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## **Effectiveness of a Hypertension Educational Program on Increasing Medication Compliance in Shiraz, 2004**

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### **Abstract:**

It has been shown that educational programs are effective to improve antihypertensive compliance, but there are a few studies about this subject in developing countries. The aim of this study was to examine the effect of education on drug compliance in hypertensive patients in Iran.

For this Purpose, 150 noncompliant hypertensive patients were taught through two stages: first direct educational interview in clinic that showed the patients how to handle their problem in taking drugs. Then all cases divided randomly to four groups which received education through telephone consult, telephone consult and educational booklet, educational booklet and on education respectively. Compliance was measured by a standard questionnaire before and after education. Non parametric test, analysis of covariance and chi-square test were used to analyze data.  $P < 0.05$  was considered statistically significant. From 150 patients who received first stage of education 58 were remained in the study. In the final study group the mean score of compliance after education program was greater than before education significantly. (4.16 vs. 2.66,  $p < 0.05$ )

It was concluded that direct education based on patient's problem is effective in improvement patients' medication compliance. Further large studies are needed to differentiate various educational methods.

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Key Words: Education, Hypertension, medication compliance, Shiraz.

## Introduction:

Hypertension is major health problem affection approximately 20% of Iranian adults.<sup>(1)</sup> Among the many causes for inadequate blood pressure control in hypertensive patients, poor compliance with long term pharmacologic treatment is the leading one.<sup>(2)</sup> one year after the beginning of treatment 16-50% of patients fail to continue to take their medications.<sup>(3, 4)</sup>

Several educational programs to improve medication compliance in hypertensive patients proved to be effective, but few studies included the direct comparison between different types of psychoeducational care.<sup>(5)</sup>

In order to examine the effect of a health education program on antihypertensive drugs compliance in Iranian patients and to compare the various educational methods, we do an experimental study in noncompliant hypertensive patients attending university related clinic in Shiraz, Iran.

## Materials and Methods:

**Study subjects:** From previous cross sectional nonrandomized study about determinant factors of medication compliance in hypertensive patients which carried out in the Shaheed Motahari clinic (the largest out patient university related clinic in Shiraz, Iran), we selected 150 noncompliant patients (from 250 cases who studied). The inclusion criteria were: 1- Age between 25 and 65 year old. 2- Living in Shiraz, Iran. 3- Able to understand and answer the question. 4- Patients agreement to participate in the study.

**Compliance measurement:** Medication compliance was measured by a self reported

measure which its score ranging from 0 to 5. We used Morisky's self reported measure of medication adherence with some changes. This scale has now been used in several different study population and has consistently demonstrated sufficient internal consistency ( $\alpha = 0.61$ ) and adequate predictive validity with diastolic blood pressure.<sup>(6, 7)</sup> We added a screening question to it to differentiate non adherent (who take no prescribed drugs) from poor adherent. Reliability of these measure in our study population was  $\alpha = 0.752$ .

**Educational program:** At first, education about taking antihypertensive drugs regarding patients' problem was conducted by face to face method immediately following the patients' interview in clinic. The most prevalent causes of noncompliance were, drug side effects, forgetfulness and patients' beliefs that they are treated and didn't need to take drugs. This education was based on JNC v1 (Joint National Committee) recommendations<sup>(8)</sup> and taught patients how to handle their problem in taking drugs. All 151 noncompliant patients received this education. The second intervention consisted of instructed telephone consultation and an educational booklet. Two trained medical student did telephone consultations. The education topics were selected to emphasize factors shown by health belief model to be important in increasing compliance, namely perception of the disease as serious, belief in the effectiveness of treatments, satisfaction with treatment, adapting the regimen to the patients' individual schedule.

All 151 noncompliant patients were allocated to one of educational or control groups randomly by a software program. There were three educational groups (with 38 patients in

each group) and a control group with 37 cases. In each groups some patients were not available for second intervention for different reason (their address had changed, incorrect address, were not at home or didn't agree to continue.) Table 1 show the baseline characteristics of patients who remaining in study and who did not.

Patients whose address was available were assigned to one of beyond educational group through second intervention:

- Only received education through telephone conversation (group 1)
- Both telephone consult and educational booklet (group 2)
- Only received educational booklet (group 3)
- didn't receive any education (control group or group 4)

The instructed telephone consultations were conducted one time per week (15-20 minutes each time) for one month in group 1 and 2. Educational booklet was sent for group 2 and 3 at the end of same month.

After two weeks from the end of educational program we posted compliance questionnaire and mailed pocket with timber for all available patients and asked them to complete it and send back. Following recall for give back questionnaire was done one month later for unresponsive patients. There wasn't any significant Differences in age, sex, socioeconomic status, mean years of diagnosed hypertension, primary compliance and complication from high blood pressure between no available group, no responsive group and remaining group. (Table 1)

Table 1: Comparison of baseline characteristics for patients not available , not responsive and patients remaining study.

