ANALYSIS

23(96), March - April, 2019

ISSN
2321–7359
EISSN
2321–7367

Medical Science

Determinants of Dietary Approaches to Stop Hypertension (DASH) among Prehypertension Individuals: An Application of Protection Motivation Theory

Seyed Saeed Mazloomy Mahmoodabad[1], Saeid Dashti[1]✉, Amin Salehi-Abargouei[2&3], Hossein Fallahzadeh[4], Mohammad Hossein Soltani[5]

Introduction: **Pre-hypertension is a common worldwide disease in 30-50% of the studied population. Diet compliance among pre-hypertensions is one of the most important changes in lifestyle. This study aims to determine compliance dietary approaches to stop hypertension (DASH) among prehypertension by using the protection motivation theory.** ***Material and Methods:*** **This cross-sectional study was performed on 165 prehypertension individuals in Ferdows city. A researcher-made questionnaire was used to examine the scores of the theory of protection motivation structures. The diet was measured by using a three-day dietary questionnaire. Validity and reliability of the instrument were confirmed. The data were analyzed by means of correlation coefficient, chi-square, and linear regression.** ***Results:*** **The average Dash diet compliance was 25.24±4.7. There is a significant correlation between all incentive protection structures, except perceived rewards and perceived costs with the intention of diet compliance. Theoretical structures were able to predict 66% of the variance of the intention of diet compliance.** ***Conclusion:*** **According to the ability of the protection motivation theory structures to explain the behavior of a diet, interventions based on the structures of this theory are suggested, in particular to improve the self-efficacy as the strongest predictor of the intention to diet compliance.**

INTRODUCTION

Pre-hypertension was determined according to the 7th Joint Committee on Prevention, Diagnosis, Evaluation and Treatment of High Blood Pressure (JNC7), systolic blood pressure (SBP) from 120 to 139 mmHg or diastolic blood pressure (DBP) 80 to 89 mmHg (1). Based on the researchers' opinion and the results of a meta-analysis, prehypertension like hypertension is one of the most important risk factors for cardiovascular disease (2, 3). The prevalence of pre-hypertension is reported to be between 30% and 48.9% among populations (4). In a study in Iran, the prevalence of high prehypertension in men and women were reported as 52% and 44%, respectively (5, 6). The most important feature of prehypertension is its insignificance, as well as there is no need for advanced diagnostic equipment and can be easily identified and treated and controlled by self-care and lifestyle changes (7). The proposed lifestyle changes suggested, by JNC7 for all people to prevent high blood pressure, are important in reducing blood pressure, respectively included: (8), loss of weight (9, 10), compliance of DASH diet (11), the reduction of Sodium consumption (11-13) and physical activity (14, 15).

International guidelines for high blood pressure control recommend the DASH diet (16, 17-20). This diet is also recognized for both proper prevention and treatment (21). This diet is rich in fruits, vegetables, low-fat dairy products, herbs, grains, lean meat, chicken, fish which it is full of fiber, potassium, magnesium and calcium, while the restricted consumption of sodium (2300 mg daily), saturated fat, total fat and cholesterol are recommended (22, 23, 49, 50). The results of the meta-analysis showed that following the DASH diet could reduce systolic and diastolic blood pressure to 6.74 and 3.43 mmHg, respectively (24). Several important factors play a role in determining nutritional behavior, such as interpersonal, individual, cultural and environmental factors that can promote or prevent healthy food (25). Also, there are other factors which are affected in this field, such as knowledge (26, 27), healthy nutrition benefits (28, 29), and barriers (28, 30, 31), efficacy (32, 33), So, due to the importance of healthy nutrition in preventing high blood pressure which is influenced by several factors, health providers must use psychological approaches to know these factors better (34). The protection motivation theory provides a useful framework for

[1]Social Determinants of Health Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; [2]Department of Nutrition, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; [3]Nutrition and Food Security Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; [4]Department of Biostatistics, Shahid Sadoughi University of Medical Sciences, Yazd, Iran; [5]Head of Yazd Cardiovascular Research Center, Shahid Sadoughi University of Medical Sciences, Iran;
✉*Corresponding author:* Saeid Dashti, Social Determinants of Health Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran, Email: drsaeiddashti@gmail.com; Tel: 00989151067166

