

The effects of education given by nurses on rational drug use and health literacy of patients receiving hypertension treatment

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Abstract

Context: Health literacy and rational drug use are associated with controlling high blood pressure.

Aim: The aim of this study was to evaluate the effects of education given by nurses on rational drug use and health literacy of patients receiving hypertension treatment.

Settings and Design: The type of study is a randomized controlled experimental study. This study was carried out at the family health center.

Materials and Methods: One hundred patients with hypertension were assigned to the intervention (50 patients) and control (50 patients) groups using the simple sampling method. Data were collected twice with 3 months intervals with the patient identification form, the Rational Drug Use Scale (RDUS), and the Adult Health Literacy Scale (AHLs).

Statistical Analysis Used: The data were analyzed by SPSS 22. Independent samples *t*-, Mann–Whitney U-, Paired samples *t*-, Wilcoxon signed-rank, and Chi-square tests were used for statistical analysis of within-group and between groups.

Results: The mean age of the intervention group was 55.38 ± 7.07 years and 68.0% were female. The mean age of the control group was 55.12 ± 6.88 years and 64.0% were female. Intervention group was found a total score of AHLs (13.28 ± 4.10) and a total score of RDUS (50.70 ± 7.82). The scores were statistically significant. After the training given to the intervention group, there was a decrease in blood pressure.

Conclusions: It was concluded that the training given by the nurse positively increased the rational drug use and health literacy in patients with hypertension. Necessary training should be given to patients by nurses. These trainings will benefit patients.

Keywords: Health literacy, Hypertension, Rational drug use

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Received: 29 November 2020; **Accepted:** 25 August 2021; **Published:** 07 October 2021

Access this article online	
Quick Response Code:	Website: www.jnmsjournal.org
	DOI: 10.4103/jnms.jnms_168_20

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How to cite this article: Cakmak V, Pakyuz SC. The effects of education given by nurses on rational drug use and health literacy of patients receiving hypertension treatment. *J Nurs Midwifery Sci* 2021;8:246-52.

INTRODUCTION

Hypertension, one of the common chronic diseases, is a global public health problem. Hypertension, which is high in the world, ranks first among the preventable causes of death.^[1] According to the World Health Organization (WHO) Global Situation Report of Noncommunicable Diseases (2010), the prevalence of hypertension is approximately 40% in adults aged 25 and over the world, and it is estimated that hypertension causes 7.5 million deaths each year.^[2] The number of hypertensive patients in Turkey is estimated to be approximately 15–16 million.^[3]

Basic conditions for success in hypertension treatment are to ensure timely and accurate diagnosis of patients, to implement lifestyle changes effectively, to start medication on time, and to ensure compliance with medication.^[4] The inability of the patient to adapt adequately to drug therapy plays a major role in not controlling blood pressure.^[5] In a study, it was found that patients with hypertension knew the reason for drug use (89.3%), accurate blood pressure measurement (85.7%), and hypertension-specific nutrition (98.2%). In addition, it was stated that some of the patients did not know the undesirable effects of medications and in what cases they should consult a physician (42%), did not remember to use medication (50%), and did not make salt restrictions (19.6%).^[6] In another study, women with 34.7% and men with 12% do not use their drugs regularly and it has been reported that there is a significant relationship with patients' regular use of medication, dose of medication, time of medication, and information about medication.^[7]

Incorrect and unnecessary drug use of patients is an important problem affecting public health in Turkey as well as all over the world.^[8] Many studies related to rational drug use show that drugs are used unnecessarily and incorrectly.^[7,9,10]

Nurses who have important responsibilities regarding rational drug use should raise awareness about the use of prescribed drugs. In addition, nurses should provide training and consultancy services on compliance with treatment, storing medicines in a suitable environment, using nonprescription medication, correct use of accumulated medicines at home, self-medication, and drug use with neighbor/friend advice.^[9]

Family health centers are critical for the introduction of rational drug use principles from the very beginning in case drug treatment is planned since it has the feature of being

the first center to be applied in case of illness, and therefore, it is the place to start treatment.^[11] In addition, family health centers are the most suitable place for establishing long-term relationships with patients, thus conducting both prevention and follow-up procedures in hypertension.^[12]

The health literacy levels of individuals can be determined by repeating comprehensive interviews. It is beneficial to improve public health by making necessary initiatives according to the level of health literacy.^[13] Health literacy is expressed by the WHO to use the ability of a person to access, understand, and apply health information for health protection and continuity.^[14] It is stated that the level of health literacy, which is a common function of social and individual factors, is low in developed and developing countries.^[15] The purpose of this research was to evaluate the effects of education given by nurses on rational drug use and health literacy of patients receiving hypertension treatment.

