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The Relationship between Health Literacy and Hypertension Treatment Control and Follow-up

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ABSTRACT

Objectives: Hypertension is the most important controllable risk factor for cardiovascular, stroke and kidney diseases. Acquiring health information and proper compliance with medical personnel advice requires high levels of health literacy. Thus, the present study was conducted to determine the relationship between health literacy and hypertension treatment control and follow-up in patients attending rural health centers of Rasht city.

Methods: This descriptive cross-sectional study was conducted on 257 patients with hypertension selected according to a multistage random sampling method from all rural health centers of Rasht city. Data collection tools included Short Test of Functional Health Literacy in Adults (STOFHLA), hypertension knowledge, and Charlson Comorbidity Index that were completed by patients. Data were analyzed using Pearson's correlation, regression, and Chi-square tests.

Results: Participants' mean age was 55.7 years and their mean health literacy was 68.7%. Health literacy was found significantly related to education level (P<0.001), age (P<0.001), and monthly hypertension control (P<0.001). The main sources of acquiring health information included doctors (38.5%), medical personnel (33.7%), and proper use of medication 94.9%.

Conclusion: Patients with adequate health literacy were more successful in control and treatment of their diseases. Doctors and medical personnel were more effective in education than other health information sources. Identifying patients with poor health literacy and providing them with appropriate education can have a major role in promoting community health.

Introduction

Hypertension is a major global health concern, and responsible for 7.1 million adult deaths annually [3]. Hypertension is an important risk factor for atherosclerosis, cardiac failure, stroke, and kidney failure in many countries [1]. Despite effective treatments available, only 37% of patients manage to maintain their blood pressure below levels recommended by health professionals [2]. After development of hypertension, it is particularly important to control it, so that complications can be minimized through blood pressure control. Although health authorities and planners attend to prevention and treatment of hypertension, and provide certain treatment strategies, the reported hypertension control remains disappointing [1]. There have been sporadic studies on the prevalence of hypertension in Iran [4]. According to the latest statistics published by the Ministry of Health in the national study of risk factors for non-communicable diseases in 2004, the crude prevalence of hypertension was reported 30.5% in urban communities and 29.2% in rural [1]. According to studies conducted, one fifth of those affected live in northern Iran [3].

The right treatment and control of diseases is a major problem for both patients and doctors. Inappropriate treatment can not only lead to failure to respond to medication therapy, but also affect further follow-ups and compliance with lifestyle adjustment recommendations. In fact, patients' knowledge is an important factor in response to treatment and control of these diseases [5].

A wide range of capabilities and competences, and actually many "literacies" are required for an individual to perform favorably. Such literacies are dynamic and flexible, and range from the ability to read newspapers to understanding information provided by a health employee [6]. Health literacy involves a set of skills such as reading, listening, analysis, and decision-making, and ability to apply these skills to health-related situations, and does not necessarily imply level of education or general reading ability [7]. Various studies have demonstrated that poor health literacy leads to delay in diagnosis, self-care incapability, further use of emergency services, prolonged hospital stay, increased incidence of diseases, and eventually increased mortality rate [8].

In an extensive national survey across America, health literacy was inadequate in 48% of people, and adequate in only 11% [6]. In a study conducted in five provinces of Iran, level of health literacy was inadequate in 56.6%, borderline in 15.3%, and adequate in only 28.1% of people [6, 9].

Various studies have addressed the relationship between health literacy and hypertension. In a study by Levinthal, Morrow et al., severity of the disease was significantly related to health literacy [10]. The results obtained by Pandit et al. showed health literacy as an important predictor of blood pressure control [11]. Aboumatar et al. study also points out the effect of higher health literacy on improvement in hypertension [2].

Health literacy is a component based on socioeconomic status and the ruling culture

of society. Given the social-cultural differences, and especially lifestyles of people from Gilan (particularly rural people) compared to other studied regions (such as Isfahan); the present study was conducted with the aim to determine the relationship between health literacy and hypertension control and follow-up in patients from rural areas of Rasht city in 2014.

Materials and methods

This cross-sectional study was conducted from mid-July to early November 2014 on patients with hypertension attending health centers in rural Rasht. Study population consisted of patients with hypertension and medical records in rural health centers. Sample size was determined 250 patients according to data extracted from Sharifi-Rad et al. study titled "The relationship between health literacy and general health and health behaviors in older adults in Isfahan" and the following equation:

Where: α=0.05, P=20.4, q=79.6, and d=0.05

Samples were selected according to sample size and multistage sampling method. First, each center was considered a cluster, and 10 centers were randomly selected out of the 25 covered by Rasht health center. In the second stage, 25 samples were selected according to systematic random sampling from the list of patients with records in rural health homes covered by the 10 selected centers. To cover possible withdrawals, the minimum sample size required from each center was increased by 10%. Participants were older than 30 years of age, with minimum reading and writing literacy. By

prior arrangement with Rasht health center, patients' demographic and disease details were extracted from records available in rural health homes and health centers. Patients selected were invited to attend health homes on prearranged days to be examined by the researcher.

