Original Article

Effect of Educational Program on Lifestyle of Myocardial Infarction Patients in Iranian Population

ALI KHANI JEIHOONI[1], ZHILA FEREIDOUNI[2], POUYAN AFZALI HARSINI[3], ESMAEIL KAVI[4], HAJAR HAGHSHENAS[5], LEILA AKBARI[6]

ABSTRACT

Introduction: Cardiovascular Diseases (CVDs) are among the top three causes of mortality and disability in the world. Applying Theory of Planned Behaviour (TPB) can be effective on changing lifestyle of patients with Myocardial Infarction (MI).

Aim: To determine the application of theory of planned behaviour to change the lifestyle of myocardial infarction patients in Iranian population.

Materials and Methods: The research was carried out at two stages; at first, a cross-sectional study was carried out to determine predictors of TPB (attitudes, subjective norms and perceived behaviour control) on 175 patients with MI. Then, a quasi-experimental study was conducted on 100 MI patients (50 experimental groups and 50 control groups) hospitalized in Valiasr Hospital of Fasa, Fars, Iran in 2016-2017. Data gathering tool was a questionnaire with three sections: 1) demographics (age, gender, education, job, marital status and smoking habits); 2) lifestyle inventory questionnaire; and 3) author-designed questionnaire based on TPB. The educational intervention was carried out in eight sessions (One session is of 55-60 minutes)

including symptoms and risk factors of MI; healthy cooking methods; improving diet at work; weight loss methods; good effects of physical activity and exercising on the body; effects of exercising on MI; stress and managing it; heart rehabilitation; role of attitudes and beliefs in improving lifestyle and obstacles and facilitators found in the society to improve healthy lifestyle. The collected data was analysed in SPSS 22 using logistic regression, paired sample t-test, independent t-test and chi-squared test.

Results: The results showed no significant difference between the experiment and control groups before the intervention in terms of attitudes, subjective norms, perceived behaviour control, intention and score of lifestyle. Three months after the intervention, however, the experiment group showed a notable increase and significant difference in terms of the mentioned variables comparing with the control group.

Conclusion: Applying the TPB is very effective for developing an educational program for a healthy lifestyle among patients with MI. Besides such programs, follow-up education on monitoring is highly recommended.

INTRODUCTION

Cardiovascular diseases are among the top three causes of mortality and disability in the world [1]. Along with increase in life expectancy, an increase in prevalence of chronic diseases has taken place and death rate due to heart diseases crossed 25% line in the late 20th century and this figure is expected to be at 35-60% range by 2025. In addition, along with changes in lifestyle, non-communicable diseases have become the main cause of mortality [2]. Although the risk of communicable diseases is more because of their contagious nature, the side effects of chronic diseases including CVDs are more resilient, expensive, and debilitating [1]. Studies have shown that CVDs are among the top and most common causes of death in Iran [3]. The most common type of CVD is MI, which is the outcome of coronary vessels occlusion and ischaemia of myocardium [4]. MI is a major cause of mortality among heart patients. One MI happens in the USA every 20 second and every minute one dies due to this disease [5]. It is one of the main reasons for hospitalisation of heart patients, which is usually assumed as a threatening situation for the patient and the family [6]. According to The World Health Organization (WHO), 31% of global mortality rate in the world in 2012 was due to CVDs. According to the latest statistics by WHO, more than 75% of CVDs happen in countries with low and average income levels. Forecasts indicate that by 2020, CVDs will be the cause of more than 75% of deaths in the world. With the current trend, 4.23 million will die by 2030 due to CVDs [7,8]. Several risk

