

Araştırma makalesi

Research article

The Effect of the Motivational Interviewing on the Lifestyle, Body Mass Index, Blood Pressure, Self-Efficacy Perception and Medication Adherence of Hypertensive Individuals



Funda ÖZPULAT¹, Oya Nuran EMİROĞLU²

ABSTRACT

Aim: This study aims to analyze the effect of motivational interviewing on the lifestyle, blood pressure, body mass index, self-efficacy perception, and medication adherence of hypertensive individuals.

Material and Methods: This study was conducted with hypertensive individuals between the ages of 25 and 45 registered in seven Family Health Centers in Akşehir, Konya. Inclusion in the present study was voluntary, and 80 people who agreed to participate were randomized into two groups as experimental and control groups. However, the present study was completed with 75 participants. Both groups were administered the pre-test, then the experimental group was visited for a total of 5 times: four visits at three-week intervals and one visit after one month. In each visit, a 30 to 45 minute individual motivational interviewing was carried out. The study was completed by administering the last-test to both groups. The study was conducted between February 6 and June 24, 2014, and the data were analyzed using the SPSS 17.0 package.

Results: Statistically significant differences were found between the pre-test and last-test scores of the experimental group in terms of Blood Pressure, Body Mass Index, the Medication Adherence Self-Efficacy Scale, and the General Self-Efficacy Scale.

Conclusion: Motivational interviewing can be used in ensuring healthy nutrition and regulation of exercise level and blood pressure of hypertensive individuals, and in increasing their self-efficacy and treatment adherence.

Keywords: Hypertensive individuals, lifestyle, medication adherence, motivational interviewing, self-efficacy

ÖZ

Motivasyonel Görüşmenin Hipertansif Bireylerin Yaşam Tarzı, Vücut Kitle İndeksi, Kan Basıncı, Özyeterlilik Algısı ve İlaç Tedavisi Uyumuna Etkisi

Amaç: Bu çalışmada, motivasyonel görüşmenin yaşam tarzı, kan basıncı, beden kitle indeksi, öz yeterlilik algısı ve hipertansif bireylerin ilaç uyumu üzerindeki etkisi incelenmiştir.

Gereç ve Yöntem: Bu çalışma, Konya Akşehir'de bulunan yedi Aile Sağlığı Merkezinde kayıtlı 25 ve 45 yaşları arasındaki hipertansif bireylerle yapılmıştır. Çalışmaya katılım isteğe bağlı tutulmuş ve katılmayı kabul eden 80 kişi randomize olarak deney ve kontrol gruplarına ayrılmıştır. Ancak çalışma 75 katılımıyla tamamlanmıştır. Her iki gruba ön test uygulanmış, sonra deney grubu üç haftalık aralıklarla dört ziyaret ve bir ay sonra bir ziyaret olarak toplam 5 kez ziyaret edilmiştir. Her ziyarette, 30 ila 45 dakikalık bireysel motivasyonel görüşme yapılmıştır. Çalışma, her iki gruba da son test uygulanarak tamamlanmıştır. Çalışma 6 Şubat - 24 Haziran 2014 tarihleri arasında gerçekleştirilmiş ve veriler SPSS 17.0 paketi kullanılarak analiz edilmiştir.

Bulgular: Deney grubunun ön test puanları ile son test puanları arasında; Kan Basıncı, Beden Kitle İndeksi, İlaç Tedavisine Uyum Öz Yeterlilik Ölçeği ve Genel Öz Yeterlilik Ölçeği açısından istatistiksel olarak anlamlı fark bulunmuştur.

Sonuç: Motivasyonel görüşme, hipertansif bireylerin sağlıklı beslenmesinin sağlanmasında, egzersiz seviyesi ve kan basıncının düzenlenmesinde, öz yeterliliğin ve tedavi uyumunun artırılmasında kullanılabilir.

Anahtar kelimeler: Hipertansif bireyler, yaşam tarzı, ilaç uyumu, motivasyonel görüşme, öz yeterlilik

¹PhD. Selcuk University Akşehir Kadir Yallagoz School of Health Department of Community Health Nursing Konya, Turkey E-mail:funda-ozpulat@hotmail.com, Tel: 0332 813 05 72, ORCID: 0000-0002-1789-6216

²Professor Hacettepe University Faculty of Nursing Department of Community Health Nursing Ankara, Turkey, E-mail: oyanuran@gmail.com, Tel: 0312 324 20 13, ORCID: 0000-0002-57225660

* The study was presented as a verbal presentation at the "4th World Conference on Health Sciences (H-SCI 2017)" on April 28-30, 2017.

Geliş Tarihi:09 Temmuz 2019 , Kabul Tarihi: 11 Mayıs 2020

Atıf/Citation: Ozpulat F. Emiroglu O.N. The Effect of the Motivational Interviewing on the Lifestyle, Body Mass Index, Blood Pressure, Self-Efficacy Perception and Medication Adherence of Hypertensive Individuals. Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi 2020; 7(2):149-160. DOI: 10.31125/hunhemsire.763174

INTRODUCTION

Hypertension is a significant health problem around the world due to its high prevalence and the fact that it increases the risk of cardiovascular disease and is a significant risk factor for coronary artery disease, stroke, chronic renal failure, congestive heart failure, and peripheral vascular diseases¹.

Effective management of blood pressure significantly reduces the prevalence of heart failure, heart attack and stroke. A 5 mmHg reduction in systolic blood pressure in the population has been estimated to result in a 14% overall reduction in mortality due to stroke, 9% reduction in mortality due to coronary heart disease, and a 7% reduction in all cause mortality². By applying antihypertensive treatment against hypertension, blood pressure can be contained, and strokes and deaths, resulting from increased blood pressure, can be reduced. However, despite all known advantages, the most challenging problem in the treatment of hypertension is the hypertensive individuals not complying with their treatments. Only a third of hypertensive patients establish and maintain blood pressure control. Medication adherence can be considered as an important behavioral contribution that eliminates inadequate blood pressure control and cardiovascular risks^{3,4}. Medication adherence is a concept that means taking prescribed medications as prescribed and using them regularly. Compliance with prescribed medications leads to better health outcomes, fewer visits to emergency rooms, a decline in hospitalizations, mortality rates, and healthcare costs⁵.