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS

Table 1 Characteristics and Level of Dash Diet in Pre-Hypertensive Patients

		Level of Dash Diet						
		1	2	3	4	5	N (%)	P value
Gender	Female	13	18	12	12	13	68(43)	P = 0.174
	Male	21	11	19	24	15	90(57)	
Age	Under 30 years old	2	1	1	0	0	4(2.5)	P = 0.751
	30 to 40 years old	5	6	6	3	2	22(13.9)	
	40 to 50 years old	12	10	15	15	11	63(39.9)	
	50 to 60 years old	12	10	9	14	12	57(36.1)	
	Over 60 years old	3	2	0	4	3	12(7.6)	
Level of education	primary	10	9	4	9	9	37(26.1)	P = 0.222
	Diploma	10	12	13	11	14	60(38.2)	
	Academic	14	8	14	15	5	56(35.7)	
marital status	Married	29	29	30	35	27	150(94.9)	P = 0.327
	Single / Divorced	5	0	1	1	1	8(5.1)	
Job	housewife	11	17	10	13	12	63(40.1)	
	Employee	12	7	9	7	4	39(24.8)	P = 0.342
	Retired	5	3	7	9	9	33(21)	
	self-employed	5	2	5	7	3	22(13.9)	
BMI	normal	26	23	27	28	22	126(80.3)	
	Overweight	5	5	3	8	4	25(15.9)	P = 0.173
	fat	3	1	0	0	2	3.8	
economic situation	good	9	4	8	9	3	33(20.9)	
	average	23	24	21	27	25	120(75.9)	P = 0.433
	weak	2	1	2	0	0	5(3.2)	

understanding the health-related behaviors. This theory was designed by Rogers in 1975 to explain the effects of fear on attitudes and health behaviors (35). In this theory, it is assumed that accepting recommended health behaviors is the result of an individual's incentive to protect him/her. This theory has been used for a large range of preventive behaviors, such as encouraging screening for various cancers, increasing treatment regimens, stopping smoking, and adopting healthy eating habits (38-36).

Recognition of the influencing factors on dietary dash compliance can increase the effectiveness of educational interventions in the future, and since people with prehypertension are at high risk, and for the first time, this study is aimed at determining the compliance of Dietary Approaches to Stop Hypertension (DASH) which it was performed among prehypertension individuals by using the protection motivation theory.

MATERIAL AND METHODS

The present study was a cross-sectional descriptive-analytic study which was carried out on 165 prehypertension people in Ferdows city who were willing to participate in the study in winter 2018. Inclusion criteria of the study included: A person's blood pressure should be within the range of prehypertension, they should be satisfied with the presence in the study. Exit criteria included 1- diagnosis of diabetes, kidney failure and inability to answer questions. Cluster sampling was sampling method. As health centers were considered as clusters, then two of them were selected randomly and available prehypertension subjects were examined. The necessary explanations regarding the study and the confidentiality of their information described to the participants. A 3-day food records (2 weekdays and 1 weekend) questionnaire was used to determine the prehypertension person's dietary intake.

The Dietary Approaches to Stop Hypertension (DASH) assessment was based on the scoring of diet based on 8 food components including fruits, vegetables, grains, legumes and meals, low fat dairy products, red and processed meat, sweet beverages and salt intake. The subjects were ranked in different quintuple according to their intake for each component of the diet pattern. In the DASH diet plan, receiving more than 5 first groups and receiving low amounts of meat, sweet beverages and salt is desirable, so the lowest quintuple get the less amount of meat, sweet beverages and salt, which it would get the lowest score (5) and the highest quintuple would get 1. Then scores ranged from 8 to 40 in the DASH diet plan. People whom their score were more, they compliance the DASH diet and vice versa (39).

A researcher-made questionnaire was used to examine the structure of protection motivation theory. The questionnaire was designed based on the opinions of health education specialists (8 people), interview with prehypertension and dietitian and cardiologist. Content validity ratio (CVR) and content validity index (CVI) were used to determine validity and validity.

A questionnaire was confirmed for assessing validity by 10 health and nutrition and cardiovascular health professionals. In this study, the reliability of the questionnaire was evaluated by using Cronbach's alpha.

