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The Effect of Perceived Susceptibility Constructs Educational Program on Promoting Adaptation of hyperthyroidism Patients

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Abstract

Hyperthyroidism in people can lead to poor mental health; it can also affect physical health in many areas. Therefore, the adaptation of patients with hyperthyroidism is very important. In this regard, educational programs play a very important role. Health belief model is one of the effective models of health education. The aim of this study was to evaluate the effect of the perceived susceptibility structure educational program of the Health Belief Model on improving the adaptation of patients with hyperthyroidism. For this purpose, 60 patients with hyperthyroidism in Milad Hospital of Tehran were randomly divided into a control and an experimental group (30 patients each). A questionnaire based on the Health Belief Model was used to collect information on improving the adaptation of patients with hyperthyroidism. The case group received an educational program for one month and both groups completed the corresponding questionnaire 3 months after the educational intervention, and the data were analyzed.

The results show that before the educational intervention, the experimental and control groups had no significant difference between the scores for awareness, susceptibility, severity, perceived benefits and barriers, and performance, whereas after the educational intervention, these factors increased significantly in the experimental group compared to the control group, and perceived obstacles also decreased ($p = 0.001$). This study shows that a health education program developed based on a Health Belief Model is effective in promoting adaptive behaviors in patients with hyperthyroidism. In addition, control, monitoring, and educational follow-up are recommended when implementing these programs.

Keywords: *Education, Health Belief Model, Adaptation, Hyperthyroidism*

Introduction

The largest gland within the human body is thyroid and thyroid is responsible for the synthesis, storage, and release of metabolic hormones such as Thyroxin and TriiodothyroninE. Thyroid-stimulating hormone (TSH) is responsible for stimulating the secretion of hormones. Thyroid hormones have act on almost all cells inside the body and growth the basal metabolic rate. These hormones are also involved in protein synthesis and regulation of protein, lipid, and carbohydrate metabolism. In addition, changes in these hormones can have very serious effects on human health. Thyroid disorders are caused by a decrease or increase in the level of these hormones. Hyperthyroidism is a condition in which the level of thyroid hormones in the blood increases due to an overactive thyroid gland (Kravets, 2016). Hyperthyroidism is a relatively prevalent disease worldwide with an overall prevalence of 1.2% in the United States, a prevalence of overt hyperthyroidism of 0.5%, and under clinical hyperthyroidism of 0.7% (Pereira & Lim, 2021). The disease can lead to a wide range of symptoms including palpitations, heat intolerance, diaphoresis, tremors, staring, drooping eyelids, excessive defecation, increased appetite, and neuromuscular symptoms including proximal muscle weakness as well as psychiatric symptoms including anxiety and overt psychosis. Long-term untreated hyperthyroidism can lead to vestibular fibrillation in 10 to 15% of patients or heart failure in 5.8% of patients (Reid & Wheeler, 2005). Hyperthyroidism, its problems, and complications put a lot of financial and economic burden and pressure on the families of patients and governments, and also due to the formation of physical problems and psychological and social incompatibilities for people with hyperthyroidism, it causes a lot of pressure and stress for people with the disease (Vita et al., 2020). Therefore, it seems that the issue of adaptation to the disease and its perception has become a very important issue in patients with hyperthyroidism.

Adaptation means coping with life's stressful events and involves the process of coping with stress and stressful life events that are influenced by internal and external sources (Ryan et al., 2020). Studies have proven that adaptation is an important predictor of excellent of lifestyles in people with diverse illnesses. Also, adaptation in patients improves the adverse effects of pain and disability that can raise the quality of life of patients (Trail et al., 2016). The study of Kim et al., suggests that few studies had been carried out in the area of adaptation to chronic diseases and this important factor is often neglected (Kim et al., 2019). Patients need a lot of coping mechanisms to adapt to the disease, and educational programs play a very important role to achieve an appropriate level of adaptation. The profit of the training program is depends on its effectiveness and the change or introduction of the right behaviors. Training effectiveness additionally relies on the appropriate use of behavioral theories, and educational theories and models. In other words, so long as there is good enough theoretical support together with fundamental health needs, growth the effectiveness of health training planes (Shaw, 2016). For this reason, researchers have used models to

