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The Effects of Family-Centered Education Based on the Health Belief Model on Knowledge and Attitude Among the Parents of Children with Asthma: A Randomized Controlled Clinical Trial

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Abstract

Background: Asthma is the most [illegible]on ch[illegible]ic condition among children. It requires parents to engage in child care. Thus, the quality of asthma control depends on pare[illegible]knowled[illegible]nd attitude towards asthma and its treatments.
Objectives: This study sought to evaluat[illegible]e effects[illegible]amily[illegible]ntered education based on the Health Belief Model on knowledge and attitude among the parents of children[illegible]with[illegible]ma.
Methods: This randomized controlled clinica[illegible]al was conduc[illegible]64 parents of children with asthma who were purposefully recruited from a pulmonary clinic in Ahvaz, Iran. Participa[illegible]were ranc[illegible]ly allocated to either a control or an intervention group. Participants in the intervention group were offered a fa[illegible]y-cen[illegible]d ed[illegible]ational program based on the Health Belief Model, while participants in the control group received the same edu[illegible]tional ma[illegible]s without the use of the Health Belief Model. Participants' knowledge and attitude were measured before and three [illegible]nth[illegible]er the i[illegible]tion using a forty-item researcher-made questionnaire. The SPSS program (version 18.0) was employed for da[illegible]nalysi[illegible]
Results: There were no significant differences between the groups re[illegible]rding partic[illegible]nts' de[illegible]ographic characteristics and the pretest mean scores of knowledge, perceived susceptibility, perceiv[illegible]severity, perceive[illegible]efits, perceived barriers, and self-efficacy ($P > 0.05$). However, all posttest values of these mean scores [illegible]he intervention[illegible]o were significantly different from the control group ($P < 0.05$).
Conclusions: Family-centered education based on the Health Belief Model is effe[illegible]e in signi[illegible]y improving knowledge and attitude about asthma and its treatments among the parents of children with ast[illegible]a.

Keywords: Health Belief Model, Family-Centered Care, Asthma

1. Background

Asthma is the most common chronic disease in childhood (1). Around 5% of the total global population (around 300 million) and 7% of the total population of the United States (22.2 million people) suffer from asthma (2). The prevalence of asthma among the total population of Iran and among Iranian children is 5.5% and 10%, respectively (3-5).

Although asthma-related mortality rate is low, its disability rate is very high. Asthma is the first leading cause of absence from school (1) and the third leading cause of hospitalization among children younger than fifteen (6). Each year, childhood asthma re[illegible]lts in 6.1 m[illegible]l visits in emergency departments, more [illegible]an 200 th[illegible]and cases of hospitalization, and 1.1 million ab[illegible]nces[illegible]m school in the world (7). It negatively affects scho[illegible]erformance (8, 9), greatly involves parents in child care, and imposes heavy care and financial burdens on families (10).

There is no definitive treatment for asthma. Yet, most patients with asthma can effectively manage the disease and its complications through adhering to their treatment and dietary regimens, taking anti-inflammatory medications, and avoiding allergens (3). Moreover, educational programs for parents can help them prevent or minimize asthma complications.

There are different models and theories to develop educational interventions for patients and their family members (11, 12). The Health Belief Model (HBM) is one of the most commonly used models in this area. As a theoretical framework for this research, HBM is one of the most effective models of health education, mainly focused on prevention of diseases and adoption of behaviors to avoid illness and disease chains and it is one of the important precise models which is used to determine the relationship between health beliefs and behaviors. The HBM posits that people will take action to prevent illness if they regard themselves susceptible to a condition (perceived susceptibility), if they believe it would have potentially serious consequences (perceived severity), if they believe that a particular course of action available to them would reduce the susceptibility or severity or lead to other positive outcomes (perceived benefits), and if they perceive few negative attributes related to the health action (perceived barriers). Additionally, HBM scholars later suggested that self-efficacy, the belief that one can successfully complete the behavior of interest despite considered barriers, be added to the model (13). This model can be used in addition to family-centered care in order to improve quality of life among children with asthma (14).

A study reported that family-centered empowerment significantly improved knowledge, attitude, and self-efficacy among children with asthma and their parents. Educational programs significantly improve knowledge, attitudes towards asthma, and self-efficacy, lower absenteeism from school promote the ability to perform physical activity, help better manage asthma, and reduce patients' use of healthcare services (3). However, no study had yet evaluated the effects of family-centered education based on HBM on knowledge and attitude among the parents of children with asthma in Iran. Therefore this study was conducted to narrow this gap.

2. Objectives

The aim of the study was to evaluate the effects of family-centered education based on HBM on knowledge and attitude among the parents of children with asthma.

