Original Article

The impacts of a health belief model-based educational program on adopting self-care behaviors in pemphigus vulgaris patients

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ABSTRACT

Introduction: Since pemphigus vulgaris (PV) is a chronic disease and regarding its autoimmune nature, patients need to adopt self-care behaviors. This study aimed to assess the impacts of an educational program based on health belief model (HBM) on adopting self-care behaviors among patients with PV referred to Razi Hospital. **Materials and Methods:** Eighty-eight patients with PV were randomized in an educational intervention study in two groups in 2013–2014. The intervention group attended a 6 months self-care educational program in a specialized outpatient clinic, in addition to the regular care presented for both groups. To collect information about demographic characteristics, PV-related variables, and HBM constructs items, a self-designed questionnaire was used. Data were analyzed by SPSS 20. A $P < 0.05$ was considered as statistically significant. **Results:** Increase in perceived susceptibility, severity, and benefits score were significantly higher in intervention group compared with controls when adjusting for the difference in baseline scores of these HBM constructs and house ownership and employment status distribution in two groups using ANCOVA ($P < 0.001$). Furthermore, after intervention, the decrease in perceived barriers' scores was significantly more than controls ($P < 0.001$), However, the decrease in cues to action score was not found significant ($P = 0.380$). **Discussion:** The results of this study show the effects of an HBM-based educational program as a tertiary preventive measure on adopting self-care behaviors in patients that can help them achieve self-efficacy in controlling their disease and enhancing their treatment process.

Key words: Educational intervention, health belief model, pemphigus vulgaris, self-efficacy

INTRODUCTION

Pemphigus is one of the immunobullous diseases, characterized by widespread blistering and erosions affecting the skin and mucous membranes.[1] Six variants of pemphigus are identified, of which pemphigus vulgaris (PV) is the most prevalent.[2] The incidence of this disease ranges from one to five cases per 1 million population per year but it is higher in patients of Ashkenazi Jewish descent and those of some Eastern countries including India, Malaysia, China, and Japan.[1,2] PV is also the most prevalent variant in Iran with prevalence rates of 0.64–1.5/10^5 population/year.[3-5] Pemphigus research unit in Razi Hospital, a dermatology referral center in Tehran, Iran, reported its prevalence to be approximately 1/10^5 population per year.[6] Differences in onset, occurrence, and prognosis of the disease regarding age and gender in PV patients are reported by some studies. Evidence shows an earlier onset of the disease in Iran

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compared to other countries.[3-5] Furthermore, it is shown that females are at greater risks of PV disease.[3-7]

Studies suggest that concerning the insufficiency of preventive measures for chronic diseases such as PV in routine clinical practice, self-care behavior programs, having beneficial effects on recurrence of these diseases, are viable substitute choices. Due to the fact that the management of chronic conditions is generally based on the patient and medical technology is only used as a monitoring tool, adopting self-care behavior seems to be of great importance. According to the late onset of PV in the fourth decade of life concurrently with other chronic diseases, the need for self-care behavior is more eminent.[8] Hence, guidelines on secondary prevention and treatment for PV emphasize on some points including the importance of employing self-care behaviors, adherence to medical regimen for symptomatic treatments, dealing with side effects of steroids and other immune suppressants and adherence to suggested dietary modifications. The bullous nature of PV projects the necessity of paying special attention to wound healing process, prevention of wound infection, and its treatment.[9] Moreover, stress management should be taken into account regarding chronic and daily sources of psychological stress caused by this disease.[10]

Therefore, utilizing health behavior models in clinical practice is an on-going argument among researchers trying to yield effective health education. Health belief model (HBM) as a model to prevent and disease control, the framework applied in this study, is used to assess the patients' motivation to change health-related behavior. The framework of intervention was based on HBM constructs. This model consists of six key constructs affecting health behaviors, including perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy.[11] The impact of educational programs on self-care behavior modifications in some chronic diseases is also confirmed in existing literature. As noted above, existing studies more related to epidemiological research and focused on prevalence and incidence of PV,[1-7] while back to the nature of disease as a chronic one, the role of self-care in disease control neglected. On the other hand, earlier interventional studies carried out based on medical approaches in PV, although the current study is the first on based on application of HBM in PV control by promoting self-care behaviors. This study aimed to design, implement, and evaluate an HBM-based interventional program to improve adopting self-care behaviors in patients with PV, referred to Razi Hospital in Tehran, Iran.