Finally, the questionnaire was designed with 70 questions in seven constructs: perceived severity with 10 questions, perceived sensitivity with 7 questions, self-efficacy with 10 questions, response efficiency with 11 questions, cost with 9 questions, reward with 9 questions, fear with 4 questions, and behavioral intention with 10 questions with Cronbach's alpha score of 0.76-0.96. Questions were in the form of Likert scale (5 option), the score of "*I completely agree*" option was 5 and the score of "*I completely disagree"* was 1. Data were analyzed by using SPSS software version 18 using correlation coefficient, linear regression and Chi-square test. The level of significance was 0.05 in the tests.

RESULT

The average age of participants was 49 years old with a standard deviation of 8.99. The mean systolic blood pressure is 133 ±9.82 mmHg and diastolic blood pressure 82 ± 11 mmHg. The demographic information is presented in Table 1 and Figure 1-3. Only 28 individual (17.7 percent) of prehypertension people had the highest score in the diet. Chi-square showed that there was not a significant relationship between demographic variables and dietary compliance score (P> 0.05), (Table 1).

The average Dash diet compliance was 25.24±4.7. Perceived sensitivity, perceived severity, self-efficacy, response efficacy, and fear

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS

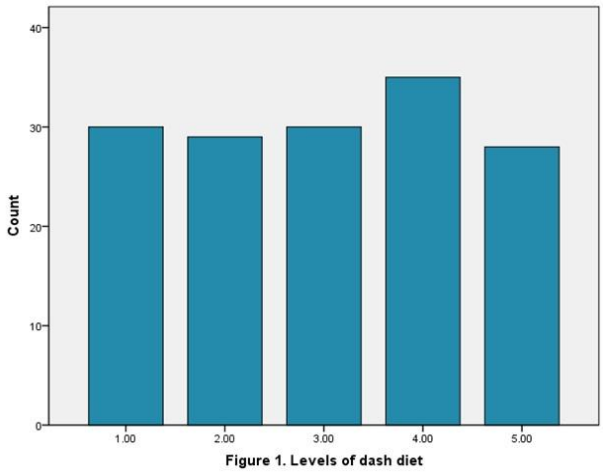

Figure 1. Levels of dash diet

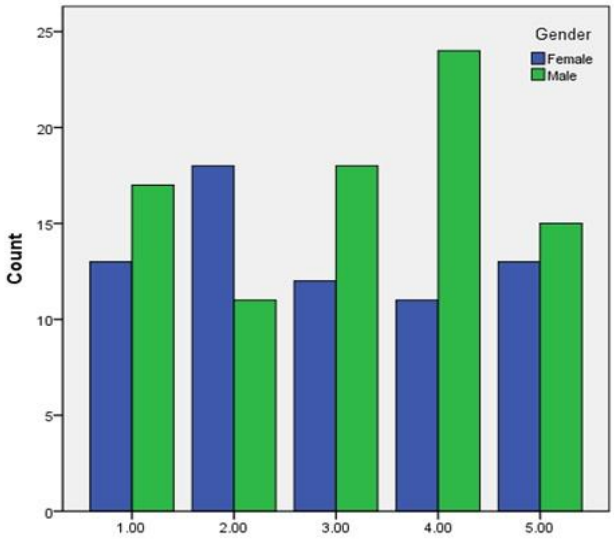

Figure 2. Frequency comparison of gender variables in levels of dash diet

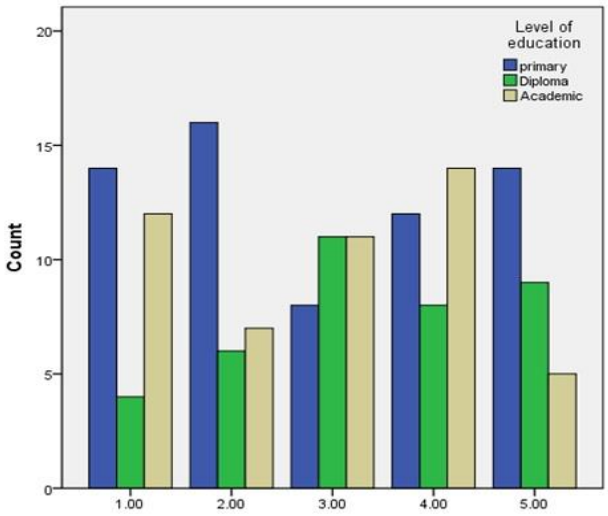

Figure 3. Frequency comparison level of education variables in Levels of dash diet

