ORIGINAL ARTICLE

Effect of Orem's Self-Care Model on Perceived Stress in Adolescents with Asthma Referring the Asthma and Allergy Clinic, Isfahan, 2014

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ABSTRACT

Background: Incidence of asthma in adolescents leads to variations in family status, roles and interaction with peers for them, which could be a source of stress and psychological tensions in them. Therefore, the present study was conducted to investigate the effect of Orem's self-care model on perceived stress in adolescents with asthma.

Methods: In this semi-experimental study conducted from April 2013 to February 2014, 64 asthmatic adolescents referring Shariati Hospital, Isfahan were enrolled by simple random sampling and the patients were assigned to two groups of control and intervention. Then, Orem's self-care model-based training was implemented throughout eight sessions of two hours each and the *Cohen Perceived Stress Scale* was administered to both groups prior to and two months after the completion of the training. The data were analyzed by descriptive and analytical statistics consisting of paired t-test, independent t-test, Chi-square and Mann-Whitney using SPSS Version 20.

Results: Mean age of the participants was 14.15±3.12 years in the intervention group and 15.21±3.09 years in the control groups. 68.8% and 59.4% of the participants were male in the intervention and control groups, respectively. Independent t-test indicated a significant difference in the mean scores of perceived stress in the intervention (25.46±5.31) and control groups (28.90±5.27) after the training. Also, the result of paired t-test indicated a significant difference in the mean score of perceived stress between before (29.18±5.27) and after (25.46±5.31) training.

Conclusion: As the training based on Orem's model had a positive effect on declining perceived stress in asthmatic adolescents, continuation of using these training interventions could contribute to ultimately achieving positive outcomes in health functions of these patients.

KEYWORDS: Adolescent; Orem's self-care model; Stress

INTRODUCTION

Asthma is one of the most prevalent diseases in children and adolescents worldwide[1,2] and the leading reason for inability in children.[3] The prevalence of asthma has been reported variously in Iran (4-7%) and worldwide (8-12%). Also, the prevalence in children is so growing worldwide that it has increased by 50% in different countries.[4] As shown, asthma accounts for approximately 1.6 million emergency visits, over two million hospitalizations, and about 1.1 million days of school absence, major activity limitation, and unsatisfactory performance in children.[5]

Te incidence of asthma in adolescence not only brings about numerous challenges for adolescents, but also increases the likelihood of symptoms' exacerbation and asthma attacks, because significant physical, psychological, emotional, sexual, and social variations occur in adolescence.[6] Therefore, psychological and mental problems in adolescence are more prevalent than other life periods; for example, the incidence rate of such problems in 14 years of age increases by 10 times as compared to 10 years of age.[7] As a result, acquisition of any disease, particularly chronic ones such as asthma, could intensify the crises of adolescence and lead to various complications, including psychological, because of the nature of chronic diseases which cause many limitations, and affect the adolescents' life greatly and hence their group activities as well as psychosocial functioning.[8] More clearly, incidence of chronic diseases such as asthma in adolescence results in some lack of balance and peace for adolescents due to difficulties including repeated hospitalizations, side effects of treatment, school absence, and decline in academic performance culminating in stress.[9]

In this regard, the findings of a study demonstrated that stress and depression were highly prevalent among the adolescents with asthma.[10] Moreover, the results of another study indicated that the incidence of asthma symptoms and attacks in the asthmatic adolescents suffering higher stress was more than those with lower levels of stress. Accordingly, the experience of stress in asthmatic adolescents increases the likelihood of asthmatic attacks.[11] Therefore, prevention of attacks and control of stress and anxiety in the adolescents with asthma is an important concern of healthcare teams. As the nurses spend the greatest amount of time with patients, they are often in the best position to detect symptoms and prevent complications in these patients.[12]

Training is a significant way to promote the adolescents' health through implementing various projects with reliance on the patients' active participation in various health behaviors.[13] By relevance, self-care pattern is an important training pattern which is based on the individual abilities and needs. For example, Orem's self-care model is a self-care pattern which is an appropriate clinical guideline to plan for and implement self-care principles and could be applied as a conceptual framework to design self-care programs.[14]

The Orem Self Care Model is developed in three types of care systems with reference to the patient's needs and health problems and the role of the nurse, namely wholly compensatory nursing system, partly compensatory nursing system, and supportive-educative nursing system. In this model, when the patient is going to learn and perform the behavior of interest but is not able to do it without assistance, the supportive-educative nursing system is applied. Here, the role of nurses is to advise as required. This system is conducive to decision making, behavior management, and acquisition of knowledge and skills. In this study, the supportive-educative nursing system was adopted for the patients.[15]