Various methods are used to control diseases and ensure effective disease management. One of these methods is health education. Individual or group health education sessions aim to make a permanent and desirable behavioral change. Individual behavioral changes can be successfully planned and implemented, considering the readiness and phase of change of the individuals, via the transtheoretical model and motivational interviewing. The motivational interviewing (MI) technique is defined as a counselee-oriented directive counseling that aims to solve ambivalence in order for the individual to make a behavioral change⁶. The theoretical underpinnings of MI include cognitive dissonance theory, self-perception theory, and self-efficacy theory. These theories entail assessing an individual's attitudes, experiences for their influence on behavioral change. Several MI principles focus on compassion, support self-competence, and advance acceptance to the opposition and take lessons from the conflict of present actions and personal objectives⁷.

Nurses are healthcare personnel with duties and responsibilities in chronic disease management. Due to low patient morale, motivating them is also an important task that falls on nurses and motivational interviewing method can be used as a helpful tool for nurses, in their quest to boost patient morale⁷. They can use motivational interviewing effectively in increasing patients' self-efficacy, ensuring treatment adherence, regulating blood pressure, enabling disease management, and making changes in

patients' lifestyle. In a study conducted by Chlebowy *et al.* (2016), motivational interviewing method was found useful in the experimental group with Type 2 diabetes, the group was selected from the 62 individuals who were chosen randomly for the study, while the physical activity levels of these individuals had increased, their glucose levels and body mass index (BMI) had decreased compared to usual methods⁸. In a controlled study conducted by Masterson *et al.* (2016), motivational interviewing method was tried with patients over 90 days, which exceeded the period of usual care, who had chronic heart failures and a substantial and clinically important improvement was seen in patients who received the motivational interviewing⁹. Similarly, the motivational interviewing technique was used by nurses in other studies as an effective and successful method^{10,11,12}. However, no studies were found on the effect of motivational interviewing on hypertensive individuals' lifestyle, self-efficacy perception and medication adherence together, either in Turkey or anywhere else, although the acquisition of a healthy lifestyle, a high self-efficacy level, and ensuring medication adherence is very important in hypertension.

This study was planned considering the deficiencies in the studies on this subject conducted in Turkey and in the rest of the world, using the home visit technique, which is known to be highly effective in public health nursing, to analyze the effect of motivational interviewing on hypertensive individuals'

Research Questions

-Is the motivational interviewing method effective in increasing the scores of hypertensive Individuals' medication adherence?

-Is the motivational interviewing method effective in increasing hypertensive Individuals' General Self-Efficacy Scale scores?

-Is the motivational interviewing method effective in reducing of hypertensive Individuals' systolic and diastolic blood pressure?

-Is the motivational interviewing method effective in reducing of hypertensive Individuals' BMI measures?

-Is the motivational interviewing method effective in increasing the hypertensive Individuals' lifestyle?

MATERIAL and METHODS

Design and Sample

This experimental study aimed to analyze the effect of motivational interviewing on the individuals' lifestyle, blood pressure, BMI, self-efficacy perception and medication adherence. The study was conducted with hypertensive individuals between the ages of 25 and 45, registered in the Family Health Centers in Akşehir, Konya, Turkey. There are seven family health centers in Akşehir center. Within the scope of the study records of these seven family health centers were examined. While 350 individuals in the 25- 45 age range appear to use at least an antihypertensive, 150 individuals could not be included in the research for one of the following reasons: when their addresses were visited it was discovered that several individuals had

antihypertensives prescribed for their elders, the addresses provided were wrong, or the individuals have relocated from their addresses. An additional 90 individuals were excluded from the study as a result of either stating they used their medications regularly and correctly or refusing to participate in the study. The inclusion criteria were being literate, being between the ages of 25 and 45, being able to communicate, not diagnosed with cancer, living within the borders of Akşehir, and volunteering to participate in the study. Eighty individuals who met the inclusion criteria were randomized into two groups as experimental and control groups. However, the study was completed with 75 participants, (37 in the experimental group and 38 in the control group), since three participants from the experimental group and two from the control group left the study. The study was conducted between February 6 and June 24, 2014 (Figure 1).

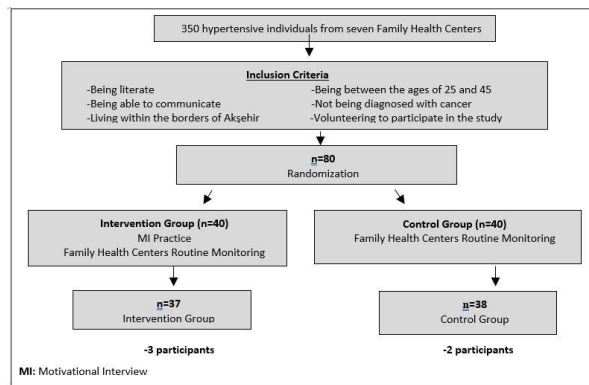


Figure 1. Flow Chart of the Study

Data Collection

The data were collected using the Hypertensive Individuals Monitoring Form developed by authors, the General Self-Efficacy Scale, the Medication Adherence Self-Efficacy Scale (MASS), the Motivational Interviewing Phase of Change Assessment Form, and the Treatment Adherence Assessment Form. The first section of the Hypertensive Individuals Monitoring Form includes eight questions on the participants' gender, year of birth, marital status, education level, occupation, family type, regular monthly income status, and social security. The second section includes forms created to monitor the hypertensive individuals' nutrition and exercise, BMIs and blood pressure values. The Motivational Interviewing Phase of Change Assessment Form was prepared by the authors to identify which motivational interviewing phase of change the participant had reached. Another form prepared by the authors is the Treatment Adherence Assessment Form, which has two subscales to determine the level of medication adherence and the individuals' self-confidence in their medication. For these subscales, participants were asked to select a number between 0 and 10.

MASS was developed by Ogedegbe *et al.* in 2003 to assess the self-efficacy of individuals with high-risk hypertension receiving antihypertensive treatment in terms of their

medication adherence. This scale consists of 26 statements, and individuals' agreement with these statements shows their self-efficacy level. The total score of the scale is between 26 and 78. The Cronbach's alpha coefficient of the original scale was found to be 0.95. A higher score shows a better antihypertensive medication adherence¹³. The scale was adapted to the Turkish language by Gözüm and Hacıhasanoğlu in 2009 with 140 hypertensive patients. They found the Cronbach's alpha coefficient of the scale to be 0.93. The scale with 26 items tested by Gözüm and Hacıhasanoğlu (2009) for validity and reliability in Turkish was used in the present study¹⁴.

