ORIGINAL ARTICLE

The Effect of a Health Belief Model Based Education Program for Foot Care in Diabetic Patients Type II in Kermanshah, Iran (2005)

Sharifirad Gh[a], Hazavehi MM[b], Baghianimoghadam MH[b], Mohebi S[b]

[a]Department of Health Services, Isfahan University of Medical Sciences, [b]Department of Health Services, Yazd University of Medical Sciences I.R.Iran.

Diabetes mellitus is one of the most common medical problems in the world. Approximately 18% of persons over 65 years old are diabetic. The WHO estimates that the prevalence rate of diabetes, 4% in 1995, will increase to 5.6% in 2025. Diabetic foot problems are potentially the most preventable long–term complication in diabetic patients.

The purpose of this study was to test the utility of the Health Belief Model (HBM) in understanding and predicting the intention of diabetic patients in prevention of their foot lesions and amputations.

Material and Methods: This was a Quasi experimental and cohort study, carried out in 108 diabetic patients Type II in Kermanshah. They were divided in two groups (54 case and 54 control groups). The data were collected by using a researcher made questionnaire in 5 sections; all of the data were collected by direct interviews and on the basis of the constructs of HBM. Data were analyzed by SPSS software.

Results: More than 33% (n=36) of patients were men. About 60% of participants were illiterate and had completed only primary school; of participants, 58% were aged between 30 and 50 years, while 37.4% were between 50-60 years old. There was no significant difference between the mean grades score of variables (knowledge, perceived susceptibility, perceived severity, perceived threat, perceived benefits perceived barriers, caring of foot and check list) in the case and control groups before intervention, but, t-test showed significant differences between all of mentioned variables, in these two groups after intervention($p<0.00$). T-test, also showed, there was a significant difference between mean grade scores all of variables in the case group, before and after intervention.

Conclusion: The findings of this study showed that, increasing the knowledge and constructs of HBM in patients, results in better foot care by the patients themselves, confirming that HBM constructs cause changes that improve patient behavior in taking care of themselves.

Key Words: Diabetes, Foot care, HBM, Lesions, Amputation

Received: 17.05.2007 **Accepted**: 17.08.2007

Correspondence:.GH Sharifirad, Department of Health Services, Isfahan University of Medical Sciences, I.R.Iran.;
E-mail: sharifirad@hlth.mui.ac.ir

Introduction

Diabetes mellitus is one of the most common world wide medical problems with a fast increasing, prevalence.[1] It is ranked as the 5th cause of death in Europe and 4th cause for physicians' visits. About 15% of financial budget of public health services in the USA is allocated to diabetes.

Approximately 18% of persons over 65 years old have diabetes mellitus. WHO es-

timates that the prevalence rate of diabetes, 4% in 1995, will increase to 5/6% in 2025. According to the latest report of WHO, it is estimated that, the percentage of diabetic patients will increase to 122% in 2025, and this increase in developing countries will be 170%, increasing the number of diabetic patients in these countries from 84 million to 228 million.[2] The data for prevalence and incidence of diabetes in Iran differs; the Endocrinology and Metabolic Research Center of Shaheed Beheshti Medical University, Tehran and Kermanshah, reported the prevalence of diabetes as 2-10%, more than 12% and 7% respectively. The ministry of health has reported a prevalence of 2.3%.[3-4]

Foot problems are a major determinant of the quality of life in patients suffering from diabetes, and have remained one of the most common reasons of hospital admission among diabetic patients, despite efforts to prevent and treat this long–term complication during the last decade.[5] If the complications of diabetic foot remain untreated, they could lead to amputation of feet or even death. The financial cost to the public health services, and psychological cost to the patient and the patients' family, are considerable.[6] Present costs of treating the diabetic foot, worldwide, are about billion dollars.[5] In the USA, the annual cost of finger amputation in 2001 was 22700 dollars and for amputation of foot, was 51300 dollars.[6] More than 15% of diabetic patients have diabetic foot[7] and 14-24 % of them to have amputation of limbs.[8] Also probability of ulcer and gangrene in diabetic patients compared to non diabetic participants is up to 15 and even 59 fold respectively.[9] According to results of a study done by the Tehran Medical University, 34.7 % of ulcers in diabetic foot patients resulted in amputation, and their duration of hospitalization was 3.8 weeks , higher than rates elsewhere in the world.[10] Studies in the USA have shown that almost 60% of amputations are in diabetic patients, and the cause of 85% of these is diabetic foot.[11]