3. Methods

This randomized controlled clinical trial was conducted on 64 parents of children with asthma who, from September 2011 to March 2013, referred to the pulmonary specialty clinic of Arya Hospital, Ahvaz, Iran. Sampling was done purposefully. Inclusion criteria were basic literacy skills and having a child with an age of 6 - 12, a definite diagnosis of asthma established by a pulmonologist at least six months before recruitment to the study, and no affliction by other chronic serious conditions. Parents were excluded if they simultaneously participated in another asthma-related educational program, had more than one absence from the educational sessions, and incompletely answered to the study instruments. Parents were matched with each other two by two respecting their educational level and financial status and their asthmatic children's age, gender, and asthma duration. Then, matched parents were randomly allocated to either a control or an intervention group through coin tossing (Figure 1).

Study instruments were a demographic questionnaire, the Asthma Control Scale, and a researcher-made questionnaire developed based on HBM components. This ques-

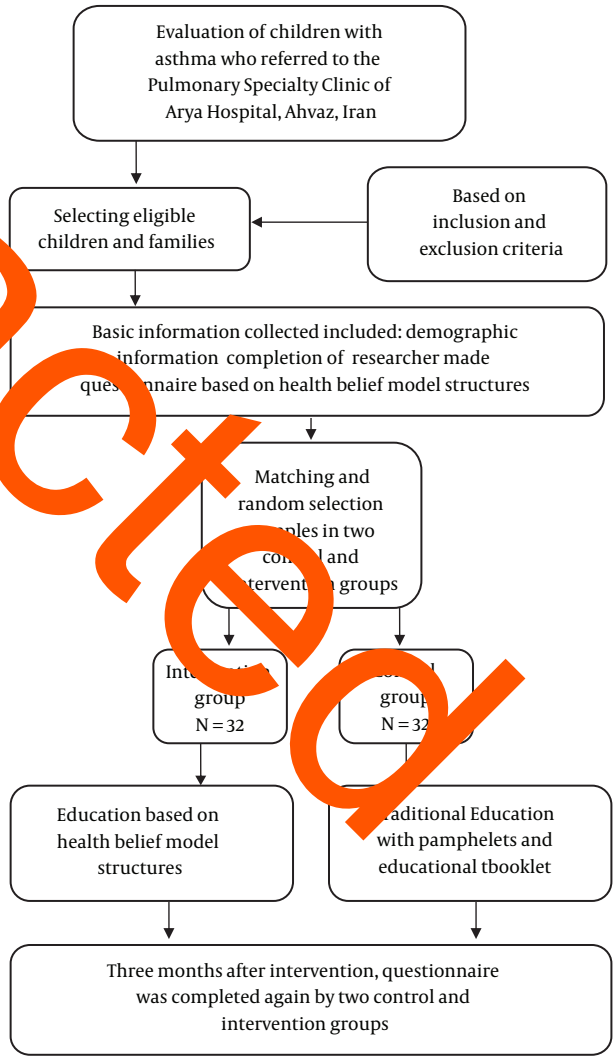

Figure 1. Study flow chart

tionnaire included fourteen items on knowledge, four on perceived susceptibility, four on perceived severity, eight on perceived benefits, six on perceived barriers, and four on self-efficacy -forty in total. The knowledge items were scored either 2 (the right answer), 1 (the "I don't know" answer), or 0 (the wrong answer). The possible five answers to the items of the perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy domains ranged from "completely agree" to "completely disagree". The right answer was scored 5 and the other answers were scored from 4 to 1. The items of the barrier domain were reversely scored. The content validity of this questionnaire was approved by nursing faculty members. For reliability evaluation, thirty parents completed this questionnaire and Cronbach's alpha value was calculated to be more than 0.7 for all domains. The Asthma Control Questionnaire was also used for the matching of parents regarding asthma control. It contained five domains related to the severity of asthma symptoms, the effects of asthma on sleep quality, the level of physical activity, the use of inhaled medications, and asthma control evaluation. This questionnaire contained seven items with seven possible answers to each, ranging from 0 to 6. The results total score ranged from 0 to 42 which was interpreted as the following: 0 - 19: poor asthma control; 20 - 24: moderate asthma control; and more than 25: good asthma control. This questionnaire was reported to have acceptable validity and reliability with a Cronbach's alpha of 0.94 (15, 16).