Data collection tools included a demographic questionnaire containing questions on age, marital status, education, medical insurance, and income. The "Short Test of Functional Health Literacy in Adults" (STOFHLA) questionnaire was used to assess health literacy, and designed to determine participants' ability to read and understand health-related texts. In this study, instead of the original TOFHLA with 17 items in 3 conceptual domains, the short form with 4 items in 2 domains was used, which reduced completion time from 22 minutes to 12 minutes. Validity of the Persian version of STOFHLA had been confirmed by a number of related professors, and its reliability was confirmed with Cronbach's alpha 0.77. In this test, scores range from 0 to 100, and scores from 0 to 59 indicate inadequate literacy, 60 to 74 borderline, and above 75 adequate literacy. This questionnaire continues with questions on the disease, including the time of blood pressure measurement, blood pressure educational sessions, self-care, and sources of hypertension-related health information. To investigate comorbidities, Charlson Comorbidity Index was used, in which questions were asked about 19 important comorbidities. In this questionnaire, questions 1 to 10 score one point, 11 to 16 score two points, 17 scores three points, and 18 and 19 score six points. Participants'

scores are found using age-adjusted tables. Eventually, participants are divided into 4 groups including 0, 1 to 2, 3 to 4, and above 4.

Data were analyzed in SPSS-18 using descriptive statistics including mean, standard deviation, and mean difference, and non-parametric statistics such as Chi-square, Pearson's correlation and logistic regression tests.

Results

A total of 257 adults with mean age 55.7 ± 9.9 years (range: 30 to 82 years) took part in this study, of whom, 31.5% were male and the rest were female, 87.9% were married (226) and the rest (0.8%) were single or widowed (11.3%), 76.7% had primary school education, and only 1.2% had university education. Mean health literacy score was found 68.7 ± 16.4. Health literacy was inadequate in 28.4% of participants, borderline in 30%, and adequate in 41.6%. Mean health literacy score was 70.7 in patients with blood pressure less than 140/90, and 66.4 in those with blood pressure above 140/90. Mean health literacy score was 70 in patient who were controlled monthly and 66.4 in those not controlled monthly.

Table 1. Frequency distribution of health literacy in the participants

Level of health literacy	Number	Percentage
Inadequate	73	28.4
Borderline	77	30
Adequate	107	41.6
Total	257	100

In this study, no significant relationship was found between health literacy and seasonal blood pressure control (P=0.1). Mean health literacy score was 69.7% in patients with seasonal control, and 65.7% in those with no seasonal control. About 77.8% of patients underwent monthly blood pressure control, and 77.4% underwent seasonal control. Furthermore, 72.8% of patients complied with the blood pressure control program developed by rural health homes. Health literacy was found significantly related to monthly blood pressure control (P=0.038, β1=37%), but not to seasonal control (P=0.28). In this study, a significant relationship was found between health literacy and improvement in blood pressure (P=0.017).

Table 2. Frequency distribution of blood pressure knowledge in the participants

Blood pressure knowledge	Number	Percentage
Poor	54	21
Moderate	33	12.8
Good	90	35
Excellent	70	31.1
Total	257	100

Health literacy was found significantly related to education level (P<0.001), knowledge of blood pressure (P<0.001), and age (P<0.001), but not to gender (P=0.094). There was a significant relationship between health literacy and comorbid diseases (P<0.001).
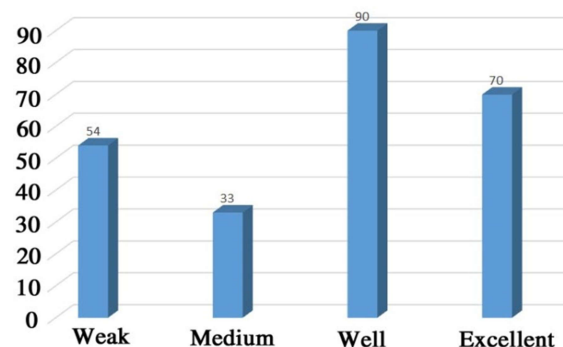