Diabetic foot problems, however, are potentially the most preventable long-term complication of diabetes. Among major health strategies for 2010 are the decrease of ulcer and amputation incidence in diabetic patients.[12]

There is clear evidence that lower extremity amputation rates can be dramatically reduced by programs that educate patients and their care providers, on techniques of stress prevention and early identification and treatment of injuries.[13-16] Results of studies, show that we can prevent approximately 85% of foot amputation by preventive educational programs.[17]

The health belief model (HBM) is one of the most widely used models in the public health theoretical framework. It explains health behavior modification and can function as a foundation for health education.[18] Social psychologists developed the HBM during the 1950s to predict why individuals do not participate in preventive health behaviors such as immunization. The model assumes a value expectancy approach postulating that behavior depends upon the expected outcome of an action and the value individuals place on those outcomes.[18-20]

The evaluation of theory-based health education programs requires valid measurement instruments to assess a program's impact on the theoretical mediating variable; failing to develop and use standard instruments can cause result in invalid findings.[21-22]

The HBM has six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self- efficacy and cues to action. Researchers have successfully applied the model's constructs in expanding a variety of preventable health behaviors, sick–role behaviors and clinic utilization behaviors.[22-24]

We assessed the content and concurrent validity of constructs of HBM scales to evaluate safer choices by diabetic patients to prevent their foot lesions and amputations.

The purpose of this study was to test the utility of the HBM in understanding and pre-

dicting the intentions of diabetic patients in the prevention of their lesions and amputations.

Materials and Methods

This was a Quasi experimental and cohort study to test the utility of HBM as a common theory in understanding and predicting the intentions of type II diabetics in the care of their feet. Overall, 108 diabetic patients were randomly selected from patients who were referred to the diabetic center of Kermanshah; they were divided into two groups (case group-54 and control group-54). Patients with feet complications, or those who had had amputations of their feet or were over 60 years old, were excluded. HBM was used to compare health behaviors. Data were collected by using questionnaires, completed during interviews. The questionnaire included 59 questions in 5 sections; the demographic section=5, knowledge=12, HBM=22 (perceived susceptibility=5, perceived severity-5, perceived benefits=5, perceived barriers=5 and cues to action=2 questions), practice in caring of foot=10 questions. There were 10 questions for a check list.

HBM constructs were measured using four-point Liker scales (strongly agree= 4 thoroughly strongly disagree =1). The perceived susceptibility, perceived severity, perceived threat, the perceived benefits and barriers (range: 5–20) were measured by summing participant responses to 5 statements, with a high score reflecting higher threat for prevention of their feet problems. Cues to action were measured by summing participant responses to 2 statements (range: 2-8) and the knowledge and practice of caring of their feet were measured; (range: 0-12, 0-10) respectively. For analyzing data, the sum of scores for all constructs was 100.

The questionnaires were completed before intervention by the two groups. Then, education, as the intervention factor, was given using lecturing, group teaching and performance in three 60- minute sessions; one of the near-family members of patients was present in the second session.

To ensure the clarity of questionnaires, pilot testing of the questionnaire was also done for coherence and consistency in 15 diabetic patients who were not included in the survey. Then content and validity was established by five experts chosen from among the academic staff. To determine the internal reliability, a Cronbach alpha was calculated for each scale (α=0.65 for knowledge scale, α= 0.83 for constructs of HBM and α= 0.73 for caring of feet). All data were collected before and 2 months after intervention and transferred directly to SPSS software. The data were analyzed using the T-test and analyze–variance, and the level of confidence interval was 0.95. Participants were assured that their responses would be kept confidential. The details of the HBM are given below to facilitate a better understanding of the items of HBM and aim of the study:

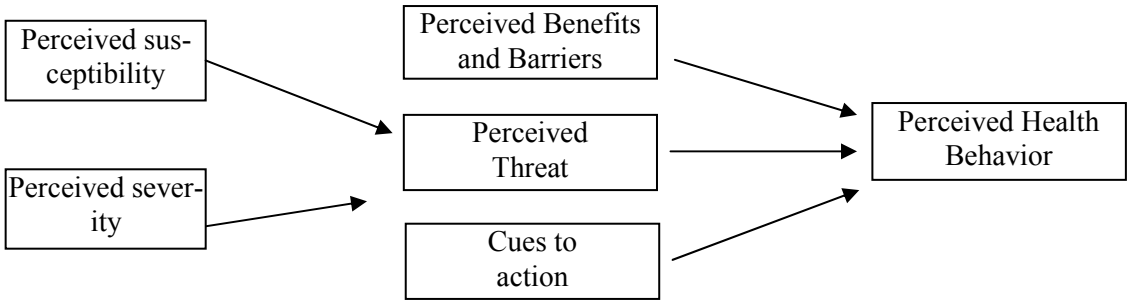

Fig. 1. Image of the health belief model showing its six constructs

Results

In 2005 we conducted interviews with 108 diabetic patients, of which over 33% (N=36) were men. About 60% of participants were illiterate or of primary school level; 58% of were aged between 30 and 50 years while 37.4% were between 50-60 years old. There was no significant difference between the age, sex, marital status, education and duration of morbidity in the case and control groups (Table 1).

Table 1. Distribution of some demographic characteristics of participants as sex, marital status and education

Demographic characteristics	Case group		Control group		Total	
	No	Percent	No	Percent	No	Percent
Sex						
Female	35	64.8	37	68.5	72	66.7
Male	19	35.2	17	31.5	36	33.3
Marital status						
Unmarried	3	5.6	4	7.4	7	6.5
Married	51	94.4	50	92.6	101	93.5
Education						
Illiterate	14	25.9	9	16.7	23	21.4
Primary	18	33.3	17	31.5	35	32.4
Guidance	9	16.7	11	20.4	20	18.5
High school	10	18.5	11	20.4	21	19.4
University	3	5.6	6	11.1	9	8.3

The results showed no significant differences between the mean grades score of variables (knowledge, perceived susceptibility, perceived severity, perceived threat, perceived benefits perceived barriers, caring of foot and check list) in the case and control groups before intervention, (Table 2); the t-test however showed, a significant difference between all variables mentioned, in the case and control groups after intervention ($p<0.00$); there was significant difference between mean grades score of all of variables in case group, before and after intervention. No significant difference was seen between mean grades score of variables in control group, before and after intervention (Table 2). The results in tables 3 and 4 show distribution of internal and external cues to action in case and control groups, separately before and after intervention.

Discussion

This study confirms the feasibility of applying the HBM to predict and understand the intention of diabetic patients to implement and follow practical activities, long term, with a view to in prevent their foot lesions and possible amputations.

The HBM provides a means to understand the attitude, behaviors and educational needs

Table 2. The comparison of mean grades score of knowledge, perceived susceptibility, severity, threat, benefits and barriers, caring of foot, check list, before and after intervention in case and control groups

Variables	Groups	Before intervention	After intervention
Knowledge	Case	50.58 ±12.20	95.50 ± 5.79
	Control	51.82±12.18	53.36±11.95
	P	=0.6	<0.001
Perceived susceptibility	Case	54.72±8.49	89.26±5.94
	Control	55± 9.32	55.65±9.11
	P	=0.872	<0.001
Perceived severity	Case	57.69±8.62	97.78±3.17
	Control	57.31 ±10.22	57.5±10.13
	P	=0.839	<0.001
Perceived threat	Case	56.20±8.35	93.52 ±4.19
	Control	56.15±9.66	56.57 ±9.50
	P	=0.979	<0.001
Perceived benefits	Case	53.70 ±7.78	94.25±4.17
	Control	52.5± 8.17	52.87 ±7.99
	P	=0.471	<0.001
Perceived barriers	Case	52.41±7.12	33.89±3.84
	Control	51.11±7.12	50.83 ±7.19
	P	=0.346	<0.001
Care of foot	Case	47.41 ±8.28	89.82±8.35
	Control	47.78±8.16	48.02 ±8.72
	P	=0.815	<0.001
Check list	Case	44.81±8.18	87.40 ±7.05
	Control	45.93±7.40	46.48 ±7.31
	P	=0.461	<0.001