factors like diabetes, hypertension, high cholesterol and lipid, and lack of adequate physical activity are effective on development and progression of CVDs [9]. As suggested by studies, most of the risk factors of CVDs are rooted in one's behaviour and awareness [10]. In light of this, educational program scan have a notable effect on decreasing the behaviours pertinent to risk behaviour and increasing healthy behaviours [11-13]. Educational program is a key tool to change lifestyle, which is an element of health care services. In general, educational intervention is clearly an economic strategy so that each dollar spent on education results in 3 to 4 dollars saving [14]. To control the risk of CVDs and its side-effects, a healthy lifestyle is recommended, which must be featured with healthy diet, weight control and physical activity [15]. Providing access to the information about lifestyle adjustment using proper educational methods and effectiveness of a health education program, depends, to a great extent, on utilisation of a suitable education theory [16]. TPB is most comprehensive and suitable theories of studying behaviour. [17]. It takes the individual as a rational doer so that one tends to process information before showing behaviour and it is possible to change one's fundamental beliefs and behaviours consequently [18]. As the theory implies, the main cause of behaviour is the intention to do it and the intention is a function of three factors: 1) attitudes; 2) subjective norms; and 3) perceived behaviour control in terms of ease or hardship. On the basis of this theory, individuals sometimes evaluate their behaviour positively and they intend to do so, as they

tend to believe that influential and important people behave in the same way and thus their behaviour can also be controlled [18]. It is argued that this educational mode, potentially, is a way to develop behaviour change interventions for habitual behaviours in particular [19].

On one hand, lifestyle of Iranian population is not healthy in terms of CVDs, and on the other hand, along with high mortality rate, CVDs are heavy financial burden for health sectors of countries. Currently, more than one half of public health-treatment budget in Iran is spent on CVDs [20]. This indicates the necessity that CVD patients need to have self-care activities and receive required education on changing lifestyle. TPB has been applied by other studies on low-salt diet for diabetic patients [21], changing lifestyle of MI patients [22], physical exercise in heart patients [23] and physical exercise in Bariatric Surgery [24]. Thereby, applying TPB can be effective on changing lifestyle of patients with MI and the present study is an attempt to use the theory to change lifestyle of these patients in Iran.

MATERIAL AND METHODS

The study was carried out at two stages; at first, a cross-sectional study was carried out to determine predictors of TPB on 175 patients with MI. Constructs of attitudes, subjective norms, and perceived behaviour control predict intention to change lifestyle in the MI patients. Then, a quasi-experimental study was conducted in Fasa, Fars, Iran from June 2016 to May 2017. Based on the following formula, number of subjects in each group (control and experiment) was obtained equal to 34 and taking into account probable leaves, 50 subjects were selected for each group.

$$^2n\ [(Z_{1-\alpha/2} + Z_{1-\beta})^2\ (\sigma_1 - \sigma_2^2)/(\mu_1 + \mu_1)^2$$

n= sample size

α=0.05

β=0.20

$\sigma1$= 2.59 in Karimi et al study [22].

$\sigma2$=1.23 In Karimi et al. study [22].

$\mu1$=11.28 In Karimi et al. study [22].

$\mu2$=14.03 In Karimi et al. study [22].

Level of confidence =99%

Test power = 95%

Inclusion criteria were definite diagnosis of MI by a cardiologist, participation in the educational course, no psychological disorder, age range 30-65, MI in the last year, discharged from hospital for more than three months, and not a member of health personnel. Exclusion criterion was the absence of more than one session of the participants at the training sessions. To select candidate subjects, medical files of all the MI patients hospitalized in Valiasr Hospital of Fasa City in the past year, not including the last three months were examined. The files that met the inclusion criteria were arranged based on the admittance date. Based on random number table, 100 patients were selected and then the patients with odd numbers were categorized as experiment group and the remaining in the list were categorized as control group. Given that all the patients had been discharged from the hospital at least three month prior, the authors had to visit them at their provided address and introduce them to the study. In any case if the subject was not interested, a new candidate was elected randomly. Those interested in participation were asked to sign an informed letter of consent. Data gathering tool was a questionnaire with three sections: 1) demographics (age, gender, education, job, marital status and smoking habits); 2) standard lifestyle inventory questionnaire; and 3) author-designed questionnaire based on TPB. Lifestyle inventory consists of 52 statements designed based on Likert's four-point scores (1= never, 4=always). Different aspects of lifestyle including responsiveness, nutrition, physical activity, stress management, spiritual development,