The original General Self-Efficacy Scale with 23 items was developed by Sherer *et al.* in 1982. The original scale was a 4-point scale, but then it was converted to a five-point Likert type scale^{15,16}. The General Self-Efficacy Scale was adapted to Turkish by Gözüm and Aksayan in 1999 and its Cronbach's alpha internal consistency coefficient was found to be 0.81. Its test-retest reliability was found to be 0.92. The minimum and maximum scores of this 23-item scale are 23 and 115, respectively¹⁷. The Turkish version of the scale was finally tested by Yıldırım and İlhan (2010) for validity and reliability, and its Cronbach's alpha coefficient was found to be 0.80. This final scale has 17 items which are scored as "Not at all (1)" and "Very well (5)." The 2nd, 4th, 5th, 6th, 7th, 10th, 11th, 12th, 14th, 16th and 17th items are reversely scored. The total score of the scale ranges between 17 and 85. A high score shows a high self-efficacy belief¹⁸. The scale with 17 items tested by Yıldırım and İlhan (2010) for validity and reliability in Turkish was used in the present study.

Intervention

The intervention was carried out by the first author, a specialist public health nurse who acquired motivational interviewing skills by attending the two-stage Motivational Interviewing Technique course between December 13, 2013 and January 17, 2014. During the intervention, 80 participants were visited at their homes between February 6 and 13, 2014, and administered the Hypertensive Individuals Monitoring Form, the General Self-Efficacy Scale, the Medication Adherence Self-Efficacy Scale, the Motivational Interviewing Phase of Change Assessment Form, and the Treatment Adherence Assessment Form. Each form was filled out in 15 to 30 minutes on average. In addition, blood pressure of all participants were measured, their height and weight were measured to calculate and record their BMI. Two visits were made to the control group, at the beginning and end of the study. The experimental group was also administered the Motivational Interviewing Phase of Change Assessment Form and the Treatment Adherence Assessment Form, and their blood pressure was measured in each visit. The guidebook, "**High Blood Pressure Management**", developed for hypertensive patients, and time-adjusted drug containers were also distributed to the experimental group with the necessary explanations. **In the first home visit:** the participants were asked to identify the importance of a normal-level tension, the complications that can occur due to hypertension and the importance of treatment, and to express the benefits and harms perceived about medication. They were also

asked to fill out the forms on the causes of medication non-adherence before the next interviewing to review their benefit-harm relationship regarding medication, and to consider these causes. In addition, they were asked to note what they would gain when they completely and correctly adhered to their medication. **In the second home visit:** the patients were asked to specify the causes of non-adherence to their medication in their homework from the first visit to ensure that they recognized their non-adherence. They were also asked to explain what they would gain if they completely and correctly adhered to medication as in the homework given in the first visit. The individuals were asked to keep a diary and record their hypertension disease, opinions on the medication applied and the blood pressure measurement results in this diary. The patients were informed about methods that would facilitate their adherence to medication and asked to evaluate these methods. **In the third home visit:** the diaries given as homework in the second visit were reviewed with the patients. The methods that facilitate adherence to medication were also reviewed with the patients, and they were asked to decide the most appropriate methods for them. The sources of support that may help the patients in adhering to their medication and how they could use them were determined, and the day they would start their medication was decided. **In the fourth home visit:** the blood pressure measurements were assessed with the patients, and the hypertensive individuals who started to adhere to medication were supported. The patients were asked to more effectively use the sources of social support that they had determined. They were also asked to reward themselves for using their medicines correctly and regularly, and to write what they thought they had gained due to correctly and regularly continuing their medication, along with their feelings. **In the fifth home visit:** the homework given in the previous visit and the continuation of adherence to medication were assessed with the patients. The reasons for inability to maintain adherence to their medication were discussed with the patients who could not maintain adherence, the points at which these patients were unsuccessful were determined, and the patients were motivated to try again to adhere to their medication. The whole experiment was assessed with the patients and the interviewing was ended. Final home visits were carried out between June 10 and 24, 2014 simultaneously with the experimental and control groups, and the 75 participants who completed the study were administered the Hypertensive Individuals Monitoring Form, the General Self-Efficacy Scale, the Medication Adherence Self-Efficacy Scale, the Motivational Interviewing Phase of Change Assessment Form, and the Treatment Adherence Assessment Form. Each form was filled out in 15 to 30 minutes on average. In addition, these 75 participants' height and weight were measured to calculate and record their BMI.

Data Analysis

The independent variable of this study was the motivational interviewing, and the dependent variables were systolic and diastolic blood pressure, BMI, self-efficacy perception and medication adherence. The Wilcoxon Paired Samples Test

was used to compare the first and last assessment scores on the MASS and the General Self-Efficacy Scale and blood pressure measurements; and the Dependent Samples T Test was used to compare the first and last BMI measurements. In addition, experimental and control groups were compared using Mann Whitney U Test and Independent Sample t-Test.

Ethical Consideration

The study was conducted after the written permissions were obtained from Akşehir District Public Health Directorate and Konya Provincial Directorate of Public Health, and from the Ethics Committee of Faculty of Medicine (08.11.2013-GO 13/551). In addition, two copies of written consent were obtained from each of the hypertensive individuals who agreed to participate in this study, and one of these copies was given to the participants.

Limitations of the Study

The results were generalized to a limited number of hypertensive individuals and large samples could not be reached.

RESULTS

Facts Related to Socio-Demographic Features of Hypertensive Individuals

The ages of the hypertensive individuals who participated in the study changes between 25 and 45. The median age of the experimental group is 44, while 43.5 is the median age of the control group. 83.8% of the participants are women, while 75.7% are married. While 67.6% of the experimental group and 84.2% of the control group are primary school graduates, there are a total of 4 college graduate individuals. The majority of the families (**Experimental:** 86.5%, **Control:** 97.4%) have a nuclear family type (Table 1).

Table 1. The Socio-demographic Characteristics of the Participants (n=75)

	Experimental Group			Control Group		
	Min	Max	Me dian	Min	Max	Me dian
Age	30.0	45.0	44.0	25.0	45.0	43.5
Gender	Experimental Group		Control Group			
	n	%	n	%		
Female	31	83.8	34	89.5		
Male	6	16.2	4	10.5		
Marital Status						
Single	9	24.3	3	7.9		
Married	28	75.7	35	92.1		
Education Level						
Literate	5	13.5	1	2.6		
Primary School	25	67.6	32	84.2		
Secondary School	-	-	2	5.3		
High School	5	13.5	1	2.6		
University	2	5.4	2	5.3		

Table 1. The Socio-demographic Characteristics of the Participants (n=75) (continued)

Occupation				
Unemployed	32	86.5	33	86.8
Civil Servant	2	5.4	-	-
Self-Employment	3	8.1	3	7.9
Worker	-	-	2	5.3
Family Type				
Nuclear Family	32	86.5	37	97.4
Extended Family	5	13.5	1	2.6
Regular Income				
I have an income	23	62.2	23	60.5
I don't have an income	14	37.8	15	39.5
Social Security				
Yes	34	91.9	38	100
No	3	8.1	-	-
Total	37	100	38	100

Facts Related to the Features of Intervention Group and Control Group

In Table 2, the comparison of the features of experimental and control groups before and after the intervention can be found. While no difference was monitored between the experimental and control groups in terms of General Self-Efficacy Scale scores at the beginning of the study, a statistically significant difference between the groups after the motivational interviewing was discovered (p=.000). Similarly, before the intervention, experimental and control groups showed similar features in terms of the MASS scores. Following the motivational interviewing being applied to the experimental group, there was a change of scores between the groups and as a result, a statistically significant difference was found between the experimental and control groups (p=.000).