had a positive and significant correlation with the intention. The highest score among the constructs of the protection motivation theory was perceived self-efficacy (4.44 ± 0.68) and the lowest perceived cost scores (3.16 ± 0.96). The results of correlation test showed that there is a positive and significant correlation between the Dash diet and the self-efficacy and intention constructs, as well as the perceived self-efficacy with intention (r = 0.48) and behavior (r = 0.16) had the highest correlation (Table 2).

Regression analysis results showed that the protection motivation theory predicted 66% of variance in behavioral intention and perceived susceptible constructs, self-efficacy, response efficacy and fear predicted the intention. Among the constructs, perceived self-efficacy had the highest share in prediction of behavioral intention (β = 0.474) also the behavioral intention predicted 4% of the variance level of the Dash diet with β = 0.216 (Table 3).

DISCUSSION

The best way to prevent cardiovascular disease is the educating of the community to change lifestyles. Therefore, effective delivery of educational services is an appropriate understanding of preventive behaviors such as a diet. Many studies have been carried out in relation to the effectiveness of the protection motivation theory for the study and intervention in prevention and protection behaviors, that their results indicate the effectiveness of this theory (37, 38). Therefore, in this study, this theory was considered as the framework of the study.

The results of this study showed that the average of compliance of the Dash diet was 25.24% and 17.7% of the prehypertension people had the highest levels of compliance of the Dash diet. Leon et al., in their study, also they reported the rate of compliance of the Dash diet 20% in patients with high blood pressure in the hospital (40). Systematic Review kawan and colleagues reported that the compliance of the Dash diet was low (41), Racine et al. reported that only 21% of the participants in the intervention study were adherent after receiving food counseling death (42).

In the study of Dawn and colleagues before the onset of intervention, the rate of the Dash diet compliance among people with high blood pressure was 36.3 (43). Findings of the various findings may have different reasons, including the different definition of the Dash diet in different studies, number and the type of participants and the credibility of the food appraisal tool.

According to demographic factors, the results showed that there was no significant relationship between Dash diet and none of these factors. The study of AbdolKarimi et al. showed that age and BMI with physical activity were not significantly different among diabetic patients (38). In the study of Leon and colleagues, gender, marital status, income levels has significant relationship with Dash diet compliance (40), Gunther and colleagues did not found a relationship between BMI and compliance diet (44). The differences in findings seem to be due to the differences in lifestyle, especially nutrition among cultures and communities, and among different illnesses.

The results of this study showed that there is a significant relationship between the intention of Dash diet compliance and the scores of sensitive and perceived severity structures, self-efficacy, response efficacy, and fear. However, the correlation between structures and intentions was different, so that the highest correlation was between intention and self-efficacy and the lowest correlation was in perceived cost. In the case of self-efficacy, the results of this study are similar to most studies. Most studies have considered self-efficacy as one of the most important components of self-care activities of patients (45, 46).

These results indicate that if one's belief increase in being able to perform health behaviors (self-efficacy), and make the recommended behavior effective, the intention of doing the health behaviors will be

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS

Table 2 Descriptive Statistics and Inter correlations of PMT Construct in prehypertension Patients

PMT Constructs	1	2	3	4	5	6	7	8	9
1.Vulnerability	1								
2.Severity	R=0.517 P=0.000	1							
3.Self-Efficacy	R=0.439 P<0.000	R=0.347 P=0.000	1						
4.Response Efficacy	R=0.503 P<0.000	R=0.436 P=0.000	R=0.490 P=0.000	1					
5.Reward	R=0.026 P=0.652	R=0.048 P=0.406	-R=0.013 P=0.818	R=0.002 P=0.970	1				
6.Perceived Cost	-R=0.051 P<0.376	-R=0.029 P<0.621	-R=0.096 P<0.100	-R=0.107 P<0.065	R=0.160 P=0.005	1			
7. Fear	R=0.200 P<0.001	R=0.235 P<0.000	R=0.197 P<0.001	R=0.227 P<0.000	R=0.097 P=0.097	R=0.212 P=0.000	1		
8.Intention	R=0.461 P=0.000	R=0.305 P=0.000	R=0.488 P=0.000	R=0.467 P=0.000	-R=0.005 P=0.936	-R=0.087 P=0.138	R=0.253 P=0.000	1	
9.Dash diet	R=0.101 P=0.100	R=0.045 P=0.462	R=0.166 P=0.008	R=0.071 P=0.253	-R=0.099 P=0.106	-R=0.085 P=0.167	R=0.053 P=0.402	R=0.166 P=0.009	1
Mean	4.31	4.33	4.44	4.32	3.48	3.16	3.96	4.35	25.24
SD	0.65	0.67	0.26	0.68	0.85	0.96	0.95	0.66	4.7