Table 3. Distribution of internal cues to action before and after intervention in case and control groups

Cues to action	Before intervention		After intervention	
	No	Percent	No	Percent
Cryostat	4	7.4	10	18.5
White foot	1	1.9	4	7.4
Erosion	0	0	4	7.4
Flush	5	9.3	11	20.4
Itching	2	3.7	5	9.3
Murmur	3	5.5	3	5.5
Tingling	1	1.9	6	11.1
Numbness	6	11.1	11	20.4
None	32	59.2	0	0
Total	54	100	54	100

Table 4. Distribution of external cues to action before and after intervention in case and control groups

Cues to action	Before intervention		After intervention	
	No	Percent	No	Percent
Physician	7	13	3	5.5
Personnel of diabetes center	38	70.4	6	11.111.1
Family	3	5.5	31	57.4
Others diabetic patients	2	3.7	0	0
Educational books	4	7.4	14	26
Mass media	0	0	0	0
Total	54	100	54	100

of populations and therefore can be used as a practical tool to develop effective intervention strategies.[25]

The results of this study identified several basic educational needs of participants which increase their knowledge and motivate change in their practices for prevention of their foot lesions and amputations. It was shown that the awareness of patients regarding their foot lesions and amputations was average, and about 50% of them were unaware of their foot lesions and complications; findings of this study are consistent with the observation of Afkhami and some other studies,[26,27] all of which recommend increasing the participants' awareness of the need for prevention and control of their diabetic foot through educational campaigns to improve their intentions to prevent and control their foot lesions and amputations. The awareness of patients, significantly increased after intervention in the case group, consistent with the observations of Bockting et al., who described the increase of AIDS knowledge after intervention[28] and finding of Tan et al, who found that HbA_1C in diabetic patients declined when their awareness increased.[29] These results support the finding of studies of Beranth[30] and Neil.[31]

The mean for grade scores of perceived susceptibility, as one of the constructs of HBM in both the case and control groups was average. The results of our study are similar to the results of Beranth[30] and Tan;[32] Tan described that the patients did not prevent the complications of their diabetic foot, because their perceived susceptibility was low.

Perceived susceptibility of participants increased in the case group, suggesting that education may have influenced patient behavior, results consistent with the findings of Beranth[30] and the finding of a study in India[33] which revealed that increasing the perceived susceptibility in patients, helps to prevent and control their diabetic foot complications. Results of a study in the USA revealed that, low perceived susceptibility is the reason for patients not caring for their healh.[34]

There was no significant difference between the mean grade scores of perceived severity in the case and control groups, before intervention, results which show that there is lack of perceived severity among patients about complication of foot lesions in all groups; results of the Rith–Najarian[35] and Aljasem[36] studies support our results. They revealed that since the perceived severity of participants in their study was not appropriate, the patients ignored foot complications. Following intervention, the perceived severity of case group increased 211 times more than in the control group. These results are consistent with the findings of Berant[30] and Cerkoney.[37]

It has been shown that, perceived threat, as another construct of HBM, can be used to prevent and control disease. The mean grade scores of participants in the case and control groups before intervention was low, similar to the results of the Driver study[38] who showed that the rate of amputation of foot in participants was high. The perceived threat of patients of the case group in both the Driver and in our study increased after intervention, decreasing foot amputation by 84% in the Driver study. Our data about perceived threat is similar to the results of Ghofranipour[39] who showed that, increase of perceived threat could prevent and control brucellosis. The result of a research that was carried out by Vickie R, showed that, amputation rate in diabetic patients, with low perceived threat, was higher than others.[40]

In practice, perceived barriers and benefits, had an important role in the control and prevention of disease in patients who had a first infarction.[41] A study carried out in nurses with less than two years professional experience showed that those who followed the recommendation of not recapping the needle, have less barriers and more benefits.[42] Our finding showed that, both perceived barriers and benefits constructs were significantly in-

creased after interventions in the case but not in control group ($p<0.001$).

