharmacological and non-invasive, may be a useful complementary medical treatment for the management of anxiety in children with diabetes.

Keywords: Orange essence, anxiety, diabetes, child.

INTRODUCTION

Diabetes is a health challenge and widelyaffect the lives of patients with diabetes[1].So that one of the most common metabolic diseases in childrenis type 1diabetes[2].Now in Iran, patients withdiabetestype 1 are reported between 5-10%, and it is increasingabout one percent annually[3,4]. That's whythe World Health Organization,has called thedisease a silent epidemic[5].

There are several complications for diabetes patients.Among them, one of the complications that may negatively affect these patients,is psychological factors related to quality of life[6,7]. Stressand anxiety caused by diabetes, in addition to the physical and mental effects, is of the major causes of depression in these patients.It also can reduce concentration and lead to disorders related to decision-making skills, as a result, disorder in communicating with the therapist and that's why it reduces the effectsof psychological interventions[8]. Anxiety is referred to vague and fear feeling and respond to internal and external stimuli that can have much cognitive, behavioral, emotional and physical symptoms. Anxiety is one of the most common psychological reactions to the beginning of stress and all people may experience it[9]. Anxiety in children is detected by several symptoms like persistent inquietude in the field of sorrow or unrealistic fear[10]. Reducing anxiety in children who have experienced disease and hospitalization is

very pleasant and helpful for parents and their children[11].

Anxiety leaves different symptoms within physiological, emotional and communicationalareas.Among physiological symptoms of anxiety, changes in appetite, muscle tension, headache, lethargy, palpitations, weight changes, and sleep disturbances could be mentioned.Among emotional symptoms of anxiety,reduction in the power of concentration, forgetfulness, vain thoughts, worries, frustration and irritability could be named.Anxiety would also leave different communicational symptoms such as, loneliness, having few friends, being irritable, lowering threshold tolerance,reluctance to talk[12].

To reduce anxiety, benzodiazepines was often used that needsdoctor's prescription and may produce side effects such as nausea, vomiting and drug habits[13]. The use of non-pharmacological methods such asaromatherapy is a complementary treatment that considers the whole human being.In a way that this type oftreatment has been introducedas holistic nursing by the Nursing State of America[14]. Aromatherapy as a treatment for low-risk, easy, cheap andlowand limited side effects has been growing in nursing care[15]. Also, given that this type of treatment does not need doctor's prescription, and it can be independently run by nurses, hence is of utmost importance[9].Results of previous studies show that aromatherapy works for skin wound healing, reducing anxiety, pain and fatigue[16].To reduce stress and anxiety, various fragrances such as lavender[17], orange[15,18,19], and rose[20] is used.

One of the vegetable essences is essential of orange.Orange is a tree plant and a subcategory of sour orange that is grown in different parts of Iran andit is medically used to treat liver disorders, colds, problems related topostmenopausal bile, digestive disorders, skin rashes, and rheumatism[18].Given the prevalence of anxiety in schoolchildren with diabetes andthe role of orangearoma in reducing anxiety in patients,so this research aimsto determine the effect of orange essence aromaon the anxiety ofschool agechildrenwith diabetesin Ilam.

MATERIALSAND METHODS

The present clinical trialwas conducted on 60 patients (30experimental and30 control persons)of school-agechildrenwith diabetesin Ilam.Inclusion criteria were having type 1 diabetes, aged 6 to 12, living in Ilam and informed consent to participate in the study.Exclusion criteria were lack of desire to participate in the study, theexistenceofany crisisfor the client during the intervention, presence of asthma and allergies in children,known psychiatricdisordersin children,sensory and motor disorders in children,gaining more than 6 points in the area of polygraph of children's manifest anxietyand having anxiety-lowering pills in a month before and during the intervention.

First the aim ofthis study was explained for parentsandtheirchildrenand in case of informed consent of parents and childrento participate in the intervention,the aromatherapybegan.Data were collected by the SpilbergerTrait Anxiety Inventoryand the revised children manifest anxiety scale.If children in the study gained scores more than 40 inthe SpilbergerTrait Anxiety Inventory, then they were excluded[21]. After rejecting the children with anxiety character in the experimental group,rash and smell tests were performed.In skin allergy test,0.2milliliter of cardamom solution covered with hypoallergenic adhesive was placed under children's arm.Then, the next evening by visiting children and their examination,in case of the presence of allergy symptomsin children, such as redness, itching and swelling at the site of skin test, is the children were excluded[21,22]. To perform olfactory test, the ability to detect the smell oforangesolution,was considered as the capability of detecting pleasant smellof orangefor children[21].

After rejecting the children with anxiety character as well as the existence of respiratory and skin allergies,anxious behavior questionnaire was completed by interviewing children.This questionnaire has37 questionswhich investigate the manifest anxiety in the three areas of physiological, social, and worry anxiety.In this questionnaire 28 questions are related to indicators of physiological, social and worryanxiety (score 0-28),and 9 questions are related to the polygraph

scale (score 0-9).Each question is responded as *yes* (score 1) and *no* (score zero), and if the score of anxiety scale is low, it suggests lower anxiety level and if thepolygraph score is low it implies more sincerity in responding to questions by the children.It should be noted that if the polygraph scores were above 6,the samples were excluded from the study[12,23].The reliability of this questionnaire in thestudy have been approved by the study of Taghavi *et al*[24].

To split the children in the two control and experimental groups,inside two A and B envelopes, the name of each experimental and control groups were written, and children chose one of the envelopes every day.For experimental group, aromatherapy was conducted by orange essence 3 times a week(Saturday, Monday and Wednesday) before bedtimefor two weeks.The control group received only routine care as previous.).For the children in experimental group, two drops of orange essence were poured on one gauze inside an open box, and it was hold at a distance of 5 cm from the children's nose and the children were asked to take deep breaths for a period of two minutes(25).Then the anxiety questionnaire was filled before and afterintervention for the children in experimental and control groups.It should be noted that thephone number of the researcherwas given to children so as to call in case of any questions.