Correlation is significant at the 0.01 level (2-tailed).

Table 3 Regression analysis of PMT variables as predictors of Intention and Dash Diet

Variables	β	SE	p-value	R2	Dependent Variable
Vulnerability	0.248	0.087	0.005		
Severity	-0.111	0.077	0.153		
Perceived Cost	-0.032	0.054	0.554		
Response Efficacy	0.197	0.080	0.020	0.66	Intention
Self-Efficacy	0.474	0.084	0.000		
Reward	-0.56	0.041	0.272		
Fear	0.128	0.041	0.032		
Intention	0.216	0.175	0.008	0. 04	DASH DIET

increased, and that whosoever sees himself as more vulnerable to the threat, he or she will behave more healthily (47).

The results of regression test showed that the protective motivation theory predicted 66% of behavioral intention variance. In this study, perceived susceptibility, self-efficacy, response efficacy and fear were the predictors of intension which the perceived self-efficacy was the most contributed in predicting behavioral intention. AbdolKarimi et al. also showed that self-efficacy and perceived costs were the most important predictive structures for physical activity behavior among diabetic patients (38). Self-efficacy implies to the person's beliefs in relation to his/her ability to perform affairs and derives from various sources such as successes and failures of a person, observing the success or failure of others, and encouraging verbal self-efficacy. It results in more perseverance and success and less fear in the individual (48). These results were not consistent with the results of the study of Rahaei et al. (37) which were predictive of self-efficacy and reward. To justify this contradiction, we can point to the difference in the nature of behavior in the two studies.

The present study was the first study in the field of Dash diet for prehypertension patients in Iran which as well as the correlation, prediction of intention and behavior of Dash diet compliance plan was studied. Our study has some limitations, including collection of the dietary information and the structures of protection motivation theory through self-reporting, which could be a measurement error, in addition, the 3-day food records questionnaire was not able to measure the exact level of sodium diet, which is one of the main components of the diet. Also, the cross-sectional nature of this study was also a limitation of this study. However, it is recommended that by performing precise educational interventions based on the protection motivation theory, the practical effectiveness of this theory should be analyzed among prehypertension individuals.

CONCLUSION

The present study showed that there is a correlation between all PMT structures except perceived rewards and perceived costs with the intention of compliance diet. And perceived susceptible structures, self-efficacy, response efficacy, and fear, behavioral intention were predicted, and also behavioral intention and self-efficacy were predictable. Therefore, according to the function of PMT in predicting

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS

behavior, it is suggested that interventional programs could be used to enhance the rate of diet compliance from predictive structures.