MATERIALS AND METHODS

This study is a randomized controlled experimental study. The universe of the study consisted of patients receiving hypertension treatment who came to Demirci No. 1 Family Health Center between January 1, 2018, and January 1, 2019. The sample: the study included patients with hypertension who applied to family health center and met the sample selection criteria. There were a total of 100 hypertensive patients, 50 for the intervention group and 50 for the control group; the sample was selected by block randomization selection method.

Patients aged between 18 and 65 years who had a diagnosis of hypertension (stage 1, 2, 3), who were literate in Turkish and who did not have any communication problems, did not have any diagnosed psychiatric disease, answered the questions, and were willing to participate in the study were included in the study. Patients who were diagnosed with cancer, who had physical disabilities, and did not respond fully to the forms were excluded from the study.

Instruments

The patient Identification Form consisted of 21 questions. The first 11 questions are related demographic characteristics (age, sex, marital status, education, etc.) and the other questions are related using rational drug use.

The Rational Drug Use Scale (RDUS) was developed by Cakmak and Pakyuz and whose validity reliability was tested, it includes a total of 36 items related to rational drug use by adults. As a result of the exploratory factor analysis for

construct validity, 36-item scale with 6 factors was reached. After confirmatory factor analysis, it was determined that the model was acceptable with data. The RDUS Cronbach's alpha was found 0.85. Scoring of items in the scale developed as a 3-point Likert type is never 0, sometimes 1, and always 2. The scores that can be taken from the scale vary between 0 and 72. The score obtained from the RDUS increases, the level of rational drug use increases.^[16]

The Adult Health Literacy Scale (AHLS) was developed by Sezer and Kadioglu. There are 23 items in the scale. As a result of reliability and validity analysis, Cronbach alpha coefficient of AHLS is found as 0.77 and the test-retest reliability coefficient is found as 0.87. The content validity index of the scale is 90.71%. thirteen questions in the scale should be yes/no, 4 of them should be filled with gaps, 4 of them should be multiple choice, and 2 of them should be matched. The scores that can be obtained from the scale vary between 0 and 23, and as the score obtained from the scale increases, the level of health literacy increases.^[17]

The forms were filled with face-to-face interview methods with the patients participating in the study. During the interview, written consent was obtained from the patients. Intervention and control group patients were interviewed twice. At the first meeting, data collection tools were filled to the intervention group. Each patient in the intervention group was given one-on-one training in the form of one-on-one verbal expression and question-answers, lasting 30–45 min, in the training room in the family health center. Colorful education booklets prepared by the researcher were given to the patients for reading at home. The contents of the booklet included the subjects of hypertension, rational drug use, and health literacy. In the control group, data collection tools were filled in the first interview. The second interviews were made to the intervention and control group patients 3 months later and the data collection tools were applied again. The control group was given the training booklet at the second meeting.

Collected data in the study were evaluated using IBM SPSS Statistics 22.0 package program. Data were shown as mean \pm standard deviation, number, and percentage. Independent samples *t*-, Mann-Whitney U-, Paired Samples *t*-, Wilcoxon signed-rank-, and Chi-square tests were used for statistical analysis of within-group and between groups. $P < 0.05$ was considered to be statistically significant.

Ethical considerations

Scientific and universal principles were complied with this study. In this respect, the principles of informed consent, autonomy, confidentiality and privacy protection,

equity, and nonharm/benefit principles were taken into consideration. The study was conducted in accordance with the Helsinki Declaration. This study was approved by Manisa Celal Bayar University School of Medicine Clinical Research Ethics Committee (Approval no. 20478486) and Manisa Health Directorate.

RESULTS

The mean age of the patients was 55.38 ± 7.07 years for the intervention group and 55.12 ± 6.88 years for the control group. Considering the gender distribution, 68.0% were female and 32.0% were male for the intervention group; for the control group, 64.0% were female and 36% were male. Considering the marital status, 92% of the patients in the intervention and control groups were married and 8% were single. Regarding the educational status, 40% of the patients in the intervention and control group were literate/primary school graduates and 10% were high school/university graduates. It was found that the majority of patients in both groups were housewives or retired and did not work. No statistically significant differences were found between the intervention and the control group in terms of gender, age, educational status, marital status, and occupation ($P > 0.05$), [Table 1].