exchange behavior that the HBM is one of the successful models in health field, which view behavior as a characteristic of knowledge and attitudes (Asani et al., 2021). The HBM used as the principle framework of this paper, is one of the earliest theories of health behavior and various experts in various fields of behavioral sciences have used it in development and examination behavioral interventions. The HBM is based on the view that individuals' perceptions of a health threat such as illness leads to a change in behavior toward health-promoting behaviors (Sadeghi et al., 2015). On this basis, the occurrence of behavior depends on the expected consequences of an action. This model consist of 6 components which include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and action guidelines. Based on the components of this model, healthy behaviors are the result of understanding the susceptibility and severity of the problem, understanding the behavioral benefits needed to avoid or manage the problem, and confronting stimulants that enhance action and confidence in one's capacity and ability to perform successful behavior (Asani et al, 2021). Therefore, if people believe that they are prone to diseases such as hyperthyroidism or are aware of its complications (perceived susceptibility), additionally recognize the intensity of threat and severity of the side effects of the disease in life (perceived severity), find the useful behaviors suggested to reduce the risk of worsening of the illness (perceived benefits), be able to overcome limitations including cost, time,… (Perceived barriers), confidence in their ability to carry out the behavior to achieve the expected and proper results result (perceived self-efficacy), they will be more tend to participate in health-promoting behaviors, and as a result, their adaptation to hyperthyroidism will improve. Improving adaptation in patients helps them to be more tolerant of adverse conditions caused by the disease.

Considering the importance of educational programs in improving patient's adaptation and considering that hyperthyroidism is a threat to the health of the community, the present study was aimed to determine the effect of perceived susceptibility to the educational program HBM on promoting patients' adjustment to hyperthyroidism. The results of the present study can be used in planning to enhance the adjustment of patients with hyperthyroidism.

Materials and methods

This paper is a quasi-experimental study that conducted on 60 hyperthyroidism patients in Milad Hospital in Tehran. The sample size was estimated with a confidence level of 95%, using the sample size formula to compare the means of the two groups,60 subjects were estimated, every other of which was randomly assigned to the two groups, intervention and control. The data collection instrument was a multipart questionnaire including: Demographic data (8 questions), awareness (30 questions), the HBM models dimension of (40 questions) including 5 questions for barriers, 5 questions for benefits, 5 questions for susceptibility, 4 questions for perceived severity, 3 questions for guidelines for action and 19 questions for self-efficacy in the form of checklists. The questions were designed as a 5-option Likert scale (From completely disagree to completely agree) to measure the dimensions of the HBM. It should be noted that completely disagree with a score of 1, disagree with a score of 2, have no opinion with a score of 3, agree with a score of 4, and completely agree with a score of 5. In total, the score of each dimension of the questionnaire was calculated based on 100 points.

The validity of the HBM questionnaire was assessed through content validity and review of extensive text. The overall reliability of the HBM questionnaire was obtained by Cronbach's alpha of 0.88. Also, the reliability of the subscales of the questionnaire was obtained respectively0.83, 0.81, 0.85, 0.87, 0.83, and 0.86 for perceived susceptibility, perceived severity, perceived benefits, perceived barriers, guidelines for action and self-efficacy. The reliability of the performance checklist was also determined with a kappa agreement coefficient of 0.89. Prior to the training intervention, the above-mentioned questionnaire was completed for each of the two groups involved in this research. In the next step, the educational training program was designed and compiled based on the HBM model to first feel threatened about the problem (suffering from hyperthyroidism problems) to improve the adaptation of patients with hyperthyroidism according to this model (perceived susceptibility). Then understand the intensity of this hazards and the understand the seriousness of its different symptoms (perceived severity), the positive symptoms they receive from their surroundings or internal environment (guidelines for action) to consider in the usefulness and applicability of their behavior (perceived benefits), discover the factors that avoid this action as more costly than its benefits (perceived barriers) and rely on their ability to follow hyperthyroidism prevention behaviors, ultimately achieve the promoting hyperthyroidism prevention behaviors. In order to implement the training program, the lecture program, along with question and answer sessions, the use of educational methods using pamphlets and booklets were used in 5 sessions. The lecture method was used in order to save time, resources and facilities, to present lessons to the learners during one session, and also to create a sense of security and usefulness in the learners. The question and answer method was used to maintain the participants' participation in the learning process. The educational content included the definition of hyperthyroidism problems and their symptoms, they need to pay attention to hyperthyroidism problems, especially at work (perceived barriers, benefits, intensity, and susceptibility), and ways to prevent it. The