and interpersonal relationship were measured. Score range of the inventory is 52-208 and its validity and reliability have been supported by previous studies [22,25]. The questionnaire designed based on TPB was based on Ajzen's recommended process; so that, after literature review, a quasi-structured interview was carried out with 20 MI patients – which were excluded from the main study- to extract that key attitudes. Validity of the designed questionnaire was determined through content validity so that the questionnaire was provided to 12 health education, heart, and nursing professors and their feedbacks were used to modify the questionnaire {Content Validity Index (CVI)=0.78, Content Validity Ratio (CVR)=0.58}. Reliability of the questionnaire was examined through internal consistency (Cronbach's alpha) and test-retest method; so that the questionnaire was tested on a small group of patients with similar conditions (n=20). Cronbach's alpha for different sections of the questionnaire was obtained at 0.75-0.95 range, which is acceptable from statistical point of view. To implement test-retest method, the same subjects were asked to fill out the questionnaire once more 15 days later and then cluster internal correlation was obtained. Correlation coefficient test for constructs of TPB was higher than 0.7 so that all the variables of the theory had acceptable consistency coefficients. The author-designed questionnaire consisted of 71 questions with four subscales designed based on Likert's five-point scale (1-5); 21 questions on attitudes (min score=13; max score =225), 18 questions on subjective norms (min score =9; max score = 225); 22 questions on perceived behaviour control (min score = 5; max score = 15); and 10 questions on behaviour (min score = 10; max score = 50). Scoring method followed Ajzen's proposed method; all items were reported as percentage. The questionnaires were filled out through interview once before the intervention and once three months after the intervention. Contents of the educational intervention were determined based on analysing the data obtained before the intervention and literature review including mortality rate of heart diseases in Iran and the world; function of the heart and MI in Iran and the world; symptoms and risk factors of MI (age, gender, smoking, obesity, hypertension, lack of physical activity, diabetes, unhealthy nutrition, alcohol use, and stress); healthy cooking methods; improving diet at work; weight loss methods; good effects of physical activity and exercising on the body; effects of exercising on MI; stress and managing it; heart rehabilitation; role of attitudes and beliefs in improving lifestyle; role of the others in improving lifestyle; and obstacles and facilitators found in the society to improve healthy lifestyle. The educational intervention was carried out in eight sessions (One session is of 55-60 minutes) and was focused on the constructs of TPB. To facilitate group discussion, the subjects in the intervention group were grouped in five groups of 10. Each group had its separate class time, while the contents were the same. The classes were held once a week and educations on nutrition were provided by nutritionist. Healthy lifestyle was educated through group discussion, using educational movies, role playing, and answering questions about common beliefs about the healthy lifestyle. The discussions were directed by the educator to highlight positive beliefs and attitudes of the subjects; so that the subjects would be motivated indirectly to adopt a healthy lifestyle and prepare to change their attitudes.

To improve subjective norms, the patients were asked to attend the classes with one of their family members. One session was held by a cardiologist. To change perceived behaviour control about facilitators of improving lifestyle, group discussion method was adopted, where the subjects were also taught about step-by-step changes toward adopting a healthy lifestyle. In each session, the subjects were provided with approaches to heighten their will to change a specific part of their lifestyle. The control group received no educational intervention except the standard education given by nurses when the patient is discharged from the hospital. In observance of moral concerns and after the study, a one-session

healthy lifestyle class was held for the patients in the control group and they were provided with an educational booklet and a CD and one weekly educational SMS. The research plan was approved by research council of Fasa University of Medical Sciences. The collected data was analysed in SPSS 22 using logistic regression, paired sample t-test, independent t-test, and chi-squared test (p=95%).

RESULTS

[Table/Fig-1] lists the results of logistic regression analysis for predicting intention to change lifestyle in the subjects based on programmed TPB. As the findings show, the three constructs attitudes, subjective norms, and perceived behaviour control predict intention to change lifestyle in the MI patients. Totally, the variables predict 39.6% of intention to change behaviours.