While there was no significant difference between the first interview and the second interview in terms of AHLS total score in the control group ($P > 0.05$), there was a significant difference in the intervention group ($P < 0.01$). While there was no significant difference between the intervention and control groups in the first interview in terms of AHLS total scores ($P > 0.05$), in the second interview, there was a significant difference

Table 1: Differences between intervention and control group in terms of sociodemographic characteristics

Sociodemographic characteristics	Intervention group (n=50)	Control group (n=50)	Meaningfulness
Age	55.38 \pm 7.07	55.12 \pm 6.88	$t=0.186$, $P=0.853$
Gender			
Female	34 (68.0)	32 (64.0)	$\chi^2=0.178$, $P=0.673$
Male	16 (32.0)	18 (36.0)	
Marital status			
Married	46 (92.0)	46 (92.0)	$\chi^2=0.00$, $P=1.000$
Single	4 (8.0)	4 (8.0)	
Education status			
Literate/primary school	40 (80.0)	40 (80.0)	$\chi^2=0.00$, $P=1.000$
High school/university	10 (20.0)	10 (20.0)	
Job			
Housewife	32 (64.0)	30 (60.0)	$\chi^2=1.01$, $P=0.601$
Retired	10 (20.0)	14 (28.0)	
Working	8 (16.0)	6 (12.0)	

Chi-square test and independent sample test were used

between the intervention and control groups in terms of AHLS total scores ($P < 0.01$), [Table 2].

In the control group, there was no significant difference between the behavioral beliefs, control beliefs, attitude, subjective norm, intention, and knowledge subdimension scores between the first and second interview ($P > 0.05$). In the intervention group, in terms of behavioral beliefs ($P < 0.001$), control beliefs ($P < 0.01$), attitude ($P < 0.001$), subjective norm ($P < 0.01$), intention ($P < 0.001$), and knowledge ($P < 0.001$), subdimension scores was found significant difference [Table 3].

In the first interview, there was no significant difference between the behavioral beliefs, attitude, intentions, and information subdimension scores, but between the intervention and control groups ($P > 0.05$), a significant difference was found in the second interview ($P < 0.05$). There was no significant difference between the intervention and control groups in terms of control beliefs and subjective norm subdimension scores in the first interview and the second interview ($P > 0.05$), [Table 3].

A statistically significant difference was found between the first interview and the second interview in the intervention group in terms of systolic blood pressure (SBP) and diastolic blood pressure (DBP) ($P < 0.05$ vs $P < 0.001$). In the control group, no statistically significant difference was found in terms of SBP and DBP ($P > 0.05$), [Table 4].

DISCUSSION

The incidence of hypertension increases with age.^[18] In this study, the mean age of the patients was 55.38 ± 7.07 years

Table 2: Differences between groups and within groups in terms of Adult Health Literacy Scale total score and Rational Drug Use Scale total score in the first interview and second interview

	Mean \pm SD		Meaningfulness (Z, P)
	First interview	Second interview	
Total score of AHLS			
Intervention group	9.12 \pm 4.67	13.28 \pm 4.10	-6.240, 0.000***
Control group	10.18 \pm 5.08	10.26 \pm 4.94	-1.633, 0.102
Meaningfulness	U=1104.00 Z=-1.009, P=0.313	U=799.00 Z=-3.113, P=0.002**	
Total score of RDUS			
Intervention group	43.84 \pm 11.85	50.70 \pm 7.82	-5.719, 0.000***
Control group	44.44 \pm 11.83	44.52 \pm 11.72	-1.414, 0.157
Meaningfulness	U=1218.50 Z=-0.217, P=0.828	U=849.00 Z=-2767, P=0.006**	

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. Wilcoxon signed-rank test and Mann-Whitney U-test were used. RDUS: Rational Drug Use Scale, AHLS: Adult Health Literacy Scale, SD: Standard deviation

for the intervention group and 55.12 ± 6.88 years for the control group, and there was no difference between the two groups in terms of age as well as educational status, marital status, and occupation. The fact that the groups are similar in terms of demographic characteristics indicates that the patients are distributed homogeneously, and this is important for evaluating the effectiveness of the education we provide.

In a study conducted to determine the relationship between hypertension treatment, control, and follow-up and health literacy in patients applying to a rural health center in Iran, the average age was found to be 55.7 ± 9.9 years.^[19] In a similar study conducted in Turkey to evaluate the effect of training provided by nurses to patients with hypertension on treatment compliance, coping with chronic disease and metabolic variables, the mean age of the patients was 54.50 ± 11.14 years in the experimental group and 51.83 ± 10.29 years in the control group.^[20] The present study finding regarding the average age of patients with hypertension is similar to other study findings.

