ARTICLE / INVESTIGACIÓN

Efficacy of Pender's Health Promotion-based Model on Intervention for Enhancing University of Mosul Hypertensive Employees' Eating Behaviors: A Randomized Controlled Trial

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Abstract. Dietary habits are an essential lifestyle element contributing to hypertension development and can be changed if adequately controlled and educated. The DASH (Dietary Approaches to Stop Hypertension) diet, which emphasizes consuming fruits, vegetables, and low-fat dairy products, is recommended to lower blood pressure and reduce sodium intake. The article aims to identify the Efficacy of Pender's Health Promotion-based Model on Intervention for Enhancing University of Mosul Hypertensive Employees' Eating Behaviors. A proper experimental design employing the randomized controlled trial approach is used to establish the efficiency of Pander's health promotion based on intervention for enhancing eating behaviors among University of Mosul hypertension personnel. The study was conducted at the University of Mosul from first December 2021 to the end of April 2022. The sample was selected from a homogeneous group of 220 employees. Random selection and random assignment are used to create the experimental and control group for every 25 employees. This study's results show statistically significant differences across all Pander Model principles connected to hypertension-associated eating behavior. On the other hand, the perceived barrier was the only belief that remained constant over time. The study indicated that the Pender model's health promotion demonstrates the relevance of hypertension prevention and has a favorable impact on employees' perceptions of perceived advantages, Self-efficacy, and perceived risks, social support and activity-related effect of unhealthy Hypertension advised employees to use their eating behavior through a healthy diet, physical activity and other healthy behaviors to hypertension control to prevent different health hazards, social support for activating "readiness" to break free from unhealthy habits and self-efficacy for self-assurance in blood pressure control.

Keywords: Efficacy, Pender's Model, health promotion, Hypertensive Employees, Eating Behaviors

Introduction

Health Promotion Model (HPM) focuses on aiding individuals in obtaining a higher level of well-being and offering positive resources for health practitioners to assist people in making behavioral changes. The goal of the HPM isn't just to help people avoid illness by changing their attitudes and beliefs; it's also to help people improve their health or values [1]. Pender is working to create a model that will guide the nursing profession through human interactions and biophysical mechanisms that inspire people to engage in health-promoting activities that contribute to overall well-being [2]. According to Pender's theory, people are more likely to exhibit a given behavior if they are exposed to positive modeling and are supported by family members [3]. Pender's method can assist nursing staff in focusing on patient-centered health promotion programs and research to predict health-promoting behaviors. Finally, HPM has been tested on various people and environments. The nursing community also embraced it, and is now widely used in nursing practice, research, and education[4].The models have essential concepts, the first of which is the perceived benefits through the application to change the lifestyle and perceived barriers during the implementation that prevent people from reaching the goal of the program, Self-Efficacy, which is the confidence of individuals to make behavioral change, perceived activity –related affect that explain the love of individuals for change behavioral in their lives, and social support through encouraging the individual by his friends, family and society for behavioral change and enhancing [3]. Hypertension (HTN), described as more significant than .140mmHg systolic blood pressure (SBP) or more critical than 90mmHg diastolic blood pressure (DBP), is a severe public health problem across the world. However, our knowledge condition and the accessibility to therapies, 80 million adults in the United States and 266 million people in China suffer from HTN [5]. In affluent cultures, Hypertension is a primary chronic condition, affecting more than 25% of individuals. A linear link between blood pressure (BP) and the risk of cardiac disease has been found in meta-analyses. As a result, inadequate blood pressure control is the leading cause of death worldwide, accounting for 62% of cerebrovascular illness and 49% of ischemic heart disease, and 7.1 million deaths per year [6,7]. In the United States, both the net and age-adjusted prevalence ratios of Hypertension continue to climb.