Findings of a study investigating the effect of Orem's model on self-care in adolescents with asthma demonstrated that five domains of self-care including appropriate drug taking, use of exercise techniques, use of functional programs for asthma control, careful adherence to diet, and protection against environmental stimuli of asthma attacks in the

treatment group were significantly different from the controls compared with prior to the intervention.[16] Also, the results of another study demonstrated the effect of supportive-educative program, based on the Orem's theory, on knowledge, asthmatic control and self-care behaviors in the adolescents with asthma, showing that the control of self-care behaviors enhanced after the intervention.[17]

A study of training program and asthma control in adolescents showed that attending training classes by the adolescents with asthma led to a decrease in and mitigation of asthma attacks; hence, the incidence of stress became less likely in them.[18] Therefore in view of sensitive period of adolescence, adverse psychological and mental effects of asthma on adolescents as well as insufficient number of investigations on the Orem-based self-care model, this study aimed to investigate the effect of the Orem's self-care model on perceived stress in adolescents with asthma.

Material and Methods

This semi-experimental study was conducted from April 2013 to February 2014 (throughout 11 months). The sample size was calculated as 32 in each group based on the data of similar studies: (d=0.7s^2, α=0.05, β=0.2).[19] For ethical considerations, ethical approval was issued by Research and Technology Deputy of Isfahan University of Medical Sciences (291302) and relevant authorities for this study.

The study was conducted at Shariati Hospital, asthma and allergy clinic. The sampling was done in the patients referring Shariati Hospital, Isfahan. The patients were enrolled by simple random sampling so that the first referring individual with inclusion criteria was assigned to the intervention group and the second to control and it continued till the desired number of participants were included in the two groups. The inclusion criteria into the study were suffering from asthma for 6 months (by definition, chronic diseases take three months to interfere in daily activities and affect the patient's quality of life), ability to answer questions and debate in training classes, full consciousness, the age of 11-21 years, and no previous participation in similar training.

The exclusion criteria were absence in two consecutive and/or one fourth of all the sessions, no other chronic disease, mental health and no mental retardation (by medical file and the physician), no history of taking drugs with mental effects (by medical file and the physician), no emergency conditions throughout the study, no stressful incidence, for example bereavement during the study (based on the patients' statement before and during the study as they were already informed of the participation in this study) in both groups, and withdrawal from the study.

A physician confirmed that the patients in the two groups were matched for the severity of asthma and the type of the drug(s) taken. The patients training based on the Orem's model were considered as independent variable and perceived stress as dependent variable. Gender, age, disease duration, and parental education level and occupation were considered as the underlying variables in this study. The researcher completed the pre-test questionnaires after she described the research purposes for the participants and obtained their written consent forms. The participants over 18 years of age needed no parents' permission and hence independently signed the letter of consent to participate in the study. For younger participants, the parents did it on behalf of their children.

To examine the training needs of each participant before the intervention, a questionnaire was developed based on the Orem's model to investigate and detect some domains such as respiratory conditions, mood function, social function, and physical activity. Therefore, the researcher initially administered this questionnaire to the patients, and then planning for the intervention in the intervention group started with reference to the frequency of self-care needs in any domains. Among self-care needs, the highest frequency was derived for social function followed by

mood function and physical function.

After needs generation, the training materials were judged as appropriate. To develop the training materials, we derived the content by reviewing the relevant literature, and then offered to and confirmed by some university teachers who previously investigated such patients and a subspecialist. The training materials consisted of:

Asthma and methods of controlling its symptoms, effective breathing types (diaphragmatic and lip-bud), proper application of spray, and ways to relieve stress and anxiety based on the Orem's self-care model were instructed within eight 2-h sessions. Training was implemented by the researcher as a group, individually, and face-to-face through speech, brainstorming and educational aids including PowerPoint, movie and educational replica at clinical skills training workshop of Shariati Hospital with a pulmonologist's help.

It is noteworthy that all sessions were held in group, but when the parents and/or adolescents did not understand a subject and/or raised any questions regarding the disease and how to care for, they were individually trained by the researcher or a subspecialist.

In addition, the researcher's phone number was given to the patients for further advice and support if necessary during the follow-up. Therefore, the patients could call the researcher if they had any queries.

For follow-up, all the patients in the intervention group were called after the educational intervention on an ongoing basis once a week (for two months), and the content was taught to them and care practices were evaluated.

Two months after the intervention, the patients of both groups were requested to complete the questionnaire of perceived stress. The training in the control group was run as routine, so that the patients only received recommendations from physician in visits.