Table 2. The Comparison of the Features of Experimental Group and Control Group (n=75)

	Experimental Group		Control Group		Z	p*
	Min-Max	Median	Min-Max	Median		
General Self-Efficacy Scale						
First Assessment	39.00-80.00	57.00	42.00-82.00	63.50	-1.728	.084
Last Assessment	47.00-85.00	75.00	45.00-78.00	64.50	-4.767	.000
Medication Adherence Self-Efficacy Scale (MASS)						
First Assessment	26.00-71.00	60.00	26.00-74.00	65.50	-2.593	.010
Last Assessment	59.00-77.00	72.00	26.00-75.00	65.00	-5.023	.000

Table 2. The Comparison of the Features of Experimental Group and Control Group (n=75) (continued)

	Experimental Group		Control Group		Z	p*
	Min-Max	Median	Min-Max	Median		
Systolic Blood Pressure (SBP)						
First Assessment	120.00-180.00	150.00	120.00-180.00	140.00	-1.265	.206
Last Assessment	110.00-160.00	130.00	110.00-180.00	140.00	-4.476	.000
Diastolic Blood Pressure (DBP)						
First Assessment	80.00-130.00	90.00	70.00-130.00	90.00	-1.161	.246
Last Assessment	70.00-110.00	80.00	70.00-110.00	90.00	-3.862	.000
Body Mass Index (BMI)	\bar{x}	Std. Error	\bar{x}	Std. Error	t	p**
First Assessment	33.23	.93	32.35	.89	718	.475
Last Assessment	33.08	1.00	33.00	.91	.060	.952

*Mann-Whitney U Test was used

** t test was used in the independent groups.

Facts Related to the Impact of Motivational Interviewing On the Sense of Self-Efficacy and Medication Adherence On the Hypertensive Individuals

The General Self-Efficacy Scale mean scores were found to rise from 57.00 to 75.00 in the experimental group, and from 63.50 to 64.50 in the control group, when their first and last scores were compared. A statistically significant difference was found between the first and last scores on the General Self-Efficacy Scale of the experimental group (p=.000). No statistically significant difference was found between the first and last scores of the control group on the same scale (p=.387) in Table 3.

The MASS mean scores were found to rise from 60.00 to 72.00 in the experimental group, and from 65.50 to 65.00 in the control group, when their first and last scores were compared (Table 3). In the present study, it was found that the MASS scores of the experimental group increased after the motivational interviewing (p=.000). On the other hand, no statistically significant difference was found in the first and last scores of the control group (p=.466) in Table 3.

Facts Related to the Impact of Motivational Interviewing On Lifestyle of the Hypertensive Individuals

The characteristics of the diets and exercise regimes of the hypertensive individuals in the experimental group can be found in Figure 2.

Table 3 Comparison of the First and Last Scores of the General Self-Efficacy Scale and the Medication Adherence Self-Efficacy Scale (n=75)

General Self-Efficacy Scale	Experimental Group		Control Group	
	Min-Max	Median	Min-Max	Median
First Assessment	39.00-80.00	57.00	42.00-82.00	63.50
Last Assessment	47.00-85.00	75.00	45.00-78.00	64.50
Statistical test	Z	p*	Z	p*
	-5.069	.000	-.865	.387
MASS	Min-Max	Median	Min-Max	Median
First Assessment	26.00-71.00	60.00	26.00-74.00	65.50
Last Assessment	59.00-77.00	72.00	26.00-75.00	65.00
Statistical test	Z	p*	Z	p*
	-5.239	.000	-.730	.466

*The Wilcoxon paired samples test was used.

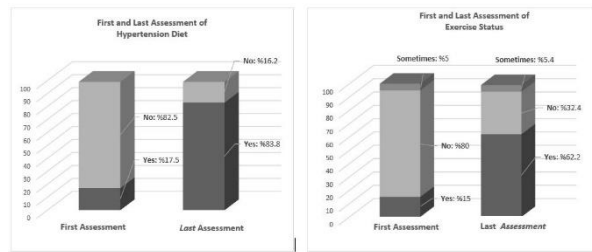


Figure 2. Diet and Exercising State of Hypertensive Individuals in the Experimental Group

While, at the beginning of the study, 17.5% of the hypertensive individuals had diet plans for their hypertension, this rate increased to 83.8% following the intervention. Similarly, the rate of those who said that they exercised after the motivational interviewing increased from 15% to 62.2%, however, there was no significant difference in the rate of those who stated that they were sometimes exercising.

The low-salt nutrition rate rose from 16.2% to 86.5% in the experimental group, and from 11 participants to 14 participants in the control group (Table 4). Of the experimental and control groups, 25.3% and 24.8% frequently consumed white meat, respectively. In the experimental group, the rate of those frequently consumed white meat rose to 32.4%, the consumption rate of vegetables and fruits rose to 32.4%, and none of the participants were frequently consuming fatty foods such as fries (Table 4). In the experimental group, the rate of those going on a specific diet program for hypertension rose from 13.5% to 83.8%, and the rate of those not going on any diet fell from 86.5% to 16.2%. No significant change was observed in the control group (Table 4).

The rate of exercising rose from 16.2% to 62.2% in the experimental group (Table 4). The number of those walking at a slow pace rose from 7 to 20, and those exercising three, four, and five times a week rose from 3 to 11, 0 to 2, and 0 to 6, respectively (Table 4). Four participants were found to exercise every day. While the number of participants

exercising for 5, 15, 20, 45 and 60 minutes was 1 for each, the number of those exercising for 30 minutes increased to 9 participants, for 45 minutes increased to 7 participants, and for 60 minutes increased to 6 participants at the end of the study (Table 4).