REFERENCES

1. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JJ, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ, National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee: The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. JAMA 2003, 289:2560–2572. Erratum in: JAMA 2004, 290:197.
2. Jang E, Baek Y, Kim Y, Park K, Lee S. Sasang constitution may act as a risk factor for prehypertension. BMC complementary and alternative medicine. 2015; 15:1-7.
3. Huang et al.: Prehypertension and incidence of cardiovascular disease: a meta-analysis. BMC Medicine 2013 11:177.
4. Grotto I, Grossman E, Huerta M, Sharabi Y: Prevalence of prehypertension and associated cardiovascular risk profiles among young Israeli adults. Hypertension 2006, 48:254–259.
5. Khosravi A, Emamian MH, Shariati M, Hashemi H, Fotouhi A. The prevalence of pre-hypertension and hypertension in an Iranian urban population. High blood pressure & cardiovascular prevention. 2014; 21(2):127-135.
6. Janghorbani M, Amini M, Gouya MM, Delavari A, Alikhani S, Mahdavi A. Nationwide survey of prevalence and risk factors of prehypertension and hypertension in Iranian adults. Journal of hypertension. 2008; 26(3):419-426.
7. Hatami H, Razavi M, Eftekhar-e-Ardabili H, Maglesi F, Sayed Nozadi M, Prizadah M. Text book of public health, Vol 2. 1st ed. Tehran: Argmand Press; 2005: p: 1101. [Persian].
8. Whelton PK, He J, Appel LJ, Cutler JA, Havas S, Kotchen TA, et al. Primary prevention of hypertension: Clinical and public health advisory from The National High Blood Pressure Education Program. JAMA 2002; 288:1882-8.
9. The Trials of Hypertension Prevention Collaborative Research Group. Effects of weight loss and sodium reduction intervention on blood pressure and hypertension incidence in overweight people with high-normal blood pressure. The Trials of Hypertension Prevention, phase II. Arch Intern Med 1997; 157:657-67.
10. He J, Whelton PK, Appel LJ, Charleston J, Klag MJ. Long-term effects of weight loss and dietary sodium reduction on incidence of hypertension. Hypertension 2000; 35:544-9.
11. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. N Engl J Med 2001; 344:3-10.
12. Vollmer WM, Sacks FM, Ard J, Appel LJ, Bray GA, Simons-Morton DG, et al. Effects of diet and sodium intake on blood pressure: Subgroup analysis of the DASH-sodium trial. Ann Intern Med 2001; 135:1019-28.
13. Chobanian AV, Hill M. National Heart, Lung, and Blood Institute Workshop on Sodium and Blood Pressure: A critical review of current scientific evidence. Hypertension 2000; 35:858-63.
14. Kelley GA, Kelley KS. Progressive resistance exercise and resting blood pressure: A meta-analysis of randomized controlled trials. Hypertension 2000; 35:838-43. M
15. Whelton SP, Chin a, Xin X, He J. Effect of aerobic exercise on blood pressure: A meta-analysis of randomized, controlled trials. Ann Intern Med 2002; 136:493-503.
16. US Department of Health and Human Services, US Department of Agriculture. Dietary guidelines for Americans 2005. Washington DC: US Government Printing Office; 2005.
17. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green L, et al. Seventh report of the joint national committee on prevention, detection ,evaluation, and treatment of high blood pressure. Hypertension.2003; 42: 1206–52.
18. National Institutes of Health- National Heart, Lung, and Blood Institute. Your guide to lowering your blood pressure with DASH, DASH eating plan. 2006.