questionnaires were completed again by the participants within one month after the implementation of the training program. The data collected by questionnaires were analyzed using SPSS 23 software. Paired t-test was used to compare the mean of awareness scores, dimensions of the health belief model, and behavior of each group before and after the intervention, and an Independent t-test was used to compare the mean of knowledge score, dimensions of the health belief model, and behavior between the two groups.

Findings

In this study, 60 patients with hyperthyroidism at Milad Hospital in Tehran were included in this research. The hyperthyroidism patients' participants completed the questionnaires in two stages and the response rate of the participants in this research was 100%. The average age of people with hypothyroidism is 40.41 (±1.35) years. Also, the age range of the patients was from 25 to 50 years. Also, the two groups of patients who participated in the study had the same demographic data.

The number of statistical samples of the research is shown in figure 1.

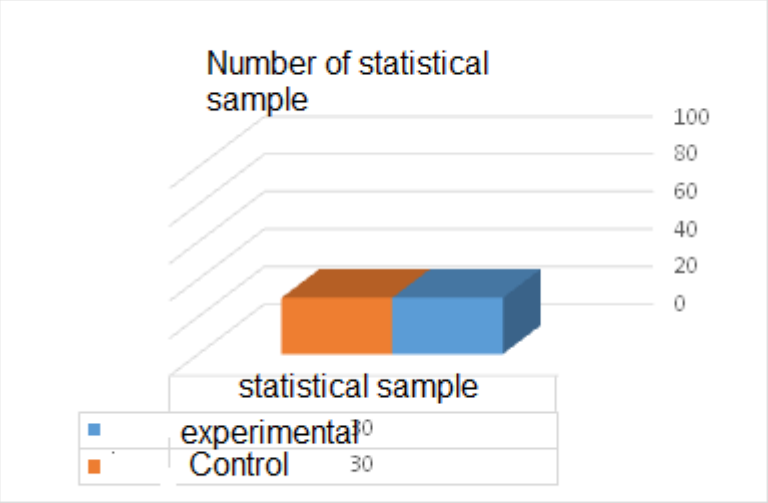

Figure 1, the number of statistical samples of the research

Table No. 1 shows the mean and standard deviation of the studied variables in 2 groups (pre-test and post-test, as well as in the test and control groups). Also, based on the Kolmogorov-Smirnov test, the distribution of data in all variables is normal, and therefore parametric experimental can be used.

Table 1: Descriptive indicators of research variables in 2 groups (control and experimental)(n = 60)

variable	Condition	Group	Mean	Standard deviation	K-S Z	P
Awareness	Pre-test	Experiment	10.32	1.93	0.458	0.345
		Control	10.11	1.84	0.365	0.547
	Post-test	experiment	13.21	1.33	0.645	0.854
		control	10.32	1.85	0.536	0.658
	Pretest	Experiment	14.80	4.63	0.911	0.378

Barriers		Control	13.20	1.69	0.731	0.66
	Post-test	Experiment	21.33	2.32	0.567	0.905
		Control	13.07	2.76	0.453	0.987
Benefits	Pre-test	Experiment	18.33	5	0.420	0.995
		Control	17.27	3.63	0.759	0.612
	Post-test	experiment	21.87	2.50	0.986	0.285
		control	16.47	2.50	0.727	0.666
susceptibility	Pre-test	Experiment	14.67	3.20	0.743	0.639
		Control	13.40	2.56	0.692	0725
	Post-test	experiment	20.27	2.15	0.713	0.690
		Control	11.80	3.38	1.007	0.262
Perceived severity	Pre-test	Experiment	28.60	6.68	0.458	0.985
		Control	29	8.07	0.489	0.971
	Post-test	experiment	42.60	3.27	0.508	0.958
		control	31.27	8.07	0.734	0.654
guidelines for action	Pre-test	Experiment	14.25	3.41	0.695	0.901
		Control	12.05	2.14	0.852	0.598
	Post-test	experiment	19.47	1.95	0.745	0.354

		Control	11.95	2.12	0.802	0.612
	Pre-test	Experiment	18.54	5.01	0.540	0.729
		Control	13.98	3.24	0.701	0.821
Self- Efficacy	Post-test	experiment	20.27	2.15	0.713	0.690
		control	14.21	3.02	0.821	0.328

The results of Table 1 show the descriptive statistics in 2 groups (control and experimental).