Facts Related to the Impact of Motivational Interviewing On Blood Pressure Readings of the Hypertensive Individuals

While the mean systolic blood pressure value of the experimental group was found to reduce from 150.00 mmHg to 130.00 mmHg, the mean systolic blood pressure value of the control group was observed to remain at 140.00 mmHg. While the mean diastolic blood pressure value of the control group was observed to remain at 90.00 mmHg, the mean diastolic blood pressure value of the experimental group was found to reduce from 90.00 mmHg to 80.00 mmHg (Table 5 and Figure 3).

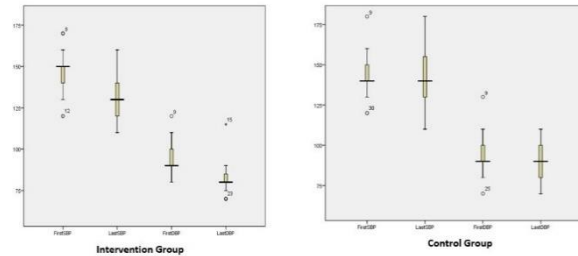


Figure 3. Blood Pressure of Hypertensive Individuals

In the present study, while no statistically significant difference was found between the blood pressure measurements of the control group after statistical comparisons (SBP: p= .823, DBP: p=.085), the systolic and diastolic blood pressures of the experimental group were found to have reduced and significant differences were found between the measurements (SBP: p= .000, DBP: p=.000) in Table 5.

Facts Related to the Impact of Motivational Interviewing On the Body Mass Index of the Hypertensive Individuals

The BMI of experimental and control groups can be found in Figure 4. In the present study, the mean of the experimental group BMI was 33.23 ± .93, and the mean of the control group BMI was 32.35 ± .89. According to the results of the last evaluation; the mean BMI of the hypertensives in the experimental group was 33.08 ± 1.00, and the mean BMI of the hypertensives in the control group was 33.00 ± .91. As a result of the statistical analyses, it was found there was a statistically significant difference between the first and last evaluation results of the experimental (p=.030) and control group (p=.000) BMI values.

DISCUSSION

The Effect of Motivational Interviewing on Hypertensive Individuals' Self-Efficacy Perception

This experimental study was conducted with hypertensive individuals between the ages of 25 and 45 and completed with 75 participants (37 in the experimental group and 38 in the control group) to analyze the effect of motivational

interviewing on hypertensive individuals' lifestyle, blood pressure, BMI, self-efficacy perception and medication adherence. A statistically significant difference was found between the first and last scores on the General Self-Efficacy Scale of the experimental group ($p=.000$). No statistically significant difference was found between the first and last scores of the control group on the same scale ($p=.387$). The self-efficacy level of the hypertensive individuals was observed to increase after the motivational interviewing. Similarly, the experimental study of Meybodia *et al.* (2011) conducted with 30 overweight and obese women, and found that the motivational interviewing technique was effective in increasing the self-efficacy of individuals¹⁹. In the 6th month of a study conducted by Chahal *et al.* (2017), by making a qualitative and quantitative evaluation of 32 adolescents and their families, it was discovered that the BMI, waist circumference, cholesterol, and triglyceride levels had decreased and it was reported that all these positive changes affected the level of self-efficacy²⁰. In a study conducted by Kang and Gu (2015) with 42 elderly diabetes mellitus patients, it was stated that the experimental group significantly improved their self-efficacy and self-management levels compared to the control group and that motivational interviewing could be used as a nursing intervention for elderly patients with diabetes mellitus¹¹.

A high level of self-efficacy is considerably impactful on increasing the tenacity, enthusiasm, and motivation of the individuals. Individuals with low levels of self-efficacy can overestimate issues and believe those issues are harder than they really are in real life. Motivational interviewing being an effective method in creating a permanent behavior change according to the stages of change, and in a short time, shows that it can be used successfully in increasing the level of self-efficacy. In the present study we conducted, similar to the three other studies we analyzed, motivational interviewing was discovered to be rather impactful on self-efficacy levels. By applying motivational interviewing to hypertensive individuals the increase of their self-efficacy levels could be ensured. Thus, all aspects of their lives, medication adherence, and prevention of complications that may arise, in particular, can be affected positively.

The Effect of Motivational Interviewing on Hypertensive Individuals' Medication Adherence

In the present study, it was found that the MASS scores of the experimental group increased after the motivational interviewing ($p=.000$). On the other hand, no statistically significant difference was found in the first and last scores of the control group ($p=.466$). Ma *et al.* (2014) conducted an experimental study with 120 hypertensive individuals and found that the motivational interviewing is as much effective in increasing medication and diet adherence as creating a statistical difference between the experimental and control groups²¹. Foster *et al.* (2013) observed in their experimental study on 220 hypertensive individuals that the treatment adherence of the experimental groups distinctly increased and their blood pressure significantly reduced²². In a study conducted by Barker *et al.* (2015) with 386

patients with stroke, the motivational interviewing was reported to be effective in increasing medication adherence at the 6th month²³, and as a result of the study conducted by Lin *et al.* (2017) with 288 patients with coronary artery bypass surgery, it was concluded that motivational interviewing could be used effectively to achieve medication adherence within a multi-faceted intervention²⁴. Similarly, some studies suggest motivational interviewing can be used as an effective method to ensure medication adherence in different age groups and different health problems²⁵⁻²⁸.

Ensuring medication adherence is very important for hypertensive individuals to maintain a healthy life and increase their quality of life. In all of the analyzed studies, including the conducted study, motivational interviewing was found to have positively contributed to medication adherence and regulation of blood pressure, as well as achieving positive results. Motivational interviewing being used as an effective method in creating behavior change in resistant patients and it frequently facing difficulties in maintaining medication adherence in hypertension demonstrate that motivational interviewing can also be used as an effective method in ensuring the medication adherence of hypertensive individuals in the future studies.