In similar national and international studies, the rate of female patients with hypertension was higher than male patients.^[6,19] Considering the gender distribution of the patients in the present study, the rate of female patients with hypertension was higher in both groups. According to this finding, nurses should take a more careful attitude toward monitoring blood pressure and hypertension in women and middle-aged patients.

In a research on patients with hypertension, 78.7%–90.9% of patients are stated to be married.^[19] In the present research, 92% of the patients in the intervention and control groups were married and the marital status is similar in both groups.

Studies have reported that the majority of patients with hypertension are primary school graduates.^[7,19,20] Another study found that 64.8% of patients with hypertension are literate primary school graduates.^[21] In the present study, in parallel with the literature, it was found that the proportion of primary school graduates in the intervention and control group was in the majority.

In a study, it was stated that 55.7% of patients with hypertension are housewives, 33.3% are retired, and 0.6% are other professions.^[21] In our study, it was found that the majority of patients in both groups were housewives or retired.

Health literacy is considered an important indicator to control the individual's blood pressure, compliance to treatment, and self-management of the disease.^[22] In the present research, it was determined that the AHLS total

Table 3: Differences between groups and within groups in terms of Rational Drug Use Scale subdimension scores in the first interview and second interview

RDUS subdimensions	Mean±SD		Meaningfulness (Z, P)
	First interview	Second interview	
Behavioral beliefs			
Intervention group	12.50±3.28	13.68±2.20	-3.543, 0.000*** -1.000, 0.317
Control group	12.22±3.62	12.26±3.61	
Meaningfulness	U=1205.00 Z=-0.311, P=0.755	U=960.00 Z=-2.009, P=0.044*	
Control beliefs			
Intervention group	9.78±2.84	10.48±2.04	-2.979, 0.003** -1.414, 0.157
Control group	9.66±2.96	9.62±3.00	
Meaningfulness	U=1064.50 Z=-1.291, P=0.197	U=1110.50 Z=-0.969, P=0.332	
Attitude			
Intervention group	3.50±2.70	4.80±2.28	-4.417, 0.000***
Control group	3.64±2.17	3.66±2.14	
Meaningfulness	U=1147.50 Z=-0.712, P=0.476	U=924.50 Z=-2266, P=0.023*	-1.000, 0.317
Subjective norm			
Intervention group	2.78±1.26	2.98±1.02	-2.887, 0.004**
Control group	2.76±1.30	2.76±1.30	
Meaningfulness	U=1247.50 Z=-0.018, P=0.985	U=1172.50 Z=-0.565, P=0.572	0.000, 1.000
Intention			
Intervention group	6.56±1.97	7.72±1.26	-4.101, 0.000***
Control group	6.96±1.85	7.02±1.76	
Meaningfulness	U=1106.00 Z=-1.006, P=0.315	U=940.00 Z=-2.175, P=0.030*	-1.732, 0.083
Information			
Intervention group	8.72±3.51	11.04±2.15	-4.719, 0.000***
Control group	9.16±3.68	9.20±3.65	
Meaningfulness	U=1151.00 Z=-0.685, P=0.493	U=898.50 Z=-2.439, P=0.015*	-1.414, 0.157

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. Wilcoxon signed-rank test and Mann-Whitney U-test were used. SD: Standard deviation, RDUS: Rational Drug Use Scale

Table 4: Differences between groups and within groups in terms of blood pressure in the first interview and second interview

	Mean±SD		Meaningfulness (Z, P)
	First interview	Second interview	
Systolic blood pressure (mmHg)			
Intervention group	127.72±23.44	124.90±10.52	-2.130, 0.033* -1.857, 0.063
Control group	130.00±15.11	131.20±14.37	
Meaningfulness	U=1148.00 Z=-0.720 P=0.471	U=870.50 Z=-2.727 P=0.006**	
Diastolic blood pressure (mmHg)			
Intervention group	83.30±9.82	80.50±6.64	-3.482, 0.000***
Control group	82.40±8.52	82.30±8.15	
Meaningfulness	U=1239.00 Z=-0.080 P=0.936	U=1069.50 Z=-1.336 P=0.181	-0.577, 0.564

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. Wilcoxon signed-rank test and Mann-Whitney U-test were used. SD: Standard deviation

scores of the intervention group were higher than the control group. In a cohort study for hospitalized patients to determine the relationship between health literacy and high blood pressure, the health literacy of patients with high

blood pressure was found low.^[23] In a study conducted with the “Short Test of Functional Health Literacy in Adults,” the mean score of the Health Literacy Scale of hypertensive patients was found to be 68.7 ± 16.4 . It was determined that health literacy of hypertensive patients was inadequate in 28.4%, borderline in 30.0%, and sufficient in 41.6%. In the same research, it was stated that patients with adequate health literacy are more successful in disease treatment and control. It has also been reported that doctors and medical staff are more effective than other sources of information in providing education.^[19] According to this, It can be said that the health literacy of the patients with hypertension is not at the desired level and they need more education about the disease.