MATERIALS AND METHODS

This study was a randomized educational intervention trial conducted in 2013–2014, approved by the Educational Deputy of Tehran University of Medical Sciences. The inclusion criteria included confirmed PV diagnosis via skin biopsy, being diagnosed with the disease for at least 6 months and wanting to participate in the study. The exclusion criteria were: Not attending the educational program or missing one-fourth of the planned sessions. 88 patients with PV participated as intervention or control groups. The purposes of the study were explained to them in their first visit to the dermatology center. Patients joined group meetings in the center where they were asked questions about the study, gave verbal informed consent, provided baseline data and were divided randomly into two groups of intervention and control. Since, the Razi Hospital as a referral one in dermatology diseases in Iran and the unique center for PV treatment, all the patients are registered and received regular treatment services about their disease. Therefore, fortunately, we had 100% response rate during intervention and follow-up phases.

Using a permuted block size of four patients was randomly divided into two study groups. The 44 subjects in intervention group participated in intervention program which included eight educational sessions lasted 2 months consisted of lecturing, question and answer, group discussions, and problem-solving strategies based on HBM to adopt self-care behaviors including healthy diet adherence of medications and the side effects (e.g., corticosteroids therapy as the main treatment of PV), stress management, and personal hygiene to avoid infection of perforated bullous. Based on the nature of HBM constructs and the necessity of complete coverage of knowledge about self-care education in recurrence prevention, appropriate educational strategies were utilized as following: Lecturing and question and answer for promoting knowledge in perceived threaten constructs (i.e., about adherence to healthy diet such as avoiding spicy meals, wound care to prevent secondary infection), group discussions for perceived barriers and benefits (i.e., prevention to recurrence infected bullous lesions based on adherence of individual health, prevention on disease poor progression) and group discussions and problem solving for perceived self-efficacy to promote skill behaviors about self-care practices (i.e., promoting stress management to prevent disease recurrence, promoting self-esteem, self-confidence resulted in promoting self-efficacy for adherence treatment regimen). The control group just received the routine treatment plan of the center. Data were collected at baseline and 3 months after the last session of the self-care intervention program.

The self-designed questionnaire included two main sections; demographic characteristics and PV related variables (14 items) including age, gender, level of education, family income, occupation, smoking, disease duration and recurrence, history of surgery and disease duration, and questions based on HBM constructs (34 items). The HBM related items included perceived susceptibility (7 items), perceived severity (7 items), perceived benefits (7 items), perceived barriers (7 items), and cues to action (6 items). Scoring of all the constructs except the cues to action, was based on 5-point Likert scale (completely disagree = 1 to completely agree = 5), so the total score of the constructs ranged from 7 to 35. Scoring of cues to action ranged from 6 to 12. Higher score means better cue to action. Cronbach's alpha for each construct was as followed: Perceived

susceptibility 0.85, perceived severity 0.89, perceived barriers 0.90, perceived benefits 0.89, self-efficacy 0.83, cues to action 0.82. Cronbach's alpha for the model constructs ranged from 0.82 to 0.90. The PV self-care intervention program was instructed by one of the researchers aware of the health education models.

The intervention program included six sessions of group discussion and problem-solving focusing on self-care aspects of the disease. In the first session, patients and educator assessed the baseline data together to sort the patient's concerns, identify more demanding areas, and set behavioral goals. On the other five sessions, HBM-based matters were investigated.[11] The entire PV self-care intervention program lasted 2 months. After intervention, the patients spent 3 months to get prepared for changing previous behaviors and adopting self-care behaviors to achieve a healthier lifestyle. Then they filled out the questionnaire again. The main purposes of this program included helping patients to confront self-care issues, explaining the importance of PV self-care behaviors, organizing behavioral stages to reach the goals step by step, reinforcing the achieved benefits, identifying barriers and trying to overcome these issues, and also improving general knowledge about PV self-care measures. In this trial, the medical treatment of patients was not changed. According to each group discussion and problem-solving session, educational topics were guided through HBM constructs. Data analysis was performed using SPSS V20 [IBM Corp: Armonk, NY.] via descriptive and inferential statistical tests. Sociodemographic and disease-related variables were compared at baseline between the two groups. Means were compared using independent samples *t*-tests. Proportions compared using Chi-square test. Ordinal variables compared by Mann–Whitney U-test. ANCOVA was used to compare the mean score of HBM construct after intervention adjusting for possible difference of the baseline value of scores and those demographic and patient characteristics whose distributions was not the same in the study groups. Results were considered significant at $P < 0.05$.