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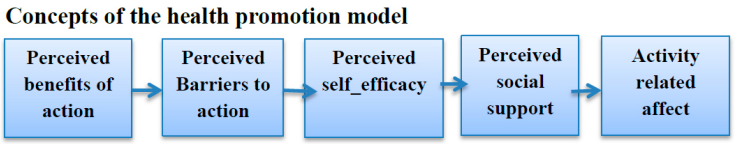
On the other hand, recent studies imply that hypertension awareness, treatment, and management have improved slightly. In Europe, hypertension therapy and control rates are substantially lower than in the United States [8,9]. Dietary changes, exercise, and medication are the most common treatments for Hypertension. Current high blood pressure preventive and treatment guidelines emphasize lifestyle changes that should improve antihypertensive medicine efficacy [10]. The American Heart Association recommends Dietary Approaches to Stop Hypertension (DASH), a widely utilized dietary strategy for Hypertension. Previous research has demonstrated that the DASH diet reduces blood pressure in extremely high blood pressure, and it is suggested for hypertension prevention and therapy [11]. Most studies and research indicated a close relationship between nutrition and high blood pressure in people and that healthy eating behavior that includes vegetables and fruits and avoiding fatty foods helps maintain stable blood pressure [12,13]. A diet or dietary behavior rich in unhealthy foods such as fast food, red meat and rich in fats leads to the risk of high pain pressure and other health problems [14]. DASH research found that a diet rich in fruits and veggies, low-fat dairy and high-fiber grains, and small portions of lean meat and minimal salt significantly lowers blood pressure in hypertensive and normotensive adults [15]. Dietary habits are an essential lifestyle element contributing to hypertension development and can be changed if adequately controlled and educated. To lower blood pressure, the (DASH) diet is recommended, which emphasizes eating fruits, vegetables, low-fat dairy products, and sodium reduction[16]. Whatever we eat or how often we eat are two fundamental aspects of dietary behavior that can be changed. Eating frequency is commonly expressed as the total number of snacks and meals consumed in a given day; it is assumed to play a role in developing obesity and other metabolic diseases. In specific trials, the higher Eating frequency was linked to better cholesterol profiles [17,18].

Materials and methods

A proper experimental design employing the randomized controlled trial approach is used to establish the efficiency of Pander's health promotion based on intervention for enhancing eating behaviors among University of Mosul hypertension personnel. The study was conducted at the University of Mosul, located on the northern side of the left part of the city. The University of Mosul is one of the city's leading educational and research institutions. At the University of Mosul, there are 22 colleges. A probability simple random sample of 50 male and female employees from faculties of different specializations was selected. The sample was collected from four colleges at the University of Mosul: the College of Medicine, Engineering, Science, and education. The sample was selected from a homogeneous group of 220 employees. Random selection and random assignment are used to create the experimental and control group for every 25 employees.The data for this study was gathered via a questionnaire with two parts: part I, which involved describing the student's socio-demographic characteristics such as age, and part II, which involved telling the student's socio-demographic (age, gender, BMI, level of education, marital status, socioeconomic status), Part II consists in measuring with a scale enhancing dietary behaviors for Hypertension based on the Bandar Health Model for University of Mosul employees. The researcher built this instrument and reviewed it with 13 experts in areas related to the topic of study and the student's specialization. This scale was made using the pander model of health promotion. It included five primary subscales: (1) "perceived benefits subscale," (2) "perceived barrier subscale," (3) "perceived self-efficacy subscale," (4) "perceived social support subscale," and (5) "activity related affect" to improve the employee's beliefs about eating behavior. The full scale had 23 items on a 5-point scale. A five-point Likert scale was used to assess improvements in employee behavior in a health promotion-based business model. For these items, the responses ranged from (1) strongly disagree to (5) strongly agree, with a higher score indicating more remarkable agreement with the beliefs. The data are collected from employees through the utilization of the study instrument. Each one spends approximately (30-40) minutes to have the questionnaire completed. The information will be analyzed using the "Statistical Package for Social Science" (SPSS, Version 26). Two approaches are employed for the data analysis: Descriptive Statistical Data Analysis Approach (percent, frequency, SD, and mean), Inferential Statistical Data Analysis Approach (Pearson Correlation Coefficient and Levene's Test for Equality of Variances.