19. Daskalopoulou SS, Khan NA, Quinn RR, Ruzicka M, McKay DW, et al. The 2012 Canadian hypertension education program recommendations for the management of pretension: Blood pressure measurement, diagnosis, assessment of risk, and therapy. Canadian Journal of Cardiology.2012; 28: 270–287.
20. U.S. Department of Agriculture and U.S. Department of Health and Human Services (2010) Dietary guidelines for Americans, 2010.
21. Svetkey LP, Sacks FM, Obarzanek E, VollmerWM, Appel LJ, Lin PH, et al. The DASH diet, sodium intake and blood pressure trial (DASHsodium): rationale and design. DASH-Sodium Collaborative Research Group. J Am Diet Assoc 1999; 99:S96-104.
22. Appel LJ, Champagne CM, Harsha DW, Cooper LS, Obarzanek E, et al. Effects of comprehensive lifestyle modification on blood pressure control: Mainresults of the PREMIER clinical trial. JAMA: the journal of the American Medical Association. 2003; 289: 2083–2093.
23. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D ,et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH sodium collaborative research group. N Engl J Med. 2001; Jan 4 ; 344(1):3e10.
24. Saneei P, Salehi-Abargouei A, Esmaillzadeh A, Azadbakht L. Influence of Dietary Approaches to Stop Hypertension (DASH) diet on blood pressure: a systematic review and meta-analysis on randomized controlled trials. NutrMetabCardiovasc Dis. 2014; 24: 1253-61.
25. Bertoni AG, Foy CG, Hunter JC, Quandt SA, Vitolins MZ, Whitt-Glover MC. A multilevel assessment of barriers to adoption of Dietary Approaches to Stop Hypertension (DASH) among African Americans of low socioeconomic status. J Health Care Poor Underserved. 2011; 22(4): 1205-20. doi: 10.1353/hpu.2011.0142. PMID: 22080704, PMCID: PMC3769217.
26. Erkoc SB, Isikli B, Metintas S, Kalyoncu C. Hypertension Knowledge-Level Scale (HK-LS): a study on development, validity and reliability. Int J Environ Res Public Health. 2012; 9(3): 1018-29. doi: 10.3390/ijerph9031018. PMID: 22690180, PMCID: PMC3367294.
27. Spencer A, Jablonski R, Loeb SJ. Hypertensive African American women and the DASH diet. Nurse Pract. 2012; 37(2): 41-6. doi: 10.1097/01.NPR.0000410278.75362.a2. PMID: 22252028.
28. Pawlak R, Colby S. Benefits, barriers, self-efficacy and knowledge regarding healthy foods; perception of African Americans living in eastern North Carolina. Nutr Res Pract. 2009; 3(1): 56-63. doi: 10.4162/nrp.2009.3.1.56. PMID: 20016703, PMCID: PMC2788162.
29. Moser RP, Green V, Weber D, Doyle C. Psychosocial Correlates of Fruit and Vegetable consumption among African American Men. J NutrEducBehav. 2005; 37(6): 306-14. PMID: 16242062.
30. Newell M, Modeste N, Marshak HH, Wilson C. Health beliefs and the prevention of hypertension in a black population living in London. Ethn Dis. 2009; 19(1): 35-41. PMID: 19341161.
31. Keshani P, Farvid MS. Perceived benefits and barriers regarding high fiber food intake in type 2 diabetes patients- A qualitative study. Iranian Journal of Nutrition Sciences & Food Technology. 2012; 7(1): 11-22. Available from: http://nsft.sbmu.ac.ir/article-1-690-en.html.
32. Burke LE, Wang J, Sevick MA. Self-monitoring in weight loss: a systematic review of the literature. J AmDiet Assoc. 2011; 111(1): 92-102. doi: 10.1016/j.jada.2010.10.008. PMID: 21185970, PMCID: PMC3268700.
33. Wingo BC, Desmond RA, Brantley P, Appel L, Svetkey L, Stevens VJ, et al. Self-efficacy as a predictor of weight change and behavior change in the PREMIER trial. J NutrEducBehav. 2013; 45(4): 314-21. doi: 10.1016/j.jneb.2012.12.004. PMID: 23433966, PMCID: PMC4114041.