Initially, participants responded to the study instruments. Based on the collected data, their educational needs in each HBM domain were identified. Then, an educational program was developed based on the identified needs. The program was offered to participants in the intervention group. In this group, participants were divided into eight four-person groups, and two sixty-minute weekly educational sessions were held for each group in two successive weeks. Educational sessions were held for four groups in the first two weeks of the study and for the remaining four groups in the second two weeks of the study. Education was provided through lecture, slide and video presentations, question and answer, and group discussion. Besides, a medical specialist provided participants in the intervention group with recommendations about asthma control. Need-based education was also provided to participants in the control group using educational pamphlets and booklets. Of course, these forms of education were not based on HBM. Follow-up telephone contacts were made to all participants throughout the study in order to remind them to follow the provided education. Three months after education, participants were asked to re-complete the study instruments.

The SPSS program (version 18.0) was employed for data analysis. The data were analyzed through the chi-square, the paired-sample *t*-test, and the Independent-sample *t*-tests. Descriptive measures such as frequency, mean, and standard deviation were also used to present the data.

This study was approved by Ahvaz Jundishapur University of medical Sciences, Ahvaz, Iran (approval code: U91057) and registered in the Iranian Registry of Clinical Trials (registration code: IRCT2012071210260N1).

4. Results

Before the intervention, there were no statistically significant differences between the groups with regard to participants' age, gender, and educational level and their children's age, gender, asthma control status, and asthma duration (P > 0.05; Table 1).

The Independent-sample *t*-test showed that participants in the intervention group did not significantly differ from their counterparts in the control group respecting the pretest mean scores of HBM components (P > 0.05). Moreover, the results of the Paired-sample *t*-test illustrated

Table 1. Between-Group Comparisons with Regard to the Characteristics of Participants and Their Asthmatic Children[a]

Characteristics	Group		P Value[b]
	Intervention	Control	
Child's age	9.28 ± 2.01	9.31 ± 2.07	0.86
Child's gender			1
Male	18 (56.2)	18 (56.2)	
Female	14 (43.8)	14 (43.8)	
Educational level			
Mothers			0.5
Primary	2 (6.3)	0 (0)	
Guidance school	4 (12.5)	5 (15.6)	
High school	6 (18.01)	6 (18.01)	
University	20 (62.5)	21 (65.6)	
Fathers			0.76
Primary	16 (48.41)	19 (57.4)	
Guidance school	13 (40.6)	16 (50)	
High school	8 (23.6)	7 (21.7)	
University	10 (31.3)	8 (25)	
Duration of asthma, y	5.65	5.73	0.86
Asthma control			0.83
Uncontrolled	17 (52.01)	13 (40.54)	
Moderately controlled	13 (40.54)	15 (45.6)	
Controlled	2 (9.19)	4 (12.1)	

[a] Values are expressed as mean ± SD or No. (%).
[b] The results of the Independent-sample *t*-test or the chi-square tests.

that the mean scores of HBM components did not significantly change in the control group (P > 0.05). However, in the intervention group, the mean scores of knowledge, perceived susceptibility, perceived severity, perceived benefits, and self-efficacy significantly increased and the mean score of perceived barriers significantly decreased after the intervention (P < 0.001). Accordingly, there were statistically significant differences between the groups with respect to the posttest mean scores of knowledge and all HBM components (P < 0.05; Table 2).

Table 2. Between[illegible] Comparisons with Regard to the Mean Scores of Knowledge and HBM Constructs[illegible]

Components, Group	[illegible]re	After	P Value[b]
Knowledge			
Intervention	19.8[illegible]	22.87 ± 2.99	0.0001
Control	[illegible]3.21	[illegible]0.18 ± 3.10	0.64
P value[c]	0.55	0.0001	-
Perceived susceptibility			
Intervention	14.4 ± [illegible]	17[illegible]1.008	0.0001
Control	14.12 ± 0.92	[illegible]4.5 ± 1.24	[illegible]
P value[c]	0.28	0.00[illegible]	-
Perceived severity			
Intervention	13.84 ± 2.28	16.36 ± 2.99	[illegible]
Control	13.65 ± 2.09	13.73 ± 3.10	0.66
P value[c]	0.63	0.0001	-
Perceived benefits			
Intervention	35.37 ± 1.01	37.17 ± 1.008	0.0001
Control	35.12 ± 0.99	35.32 ± 1.24	0.58
P value[c]	0.46	0.003	-
Perceived barriers			
Intervention	19.56 ± 3.12	16.51 ± 3.02	0.0001
Control	18.54 ± 3.24	18.17 ± 3.31	0.69
P value[c]	0.09	0.007	-
Self-efficacy			
Intervention	16.42 ± 1.001	19.23 ± 1.008	0.0001
Control	16.14 ± 0.97	16.54 ± 1.24	0.62
P value[c]	0.44	0.003	-

[a]Values are expressed as mean ± SD.
[b]The results of the Independent-sample *t*-test.
[c]The results of the Paired-sample *t*-test.