The results of the scores of HBM subscales in in both groups and before the intervention is shown in table 2.

Table 2: the comparison the scores of the HBM subscales in in both groups and before the intervention.

Variable	Condition	Group	Mean	Standard deviation	P
awareness	Pretest	Experiment	10.32	1.93	0.786
		Control	10.11	1.84	
Barriers	Pretest	Experiment	14.80	4.63	0.491
		Control	13.20	1.69	
Benefits	Pretest	Experiment	18.33	5	0.135
		Control	17.27	3.63	
susceptibility	Pretest	Experiment	14.67	3.20	0.640
		Control	13.40	2.56	
perceived severity	Pretest	Experiment	28.60	8.68	0.260
		Control	29	8.07	
self-efficacy	Pretest	Experiment	18.54	5.01	0.777
		Control	13.98	3.24	
guidelines for action	Pretest	Experiment	14.25	3.41	0.546
		Control	12.05	2.14	

The results of Table 2 show that the scores of the HBM components had no significant differences in all subscales and were the same for participants in both groups and before the intervention.

The results of the difference in HBM subscales scores between two groups after the intervention training is shown in table 3.

Table 3: the comparison the scores of the HBM subscales in both groups after 2 month of the intervention training

Variable	Condition	Group	Mean	Standard deviation	P
awareness	Pos test	Experiment	13.21	1.33	0.001
		Control	10.32	1.85	

Barriers	Post-test	Experiment	21.33	2.32	0.001
		Control	13.07	2.76	
Benefits	Post-test	Experiment	21.87	2.50	0.001
		Control	16.47	2.50	
susceptibility	Pos test	Experiment	20.27	2.15	0.001
		Control	11.80	3.38	
perceived severity	Post-test	Experiment	42.60	3.27	0.001
		Control	31.27	8.07	
self-efficacy	Post-test	Experiment	25.57	2.56	0.001
		Control	14.21	3.02	
guidelines for action	Post-test	Experiment	19.47	2.56	0.001
		Control	11.95	3.02	

The results of Table No. 3 show that there is a significant difference between HBM subscales scores between the two groups and after two months of the intervention in all the subscales studied.

Before the educational intervention between the two groups, there is no significant difference in the mean scores of the variables of awareness, susceptibility, severity, perceived benefits, perceived barriers, self-efficacy, and guidelines for action. After the intervention training, there was a significant difference in all the mentioned variables between the intervention and control group. Because in all the mentioned variables, the lower and upper limits are both positive, it can be said that the mean scores of awareness and constructs of the health belief model of the intervention group are higher than the control group.

Discussion

The results of the present study showed that the perceived sensitivity constructs educational program of the health belief model was effective in the adaptation of patients with hyperthyroidism. The results obtained in this research are in line with other researches, and studies have shown that educational programs in patients with chronic diseases lead to a better perception and higher adaptation of patients. For example, a study by Ryan et al. (2020) showed that in patients with diabetes, therapies based on educational models lead to significant improvements in resilience and supportive factors, psychological flexibility, positive emotion, valuable life, physical activity, and sedentary behavior, and also a significant reduction in depression and stress in patients. In various other studies, resilience and adaptation education in different patients has shown a positive effect on these people (Sood et al., 2011; Pakenham et al., 2018). The study of Soltanian et al, also showed that intervention program in patients with type 2 diabetes lead to a significant improvement in resilience, psychological flexibility, positive emotion, and valuable life among patients and correct inappropriate behaviors in diabetic patients and subsequently promote the mental health of the sample members (Soltanian, et al.). Based on the main assumption in the HBM model, the perception of patients 'health problems and their evaluations has the greatest effect on patients' health conditions and consequences. Therefore, it can be said that the patient's beliefs about health status and the possibility of a disease outbreak affect the performance of activities related to disease prevention, and the presence of irrational beliefs about the health of the patient is an important risk factor (Fathabadi, et al. 2018). The study of Mohammadi Pelarti et al also showed that the health belief model leads to the improvement of health characteristics in patients. This model is based on the theory of design behavior, which examines the relationship between attitude and action. Individuals' beliefs about the consequences of their behavior shape the beliefs that are formed in the minds of individuals about the probable consequences of behavior based on mental probabilities. In this way, their behavioral attitudes are formed based on their evaluations of actions and behaviors that can be positive or negative. Behavioral beliefs establish a bridge between the performance or non-performance of behavior and the consequences of the behavior. Hence, the intention to perform the behavior and its design is the most important factor that causes the behavior to occur (Green et al., 2020).