Table 1: Demographic characteristics of patients according to intervention

Demographic characteristics	Number (%)		*P*
	Intervention	Control	
Gender			
Female	28 (63.6)	34 (77.3)	0.160[a]
Male	16 (36.4)	10 (22.7)	
Marital status			
Single	8 (18.2)	15 (34.1)	0.090[a]
Married	36 (81.2)	29 (65.9)	
Level of education			
Illiterate	7 (15.9)	10 (22.7)	0.130[b]
Elementary	9 (20.4)	18 (40.9)	
Guidance	13 (29.6)	3 (6.8)	
High school and diploma	10 (22.7)	8 (18.2)	
University	5 (11.4)	5 (11.4)	
Employment			
Employed	15 (34.1)	12 (27.3)	0.020[a]
Retired/not-employed	10 (22.7)	22 (50.0)	
Housewife	19 (43.2)	10 (22.7)	
Family history of pemphigus			
Yes	3 (6.8)	3 (6.8)	>0.990[c]
No	41 (93.2)	41 (93.2)	
History of other chronic diseases			
Yes	16 (36.4)	23 (52.3)	0.130[b]
No	28 (63.4)	21 (47.7)	
History of other skin diseases			
Yes	9 (20.4)	7 (15.9)	0.580[b]
No	35 (79.6)	37 (84.1)	
House ownership			
Owned	32 (72.7)	40 (90.9)	0.003[c]
Rented	9 (20.5)	0 (0.0)	
Lives with others	3 (6.8)	4 (9.1)	
Age (year)			
Mean±SD	52.6±11.0	56.5±8.8	0.060[d]
Disease duration (year)			
Mean±SD	4.7±4.2	5.1±2.6	0.566[d]

[a]Chi-squared test, [b]Mann-Whitney U-test, [c]Fisher exact test, [d]Independent sample *t*-test. SD=Standard deviation

RESULTS

Table 1 shows the demographic characteristics of the patients. The overall mean age of the subjects was 54.6 (±10.1) years. From 88 patients in this study, 62 (70.4%) were female, and 26 (29.6%) were male. 23 (26.1%) patients were single, and 65 (73.9%) were married. 27 (30.1%) of them were employed while 61 (69.9%) were unemployed. No significant difference ($P > 0.05$) between the intervention and control group was found in gender ($P = 0.24$) and marital status ($P = 0.09$) using a Chi-squared test. But employment status was significant ($P = 0.02$). 39 (44.3%) patients recalled a history of other chronic diseases and only 16 (18.2%) subjects had other skin diseases in their past medical history. The level of education of patients in the two groups is demonstrated in Table 1. Data regarding history of chronic diseases ($P = 0.13$), having other skin diseases ($P = 0.58$) and education ($P = 0.13$) were analyzed by the Chi-squared and Mann–Whitney U-test, showing no significant difference ($P > 0.050$) between the intervention and control groups. In each group only 3 (6.8%) patients had a history of PV in their families, having no significant difference between the two groups analyzed by the Fisher exact test. With 72 (81.2%) patients owning a house, Fisher exact test showed a significant difference with $P = 0.003$ among the subjects in the intervention and control group. The mean time period of a confirmed PV diagnosis in patients in intervention and control group was 4.7 (±4.2) and 5.1 (±2.6) years, respectively. The independent sample *t*-test found no significant difference regarding this time periods. The mean scores of the HBM constructs before intervention and 3 months after that in the two groups are shown in Table 2. The scores of perceived susceptibility, perceived severity and perceived benefits of the HBM constructs showed similar

Table 2: Mean (±SD) of HBM constructs score among participants

Components	Group	Before intervention Mean±SD	P^a	After intervention Mean±SD	P^b
Perceived susceptibility	Intervention	27.3±3.9	0.028	30.2±2.8	<0.001
	Control	25.7±2.7		26.4±2.0	
Perceived severity	Intervention	28.8±4.2	0.009	33.0±2.5	<0.001
	Control	26.8±2.6		26.9±2.1	
Perceived benefits	Intervention	26.5±4.3	0.008	30.1±3.6	<0.001
	Control	24.1±3.9		25.7±3.5	
Perceived barriers	Intervention	19.0±5.4	<0.001	13.1±2.0	<0.001
	Control	25.2±4.1		20.9±4.5	
Cues to action	Intervention	2.7±0.7	0.001	2.4±0.7	0.380
	Control	2.2±0.5		2.3±0.4	

[a]Independent sample *t*-test at baseline, [b]ANCOVA after educational intervention adjusting for disease duration and house ownership.
SD=Standard deviation, HBM=Health belief model

results and all of their scores increased significantly after the intervention. Perceived susceptibility scores increased from 27.3 ± 3.9 to 30.2 ± 2.8 in the intervention group, however, its change in the control group was only from 25.7 ± 2.7 to 26.4 ± 2.0. ANCOVA showed that the increase in perceived susceptibility scores in intervention group is significant ($P < 0.001$) when adjusting for difference of these scores, house ownership and job of the subjects in the two groups at the beginning of study. Furthermore, ANCOVA showed that rise in perceived severity and perceived benefits score in the intervention group from 28.8 ± 4.2 to 33.0 ± 2.5 and 26.5 ± 4.3 to 30.1 ± 3.6 are significant when adjusting for the significant difference of these scores house ownership and job of the subjects in intervention and control when educational program began. Perceived barrier scored significantly higher (25.2 ± 4.1) in the control group and was 19.0 ± 5.4 in the intervention group at start of the study which decreased to 20.9 ± 4.5 and 13.1 ± 2.0, respectively. The decrease was significantly higher ($P < 0.001$; ANCOVA) in the intervention group after adjustment. However, the decrease in the cues to action construct, from 2.7 ± 0.7 to 2.4 ± 0.7 when adjusted for difference of these scores, house ownership and employee of the subjects in the start of study were not found significant ($P = 0.38$; ANCOVA).