5. Discussion

This study sought to assess, for the first time in Iran, the effects of family-centered education based on HBM on knowledge and attitude among the parents of children with asthma. Findings indicated that HBM-based education significantly improved parents' knowledge and helped them perceive greater susceptibility to asthma-related problems, greater benefits from behavior modification, lower barriers to behavior modification, and greater self-efficacy for behavior modification. In other words, HBM-based family-centered education can change negative beliefs about a behavior into positive beliefs, strengthen motivation for behavior modification, and thereby, facilitate behavior modification.

The findings of the present study showed that HBM-based education significantly broadened parents' asthma-related knowledge. Several earlier studies also reported the same finding (17-19). Greater knowledge about asthma, its symptoms, symptom-exacerbating factors, medications, and side effects of medications can improve patients' self-care and self-management abilities, promote their treatment adherence, and thereby, facilitate asthma control and complication prevention.

We also found that HBM-based family-centered education significantly improved parents' perceived susceptibility to and perceived severity of asthma-related problems. Similarly, previous studies reported that HBM-based education was effective in promoting anemia-preventing behaviors among female students (20), preventive behaviors for Crimean-Congo hemorrhagic fever (21), and preventive behaviors for iron deficiency anemia (22). Parents greatly value their children's health; therefore, education of parents can significantly help them perceive the threats associated with unhealthy behaviors and the benefits of self-care and preventive activities and motivate them for behavior modification. Educational programs should mainly focus on the complications, symptom-exacerbating factors, and the severity of complications and symptoms of asthma in order to improve parents' and patients' perceived susceptibility to and perceived severity of complications.

Another finding of the present study was that HBM-based family-centered education was effective in fostering parents' positive attitude towards healthcare providers' recommendations and their perceptions about the benefits of such recommendations. Similarly, a former study reported that HBM-based education positively affected behaviors related to influenza vaccination (23). Therefore, in their educational programs for children with chronic conditions (such as asthma) and their parents, healthcare providers need to focus on the benefits of behavior modification. Parents need to understand that following health-related recommendations can help them more effectively manage their children's problems and improve their children's health status.

Study findings also showed that HBM-based family-centered education significantly reduced the mean score of perceived barriers to behavior modification. In other words, it helped parents perceive fewer barriers to behavior modification. This is in agreement with the findings of an earlier study into the effects of HBM-based training on breast self examination behavior (24). Parents of children with asthma should be provided with quality education about identifying barriers to behavior modification and about how to manage such behaviors. Among the most important barriers to effective asthma control are the difficulty managing environmental allergens, the heavy cost of frequent medical visits, and having limited time for acquiring asthma-related information (25). Providing parents with education about how to effectively manage asthma symptoms and environmental allergens can reduce their perceived barriers to behavior modification, help them remove barriers, alleviate their children's asthma-related symptoms and complications, and thereby, reduce the need for frequent medical visits and heavy costs related to such visits.

HBM-based family-centered education in the present study also had significant positive effects on self-efficacy among the parents of children with asthma. Similarly, a former study showed that family-centered empowerment significantly improved knowledge, attitude, and self-efficacy among the mothers of children with asthma (3). Self-efficacy improvement is associated with better asthma control and significant improvements in the different aspects of quality of life (3) including symptom control, physical activity, environmental allergen management, and emotion management. In other words, self-efficacy improvement can significantly improve self-management, self-care, and symptom management abilities (26).

5.1. Conclusions

This study suggests that HBM-based family centered education for the parents of children with asthma can significantly improve their knowledge, attitude, perceived threat, and perceived benefits of behavior modification and reduce their perceived barriers to behavior modification in areas such as environmental allergen management and adherence to treatment and dietary regimens. Therefore, this model can be used to develop and implement behavior modification interventions for the parents of children with asthma. Given the dramatic effects of chronic conditions on both patients and their family members, engagement of both in the process of care delivery can significantly improve patient outcomes. Moreover, educational programs are needed for healthcare providers to improve their knowledge about the benefits of patient- and family-centered care in order to improve patient outcomes.

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Footnotes

Authors' Contribution: Authors' contributions: All authors participated in all parts of the preparation and submission of the manuscript. All authors read and approved the final manuscript.

Clinical Trial Registration Code: This study was registered in the Iranian Registry of Clinical Trials (registration code: IRCT2012071210260N1).

Conflict of Interests: The authors have no competing interests to declare.

Ethical Approval: This study was approved by Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran (approval code: U91057).

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Patient Consent: All participants were informed from the very beginning of the study about the study objectives and the voluntary nature of participating in the study and they will give written consent to participate in it. The results of the reports will be anonymous and confidential.

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