Adherence to antihypertensive medications is the cornerstone for achieving hypertension control.^[24] In the literature, no scale-based research on rational drug use was found. There are many studies using the Self-Efficacy Scale of Commitment/Compliance to Drug Treatment of patients with hypertension. In a study, the average score of the patients with hypertension on the Commitment to Drug Treatment/

Compliance Self-Efficacy Scale was 64.67 ± 9.59 (minimum: 26.00, maximum: 78.00).^[25] In another study, the average score of the patients with hypertension for adherence to Drug Treatment/Compliance Self-Efficacy Scale was 63.9 ± 11.3 in men and 70.2 ± 9.3 in women.^[26] In a study conducted in China, the mean score of patients with MMAS-8 was 6.7 ± 1.4 (minimum: 0, maximum: 8) patients with longer duration of antihypertensive agents used (over 10 years) reported better adherence than patients with shorter duration (5 years or less).^[27]

In the literature, no scale-based research on rational drug use was found. In this study, RDUS was first developed according to Planned Behavior Theory and then this scale was applied to patients with hypertension. In the first interview, the total score average of the RDUS of the intervention group (43.84 ± 11.85) and the control group (44.44 ± 11.83) was similar. In the second interview, it was determined that the total score of the RDUS (50.70 ± 7.82) of the intervention group, who was trained about hypertension, increased significantly compared to the control group score (44.52 ± 11.72). In terms of the RDUS score average, between the first interview and the second interview; While there was no significant difference in the control group, there was a significant difference between the two interviews in the intervention group. There was a significant increase in RDUS scores after training on hypertension for intervention group patients.

In a study, found that patients who came to the outpatient clinic had a low level of knowledge about hypertension in their study examining the level of knowledge on some issues related to hypertension (causes of hypertension, approaches to hypertension treatment, sources of information about hypertension, etc.).^[28] In the present study, it was determined that the Information sub dimension scores of RDUS were similar in the intervention and control groups in the first interview, but the Information sub dimension scores of the intervention group were higher in the second interview compared to the control group. Accordingly, it can be said that patients with hypertension have low knowledge and have educational needs. In order to increase the knowledge about rational drug use in patients diagnosed with hypertension, it may be recommended to give education by the nurse. In addition, it can be said that the information, behavioral beliefs, control beliefs, attitude, subjective norm, and intention subdimension scores of RDUS in patients with hypertension can be increased by the training given by the nurse.

It is important that the blood pressure remains at normal intervals in hypertension control. In a meta-analysis

study, SBP of hypertension patients was 126.3 mmHg in the whole group, 126.1 mmHg in women and 126.4 mmHg in men; DBP was 78.6 mmHg in the whole group, 78.4 mmHg in women and 78.7 mmHg in men.^[29] In another experimental study, no significant change in blood pressure was observed in the second interviews in both education and control groups.^[30] In the present research, in the intervention group, compared to the first interview, there was a significant decrease in SBP and DBP in the second interview. In the control group, compared to the first interview, there was no significant decrease in SBP and DBP in the second interview. According to this, it can be said that in patients who are trained by the nurse about hypertension, there is a reduction in SBP and DBP.

CONCLUSIONS

As a result of the present study, the rational drug use scores of the patients increased and it was concluded that the patients used their drugs more accurately. The health literacy scores of the patients increased and it was concluded that the patients were more attentive to health issues. Thus, the training given by the nurse on rational drug use and health literacy to patients with hypertension could be used as an effective method.

Nurses can obtain information about patients by using RDUS and AHLS scales. Accordingly, they can plan training for their patients on many subjects such as the treatment, care, and blood pressure control of patients with hypertension. Nurses can provide effective counseling to patients and engage in qualified nursing practices for patients with hypertension.

Limitations

The results cannot be generalized to all hypertensive patients since the study was conducted with a limited number of patient populations and patients previously diagnosed with hypertension at different times.

Conflict of interest

All authors have no conflict of interest.

Author's contributions

First author obtained data and performed the data coding, analysis, and writing composition; second author decided on research design, supervised the entire work process, and critically reviewed the work. All authors read and approved the final manuscript.

Financial support and sponsorship

Nil.

Acknowledgment

We would like to thank all our patients who participated in our study.

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