The Robinson study revealed that perceived benefits among the diabetic patients was not good, with significant difference between the caring of the foot and perceived benefits.[43] Our results abut the perceived barriers and benefits are consistent with the results of many other studies.[44-48]

Our results showed that there was no significant difference between mean grades scores of the foot care and the check list, or between the case and control groups before intervention, when their foot care was unsuitable, results which support the results of studies that carried out by Haidari.[49]

In addition, significant differences between mean grades scores of foot care and the check list in the case and control groups after intervention are concordant with previous studies which demonstrate that practices can be increased after intervention.[50-54]

In addition, internal cues to action (Table 3) that encourage the patients to care for their foot and the contribution of family members to care, as an external cue to action (Table 4) to increase the care of feet, are very important.

In this study since we were unable to actually see the behavior for foot care, for data collection of this parameter we used self–reporting and we were unable to collect data on self-efficacy. These were the two limitations of this study.

Overall the results of this study showed that, the mean grade scores of, knowledge, constructs of HBM of participants were average and practice of foot care was low.

Furthermore, the findings of this study showed that, with increasing the mean grades scores of knowledge and constructs of HBM of patients, resulted in better foot care by patients themselves. Hence our results and results of many other studies carried out on HBM, reveal that HBM constructs may iniate the changes and improve the behavior of patients.

Our results and the results of many studies revealed that HBM has the potential for establishing educational programs for individuals and communities. It is therefore, recommended that the application of this model may be effectively used to prevent different diseases and complications including diabetic foot lesions and amputations.

References

1. Park's textbook of preventive and social medicine, translated in Persian by H. Shodjai Tehrani , firs edition, Gilan medical university press 1991; 4: 59-60.
2. Baghianimoghadam MH, Shafiei F, Haydarneia AR, Afkhami M. Efficay of BASNEF Model in controlling of Diabetic Patients in city of Yazd. Iran. Indian Journal of community Medicine 2005; vol 30,No4:144-5.
3. Ensaf Saied Abdel- Gawad. Quality of life in Saudis with diabetes. Saudi Journal Disability and Rehablitation 2002; 8: 163-8.
4. Mahdavi hazavah A, Nourozinejad A. A plan for monitoring and evaluation of countries' planning in control and prevention of diabetes. Tehran: Research Deputy of Ministry of Health 2002.
5. Calle-Pascual AL, Durán A, Benedí A, Calvo MI, Charro A, Diaz JA, et al. Reduction in foot ulcer incidence: relation to compliance with a prophylactic foot care program. Diabetes Care 2001; 24: 405-7.
6. Hess CT. Caring for a diabetic ulcer. Nursing 1999; 29: 70-1.
7. Brooke D, Fidler. Diabetic foot care. Drug Topics 2002; 146: 34.
8. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA 2005; 293: 217-28.
9. Roberts SS. Foot care. What you need to know. Diabetes Forecast 2005; 58: 35-7.
10. Larigani B, Bastane hagh MH, Pjouhi M, Afshari M,Ghani M, Shagarian M.A survey about the prevalence of amputation in diabetic patients with diabetic foot that were confined to bed in the shariaty and emam khomaini hospitals from 1979-1984. Iranian Journal of Diabetes and Lipid 2001; 1: 83-5.
11. Centers for Disease Control and Prevention (CDC). History of foot ulcer among persons with diabetes--United States, 2000-2002. MMWR Morb Mortal Wkly Rep 2003; 52: 1098-102.