Results

The mean SD age of the study group and control group, according to (Table 1), was (2.88 1.09240) and (2.72 0.84261), respectively. Furthermore, the same table revealed that most participants had an average body weight, with an overall mean (SD) of (24.8282 3.66422). From observing the results in the table up (1), we find that the two variables are homogeneous in each case, in terms of the probability value (P-value) accompanying each case, whose values appeared greater than (0.05), and this leads us to accept the null hypothesis the meaning that the two samples are homogeneous.

Table (2) shows an examination of the changes that occurred to employees through three stages "(pre, post1, post2)" it was found in the first stages"(baseline)" that their feeding behavior was (M=2.590),(SD: 0.30516). But after the intervention and giving the training program in post1, it became (M=3.880) (SD: 0.17854), indicating the program effectively changed the employees' behaviors. In the third stage", the participants were collected after two months of the intervention and their health behaviors tested. The ratio of (M=3.8800) and (SD: 0.17854) appeared. This indicates that they have maintained the same information and behaviors and may have increased. This also confirms to us that they have implemented all the instructions given to them during the lecture. A comparison in the control study in the three stages "pretest" was (M=2.4800), "posttest1" (M=2.6700), and "posttest2" (M=2.6700") shows that the results were similar, and the official reason was that they were not participating in the program.

Group statistics							
Factor		N	Mean	SD	Std. Error mean	Levene's test for Equality of variances	
						F	P-value
Age	Experimental	25	2.8800	1.09240	.21848	1.597	0.212
	control	25	2.7200	.84261	.16852		
BMI	Experimental	25	24.8282	3.66422	.73284	1.034	0.314
	control	25	25.2955	3.20652	.64130		
Gender	Experimental	25	1.4800	.50990	.10198	0.000	1.000
	control	25	1.4800	.50990	.10198		
Marital status	Experimental	25	1.3600	.48990	.09798	1.064	0.307
	control	25	1.2400	.52281	.10456		
Residential unit	Experimental	25	1.2800	.45826	.09165	0.000	1.000
	control	25	1.2800	.45826	.09165		

Note: F: Frequency, M: Mean, SD: Standard deviation, BMI: Body Mass Index, All group differences p > 0.05

Table 1. Demographical Characteristics and Homogeneity Between Experimental and Control Groups

Case summaries							
Concept of Pander Model		Experimental			control		
		Pretest	Posttest 1	Posttest 2	Pretest	Posttest 1	Posttest 2
Benefit	Mean	2.5900	3.7600	3.8800	2.4800	2.6700	2.6700
	SD	0.30516	0.18371	0.17854	0.32210	0.34400	0.34400
Barriers	Mean	3.0857	3.1143	3.0857	3.0343	3.0743	3.0800
	SD	0.25754	0.25085	0.25754	0.28655	0.29196	0.28595
Self-efficacy	Mean	2.7667	4.1267	4.1333	2.9533	2.9467	2.9533
	SD	0.24056	0.18807	0.18634	0.18333	0.21365	0.18333
Social support	Mean	2.8200	3.8400	3.8600	2.8400	2.8200	2.8200
	SD	0.43012	0.23805	0.27080	0.47258	0.45369	0.45369
Activity related affect	Mean	2.8700	4.1000	4.0900	2.8500	2.8600	2.8700
	SD	0.29861	0.23936	0.25900	0.29756	0.29826	0.28062

Note: SD: Standard deviation

Table 2. The statistical description of the study for each of the five studied concepts of the health promotion of the Pander Model

Correlations					
Concept of Pender Model		**Barriers**	**Self-efficacy**	**Social support**	**Activity related affect**
Benefit	**Pearson Correlation**	-0.012	**0.875****	**.789****	**.843****
	P-value	0.917	0.000	0.000	0.000
	N	75	75	75	75
Barriers	**Pearson Correlation**		0.055	0.009	-.028
	P-value		0.638	0.941	.812
	N		75	75	75
Self-efficacy	**Pearson Correlation**			**0.781****	**0.878****
	P-value			0.000	0.000
	N			75	75
Social support	**Pearson Correlation**				**0 .717****
	P-value				0.000
	N				75

Table 3 Analysis of the correlation between the five studied concepts of the model.