Variables	Not available N =	Not responsive N =	Remaining in study N =	Significance
Age ( year )	48.2(±10.26)	49.9(±10.2)	50.9(±7.6)	F=0.84* P=0.43
Sex ( female )	62.1%	70.9%	56.9%	X2 =0.29** P=0.76
Socioeconomic Status score	-0.27(±0.87)	-0.082(±0.89)	0.2(±1.11)	F=2.49 P=0.088
Duration of Hypertension ( year )	6.17(±4.62)	6.16(±6.66)	7.24(±6.98)	F=0.291 P=0.75
Hypertension Complication ( yes )	51.7%	58.2%	50%	X2=0.8 P=0.66
Primary compliance score	2.43(±1.13)	2.69(±1.25)	2.24(±1.52)	X2=2.00*** P=0.24

\*Analysis of covariance, \*\*Chi-square, \*\*\*Kruskal-wallis

**Other Measurements:** We used an instructed interview for data collection about demographic variables , duration of disease, complication of hypertension, and primary compliance scores, their address and phone number. These data were collected for all

151 noncompliant patients when attending in Shaheed Motahari clinic in pervious study. We used three variables, years of schooling, class of job and income to define socioeconomic status score using Factorial Analysis Model.

**Statistical methods:** The results are expressed as means  $\pm$  standard deviations and proportions. Since the distribution of compliance scores were not normal we used nonparametric statistics to compare compliance scores, like Kruskal-Wallis for K independent samples and Willcoxon signed rank test for two related sample. Analysis of Covariance was used for difference between continuous variables regarding its limits and Chi-square for differences between

proportions. A p value  $<0.05$  was considered statistically significant.

### Results:

No significant differences were observed between study and control groups with respect to such factors as age, sex, socioeconomic status, mean years of diagnosed hypertension, primary medication compliance and complication from high blood pressure (Table 2).

Table 2: Comparison of baseline characteristics for final study groups.

Variables	Group1	Group2	Group3	Group4	Significance
Age(year)	47.4( $\pm$ 6.5)	51.0( $\pm$ 7.0)	52.2( $\pm$ 8.1)	52.4( $\pm$ 8.4)	F=1.11* P=0.32
Sex(female)	50%	56.3%	64.7%	53.8%	X <sup>2</sup> =0.7** P=0.87
Socioeconomic Status score	0.67( $\pm$ 1.08)	0.06( $\pm$ 1.0)	-0.001( $\pm$ 1.13)	0.22( $\pm$ 1.25)	F=0.98 P=0.4
Duration of Hypertension(year)	6.5( $\pm$ 4.2)	8.7( $\pm$ 6.6)	8.1( $\pm$ 7.01)	7.76( $\pm$ 8.7)	F=1.54 P=0.21
Hypertension Complication(yes)	41.7%	50%	64.7%	38.5%	X <sup>2</sup> =2.49 P=0.47
Primary Compliance score	2.67( $\pm$ 1.15)	2.25( $\pm$ 1.34)	2.82( $\pm$ 1.51)	2.92( $\pm$ 1.11)	X <sup>2</sup> =3.53*** P=0.31

\*Analysis of covariance, \*\*Chi-square, \*\*\*Kruskal-wallis

The mean score of compliance after education program was greater than before education significantly (4.16 vs. 2.66,

$p < 0.05$ ). These differences were observed in study and control group as well. (Table 3)

Table 3 : Comparison of compliance score in study groups before and after education.

Groups	Compliance score		Significance	
	before	after	Z*	P
	means $\pm$ SD	means $\pm$ SD		
1	2.67 $\pm$ 1.15	4.14 $\pm$ 0.93	2.53	0.011
2	2.25 $\pm$ 1.34	3.88 $\pm$ 1.66	2.71	0.007
3	2.82 $\pm$ 1.51	4.35 $\pm$ 1.36	3.37	0.001
4	2.92 $\pm$ 1.11	4.23 $\pm$ 0.83	2.85	0.004

\*Willcoxon signed rank test

The means of compliance scores in group 1, 2, 3 and 4 were 4.17, 3.88, 4.35 and 4.23 respectively. There was not any significant difference in compliance score between study and control groups. ( $X^2 = 2.249$  df = 3, p = 0.52).

There wasn't any significant difference between the answer of patients to the compliance questions. (p<0.05)

### Discussion:

In our study all patients showed an improvement in their medication compliance at the end of educational programs, but there wasn't any significant difference between study and control groups.

We suppose short educational interview with all patients in clinic and based on their problems in medication taking had been effective but additional education was not able to increase compliance further.

Gonzalez et al. showed short education program by interviewing patients in hospital can improve the patients adherence to treatments.<sup>(9)</sup>

The long term effects of health education program on medication compliance was shown by some study<sup>(10, 11)</sup>, however Morisky et al showed the cost effectiveness of an educational interview did not exceed

that of the usual case control groups on increase of medication compliance.<sup>(6)</sup>

A meta-analysis of the effects of psycho educational care in adults with hypertension showed education have positive effects on compliance with medication, but few studies included the direct comparison between different types of psycho educational care and without such contrasts, firm conclusion about the relative effectiveness of different type of education are not possible.<sup>(5)</sup>

We also could not show any significant differences between different educational programs. It may be due to small sample size in each groups and small differences between them, but in other hand it's probable the primary educational interview had reasoned the maximum increase in compliance score and any education could not improve patients' compliance further.

We need more study with larger population to determine the effects of different types of education on medication compliance.

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