In the quasi-experimental study, mean age of the subjects in the experiment and control groups were 52.80±6.71 and 51.65±6.90 years respectively; hence, there is no significant difference in this regard.

Analysis of the results of the intervention study using chi-squared test indicated no significant difference between the experiment and control groups in terms of variables like job, gender, educational level, marital status, diabetes, hypertension, high cholesterol level, and smoking history [Table/Fig-2].

The results showed no significant difference between the experiment and control groups before the intervention in terms of attitudes, subjective norms, perceived behaviour control, intention and score of lifestyle. Three months after the intervention, however, the experiment group showed a significant difference in terms of the mentioned variables comparing with the control group [Table/Fig-3].

DISCUSSION

Application of TPB to change lifestyle of patients with MI was examined. The findings showed that the constructs attitudes, subjective norms, and perceived behaviour control were predictors of intention to change lifestyle in the subjects by explaining 39.6% of intention to change behaviours. Moskhi M et al., studied the factors pertinent to lifestyle based on TPB and found that attitudes construct was a notable predictor of intention for having a healthy diet [26]. Zoellner J et al., and Yekaninejad M et al., reported that the constructs of TPB predicted a high percentage of intention [27,28]. Blandchard CM et al., studied 215 heart patients and found that the construct of TPB predicted 30% of variance of intention to do exercise [29]. In the study of Ferreira G et al., TPB predicted 45% of behavioural intention [30].

The results of the interventional study indicated effectiveness of the interventions based on TPB on improving lifestyle of the subjects, hence there was a significant difference between the control and experiment groups after the intervention in terms of healthy lifestyle. Borji M et al., reported a significant increase in MI patients intervention group comparing with those in a control group in terms of their attitudes about risk factors of the disease after an educational intervention based on Health Belief Model [31]. Abbaszadeh A et al., showed that an educational intervention for MI patients improved their attitudes [32]. Karimy T et al., demonstrated that the educational intervention based on TPB improved attitudes of MI patients [22].

Mean score of subjective norms after the educational intervention in the experiment group increased significantly comparing with the control group. White KM et al., examined the effects of behavioural intervention based on TPB on improving physical activities and healthy diet in elderly subjects with CVDs and diabetes type II comparing with the control group, and reported an increase in the construct subjective norms of physical activity in the experiment

Variables	Beta	B	p	Dependent variable
Attitudes	0. 143	0. 366	0. 021	Intention to change lifestyle in the patients with MI R^2=0.396 R^2Adjusted= 0.023
Perceived behaviour control	0. 256	0. 274	0. 031	
Subjective norms	134/0	0. 169	0. 008	

[Table/Fig-1]: The factors effective on intention to change lifestyle in myocardial infarction patients based on Theory of Planned Behaviour (TPB).

Variable		Experiment group		Control group		Sig.
		n	%	n	%	
Gender	M	31	62	30	60	p=0.431
	F	19	38	20	40	
Educational level	Illiterate	1	2	0	5	p=0.152
	Elementary	4	8	5	10	
	Junior high school	10	20	10	20	
	High school	23	46	25	50	
	College	12	24	10	20	
Marital status	Unmarried	5	10	7	14	p=0.325
	Married	45	90	43	86	
Job	Housekeeper	13	26	12	24	p=0.122
	Retired	8	16	10	20	
	Employee	29	58	28	56	
History of smoking	Positive	17	34	16	32	p=0.118
	Negative	33	66	34	68	