Notably, the researcher trained the patients of both groups similarly for observance of research ethics. *Cohen Perceived Stress*

Scale has three versions, 4, 10, and 14-item, administered to measure the overall perceived stress. This scale measures thoughts, stress-causing incidence, control, overcoming, coping with psychological pressure and experienced stresses. The items are scored on a 5-point Likert scale as *never* (0), *almost never* (1), *sometimes* (2), *often* (3), and *many times* (4). The items 4-13 are scored inversely ranging from *never* (4) too *many times* (0). It should be noted that for positive statements (4-10, and 13), the scores were calculated inversely. Overall, the scores ranged from 0 to 56.

This scale, which was psychometrically investigated by Ghorbani et al. in 2002, assesses perceived typical stress over the past month. Ghorbani et al. reported Cronbach's alpha at 0.84 and 0.86 for this scale. In the study done by Ghorbani et al., Cronbach's alpha in an American sample was 0.86 and in an Iranian sample it was calculated as 0.81.[20] Cohen et al. calculated Cronbach's alpha for this scale as 84% and 86%, respectively.[21] In addition, its validity was approved in the study performed by Khushabi et al. in Iran.[22]

This questionnaire has been already used in the studies on students and its validity and reliability (Cronbach's alpha: 80%) had been confirmed for this population.[23,24] To investigate the questionnaire's validity, concurrent validity with the scales of positive and negative emotions, happiness, and depression was used. The positive emotion was significantly correlated with positive (r=0.73) and negative (r=0.53) perceived stress, negative emotion was significantly correlated with positive (r=0.68) and negative (r=0.68) perceived stress, happiness was significantly correlated with positive (r=0.68) and negative (r=0.43) perceived stress, and depression was significantly correlated with positive (r=0.57) and negative (r=0.49) perceived stress.[25]

Further, the association between this scale and validity criteria is not affected by age and gender.[24]

The data were analyzed using descriptive and analytical statistics consisting of paired t-test, independent t-test, Chi-square and

Mann-Whitney tests in SPSS 20.

RESULTS

The results of independent t-test, analysis of variance, and Mann-Whitney revealed that there was no significant difference in age, duration of asthma, gender, fathers and mothers' education, and fathers and mothers' occupation between the two groups. Therefore, the two groups were similar in view of these variables. (Table 1).

Independent t-test indicated a significant difference in the mean score of perceived stress after the intervention in both studied groups (P=0.01), while no statistically significant difference was obtained prior to the intervention in the two groups (P=0.79). Furthermore, paired t-test indicated a significant difference in the mean score of perceived stress between before and after the intervention in the intervention group (P=0.01), but no statistically significant

difference was derived in the control group (P=0.68). (Table 2)

Moreover, independent t-test indicated that the mean differences in perceived stress score between the intervention and control groups were significant before and after training (P=0.04) (Table 3).

DISCUSSION

This study was conducted to investigate the effect of the Orem's self-care model on perceived stress in adolescents with asthma. As to the participants' demographics in the present study, most adolescents of intervention and control groups were male.[16] In another studym the mean age of asthmatic children in treatment and control groups was reported 7-15 years.[26]

The present study indicated that although there was no significant difference in the mean score of perceived stress prior to the training in both intervention and control groups, the

Table 1: Demographic characteristics of asthma patients in the two groups

Demographic variables		Intervention group	Control group	P value
Age (yrs.), Mean±SD		14.15±3.12	15.21±3.09	0.21
Duration of asthma (month), Mean±SD		26.38±19.88	25.89±23.56	0.93
Sex N (%)	Male	10 (31.3)	13 (40.6)	0.30
	Female	22 (68.8)	19 (59.4)	
Father Education level N (%)	Elementary	7 (21.9)	9 (28.1)	0.74
	Secondary	6 (18.8)	4 (12.5)	
	Diploma	14 (43.8)	15 (46.9)	
	University degree	5 (15.6)	4 (12.5)	
Mother Education level N (%)	Elementary	10 (31.3)	9 (28.1)	0.67
	Secondary	6 (18.8)	4 (12.5)	
	Diploma	12 (37.5)	16 (50)	
	University degree	4 (12.5)	2 (6.3)	
Father Employment status N (%)	Self-employed	24 (75)	23 (71.9)	0.21
	Employment	5 (15.6)	9 (28.1)	
	Employees & retirees	3 (9.4)	0 (0)	
Mother Employment status N (%)	Housekeeper	30 (93.8)	29 (90.6)	0.5
	Employment	2 (6.3)	3 (9.4)	

Table 2: Comparison of mean±SD score of perceived stress in the intervention and control groups before and after training

Time	Group (Mean±SD)		P value
	Intervention	Control	Independent sample t-test
Before training	29.18±5.27	29.62±7.88	0.79
After training	25.46±5.31	28.90±5.27	0.01
P value (Paired sample t-test)	0.01	0.68	

Table 3: Difference in mean perceived stress between the two groups of the study before and after training

Group	Mean±SD	P value
Intervention group	29.34±6.69	0.04
Control group	27.18±5.53	

difference were significant between the two groups after the training.

