Impact of Literacy on the Prevalence, Awareness, Treatment and Control of Hypertension in Iran

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ABSTRACT

Introduction: Hypertension is an important global health concern claiming 7.1 million lives annually. Literacy, as an essential element of the health education, and its relationship with health has previously been studied. However, few studies have been conducted on the association between literacy and health outcomes. To assess the association between educational level and hypertension, awareness and hypertension control in the north of Iran were the main objectives of this study. **Methods**: The present study was a population-based cross-sectional study carried out on 3497 subjects aged 15-65 years using stratified and cluster sampling. Interviewers recorded the data using a multidimensional questionnaire, including blood pressure level. Blood pressure was measured three times with 5-minute intervals and defined based on JNC-7. **Results**: Totally, 21.2 %(741 cases) of our patients suffered from hypertension and illiterate people were significantly more aware of their disease (*P*=0.011). Among the aware group, at least 89.6% (435 cases) used one method to control their disease; this however was not statistically significant among the educational levels. Control of hypertension was significantly greater in college educated group than in illiterate group (32.4% vs. 68.8%; *P*=0.001). Logistic regression analysis revealed that illiteracy is a risk factor for hypertension (*P*<0.001). **Conclusion**: In spite of the fact that awareness in illiterate people was high, the rate of hypertension control was low in this group. Prevention, detection, treatment, and control of hypertension especially in illiterate people should receive high priority.

Introduction

Hypertension is an important public health concern worldwide being responsible for an annual death of 7.1 million people.[1] The estimated total number of adults with hypertension in 2000 was 972 million (333 million in economically developed countries and 639 million in economically developing countries). The number of adults with hypertension in 2025 has been predicted to increase by about 60% to a total number of 1.56 billion.[2] Literacy, as a multifaceted concept containing numerous social and cognitive skills learned through formal education processes i.e. reading and numeracy[3] is considered as an essential for the health education.[4-6] The relationship between education and health knowledge has been approved by some studies[7-9]; however, fewer studies have been conducted on the association between literacy and health outcomes.[3-5] In addition, a few studies on the prevalence, awareness and control procedure of hypertension have been established.[10-14]

Iran as a developing country in the Middle East Regions considered to be a country in nutrition transition.[15] Similar to the most countries having undergone rapid economic and demographical changeover, non-communicable diseases, especially cardiovascular disease, are the major causes of mortality and morbidity in Iran.[16-18]

Of the population of 1,600,000 in Golestan province, 66.39% were 15-64 years old; 43.9% and 56.1% lived in urban and rural area, respectively.[19] Agriculture is the main job in the rural area. Different ethnic groups such as Fars (native), Turkman and Sisstanilive in this region.

In the present study, education was selected as a marker of socioeconomic status as it can be easily quantified in terms of numbers of years and reliably recalled. Moreover, the reverse in centive would not confuse the interviewer.[20] Due to the restrictions in executing epidemiological projects, there has not been any study on the hypertension in this area so far; therefore, designing the research project on it was necessary and inevitable. The aim of this study was to examine the prevalence of hypertension and to assess the association between educational level on the awareness,

treatment and control of it in the Northern Iranian adults.

Materials and methods

The present study is a cross-sectional-descriptive study based on the population and 3497 cases (1750 men and 1747 women) aged between 15-65 years old who were selected by cluster and stratify sampling. Subjects were randomly chosen from 175 clusters and each cluster included 20 cases. Family code of primary health center in rural areas and postal code in urban areas were used for classification with equal proportion of age and sex. From each district, one team had been trained to complete the questionnaire and measuring blood pressure. Blood pressure was measured for three times with 5-minute intervals. Interviewers recorded the data using a multidimensional questionnaire including socio-demographic indexes, blood pressure status, procedure of disease control and awareness from the existing problem. Pregnant women and those unwilling to participate in the research were excluded from this study.

SPSS 16.0 software was used for the statistical analysis and chi-square test for comparing frequencies. Logistic regression analysis was applied in order to estimate the odds ratio of hypertension considering the educational level at 95% significant level. The *P*-value less than 0.05 was considered statistically significant. The reliability was assessed using Cronbach's alpha coefficient and found to be 0.83.

In this analysis, blood pressure values were classified according to the guidelines from the JNC-7 report .[21] Hypertension was defined as a systolic blood pressure of =140 mm Hg or diastolic blood pressure of = 90 mm Hg or current use of antihypertensive medication. Pre-hypertension was defined as a systolic blood pressure of 120-139 mm Hg or a diastolic blood pressure of 80-89 mm Hg. Normal blood pressure was defined as a systolic blood pressure of <120 mm Hg and a diastolic blood pressure of <80 mm Hg.

Awareness of hypertension was defined as self-reporting. Any prior diagnosis of hypertension by healthcare professionals or family doctors among the population was defined as being hypertensive. Treatment of hypertension was defined as the use of an antihypertensive medication at the time of the interview or within the previous two weeks for hypertension. Control of hypertension was defined as measuring an average systolic blood pressure of <140 mm Hg and an average diastolic blood pressure of <90 mm Hg among the hypertensive population .[22] Educational level of the patients was classified in four groups: Illiterate, 1-9 year schooling, 9-12 year schooling and College educated.