[Table/Fig-2]: Demographics of the experiment and control groups

Variable	Group	Before intervention M±SD	After intervention M±SD	p-value
Attitudes	Experiment	26.3±4.22	57.32±4.23	p<0.001
	Control	26.22±4.36	27.44±4.09	p=0.127
	p-value	0.265	p<0.001	
Subjective norms	Experiment	28.28±2.28	63.11±3.34	p<0.001
	Control	27.81±3.15	29.10±3.53	p=0.521
	p-value	0.221	p<0.001	
Perceived behaviour control	Experiment	28.22±3.60	59.32±4.26	p<0/001
	Control	27.08±2.32	28.10±2.31	p=0.434
	p-value	0.340	p<0.001	
Intention	Experiment	26.31±3.16	62.37±3.66	p<0.001
	Control	25.98±3.49	26.45±3.14	p=0.566
	p-value	0.276	p<0.001	
Lifestyle	Experiment	23.43±3.36	57.88±3.65	p<0.001
	Control	23.78±3.61	24.20±3.28	p=0.328
	p-value	0.257	p<0.001	

[Table/Fig-3]: Mean score of attitudes, subjective norms, perceived behaviour control, intention and score of lifestyle before and three months after the intervention in the control and experiment groups.

group after the intervention. However, in terms of diet there was no notable difference between the two groups in terms of the constructs of TPB [33]. Our results are consistent with Karimy T et al., that educational intervention improved construct subjective norms of lifestyle change in the experiment group comparing with the control group [22] and Gholamnia-Shirvani Z et al., showed that educational intervention improved construct subjective norms of physical exercise behaviours in the experiment group comparing with the control group [34]. Mean score of perceived behaviour control in the experiment group increased significantly after the intervention comparing with the control group. Kelley K et al., used educational booklet about healthy life containing topics on

motivation and goal setting strategy and reported an increase in mean score of perceived behaviour control after the educational intervention [35]. Our results in this regard are consistent with other studies [22,33,34,36]. Educating healthy lifestyle skills through educational courses along with providing motivational feedbacks and information through group discussions improved perceived behaviour control in the experiment group.

Results about intention of the MI patients to change their lifestyle showed a significant increase after the intervention in the experiment group comparing with the control group. Taking into account TPB, increase in mean scores of attitudes, subjective norms, and perceived behaviour in the experiment group in the three months period after the intervention led to increase of behavioural intention in the subjects; this indicates positive effect of the intervention. In this regard, the findings here are consistent with Hill C et al., interventional study, where a theory-based motivational brochure was utilized along with a motivation and intention implementation strategy test [37]. Parrott M et al., interventional study resulted in an increase in mean score of physical exercise activity at follow-up stage (two weeks after invention) and a decrease at retention stage (one week after the follow-up stage) [38]. Karimy T et al., reported that educational intervention based on TPB improved MI patients' intention in the intervention group for changing their lifestyle [22]; they stated that there was a significant increase in the score of lifestyle in the intervention group. Karimy T et al., Krumholz HM et al., Pischke CR et al., Kurcer MA et al., and Sadeghi R et al., mentioned that educational intervention improved lifestyle of heart patients in the experiment group comparing with the control group [22,39-42]. Wu J-R et al., studied adherence of low-salt diet in heart failure patients using TPB and showed effectiveness of their intervention (based on the theory) on improvement of nutrition in the subjects in the experiment group [43]. Welsh D et al., studied effects of educational intervention based on TPB on low-salt diet in heart failure patients and showed that sodium intake of the intervention groups was less than that of the control group six months after the intervention [21]. Ali AL et al., Zigheimat F et al., Pfaeffli Dale L et al., and Broekhuizen K et al., showed that educational intervention improved performance and lifestyle of heart patients [44-47]. TPB education to promote healthy lifestyle and decrease risk of CVDs can lead to an increase in information of the subjects and changes in social norms and values about lifestyle.

LIMITATION

The strength of this study were community-based educational intervention based on the theory of planned behaviour on patients with MI. Socioeconomic factors and intervention in them are also important variables that were ignored in the current study and should be addressed in future studies. The main limitation of the present study was that we were not able to assess the long-term effects of the program. Other limitation of this study was self-reporting of participant's behaviours.