This means that the intervention implemented in this study reduced perceived stress in patients with asthma in the intervention group, while the perceived stress was not significantly different between the two groups before the intervention. Holding sessions in the hospital's clinical skills centre, use of educational aids such as models, *PowerPoint* and movie, a variety of methods including speech and brainstorming and above all presence of parents at sessions could contribute to the intervention efficacy.

The important purpose of training is to develop appropriate and stable behaviors, and if self-care activities are performed through active training methods and recognition of patients' attitudes and beliefs and also provision of an environment laden with confidence and comfort for clients, then they may contribute sufficiently to promotion of the desired healthy behaviors.[27] On the other hand, presentation of materials in an understandable manner, based on individual needs, and by group training, along with questions and answers can lead to better results, and above all help to continue appropriate caring behaviors.[28]

Since self-care as practiced by the adolescents could stimulate regressive and forgotten abilities and use them to eliminate inabilities, implementation of self-care programs could reinforce motivation and self-esteem in the patients with asthma, so that they improve their deficits and inabilities through assuming responsibility for self-care and use the self-care to remove these difficulties.

Similarly, a study of peer-centred training and health outcomes in the adolescents with asthma in Jordan demonstrated that the participants in the intervention group, as compared with controls, exhibited a significant improvement of health-related quality of life, resistance to smoking, and knowledge of asthma self-management.[29]

Moreover, a study of the Orem's self-care model in adolescents with asthma indicated that self-care skills including use of drugs and a codified program, adherence to a daily follow-up program, and protection against disease-initiating factors such as stress significantly increased in the intervention group, but they did not cause a change in the controls. Also, the number of adolescents who accomplished self-care increased in the intervention group, who were less dependent on parents for self-care.[16] Another study of self-management of asthma in adolescents indicated that the students who underwent self-care intervention had a higher level of self-esteem for management of their disease and took more measures to prevent symptoms compared to the control group. Moreover, use of appropriate coping skills, decrease in school absence due to asthma, improvement of quality of life, and decrease in hospitalization turns were reported.[30] A study on the effect of interactive teaching of children and their families on the control of disease symptoms after one-year follow-up indicated that the number of children's referral to the emergency ward decreased.[31] In addition, the present study obtained a significant difference in perceived stress score in the intervention group between before and after the training.

In view of the great contribution of psychological factors including stress to incidence and/or exacerbation of asthma conditions, training of coping strategies to the participants by the researcher and their physician led to their active participation in self-care and hence decline of stress in them. Therefore, the Orem's self-care model-based training caused a decrease in perceived stress in asthmatic adolescents.

Because this model aimed to prepare the patients for and assist them in self-care, then we must let them be actively involved in decision making and planning for self-care.

In this regard, a study of a program of stress management in the adolescents with asthma demonstrated that the intervention developed to control stress and improve coping with the disease in the intervention group resulted in promotion of physical health (lung function) and alleviation of perceived stress and depression.[32] Another study of the effect of asthma-related training on health outcomes in asthmatic children hospitalized in emergency ward of the hospital indicated that the training caused a significant decrease in hospitalization-associated stress in children, parents, and/or both compared to the controls.[33]

The distinctive point of the present study is investigation of self-care needs by the patients' needs assessment, because development and implementation of a program without consideration of the patients' needs yields no positive outcomes. Implementation of self-care program could reinforce motivation and self-esteem in these clients, so that they are able to improve the disease-derived inabilities and utilize self-care capability to remove the associated problems by self-care.

Since in the present study, because of time limitations, the effect of the Orem self-care programs has not been evaluated within an extensive length of time, it is recommended that its effect should be investigated more longitudinally (about four to six months after the intervention) to determine the reliability of the intervention.

CONCLUSION

As the present study indicated, self-care training could be addressed as a significant factor contributing to the decrease in perceived stress. Therefore, the use of the models capable of inviting the clients and involving them in self-care could provide a valuable model which could be used to identify and evaluate the healthcare system for these patients. Then, it is recommended that this program should be considered as a part of treatment program for these patients.

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