12. Valente LA, Caughy M, Fischbach L. A validation study of a self-administered questionnaire to identify increased risk for foot ulceration or amputation among people with diabetes. Diabetes Educ 2004; 30: 932, 934, 937-8
13. Kasiske BL, Kalil RS, Ma JZ, Liao M, Keane WF. Effect of antihypertensive therapy on the kidney in patients with diabetes: a meta-regression analysis. Ann Intern Med 1993; 118: 129-38.
14. Viberti G, Mogensen CE, Groop LC, Pauls JF. Effect of captopril on progression to clinical proteinuria in patients with insulin-dependent diabetes mellitus and microalbuminuria. European Microalbuminuria Captopril Study Group. JAMA 1994; 271: 275-9.
15. Borch-Johnsen K, Wenzel H, Viberti GC, Mogensen CE. Is screening and intervention for microalbuminuria worthwhile in patients with insulin dependent diabetes? BMJ 1993; 306: 1722-5.
16. Bojestig M, Arnqvist HJ, Hermansson G, Karlberg BE, Ludvigsson J. Declining incidence of nephropathy in insulin-dependent diabetes mellitus. N Engl J Med 1994; 330: 15-8.
17. Yetzer EA. Incorporating foot care education into diabetic foot screening. Rehabil Nurs 2004; 29: 80-4.
18. Strecher VJ, Rosenstock, IM. The health Belief Model. In: Glanz, K, Lewis FM. and Rimer BK, editors. Health Behavior and Health Education theory, Research and practice. 2th ed. Jossey-Bass San Francisco 1997; CA: 41-59.
19. Rosenstock,LM. Historical origins of the Health BeliefModel, Health education Monographs 1974; 15: 175-83.
20. ShilltoeRW, ChristieMJ. Determinants of self-care: the Health Belief Model. Holistic Medicine 1989; 4: 3-17.
21. Becker MH, Maiman LA. Sociobehavioral determinants of compliance with health and medical care recommendations. Med Care 1975; 13: 10-24.
22. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the Health Belief Model. Health Educ Q 1988; 15: 175-83.
23. Snillitoe RW, Christie MJ. Determinants of self care: the health belief model. Holistic Medicine 1989; 4:3-17.
24. Janz NK, Becker MH. The Health Belief Model: a decade later. Health Educ Q 1984; 11: 1-47.
25. Kloeblen AS, Batish SS. Understanding the intention to permanently follow a high folate diet among a sample of low-income pregnant women according to the Health Belief Model. Health Educ Res 1999; 14: 327-38.
26. Afkhami Ardakani M, Yadolahi A, Abolhasani A. Knowledge rate of people in Azadshahr–Yazd about diabetes disease. JMedical Univer Yazd 2000; 4 :11–4 (Farsi).
27. Batista F, Pinzur MS. Disease knowledge in patients attending a diabetic foot clinic. Foot Ankle Int 2005; 26: 38-41.
28. Bockting WO, Rosser BR, Scheltema K. Transgender HIV prevention: implementation and evaluation of a workshop. Health Educ Res 1999; 14: 177-83.
29. Tan AS, Yong LS, Wan S, Wong ML. Patient education in the management of diabetes mellitus. Singapore Med J 1997; 38: 156-60.
30. Beranth C. The Health Belief Model applied to glycemic control. Diabetes Educ 1999; 21: 321-9.
31. Neil JA, Knuckey CJ, Tanenberg RJ. Prevention of foot ulcers in patients with diabetes and end stage renal disease. Nephrol Nurs J 2003; 30: 39-43.
32. Tan MY. The relationship of health beliefs and complication prevention behaviors of Chinese individuals with Type 2 Diabetes Mellitus. Diabetes Res Clin Pract 2004; 66: 71-7.
33. Viswanathan V, Madhavan S, Rajasekar S, Chamukuttan S, Ambady R. Amputation prevention initiative in South India: positive impact of foot care education. Diabetes Care 2005; 28: 1019-21.
34. Graziani C, Rosenthal MP, Diamond JJ. Diabetes education program use and patient-perceived barriers to attendance. Fam Med 1999; 31: 358-63.
35. Rith-Najarian S, Branchaud C, Beaulieu O, Gohdes D, Simonson G, Mazze R. Reducing lower-extremity amputations due to diabetes. Application of the staged diabetes management approach in a primary care setting. J Fam Pract 1998; 47: 127-32.
36. Aljasem LI, Peyrot M, Wissow L, Rubin RR. The impact of barriers and self-efficacy on self-care behaviors in type 2 diabetes. Diabetes Educ 2001; 27: 393-404.
37. Cerkoney KA, Hart LK. The relationship between the health belief model and compliance of persons with diabetes mellitus. Diabetes Care 1980; 3: 594-8.
38. Driver VR, Madsen J, Goodman RA. Reducing amputation rates in patients with diabetes at a military medical center: The limb prevention service model. Diabetes Care 2005; 28: 248-53.
39. Ghofranipour F, Shojaee zade D. Use of Health Belief Model in prevention of Brucelosis in shahre cord city in Iran. Daneshvar J 1997; 15: 23-8 (Farsi).
40. Driver VR, Madsen J, Goodman RA. Reducing amputation rates in patients with diabetes at a military medical center: the limb preservation service model. Diabetes Care 2005; 28: 248-53.
41. Haidarnia AR. Design of model in health education for prevention of secondary myocardium infarct us for cardiovascular diseases. Special jCardiovasDis 1994; 6: 1-5.