CONCLUSION

The results supported effectiveness of educational interventions based on TPB on improvement of lifestyle of MI patients. One may conclude, then, that by using this theory it is possible to modify and change attitudes, subjective norms, perceived behaviour control, and behavioural intention of MI patients in terms of unhealthy lifestyle and improve their lifestyle eventually. Applying and examining the effectiveness of this theory about other chronic diseases in particular in which lifestyle plays a key role can be a subject of future studies.

REFERENCES

[1] WHO. Prevention of cardiovascular diseases. Swiss: Geneva; 2007: 1-16.
[2] WHO. Life expectancy improves. Available at http://www.who.int/ whr/2003/en/whr03_en.pdf.2012.
[3] Fowkes FGR, Rudan D, Rudan I, Aboyans V, Denenberg JO, McDermott MM, et al. Comparison of global estimates of prevalence and risk factors for peripheral artery disease in 2000 and 2010: a systematic review and analysis. The Lancet. 2013;382(9901):1329-40.
[4] Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics—2012 update a report from the American heart association. Circulation. 2012;125(1):e2-e220.
[5] BehnamMoghadam M, Zeighami R, Azimian J, Jahanihashemi H, Fotuhi M. Side effects of intravenous streptokinase in different age groups patients with acute myocardial infarction. Armaghane Danesh. 2014;18(11):910-17.
[6] Salehi S, Safavi M, Vafaie M. Level of anxiety and its correlation with some individual characteristics in patients with myocardial infarction in hospitals related to Islamic Azad University, Tehran Medical Branch (2005-2006). Medical Science Journal of Islamic Azad Univesity-Tehran Medical Branch. 2008;18(2):121-25.
[7] Gaziano TA, Bitton A, Anand S, Abrahams-Gessel S, Murphy A. Growing epidemic of coronary heart disease in low-and middle-income countries. Current Problems in Cardiology. 2010; 35(2):1-72.
[8] WHO cardiovascular disease; Available from: http:// www.who.int/cardiovascu./
[9] Khot UN, Khot MB, Bajzer CT, Sapp SK, Ohman EM, Brener SJ, et al. Prevalence of conventional risk factors in patients with coronary heart disease. JAMA. 2003;290(7):898-904.
[10] Bartlett EE. Cost-benefit analysis of patient education. Patient Education and Counseling. 1996;3(27):279.
[11] Bazrafshan MR, Sharif F, Molazem Z, Mani A. Cultural concepts and themes of suicidal attempt among Iranian adolescents. Int J High Risk Behav Addict. 2015;4(1):e22589.
[12] Rafi Bazrafshan M, Sharif F, Molazem Z, Mani A. The effect of paternal addiction on adolescent suicide attempts: a qualitative study. Int J High Risk Behav Addict. 2016;5(3):e22588.
[13] Bazrafshan M, Jahangir F, Shokrpour N. What protects adolescents from suicidal attempt: a qualitative study. Shiraz E-Med J. 2017;18(9):e57574.
[14] Shidfar MR, Hosseini M, Shojaeizadeh D, Asasi N, Majlesi F, Nazami S. Effectiveness of an educational program on knowledge and attitudes of angina patients in Mashhad Iran: Results of intervention. The Journal of Birjanduniv of Med Sci. 2008;14(1). [In Persian]
[15] Lapointe A, Balk EM, Lichtenstein AH. Gender differences in plasma lipid response to dietary fat. Nutr Rev. 2006;64(5 Pt 1):234-49.
[16] Tehrani H, Majlessi F, Shojaeizadeh D, Sadeghi R, HasaniKabootarkhani M. Applying socioecological model to improve women's physical activity: a randomized control trial. Iran Red Crescent Med J. 2016;18(2):e21072. Epub 2016-01-01.
[17] Armitage CJ, Arden MA. Exploring discontinuity patterns in the transtheoretical model: An application of the theory of planned behaviour. British journal of health psychology. 2002;7(1):89-103.Abstract
[18] Vafaeenajar A, Masihabadi M, Moshki M, Ebrahimipour H, Tehrani H, Esmaily H, et al. Determining the theory of planned behaviour's predictive power on adolescents' dependence on computer games. Health Education& Health Promotion. 2015;2(4):303-11.
[19] Su D, Huang X. Research on online shopping intention of undergraduate consumer in China based on the theory of planned behaviour. International business Research. 2011;4(1):781-96.
[20] Gordon JC. Beyond knowledge: guidelines for effective health promotion messages. Journal of Extension 2002;40(6):1-6.
[21] Welsh D, Lennie TA, Marcinek R, Biddle MJ, Abshire D, Bentley B, et al. Low-sodium diet self-management intervention in heart failure: pilot study results. European Journal of Cardiovascular Nursing. 2013;12(1):87-95.
[22] Karimy T, Saffari M, Sanaeinasab H, Khalagi K, Hassan-Abadi M. The impact of educational intervention based on the theory of planned behaviour on lifestyle change of patients with myocardial infarction. Iran J Health Educ Health Promot. 2016;3(4):370- 80.
[23] Teixeira PJ, Carraça EV, Markland D, Silva MN, Ryan RM. Exercise, physical activity, and self-determination theory: a systematic review. Int J Behav Nutr Phys Act. 2012;9:78.
[24] Hunt HR, Gross AM. Prediction of exercise in patients across various stages of bariatric surgery: a comparison of the merits of the theory of reasoned action versus the theory of planned behaviour. Behav Modif. 2009;33(6):795-817.
[25] Aubi E, Shadnoush M, Nazarzadeh M, Bidel Z, Ranaei A, Delpisheh A. Translation and assessment of validity and reliability of the health-promoting lifestyle questionnaire, using factor analysis. Pajoohandeh Journal. 2012;17(3):114-20.
[26] Moshki M, Torabi F. Lifestyle factors and their association with some relevant factors in adolescence using the theory of planned behaviour. J Mazandaran Univ Med Sci. 2014;23(2):117-26.
[27] Zoellner J, Estabrooks PA, Davy BM, Chen YC, You W. Exploring the theory of planned behaviour to explain sugar-sweetened beverage consumption. J Nutr Educ Behav. 2012;44(2):172-77.
[28] Yekaninejad M, Akaberi A, Pakpour A. Factors associated with Physical Activity