Figure 1. The health literacy distribution

Table 3. The relationship between health literacy and demographic parameters

Variable		Health literacy						Chi-square (P-value)
		Inadequate		Borderline		Adequate		
		Number	Percentage	Number	Percentage	Number	Percentage	
Age (year)	<30	1	6.6	2	13.3	12	80	P<0.001
	30-49	9	13	26	37.6	34	49.2	
	50-59	30	32.2	22	23.6	41	44	
	60-69	22	36.7	22	36.6	16	26.6	
	≥70	11	55	5	25	4	20	
Sex	Male	22	27.2	18	22.2	41	50.6	p<0.001
	Female	51	29	59	33.5	66	37.5	
Education	Elementary	68	34.6	71	36	58	29.4	P<0.001
	Middle school	4	8.9	6	13.3	35	77.8	
	High school	0	0	0	0	5	100	
	High school diploma	0	0	0	0	7	100	
	Higher education	1	23.3	0	0	2	66.7	
Marital status	Single	1	50	0	0	1	50	P<0.001
	Married	60	26.5	66	29.2	100	44.3	
	Widowed	12	41.4	11	37.9	6	20.7	
Income (Rls)	<3000000	13	38.2	14	41.2	7	20.6	P<0.001
	3000000-6000000	44	36.1	32	26.2	46	37.7	
	6000000-9000000	12	16.9	26	36.6	33	46.5	
	≥9000000	4	13.3	5	16.7	21	70	

The main sources of patients' information included doctors (38.5%) and medical personnel (37.7%) respectively.

Discussion and Conclusion

In the present study, the majority of patients with hypertension had adequate health literacy. In contrast, only 8.8% of older adults in Isfahan in Raeesi et al. study, and 28.1% of patients in Banihashemi study conducted in five provinces in Iran had adequate health literacy. This may have been due to participants' poor education and older age in these studies. In Javadzadeh et al. study investigating adults' health literacy, 46.5% of participants had adequate health literacy, which agrees with the present study. In agreement with other studies, health literacy in the present study was found significantly related to age, education, and economic status [6, 7]. In the present study, 31.5% of participants were male and 68.5% were female; yet no significant relationship was found between health literacy and gender (P=0.094), which disagrees with Raeesi et al. and Peyman et al. results [7, 12]. This may have been due to cultural differences as well as prominent role women of Gilan have in their children's education and their active social roles, and also cohabitation of most children after graduation with their parents, leading to improvement in women's literacy.

In the present study, blood pressure knowledge was higher than that in Mahmoodi et al. study, which may have been due to the difference in education levels and source of information [5]. In Pandit et al. study, patients' literacy mediated between education and blood pressure knowledge. Moreover, knowledge

and literacy were significant and independent predictors of blood pressure control. In this study, lower education and literacy independently and significantly predicted poor blood pressure knowledge, and patients with less literacy skills had significantly less blood pressure control, which agrees with the present study results [11]. Like in Aboumatar et al. study, in the present study, controlled blood pressure was observed less in patients with poor health literacy compared to those with higher health literacy. However, no difference was found between two groups in visiting the doctor. Hence, the effect of health literacy should be considered in use of educational tools to improve understanding blood pressure knowledge in future studies [2].

Regarding use of anti-hypertension medication, the present study results agree with those of Naimi et al. [13]. In a study by Lee et al. investigating health literacy in rural China, improvement in blood pressure knowledge was effective in reducing complications and improving hypertension [14]. In a study conducted in Greece, the quality of hypertension treatment was higher in patients with higher knowledge, which agrees with the latter study [15].

Investigating the relationship between health literacy and hypertensions and the effect of health systems on this relationship, Powers et al. showed significant differences in the relationship between patients' literacy and improvement in systolic blood pressure among various models of health services, as well as the effectiveness of features of health service systems on the relationship between literacy and improved health. In the present study, sources of information were found significantly related to monthly control and health literacy, which agrees

with the above study [16]. Despite huge wealth of evidence regarding the importance of poor literacy and inadequate health literacy, many doctors and educators either lack awareness or necessary skills and self-confidence to approach the subject [17]. In this study, the effect of health personnel on blood pressure control was significant. Thus, besides screening rural population, educational packages for identified patients are also highly important. As well as the right choice of health literacy assessment tools, tests should facilitate measurement of health literacy of patients in health service providing settings [18]. Like other similar studies, the present study also recommends particular attention to the right education for patients with poor health literacy and simplification of topics, as well as extensive assessment of patients' health literacy.

Study limitations: Mental and physical conditions of patients can affect their response to questionnaires. This was abated through training and assurances. The interference between study and agricultural work was resolved by identifying their working hours and providing information about study times, and arrangements made with authorities and health home personnel.

Patients with adequate health literacy were more successful in disease treatment and control. Doctors and health personnel were more effective in providing education than other information sources. Hence, identifying patients with poor health literacy and providing simple education for them can have a major role in promoting community health.

Conflict of interest statement

The authors have no conflicts of interest to declare for the current study.

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