The Effect of Motivational Interviewing on Hypertensive Individuals' Lifestyle

The low-salt nutrition rate rose from 16.2% to 86.5% in the experimental group after the motivational interviewing. Of the experimental and control groups, 25.3% and 24.8% frequently consumed white meat, respectively. In the experimental group, the rate of those frequently consuming white meat rose to 32.4%, and those following a diet program specific to hypertension rose from 13.5% to 83.8% after the motivational interviewing. Similarly, in the study Mirkarimi *et al.* (2017) conducted with 100 overweight and obese women who applied to a nutrition clinic, the motivational interviewing was found to be effective in improving the features of their lifestyles in a positive way²⁹. Within the scope of the study conducted by Döbler *et al.* (2018) with 249 Type 2 diabetes patients in a rehabilitation center, 12 months telephone follow-up support was provided to the experimental group, and the health status of the experimental group improved, the level of physical activity increased and the cardiovascular risk decreased³⁰. In the semi-experimental study conducted by Sobhani *et al.* (2017) with 30 obese patients, by applying motivational interviewing, eating behaviors of the patients, their fluid intake, vitamin and mineral supplement intake, fruit, vegetable, whole grain, and protein intake had increased³¹. In the study conducted by Chahal *et al.* (2017) by making a qualitative and quantitative evaluation of 32 adolescents and their families, it was reported that the consumption of fruit and vegetables increased and the screen time decreased²⁰, in a study conducted by do Valle Nascimento *et al.* (2017) with 57 diabetic patients whose HbA1cs > 7% in a 6 month period by applying regular monthly visits, it was observed that physical activity, fruit and vegetable consumption, and medication adherence had increased³².

Table 4. Nutrition and Exercise of Hypertensive Individuals (n=75)

	Experimental Group				Contol Group			
	First Assesment		Last Assesment		First Assesment		Last Assesment	
Habit of Using Salt	n	%	n	%	n	%	n	%
Normal	26	70.3	4	10.8	24	63.2	20	52.6
Very salty	5	13.5	1	2.7	3	7.9	4	10.5
Low salt	6	16.2	32	86.5	11	28.9	14	36.8
Total	37	100	37	100	38	100	38	100
The Frequently Consumed Foods*								
Red meat	12	10.8	3	2.7	8	7.1	8	7.0
White meat	28	25.3	36	32.4	28	24.8	27	23.7
Vegetable protein	15	13.5	34	30.6	20	17.7	22	19.3
Carbohydrate	17	15.3	2	1.9	21	18.6	20	17.5
Fat (Fries)	9	8.1	-	-	2	1.7	2	1.8
Vegetables and fruits	30	27.0	36	32.4	34	30.1	35	30.7
Total	111	100.0	111	100.0	113	100.0	114	100.0
Exercise Type								
Slow-pace walking	7	87.5	20	80.0	5	62.5	6	75.0
Fast-pace walking	1	12.5	5	20.0	2	25.0	1	12.5
Football	-	-	-	-	1	12.5	1	12.5
Total	8	100.0	25	100.0	8	100.0	8	100.0
The Frequency of Exercise								
Once a week	1	12.5	1	4.0	2	25.0	4	50.0
Twice a week	-	-	1	4.0	-	-	-	-
Three times a week	3	37.5	11	44.0	1	12.5	-	-
Four times a week	-	-	2	8.0	1	12.5	1	12.5
Five times a week	-	-	6	24.0	-	-	-	-
Every day	4	50.0	4	16.0	4	50.0	3	37.5
Total	8	100.0	25	100.0	8	100.0	8	100.0
The Duration of Exercise								
5 minutes	1	12.5	-	-	-	-	-	-
15 minutes	1	12.5	-	-	1	12.5	1	12.5
20 minutes	1	12.5	3	12.0	2	25.0	1	12.5
30 minutes	3	37.5	9	36.0	2	25.0	3	37.5
45 minutes	1	12.5	7	28.0	-	-	3	37.5
60 minutes	1	12.5	6	24.0	3	37.5	-	-
Total	8	100.0	25	100.0	8	100.0	8	100.0

*The participants were asked to specify their first three choice.

Table 5. Comparison of the Results of the First and Last Evaluation Results of Blood Pressure of Hypertensive Individuals (n=75)

	Blood Pressure	First Assessment		Last Assessment		Z	p*
		Min-Max	Median	Min-Max	Median		
Experimental Group	SBP	120.00-180.00	150.00	110.00-160.00	130.00	-5.066	.000
	DBP	80.00-130.00	90.00	70.00-110.00	80.00	-4.802	.000
Control Group		First Assessment		Last Assessment			
	Blood Pressure	Min-Max	Median	Min-Max	Median	Z	p*
	SBP	120.00-180.00	140.00	110.00-180.00	140.00	-.223	.823
	DBP	70.00-130.00	90.00	70.00-110.00	90.00	-1.723	.085

*Wilcoxon Paired Simple Test was used.

Nowadays, pursuing a healthy and long life has become an important topic that gets more attention with each passing day. In order to achieve that, positive behaviors of healthy lifestyles should be implemented, and this change should be permanent. Motivational interviewing being an effective way of creating and maintaining healthy lifestyle behaviors and it possibly being used as a successful method for creating lifestyle changes in hypertensive individuals can be seen in the present study conducted as well as the other three studies analyzed. Considering the results of the present study, while creating lifestyle changes, the effective use of motivational interviewing can be increased, especially in hypertensive individuals.

The Effect of Motivational Interviewing on Hypertensive Individuals' Body Mass Index

In the present study a statistically significant relationship was found between the BMI values of the experimental ($p=.030$) and control group ($p=.000$). Similar to the study we conducted, in a study conducted by Chlebowski *et al.* (2015) with 62 African-Americans who had diabetes, the level of physical activity and BMI of the group that was applied the motivational interviewing method had seen a significant improvement³³. While in the study conducted by Freira *et al.* (2018) that performed a school-based motivational interviewing on 83 overweight adolescents, the group that the motivational interviewing was applied saw a significant improvement in all anthropometric scores in the 6th month³⁴, in the study conducted by Celano *et al.* (2018) with 12 participants who had type 2 diabetes, it was observed that the motivational interviewing had a moderate effect on the BMI³⁵. Similarly, many studies are showing the positive effect of motivational interviewing on BMI³⁶⁻³⁸.

Obesity and a high BMI value can bring along several health problems, and it is known that one of the most important ones is hypertension. However, as a result of weight loss and weight maintenance being perceived as a tough period often, some attempts culminate in failure. All of the analyzed studies, including the one conducted, indicate motivational interviewing being used as an effective method in ensuring weight loss and weight maintenance. Because motivational interviewing is known to be effective while reducing and overcoming resistance, forming and maintaining a will to succeed in an individual, and achieving long term and permanent results, it can also be thought as a method that may be used while ensuring the weight control of hypertensive individuals and its use can be widened.