Results

Generally, the mean of age of the patients was 39.47 years. Hypertension was common in 21.2% of the cases with being more frequent in females rather than males (Table 1). There was a significant inverse correlation between literacy and hypertension, i.e. two times more frequent in illiterate people than college educated people (P=0.001). Of hypertensive patients, 58.7 %(435 cases) were aware of their existing disease which was significantly more frequent in illiterate people than educated people (P=0.001). Only 86.9% (378 cases) of aware patients used an antihypertensive medication. Control rate was 62.8 %(273 cases) which was two times more in educated people than illiterate people (68.8% vs. 32.4%; P=0.011; Table 2).Multiple-logistic regression was used to identify educational level contributing to the hypertension. The odds ratio estimate for hypertension was 3.093[95% CI: 2.265-4.225] for illiterate people compared to the college educated people 1.480[95% CI: 1.061-2.065] when age adjusted (Table 3).

Table 1. Characteristics of the study population

			Hypertension N(%)	
		N	Yes	No
Sex	Men	1750	346(19.8)	1404(80.2)
	Women	1747	395(22.6)	1352(77.4)
	Total	3497	741(21.2)	2756(78.8)
Age		39.47±14.28		

Table 3. Odds Ratios and 95% CI obtain from crude and age adjusted logistic regression

Criteria		Crude		Age adjusted	
		OR (95% CI)	P	OR (95% CI)	P
Educational Level	College(Ref)	1.00		1.00	
	Illiterate	3.093(2.265-4.225)	0.001*	1.480(1.061-.065)	0.021*
	1-9 years schooling	1.339(0.986-1.818)	0.062	1.286(1.770-.935)	0.122
	9-12 years schooling	0.828(0.597-1.150)	0.260	1.099(1.550-.780)	0.589
Ref = Reference category, *A statistically significant differences					

Table 2. Relationship between educational level and prevalence, awareness, treatment and control of hypertension

			Hypertension[1]		Awareness[2] N=741		Treatment[3] N=435		Normalized[4] N=435	
		N (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Education Level	Illiterate	1032(29.5)	349(33.8)	683(66.2)	247(70.8)	102(29.2)	218(88.3)	29(11.7)	80(32.4)	167(67.6)
	1-9 Schooling	1445(41.3)	277(19.2)	1168(80.8)	129(46.6)	148(54.4)	114(88.4)	15(11.6)	51(39.5)	78(60.5)
	9-12 Schooling	793(22.7)	84(10.4)	79(89.4)	43(51.2)	41(48.8)	32(74.4)	11(25.6)	20(46.5)	23(53.5)
	College	227(6.5)	31(13.7)	196(86.3)	16(51.6)	15(48.4)	14(87.5)	2(12.5)	11(68.8)	5(31.2)
		3497(100)	741(21.2)	2756(78.8)	435(58.7)	306(41.3)	378(86.9)	57(13.1)	162(37.2)	273(62.8)
[1]chi2=0.001, [2]chi2 =0.001, [3]chi2 =0.083, [4]chi2 = 0.011										

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Discussion

In present study, hypertension was detected in 21.2% of northern Iranian adults. In Iran, the prevalence of hypertension in entire of Iran[23] and in Isfahan[24] have been reported 23.3% (19.8%in men and 26.9% in women) and 18.0% (in general population), respectively. Prevalence in other countries such as the U.S[25], France[26] and Singapore[27] has been reported to be 20.1%, 37% and 24%, respectively. In agreement with the results of other studies, one-fifth of the adults were hypertensive in northern Iranian adults.

Illiterate people more than educated people were aware of their morbidity; however, disease control in this group was lower than the others. The role of educational level in cardiovascular disease is varied in different studies. In some of studies [28,29] , educational level is of a positive correlation with cardiovascular disease; while in others[30,31] , illiteracy is considered a risk factor for it. In that way, awareness rate has been reported to be more in educated people than illiterate people [32-34] and cardiovascular disease risk factors to be more in deprived or less developed regions than developed countries.[30-37]

A study conducted in China[22] showed an inverse correlation between education and both awareness and treatment rate; however, normalization of blood pressure in this group was better than others and low hypertension control has been seen in illiterate patients compared with educated people.[38]

Based on to the health promotion policies in Iran within last decades, Primary Health Care is being expanded in rural areas while strongly covered by health education. Consequently, this procedure is probable to result in increased awareness of hypertension as most people living in rural areas have low knowledge and attitude about risk of hypertension due to the illiteracy and poverty. A similar study in Austria[34] showed that not only awareness but also warning on the dangers of hypertension is necessary. Due to some limitations, we did not investigate all factors related to hypertension, such as quantity and quality of diet, duration of hypertension morbidity and ethnicity in this area.

Conclusion

Hypertension is a serious health problem in northern Iranian people affecting at least one-fifth of their population. Illiteracy is a risk factor for poor hypertension control. Other associated factors leading to the hypertension increase need to be identified and national actions and measures should be taken to reduce the adult hypertension especially in illiterate people of this area.

Practice implications

Illiterate patients should receive support to self-control their disease and become aware enough to undergo treatment of hypertension.

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