DISCUSSIONS

As presented in the results, all the HBM constructs except cues to action showed promising changes after the intervention. The scores of perceived susceptibility, perceived severity, and perceived benefits increased after the intervention in both groups of intervention and control, but the rise was greater in the intervention group. This shows the positive impact of HBM-based educational program on these constructs. It is important to note that as we did not find similar studies to compare the results with current research results, we compared the results with studies which were similar to current research in intervention phase, application of HPM model and chronic diseases.

Rakhshani *et al*. in 2010 studied the effects of education on smoking prevention in students of Zahedan.[12] Their results regarding the perceived susceptibility and perceived severity constructs were compatible with our findings showing the positive effect of education on these components. The improvement of perceived severity was also confirmed by another survey in 2001 by Tanjasiri and Sablan-Santos looking into breast cancer screening.[13] On the contrary, the results of the randomized controlled trial conducted in 2006 by Solomon *et al*. on the impact of educational mails about osteoporosis among elderly, showed no association between perceived susceptibility and this educational method.[14] The intervention group in their study just showed a small increase in self-efficacy. Furthermore, incompatible results to our study were the survey by Brown and Schoenly in 2004, testing an educational intervention for osteoporosis in US adolescents.[15] They observed no impact on perceived barriers by the intervention.

After the intervention, the score of perceived benefits increased in our study, along with a reduction in the score of perceived barriers. These changes were congruous with the results of the survey conducted by Mahmoud and Heydarnia about the effect of HBM based educational intervention on adopting preventive behaviors to avoid AIDS in 2009[16] as well as a study on application of the HBM for osteoporosis prevention among female students by Hazavehei *et al*.[17]

In a comparable study in 2012, Ghaffari *et al*. investigated the effect of an HBM based intervention on promoting nutritional behaviors for prevention of osteoporosis among female students of middle schools in Isfahan, Iran.[18] The results showed a significant increase in the mean score of perceived susceptibility, benefits, and barriers along with an improvement in taking action according to health educations.

Lajunen and Räsänen assessed the effect of HBM on promoting bicycle helmet use among teenagers. They pointed out the ability of cues to action construct in predicting adoption of preventive behaviors.[19] However, in our study, the corresponding decrease in score was not found significant after adjustments. In 2013 Bayat *et al*. investigated the effects of an HBM based educational program in type 2 diabetic patients. Compatible with our study (except for cues to action), the results showed improvements in all the HBM constructs,

3 and 6 months after the intervention in their study.[20] Although few studies found no significant changes in HBM constructs after an educational program, most of them observed statistically significant improvements in these components after the intervention.

As mentioned above, many studies have been conducted to access the effects of educational interventions on adopting self-care behaviors, but there have been no similar studies investigating this effect on PV patients, so our study population was unique. Furthermore, choosing the Razi Hospital as our research department was also one of the strengths of this study, since this hospital is a dermatology referral center and regarding the low prevalence of PV in our population, finding these many subjects would have been very difficult. Another positive aspect of our study was that our educational program was not based just on lecturing techniques; we also applied group discussion and problem solving methods in the program that could have been more effective in educating the patients. As limitations of this study, we could mention the fact that it was impossible for us to observe the changes in our subjects' behaviors, so our data are basically subjective, and the patients gave us the information themselves, so they might be different from the reality. The results of this study show the effects of an HBM based educational program as a tertiary preventive measure on adopting self-care behaviors in patients that can help them achieve self-efficacy in controlling their disease and enhancing their treatment process. As mentioned regarding the insufficiency of preventive measures for chronic diseases such as PV in clinical practice, self-care behavior programs, having beneficial effects on recurrence of these diseases, are viable substitute choices. Due to the fact that the management of chronic conditions is generally based on the patient and medical technology is only used as a monitoring tool, adopting self-care behavior seems to be of great importance. According to the late onset of PV in the fourth decade of life concurrently with other chronic diseases, the need for self-care behavior is more emphasized in the guidelines of secondary prevention and treatment for PV.

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Conflicts of interest

There are no conflicts of interest.

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