42. Brevidelli MM, Cianciarullo TI. Application of the health belief model to the prevention of occupational needle accidents. Rev Saude Publica 2001; 35: 193-201.
43. Robinson-Whelen S, Bodenheimer C. Health practices of veterans with unilateral lower-limb loss: Identifying correlates. J Rehabil Res Dev 2004; 41: 453-60.
44. Daniel M, Messer LC. Perceptions of disease severity and barriers to self-care predict glycemic control in Aboriginal persons with type 2 diabetes mellitus. Chronic Dis Can 2002; 23: 130-8.
45. Polly RK. Diabetes health beliefs, self-care behaviors, and glycemic control among older adults with non-insulin-dependent diabetes mellitus. Diabetes Educ 1992; 18: 321-7.
46. Aljasem LI, Peyrot M, Wissow L, Rubin RR. The impact of barriers and self-efficacy on self-care behaviors in type 2 diabetes. Diabetes Educ 2001; 27: 393-404.
47. Ratanasuwan T, Indharapakdi S, Promrerk R, Komolviphat T, Thanamai Y. Health belief model about diabetes mellitus in Thailand: the culture consensus analysis. J Med Assoc Thai 2005; 88: 623-31.
48. Daniel M, Messer LC. Perceptions of disease severity and barriers to self-care predict glycemic control in Aboriginal persons with type 2 diabetes mellitus. Chronic Dis Can 2002; 23: 130-8.
49. Gafarian N, Haidari AA .Programs in self-care in NIDDM who refers to Hamadan diabetes Research Center. J Shahid Sadoughi Med Univers Yazd 2003; 10: 60-3.
50. James AS, Campbell MK, Hudson MA. Perceived barriers and benefits to colon cancer screening among African Americans in North Carolina: how does perception relate to screening behavior? Cancer Epidemiol Biomarkers Prev 2002; 11: 529-34.
51. Aiken LS, West SG, Woodward CK, Reno RR, Reynolds KD. Increasing screening mammography in asymptomatic women: evaluation of a second-generation, theory-based program. Health Psychol 1994; 13: 526-38.
52. Bowen DJ, Christension CL, Powers D, Graves DR, Anderson CM. Effect of counseling and ethnic identity on perceived risk and cancer worry in African American women. J Clin Psychol Med Settings 1998; 5: 365-79.
53. Siero S, Kok G, Pruyn J. Effects of public education about breast cancer and breast self-examination. Soc Sci Med 1984; 18: 881-8.
54. Lerman C, Lustbader E, Rimer B, Daly M, Miller S, Sands C, et al. Effects of individualized breast cancer risk counseling: a randomized trial. J Natl Cancer Inst 1995; 87: 286-92.