The Effect of Motivational Interviewing on Hypertensive Individuals' Blood Pressure

In the present study, while no statistically significant difference was found between the blood pressure measurements of the control group after statistical comparisons (**SBP**: $p= .823$, **DBP**: $p=.085$), the systolic and diastolic blood pressures of the experimental group were found to have reduced and significant differences were found between the measurements (**SBP**: $p= .000$, **DBP**: $p=.000$). Sjöling *et al.* (2011) applied a 15-month experimental to 31 patients with mild to moderate hypertension in their pilot studies. Statistically significant

improvements were observed in systolic and diastolic blood pressure at the end of this study³⁹. In a study conducted by Mohamadian *et al.* (2019) with 120 hypertensive participants over the age of 60, a decreased in the blood pressures of the patients and an increase in their self-efficacy levels were observed⁴⁰. In the study conducted by Mirkarimi *et al.* (2015) with 14 hypertensive individuals, on the other hand, the systolic blood pressures and diastolic blood pressures of the motivational group significantly decreased after 6 months, and it was concluded that motivational interviewing could be used as an effective method in medication adherence and to control the recovery and progress of blood pressure in patients with hypertension⁴¹.

Regulation of blood pressure can eliminate several health risks, including strokes, in hypertensive individuals. However, regulation of the blood pressure can be exhausting in hypertensive individuals. At this point, a method with proven success and efficiency becomes necessary. The discoveries attained at the end of the study conducted, in line with the literature information, show that motivational interviewing can be used as an effective intervention method in ensuring the BMI controls of the individuals. With the application of motivational interviewing, weight control of the hypertensive individuals can be ensured, and contributions to keeping blood pressure rate at normal levels can be made.

CONCLUSION and RECOMMENDATIONS

In conclusion, motivational interviewing can be used in the acquisition of a healthy nutrition habit by hypertensive individuals, the increase in their exercise levels, regulation of blood pressure, and in increasing their self-efficacy level and treatment adherence. The patients' treatment adherence can be increased by carrying out a motivational interviewing while preparing discharge plans for them. Motivational interviewing can be used to monitor patients with chronic diseases in primary health services by training the nurses working in Family Health Centers on the motivational interviewing method, and then its results can be analyzed.

Ethics Committee Approval: Approval was obtained from Non-interventional Scientific Research Ethics Committee of Hacettepe University (08.11.2013-GO 13/551).

Conflict of Interest: Not reported.

Funding: This study was supported by Hacettepe University Scientific Research Projects Coordination Unit.

Exhibitor Consent: Informed consent was obtained from hypertensive individuals.

Author contributions:

Study design: FÖ, ONE

Data collection and analyses: FÖ, ONE

Drafting manuscript: FÖ, ONE

Acknowledgments: The authors express their appreciation to Professor Setenay Kevser Dişer Öner for statistical support and all the participants for in the study.

Etik Kurul Onayı: Hacettepe Üniversitesi Girişimsel Olmayan Bilimsel Araştırmalar Etik Kurulu'ndan alınmıştır (08.11.2013-GO 13/551).

Çıkar Çatışması: Bildirilmemiştir.

Finansal Destek: Bu çalışma Hacettepe Üniversitesi Bilimsel Araştırma Projeleri Koordinasyon Birimi tarafından desteklenmiştir.

Katılımcı Onamı: Hipertansif bireylerden bilgilendirilmiş onam alınmıştır.

Yazar katkıları:

Çalışma tasarımı: FÖ, ONE

Veri toplama ve/veya analizi: FÖ, ONE

Makalenin hazırlanması: FÖ, ONE

Teşekkür

Yazarlar, istatistiksel desteği için Profesör Setenay Kevser Dinçer Öner'e ve çalışmadaki tüm katılımcılara teşekkürlerini sunar.

REFERENCES

1. Singh S, Shankar R, Singh GP. Prevalence and associated risk factors of hypertension: a cross-sectional study in urban Varanasi. *Int J Hypertens*. 2017;2017:5491838.
2. Dinesh N, McLachlan CS, Mishra SR, Olsen MH, Perry HB, Karki A, et al. Effectiveness of a lifestyle intervention led by female community health volunteers versus usual care in blood pressure reduction (COBIN): an open-label, cluster-randomised trial. *Lancet Glob Health*. 2018;6:66–73.
3. Durand H, Hayes P, Morrissey EC, Newell J, Casey M, Murphy AW, et al. Medication adherence among patients with apparent treatment-resistant hypertension: systematic review and meta-analysis. *J Hypertens*. 2017;35(12):2346-57.
4. Silveira LCJ, Aliti GB, Da Silva EM, Pimentel RP, Gus M, Rabelo-Silva ER. Effect of motivational interviewing in hypertensive patients (MidNIGHT): study protocol for a randomized controlled trial. *Trials*. 2019;20(1):414.
5. Piercefield EW, Howard ME, Robinson MH, Kirk CE, Ragan AP, Reese SD. Antihypertensive medication adherence and blood pressure control among central Alabama veterans. *J Clin Hypertens (Greenwich)*. 2017;19(5):543-9.
6. Miller WR, Rollnick S. Motivasyonel interviewing. (Karadağ F, Ögel K, Özcan A.E. eds), HYB Printed Publications. Ankara;2009.
7. Carr DD. Motivational interviewing supports patient centered-care and communication. *JNY State Nurses Assoc*. 2016;45(1):39-43.
8. Chlebowy DO, El-Mallakh P, Myers J, Kubiak N, Cloud R, Wall MP. Motivational interviewing to improve diabetes outcomes in African Americans adults with diabetes. *West J Nurs Res*. 2015;37(5):566-80.
9. Masterson Creber R, Patey M, Lee CS, Kuan A, Jurgens C, Riegel B. Motivational interviewing to improve self-care for patients with chronic heart failure: MITI-HF randomized controlled trial. *Patient Educ Couns*. 2016;99(2):256-64.
10. Hosseini N, Mokhtari S, Momeni E, Vossoughi M, Berekatian M. Effect of motivational interviewing on quality of life in patients with epilepsy. *Epilepsy Behav*. 2016;55:70-4.
11. Kang HY, Gu MO. Development and effects of a motivational interviewing self-management program for elderly patients with diabetes mellitus. *J Korean Acad Nurs*. 2015 Aug;45(4):533-43.
12. Borji M, Taghinejad H, Salimi AH. The effect of motivational interviewing on fatigue in patients with multiple sclerosis. *Arch Neurosci*. 2018;5(3):e63436.
13. Ogedegbe G, Mancuso CA, Allegante JP, Charlson ME. Development and evaluation of a medication adherence self-efficacy scale in hypertensive African-American patients. *J Clin Epidemiol*. 2003;56:520–9.
14. Gözüm S, Hacıhasanoğlu R. Reliability and validity of the Turkish adaptation of medication adherence self-efficacy scale in hypertensive patients. *Eur J Cardiovasc Nurs*. 2009;8:129–36.
15. Sherer M, Maddux JE, Mercandante B, Prentice-dunn S, Jacobs B, Rogers RW. The self-efficacy scale: construction and validation. *Psychological Reports*. 1982;51:663–71.
16. Sherer M, Adams, CH. Construct validation of the self-efficacy scale. *Psychological Reports*. 1983;53:899–902.
17. Gözüm S, Aksayan S. The reliability and validity of Turkish form of the self-efficacy scale. *The Journal of Atatürk University School of Nursing*. 1999;2:21–34.
18. Yıldırım F, İlhan İÖ. The validity and reliability of the general self-efficacy scale Turkish form. *Turkish Journal of Psychiatry*. 2010;21:301–08.
19. Meybodfa FA, Pourshefria H, Dastbaravardeb A, Rostamia R, Zoha S. The effectiveness of motivational interviewing on weight reduction and self-efficacy in Iranian overweight and obese women. *Procedia-Social and Behavioral Sciences*. 2011;30:1395–8.
20. Chahal N, Rush J, Manlhiot C, Boydell KM, Jelen A, McCrindle BW. Dyslipidemia management in overweight or obese adolescents: a mixed-methods clinical trial of motivational interviewing. *SAGE Open Med*. 2017;5:2050312117707152.
21. Ma C, Zhou Y, Zhou W, Huang C. Evaluation of the effect of motivational interviewing counselling on hypertension care. *Patient Educ Couns*. 2014;95:231–7.
22. Boutin-Foster C, Scott E, Rodriguez A, Ramos R, Kanna B, Michelen W, et al. The trial using motivational interviewing and positive affect and self-affirmation in African-Americans with hypertension (TRIUMPH): from theory to clinical trial implementation. *Contemp Clin Trials*. 2013;35:8–14.
23. Barker-Collo S, Krishnamurthi R, Witt E, Feigin V, Jones A, McPherson K, et al. Improving adherence to secondary stroke prevention strategies through motivational interviewing randomized controlled trial. *Stroke*. 2015;46:3451-8.
24. Lin CY, Yaseri M, Pakpour AH, Malm D, Broström A, Fridlund B, et al. Can a multifaceted intervention including motivational interviewing improve medication adherence, quality of life, and mortality rates in older