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS

34. Pires CG, Mussi FC. [Health beliefs regarding diet: a perspective of hypertensive black individuals]. Rev Esc Enferm USP. 2012; 46(3): 580-9. PMID: 22773477.
35. Webb TL, Sniehotta FF, Michie S Using theories of behaviour change to inform interventions for addictive behaviours. Addiction 2010; 105:1879-92
36. Cox, D. N., Koster, A., & Russell, C. G. Predicting intentions to consume functional foods and supplements to offset memory loss using an adaptation of protection motivation theory. Appetite2004; 43, 55-64.
37. Rahaei Z, Ghofranipour F, Morowatisharifabad MA, Mohammadi E. Determinants of Cancer Early Detection Behaviors: An Application of Protection Motivation Theory. Health PromotPerspect 2015; 5(2): 138-146.
38. Morowati Sharifabad M A, Abdolkarimi1 M, Asadpour2 M, Sheikh Fathollahi M, Balaee P. The Predictive Effects of Protection Motivation Theory on Intention and Behaviour of Physical Activity in Patients with Type 2 Diabetes. Open Access Maced J Med Sci. 2018; 15; 6(4):709-714.
39. 39.Fung TT, Chiuve SE, McCullough ML, Rexrode KM, Logroscino G, Hu FB. Adherence to a DASH-Style Diet and Risk of Coronary Heart Disease and Stroke in Women. Arch Intern Med. 2008; 168(7):713–720. doi:10.1001/archinte.168.7.713
40. Nikiema Leon, Sossa Charles, Agueh Victoire D., Dedewanou Magloire , Metonnou Clemence , Colette Azandjeme , Noel M. Paraiso , Ouedraogo T. Laurent , Michel Makoutode , Houinato Dismand. Determinants of Adherence to Recommendations of the Dietary Approach to Stop Hypertension in Adults with Hypertension Treated in a Hospital in Benin. Universal Journal of Public Health.2015; 3, 213 - 219. doi: 10.13189/ujph.2015.030506.
41. M.W. Kwan, M.C. Wong, H.H. Wang, K.Q. Liu, C.L. Lee, B.P. Yan, C.M. Yu, S.M. Griffiths, Compliance with the Dietary Approaches to Stop Hypertension (DASH) diet: a systematic review, PLoS One.2013; 8, N°10, e78412. doi: 10.1371/journal.pone.0078412.
42. E. Racine, J.L. Troyer, J. Warren-Findlow, W.J. McAuley, The effect of medical nutrition therapy on changes in dietary knowledge and DASH diet adherence in older adults with cardiovascular disease, J. Nutr. Health Aging. 2011; Vol.15, N°10, 868-876.
43. Epstein DE, Sherwood A, Smith PJ, Craighead L, Caccia C, Lin PH, Babyak MA, Johnson JJ, Hinderliter A, Blumenthal JA. Determinants and consequences of adherence to the dietary approaches to stop hypertension diet in African-American and white adults with high blood pressure: results from the ENCORE trial. J AcadNutr Diet. 2012; Nov; 112(11):1763-73. doi: 10.1016/j.jand.2012.07.007. Epub 2012 Sep 19.
44. Günther AL, Liese AD, Bell RA, Dabelea D, Lawrence JM, Rodriguez BL, et al. Association Between the dietary approaches to hypertension diet and hypertension in youth with diabetes mellitus. Hypertension 2009; 53:6-12.
45. Warren-Findlow, Jan, Rachel B. Seymour and Larissa R. Brunner Huber. The Association between Self-Efficacy and Hypertension Self-Care Activities among African American Adults. Community Health. 2012; 37(1): 15–24. Doi: 10.1007/s10900-011-9410-6.
46. Solimanian A, Niknami S, Hajizadeh I, Shojaeezadeh D, Tavousi M. Predictors of physical activity to prevent osteoporosis based on extended Health Belief Theory. Payesh. 2014; 13:313-20.
47. Bandura A Self-efficacy: toward a unifying theory of behavioral change. Psychol Rev 1977; 84:191-215.
48. Howells LA. Self-efficacy and diabetes: why is emotional 'education' important and how can it be achieved?. Horm Res 2002; 57 Suppl 1: 69-71.
49. Anisa M Durrani. Types of diet and their nutritional impact on health. Science & Technology. 2015, 1(1), 26-29.
50. Maher MA, Gutbi SS. Assessment of dietary pattern among coronary heart disease outpatients attended El-Shaap teaching hospital, Khartoum state. Medical Science, 2017, 21(86), 160-172.

Article Keywords
Protection Motivation Theory, Dietary Approaches to Stop Hypertension, Prehypertension.

Funding
This study was funded by Shahid Sadoughi University of Medical Sciences, Yazd, Iran.

Conflict of Interest
The authors declare that there is no conflict of interest regarding the publication of this article.

Informed consent
Informed consent was obtained from all individual participants included in the study.

Ethical approval
The Ethics committee of the Shahid Sadoughi University of Medical Sciences-Yazd approved this study. Ethic code: IR.SSU.SPH.REC.13950103.

Article History
Received: 4 January 2019
Accepted: 19 February 2019
Published: March-April 2019

Citation
Seyed Saeed Mazloomy Mahmoodabad, Saeid Dashti, Amin Salehi-Abargouei, Hossein Fallahzadeh, Mohammad Hossein Soltani. Determinants of Dietary Approaches to Stop Hypertension (DASH) among Prehypertension Individuals: An Application of Protection Motivation Theory. *Medical Science*, 2019, 23(96), 244-249

Publication License
This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note
Avoid print-versions. If required, article is recommended to print as color digital version in recycled paper. *Save trees, save nature*

© 2019 Discovery Publication. All Rights Reserved. www.discoveryjournals.org | OPEN ACCESS