The results of the present research also proved that before the intervention training, the mean score of awareness had no significant difference in two groups of intervention and control, while after the training, these factors increased significantly in the experimental group. However, in the control group, no significant change was observed in the mean score of individuals in the field of awareness. Therefore, it can be concluded that the implementation of the education program affects improving awareness and performance in promoting the adaptation of patients with hyperthyroidism. Studies have shown that based on a designed behavioral approach, the will in behaviors that are beneficial to the individual, leads to the emergence of behavior. Accordingly, it is possible to predict the probability of the behavior occurring, and therefore the individual intends to perform the behavior, directly, which affects the action or inaction. On this basis, the “health belief

model “includes the efforts of individuals to recognize and organize effective processes for the occurrence of behavior and the realization of the goal (Glanz, et al 2008). In other words, the HBM is a theoretical model that leads to a change in patient values. In which it is institutionalized that the desire to avoid illness by gaining health and the belief that performing a particular available health behavior is a value and will prevent the behavior.

The results of the present study indicate that the Health education program designed based on HBM had significant effect on improving patients' adaptation. Various studies in this field have shown that increasing adaptation in patients will lead to improved mental well-being. Findings from the study by Scandurra et al., Halkitis et al., and Ribeiro et al., also pointed to the importance of adaptation in different patients and groups. For example, Foster et al.'s study showed that adaptation and resilience are built as an individual capacity, or an interactive process between the person and the environment, and can lead to adaptation to stress and adversity, reduce depression and burnout, increase toughness, Self-esteem, life satisfaction as well as the regulation of thoughts and feelings. Golshani and Pirnia's study also showed that in patients with prostate cancer, educational interventions with changes in patients' cognition, lead to improved fatigue intensity, sleep quality, and resilience, as well as improved psychological parameters. These findings are in line with the findings of the present research. Educational interventions help patients to have more control over their lives, thoughts, and behaviors and thus lead to greater adaptation of people to their disease.

Given that the current study is the first to examine the effect of interventions training on the HBM models in hyperthyroid patients, the most important limitation in this study was the lack of comparable studies to discuss and equate. Therefore, due to the importance of the subject, similar studies are suggested in this field. It also seems that the use of other educational models, recommending control, monitoring, and follow-up training in the implementation of these programs, modification of common educational programs in the field of hyperthyroidism and education of people with hyperthyroidism by educators and promoting health by using the health belief model can prevent hyperthyroidism problems.

Conclusion

The results of the present research indicate that the Health education program designed based on HBM, by increasing awareness and a positive impact on perceived barriers and benefits, susceptibility, and perceived severity, has a significant effect on improving patients' adaptation to hyperthyroidism. Therefore, it is suggested to apply educational programs based on health models in patients with hypothyroidism to improve adaptation to this disease. It also appears that conducting other educational models, recommending monitoring, monitor, and follow-up training when implementing these programs, modifying common hyperthyroidism education programs, and educating people with hyperthyroidism through educators and promoting health through the use of the HBM may prevent problems of patients with hyperthyroidism.

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Conflicts of interest

The authors wish to confirm that there are no known conflicts of interest associated with this publication.

Ethics statement

We declare that neither the article nor its main contents or tables have been or will be published or submitted for publication elsewhere. The manuscript is an original work of the author. All data, tables, figures, etc. used in the manuscript were prepared by the authors in the original, otherwise the sources are cited and reprint permission is included. The manuscript was read and approved by all authors. Authorship is granted only to those who significantly contributed to the research and preparation of this manuscript.

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