in adolescents in Qazvin: an application of the theory of planned behaviour. J North Khorasan Univ Med Sci. 2011;4(3):449-58. (Persian).

[29] Blanchard CM, Courneya KS, Rodgers WM, Fraser SN, Murray TC, Daub B, et al. Is the theory of planned behaviour a useful framework for understanding exercise adherence during phase II cardiac rehabilitation? J Cardiopulm Rehabil. 2003;23(1):29-39.

[30] Ferreira G, Pereira MG. Physical activity: The importance of the extended theory of planned behaviour, in type 2 diabetes patients. J Health Psychol. 2016 Feb 2. pii: 1359105315626787.

[31] Borji M, Azami M, Amirkhani M, Bastami M, Salimi E, Sayehmiri K, et al. The effect of education about the risk factors of myocardial infarction based on Health Belief Model on knowledge and attitudes of patients with myocardial infarction in Shahid Mustafa Hospital in Ilam, 2014-2015. NVJ. 2016;3(6):37-47.

[32] Abbaszadeh A, Borhani F, Asadi N. Effects of health belief model-based video training about risk factors on knowledge and attitude of myocardial infarction patients after discharge. JRMS. 2011;16(2):195-99.

[33] White KM, Terry DJ, Troup C, Rempel LA, Norman P, Mummery K, et al. An extended theory of planned behaviour intervention for older adults with type 2 diabetes and cardiovascular disease. Journal of Aging and Physical Activity. 2012;20(3):281-99.

[34] Gholamnia-shirvani Z, Ghofranipour F, Gharakhanlo R, Kazemnezhad A. Improving and maintaining physical activity and anthropometric indices in females from Tehran: application of the theory of planned behaviour. Journal of Education and Community Health. 2016;2(4):13-24.