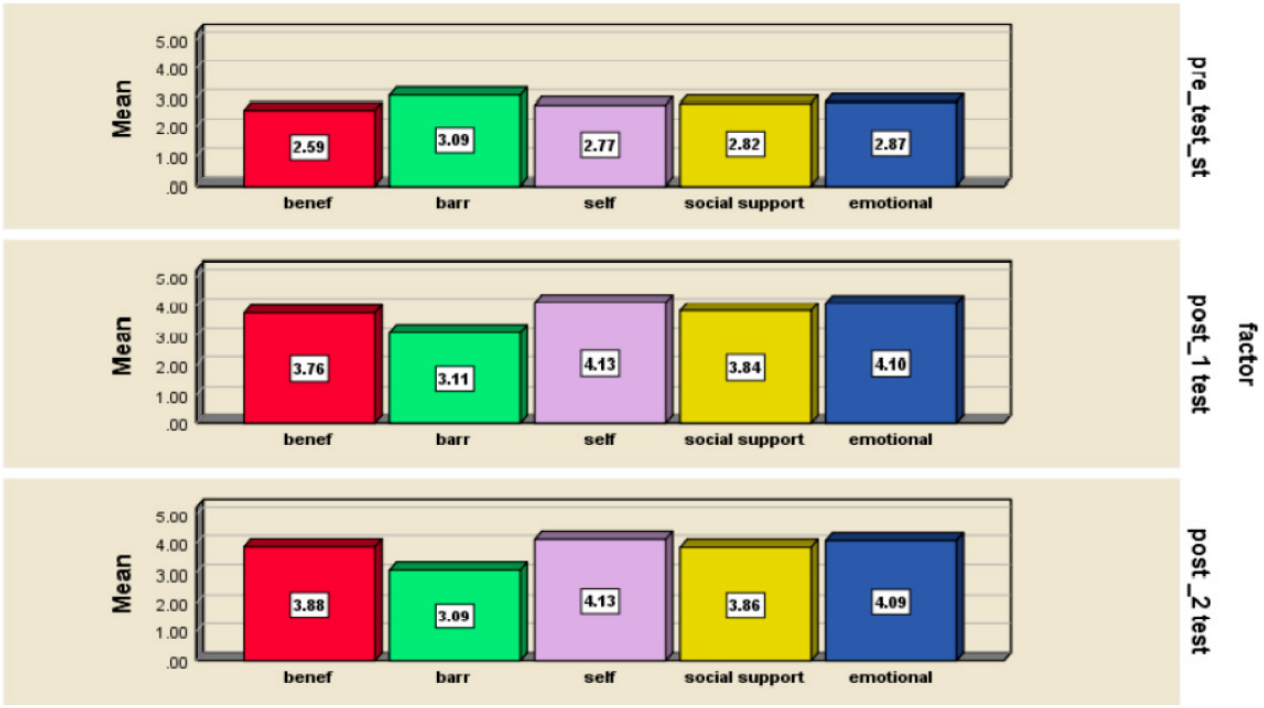


Figure 1. Behavior change according to the Bender model in reinforcing behaviors over time for three phases during the study

Table (3) shows the following: There is a direct and significant correlation between (Benefit) and (Self-efficacy) as a function of the value of the correlation coefficient, whose value appeared equal to (0.875), and this relationship is not significant in terms of the probabilistic value associated with the correlation coefficient whose value appeared similar to (0.000), which is less than (0.05). There is a direct and significant correlation between (Benefit) and (Social support) as a function of the value of the correlation coefficient, whose value appeared equal to (0.789).