- patients undergoing coronary artery bypass surgery? a multicenter, randomized controlled trial with 18-month follow-up. *Drugs Aging*. 2017;34(2):143-56.
25. Dobber J, Latour C, de Haan L, Scholte Op Reimer W, Peters R, Barkhof E, et al. Medication adherence in patients with schizophrenia: a qualitative study of the patient process in motivational interviewing. *BMC Psychiatry*. 2018;18:135.
 26. Ghimire S, Castelino RL, Jose MD, Zaidi STR. Medication adherence perspectives in haemodialysis patients: a qualitative study. *BMC Nephrol*. 2017;18(1):167.
 27. Wagonera ST, Kavookjian J. The influence of motivational interviewing on patients with inflammatory bowel disease: a systematic review of the literature. *J Clin Med Res*. 2017;9(8):659-66.
 28. Eyler R, Shvets K, Blakely ML. Motivational interviewing to increase postdischarge antibiotic adherence in older adults with pneumonia. *Consult Pharm*. 2016;31(1):38-43.
 29. Mirkarimi K, Kabir MJ, Honarvar MR, Ozouni Davaji BR, Phil M, Eri M, et al. Effect of motivational interviewing on weight efficacy lifestyle among women with overweight and obesity: a randomized controlled trial. *Iran J Med Sci*. 2017;42(2):187-93.
 30. Döbler A, Herbeck Belnap B, Pollmann H, Farin E, Raspe H, Mittag O, et al. Telephone-delivered lifestyle support with action planning and motivational interviewing techniques to improve rehabilitation outcomes. *Rehabil Psychol*. 2018;63(2):170-81.
 31. Sobhani Z, Ahadi H, Khosravi S, Pourshrfi H, Seirafi M. The effectiveness of motivational interviewing on adherence in obese patients undergoing sleeve gastrectomy surgery. *Armaghane Danesh*. 2017;21(12):1218-35.
 32. do Valle Nascimento TM, Resnicow K, Nery M, Brentani A, Kaselitz E, Agrawal P, et al. A pilot study of a community health agent-led type 2 diabetes self-management program using motivational interviewing-based approaches in a public primary care center in São Paulo, Brazil. *BMC Health Serv Res*. 2017;17(1):32.
 33. Chlebowy DO, El-Mallakh P, Myers J, Kubiak N, Cloud R, Wall MP. Motivational interviewing to improve diabetes outcomes in African Americans adults with diabetes. *West J Nurs Res*. 2015;37(5):566-80.
 34. Freira S, Lemos MS, Fonseca H, Williams G, Ribeiro M, Pena F, et al. Anthropometric outcomes of a motivational interviewing school-based randomized trial involving adolescents with overweight. *Eur J Pediatr*. 2018;177:1121–30.
 35. Celano CM, Gianangelo TA, Millstein RA, Chung WJ, Wexler DJ, Park ER, et al. A positive psychology–motivational interviewing intervention for patients with type 2 diabetes: proof-of-concept trial. *Int J Psychiatry Med*. 2018;54(2):97-114.
 36. Braun A, Portner J, Grainger EM, Hill EB, Young GS, Clinton SK, et al. Tele-motivational interviewing for cancer survivors: feasibility, preliminary efficacy, and lessons learned. *J Nutr Educ Behav*. 2018 Jan;50(1):19-32.
 37. Borrello M, Pietrabissa G, Ceccarini M, Manzoni GM, Castelnuovo G. Motivational interviewing in childhood obesity treatment. *Front Psychol*. 2015;12(6):1732.
 38. Ekong G, Kavookjian J. Motivational interviewing and outcomes in adults with type 2 diabetes: a systematic review. *Patient Educ Couns*. 2016;99(6):944-52.
 39. Sjöling M, Lundberg K, Englund E, Westman A, Jong MC. Effectiveness of motivational interviewing and physical activity on prescription on leisure exercise time in subjects suffering from mild to moderate hypertension. *BMC Res Notes*. 2011; 4: 352.
 40. Mohamadian H, Moradgholi A, Latifi SM, Bazarghani A. Effect of motivational interviewing on hypertension, self-care and quality of life of rural aged people: application of health belief model. *JECH*. 2019;6(2):95-101.
 41. Mirkarimi SK, Honarvar MR, Ariaie M, Bordi R, Kamran A. Effect of motivational interviewing on adherence to treatment in patients with hypertension. *Horizon Med Sci*. 2015;21(3):213-20.