Ethical considerations in this study include approval of the ethics committee at the Universityof Medical Sciences,random assignment of experimental and control groups, obtaining the informed consent of parents and children, no cost to the patient,explaining the nature of the research to the patients, complyingDeclaration of Helsinki andthe Belmont.Data were analyzed using SPSS Version 21 anddescriptive and analytical statistics tests.In all cases, thep-valuewas considered less than 0.05.

RESULT

The findings of this study showed that children between demographic characteristics of the study showed no statistically significant difference (p> .05). (Table 1).

Results Table 2 shows the mean and standard deviation of physiological anxiety, worry and social anxiety experimental and control groups before and after the show. Statistical tests showed that the physiological anxiety, worry and social anxiety before the intervention and control groups

Table 1: Demographic profile table-school age children with diabetes before and after the intervention

Variable	Group Experimental Group	Group Control Group	p-value
Gender			0.79
Man	18(60)	17(56.7)	
Female	12(40)	13(43.3)	
Type of insulin			
70/30	13(43.3)	11(36.7)	0.12
Nph & reg	17(56.7)	19(63.3)	
Number of insulin injections			0.88
2 times	11(36.7)	12(30)	
3 times	8(26.7)	7(23.3)	
More than 3 times	11(36.7)	11(36.7)	
Age	9.53±1.75	9.10±1.66	0.33
Duration of diabetes	3.50±1.81	3.87±1.52	0.4

was not statistically significant difference (p> .05). But after the intervention of concern and sensitivity, social anxiety and generalized anxiety patients showed significant statistical difference between test and control groups. (P <.05). The findings also showed that patients in physiological anxiety test before and after the intervention and control significant difference was observed. (P> .05).

DISCUSSION

This study aimed to determine the effect of aromatherapy with essence orange on anxiety in children with type I diabetes.The findings of this study showed that aromatherapy with essence of orange,reduces anxiety in children with type I diabetes.Aromatherapy affects in two physiological and psychological ways.Several studies have shown that vegetable oils contain chemical components that havemany effectson mind and feeling[26].Aromatherapy enters the body through the skin or one's olfactory system and thenstimulates the olfactoryreceivers.This allows transmission of messages by the olfactory nerve above the nose to the olfactory bulb, which is adjacent to the limbic system, and leads to impact on memory, emotions, spirit and feelings of the person[27,28].

The findings of this study showed that children's anxiety in the experimental group after aromatherapy with essence of orange had a significant decrease.Canaani *et al*. studied the effects of aromatherapy with essence of orangeon the anxiety of patients undergoing hemodialysis; they used a paper tissue wetted with a drop of orange essence for 15 to 20 minutes, three times a week for 4 weeks as aromatherapy.The results showed that after the aromatherapy,the manifest and hidden anxiety levels of patients was significantly reduced[15].In the study by Lehrner *et al*. which aimed to compare the impact of aromas of orange and lavender, and music therapy on anxiety of patients visiting dental office,findings suggestedthat the anxiety of patients who had received orange aroma, was significantly lower[29],which is consistent with the results of this study on the positive effects of aromatherapy in reducing anxiety in patients.

In the study of AlijaniRannani *et al*., orange aromas were given to school-age children with leukemia,as 3 days per week and 3 times per week.Results showed that the aromatherapy improved sleep quality in these patients[25].In the study by RashidiFakkari *et al*. that aimed to determine the influence of aromatherapy with essence of orange on severity of pain of nulliparous women,patients were divided into three groups.Geranium essencewas given to the intervention group (A), orangeessence was given to the intervention group(B),and for the control group distilled water was provided.The results showed that pain intensity was significantly reduced in the experimental group with orange aroma, butin group with geranium essence and control group no significant difference was observed[30].

One of the strengths of this study is to implement aromatherapy with orange for school-age children with diabetes, which isnot addressed

Table 2: Jdvl2-comparison of the mean and standard deviation of school-age children with diabetes before and after the intervention

Outcome Measure	Group	Experimental Group Mean(SD)	P value	Control Group Mean(SD)	P value
physiological	Before	6.10(2.36)	0.53	5.63(2.22)	0.44
	After	5.10(3.56)		5.57(2.02)	
worry anxiety	Before	5.43(2.43)	0	5.87(1.75)	0.43
	After	3.00(2.16)		5.93(1.55)	
social	Before	5.47(2.27)	0.02	5.43(1.75)	0.94
	After	4.00(2.71)		5.40(1.77)	
Anxiety total	Before	17.00(4.37)	0	16.93(3.91)	0.95
	After	12.10(5.54)		16.90(3.67)	

in previous researches.Among weaknesses and limitations of this study it can be pointed out that the aromatherapy is not performed by the researcher himself, and just the training is given to parents and children, and they have used aromatherapy at home.In fact, the researchers have carried out the follow-up by phone.Also in this study, a questionnaire was used to assess anxiety and clinical examinations have not been used.

CONCLUSION

Due to the positive effects of aromatherapy on anxiety in school-age children with diabetes it is suggested that this complementary treating method, which is a non-drug and non-invasive alternative, be performed to reduce anxiety in children with diabetes.

ACKNOWLEDGMENTS

Thereby the researchers, appreciate parents and children with diabetes who participated in this study.Schools and medical centers that have cooperated with the researcher in the identification of children with diabetes are sincerely appreciated as well.This study is the result of a research project with design code and code of ethics council,therefore, the Vice Chancellor of Research and Technology of IlamUniversity of Medical Sciences is appreciated due to financial support.

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