DISCUSSION

From observing the results in table up (1), This study found that the two variables are homogeneous in each case, in terms of the probability value (P-value) accompanying each case, whose values appeared greater than (0.05), and this leads us to accept the null hypothesis the meaning that the two samples are homogeneous. This study is similar to [19], which discovered that the sample's average age was (21.21 2.90). Around 90% were married, and 70% had a modest family income. Table (2) shows an examination of the changes that occurred to employees through three stages (pre, post1, post2); it was found in the first stages (baseline) that their feeding behavior was (M=2.590),(SD: 0.30516). But after the intervention and giving the training program in post1, it became (M=3.880) (SD: 0.17854) and indicated the program was effective in changing the employees' behaviors. In the third stage, after two months of the intervention, the participants were collected and their health behaviors tested. The ratio of (M=3.8800) and (SD: 0.17854) appeared. This indicates that they have maintained the same information and behaviors and may have increased. This also confirms to us that they have implemented all the instructions given to them during the lecture. A comparison in the control study in the three stages "pretest" was (M=2.4800),"posttest1" (M=2.6700), "posttest2" (M=2.6700) shows that the results were similar, and the official reason was that they were not participating in the program. These findings agree with [20] post hoc testing revealed that the average health promotion score changed (perceived benefits) differed significantly between the groups of participants (p>000). The average health promotion score for the control group did not change significantly throughout the program; according to the findings, they also mentioned that the control group did not change during these stages. Perceived barriers show the examination of the variables obtained by the employees during three stages ("pretest,posttest-1,posttest-2"); the results were similar to each other in these stages; in the first stage, it was pretest"(M=3.0857)(SD:0.25754) and in the second stage posttest-1 (Mean=3.1143) (SD:.25085) and the last stage was "posttest-2"(Mean=3.0857)(SD:.25754) This means that the barriers did not change for the employees of the test group due to the presence of "material economic barriers and in time and environment[23].It was found that the results were very similar, and the reason was due to the presence of barriers such as financial and economic obstacles.These results are in agreement with[21] as the results of their study also showed that the perceived obstacles in the study remained in its three stages similar to the result, and they reinforced that due to the presence of financial, economic, environmental and time obstacles as well. Perceived Self-efficacy shows the examination of the variables obtained by the employees during three stages (pretest,posttest-1,posttest-2); the results were different from each other in these stages; in the first stage, it was pretest (Mean=2.7667)(SD:0.24056).and in the second stage posttest-1(Mean=0.18807)(SD: 3.8400) and the last stage was "posttest-2"(Mean=3.8600)(SD: 0.27080).These results show that there are differences and changes in the three examinations after the intervention and giving the training program, and this means that the "self-efficacy" of the employees of the study group has increased, and this is a positive thing and means that the program is all influential in changing the lifestyle. Comparing the control study in the three stages (pretest Mean=2.8400)(SD: 0.47258), "posttest-1"(Mean=2.8200)(SD: 0.45369), "posttest-2"(M=2.8200)(SD: 0.45369), it was found that the results were very similar, and the official reason was that they were not participating in the program. These findings correspond with [21], who reported that study group participants had a high impact. The self-efficacy of the study group employees has increased significantly, which means their efficiency has increased. The program positively impacted them; they also mentioned that the control group did not change during these stages. Perceived social support shows the examination of the variables obtained by the employees during three stages "pretest,posttest-1,posttest-2" the results were different from each other in these stages; in the first stage, it was pretest (Mean=2.8200)(SD:0.43012).and in the second stage posttest-1 (Mean=3.8400)(SD: 0.23805) and the last stage was posttest-2(Mean=3.8600)(SD: 0.27080). These results show that there are differences and changes in the three examinations after the intervention and giving the training program, and this means that the social support of the employees of the study group has increased, and this is a positive thing and means that the program is all influential in changing the lifestyle. Comparing the control study in the three stages (pretest Mean=2.8400)(SD: 0.47258), posttest-1 (Mean=2.8200)(SD: 0.45369),"posttest-2"(Mean=2.8200)(SD: 0.45369), it was found that the results were very similar, and the official reason was that they were not participating in the program and lack of social support for them to improve their health condition from their families, acquaintances, friends and those around them. A study [22] indicated that "social support" plays a major role in changing individuals' health behaviors. When individuals receive support, their health condition improves as a "result of encouragement by family and friends." Perceived activity-related effect shows the examination of the variables obtained by the employees during three stages ("pretest,posttest-1,posttest-2"); the results were different from each other in these stages; in the first stage, it was pretest (Mean=2.8700)(SD: 0.29861).and in the second stage posttest-1 (Mean=4.1000)(SD: 0.23936) and the last stage was posttest-2(Mean=4.0900)(SD: 0.25900). These results show that there are differences and changes in the three examinations after the intervention and giving the training program, and this means that the activity-related effect of the employees of the study group has increased, and this is a positive thing and means that the program is all influential in changing the lifestyle.Comparing the control study in the three stages (pretest Mean=2.8500)(SD: 0.29756), posttest-1 (Mean=2.8600)(SD: 0.29826), posttest-2 (Mean=2.8700)(SD: 0.28062), it was found that the results were very similar, and the official reason was that they were not participating in the program and lack of the of a sense of health improvement for them[22]. They researchers[23]indicated that the participants' increased emotion-related efficacy