[35] Kelley K, Abraham C. RCT of a theory-based intervention promoting healthy eating and physical activity amongst out-patients older than 65 years. Soc Sci Med. 2004;59(4):787-97.

[36] Finigan-Carr NM, Cheng TL, Gielen A, Haynie DL, Simons-Morton B. Using the theory of planned behaviour to predict aggression and weapons carrying in urban African American early adolescent youth. Health Educ Behav. 2015;42(2):220-30.

[37] Hill C, Abraham C, Wright DB. Can theory-based messages in combination with cognitive prompts promote exercise in classroom settings? Soc Sci Med. 2007;65(5):1049-58.

[38] Parrott M, Tennant L, Olejnik S, Poudevigne M. Theory of planned behaviour: Implications for an email-based physical activity intervention. Psychol Sport Exerc. 2008;9(4):511-26.

[39] Krumholz HM, Amatruda J, Smith GL, Mattera JA, Roumanis SA, Radford MJ, et al. Randomized trial of an education and support intervention to prevent read mission of patients with heart failure. Journal of the American College of Cardiology. 2002;39(1):83-89.

[40] Pischke CR, Weidner G, Elliott Eller M, Ornish D. Lifestyle changes and clinical profile in coronary heart disease patients with an ejection fraction of≤ 40% or> 40% in the Multicenter Lifestyle Demonstration Project. European Journal of Heart Failure. 2007;9(9):928-34.

[41] Kurçer MA, Ozbay A. Effects of patient education and counseling about lifestyle on quality of life in patients with coronary artery disease. Anadolu Kardiyol Derg. 2011;11(2):107-13.

[42] Sadeghi R, Mohseni M, Khanjani N. The effect of an educational intervention according to hygienic belief model in improving care and controlling among patients with hypertension. Journal of Rafsanjan University of Medical Sciences. 2014;13(4):383-94.

[43] Wu J-R, Lennie TA, Dunbar SB, Pressler SJ, Moser DK. Predictors of adherence to a low sodium diet using the theory of planned behaviour in patients with heart failure. Journal of Cardiac Failure. 2009;6(15):84.

[44] Ali AL, Hadad LG. The effect of the health belief model in explaining exercise participation among Jordanian myocardial infarction patients. Journal Transculate Nurse. 2010;15(2):114-210.

[45] Zigheimat F, Ebadi A, Mottahedian ET, Allaf Javadi M, Hamedanizade F. Effect of training according to Health Belief Model (HBM) on health believing, knowledge and behaviour in patients undergoing coronary artery bypass graft surgery. Kowsar Medical Journal. 2009;13(4):309-13.[In Persian]

[46] Pfaeffli Dale L, Dobson R, Whittaker R, Maddison R. The effectiveness of mobile-health behaviour change interventions for cardiovascular disease self-management: A systematic review. Eur J Prev Cardiol. 2016;23(8):801-17.

[47] Broekhuizen K, van Poppel MN, Koppes LL, Brug J, van Mechelen W. A tailored lifestyle intervention to reduce the cardiovascular disease risk of individuals with Familial Hypercholesterolemia (FH): design of the PRO-FIT randomised controlled trial. BMC Public Health. 2010;10:69.

PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Public Health, School of Health, Fasa University of Medical Sciences, Fasa, Iran.
2. Assistant Professor, Department of Nursing, School of Nursing, Fasa University Of Medical Sciences, Fasa, Iran.
3. Student, Department of Public Health, Kermanshah University of Medical Sciences, Kermanshah, Iran.
4. Instructor, Department of Nursing, School of Nursing, Larestan University of Medical Sciences, Larestan, Iran.
5. Instructor, Department of Nursing, Gerash University of Medical Sciences, Gerash, Iran.
6. Department of Operating Room, Ulcer Repair Research Center, Nursing and Midwifery Care Research, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Zhila Fereidouni,
Fasa Ibn Sina square, Fasa University of Medical Sciences, Fasa-7461686688, Iran.
E-mail: fereidounizhila@gmail.com