positively affected overall health. Table(3) analyzes the correlation between the five studied concepts of the model. Firstly, the relationship is strong and positive between the benefits and self-efficacy (0.875)", and this indicates that the higher the self-efficacy leads to an increase in the perceived benefits and the relationship is not significant, as the p-value (0.000), which is less than (0.05). A study conducted by[24] supported that the greater the self-efficacy of the participants, the more detrimental the increase in the perceived benefits to them and in a positive direction.There is a direct and significant correlation between (Benefit) and (Social support) as a function of the value of the correlation coefficient, whose value appeared equal to (0.789), and this indicates that the higher the social support leads to an increase in the perceived benefits and the relationship is not significant, as the p-value (0.000) which is less than (0.05).A study conducted by[25] agreed with our study, as it indicated a strong relationship between increasing social support, which in turn leads to an increase in the perceived benefits of the people participating in the study. There is a direct and significant correlation between (benefit) and (activity related affect)"as a function of the value of the coefficient 2 The correlation whose value appeared equal to (0.843)", and this indicates that the higher the activity related affect leads to an increase in the perceived benefits and the relationship is not significant, as the p-value (0.000) which is less than (0.05). And that the benefits have a stronger influence than the self-efficacy dimension through the relative change test, so this was in a positive direction. A study conducted before[26,27] indicated that the greater the effect of the activity and the benefits, the greater the feeling of change, and the greater the perceived benefits among the people participating in the study. There is a direct correlation relationship, but it is significant between (Self-efficacy) and each of (Social support) and (activity-related affect) as a function of the value of the correlation coefficient whose value appeared equal to (0.781) and (0.878)", and this relationship is significant which p-value appeared equal to (0.000) and (0.000), respectively, which are less than (0.05). The reason for this positive relationship is because the employees started to be self-efficacy and have a relationship with friends and colleagues working inside the University. The study[28,29,30]. confirmed a strong correlation between self-efficacy, social support, and activity-related effectiveness. Social support and a sense of love for change increased, in turn, increased self-efficacy. There is a direct and significant correlation between (Social support) and (activity-related affect) as a function of the value of the correlation coefficient, whose value appeared equal to (0.717), and this relationship is significant, whose value appeared equal to (0.000), which is less from (0.05)[31,32]. The reason is that the greater the social support of the employees, the greater the feeling of change, improvement of health, and change of lifestyle for the better. A study conducted by[33]. indicated that social support plays an important role in healthy change, which generates in participants a love of change, leading to increased activity related to effectiveness[34,35].

Conclusions

The study concluded that the health intervention using the pander model's health promotion demonstrates the importance of hypertension prevention and has a positive impact on employees' perceptions of perceived benefits, self-efficacy, social support, and activity-related effect of unhealthy Hypertension advised employees to use their eating behavior through a healthy diet, physical activity, and other healthy behaviors to hypertension control to prevent.

Conflicts of Interest:

The author declares that there is no conflict of interest in this study.

Acknowledgment:

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