Impact of literacy on the prevalence, awareness, treatment and control of hypertension in adults in Golestan Province (northern Iran)

Abstract

Background Hypertension is considered as a major health problem in our society. The association between educational level with hypertension and its control in the Golestan Province (northern Iran) were the main objectives of this study.

Methods: This was a population-based cross-sectional study that enrolled 3497 subjects aged 15-65 years using stratified and cluster sampling. The interviewers recorded the data using a multidimensional questionnaire, including blood pressure level. Blood pressure was measured three times with 5 minutes interval and defined based on Join National Committee (JNC-7).

Results: Totally, 741 (21.2 %) cases suffered from hypertension and illiterate people were significantly more aware of their disease (p=0.011). In the aware group, 435 (89.6%) cases used one method to control their disease and it was not statistically significant as far as educational levels was concerned. The control of hypertension was significantly greater in college educated group than the illiterate one (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 awareness in the illiterate people was high, the rate of hypertension control was low in this group. Prevention, detection, treatment, and control of hypertension especially the illiterate people should be given high priority.

Keywords: Literacy, Awareness, Control, Treatment, Hypertension, Iran

Hypertension is an important public-health challenge worldwide and it is responsible of 7.1 million deaths annually (1). The estimated total number of adults with hypertension in 2000 was 972 million and the number of adults with hypertension in 2025 was predicted to increase about 60 % to a total of 1.56 billion (2). Literacy is considered as a mediating factor to health education and the relationship between education and health knowledge is approved by some reports (3-8). Studies about prevalence, awareness and control procedure of hypertension have been established abroad (9-13). Similar to most countries that have undergone rapid economic and demographical changeover, non-communicable diseases, especially cardiovascular disease, are the major causes of mortality and morbidity in Iran and reported with high prevalence (14-16). From the 1.6 million people in this area, 66.4 % were 15-64 years old, whereas, 43.9 % live in the urban areas (17). Agriculture is the main source of living in the rural areas and different ethnic groups such as Fars (native), Turkaman and Sistani are living in these regions. We chose education as a marker of socioeconomic status because it could easily be quantified in terms of number of years, reliably recalled and reverse incentive did not confuse the interviewer (18). Due to the restriction in executing epidemiological projects, there has not been any study on the hypertension in this area up to now; therefore, it was necessary to design a research project about it.
The aims of this study were to examine the prevalence of hypertension and to assess the association between its educational level on the awareness, treatment and control of the adults in Golestan province (northern Iran).

Methods
This is a cross-sectional–descriptive study based on population and 3497 cases (1750 men and 1747 women) between 15-65 years old were chosen by stratified and cluster sampling. The subjects were randomly chosen from 175 clusters and each cluster included 20 cases. The family code of primary health center in rural areas and postal code in urban areas were used to classify with equal proportion the age and sex.

From each district, one team was trained to complete the questionnaire and measure blood pressure. Blood pressure was measured three times with 5 minutes interval in the right arm. The interviewers recorded the data using a multi-dimensional questionnaire including socio-demographic indexes, blood pressure status, and procedure of control disease and awareness of their problem. Pregnant women and unwilling cases were excluded from this study.

Blood pressure levels were classified according to the guidelines from the JNC 7 report (19). Hypertension was defined as a systolic blood pressure of ≥140 mm/Hg or diastolic blood pressure of ≥90 mm/Hg or currently taking 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 using antihypertensive medication at the time of the interview or during the last two weeks of 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 populations defined as being hypertensive (20). Educational level and classified in four groups: 1) illiterate: People who neither read nor write, 2) People having 1-9 years of schooling 3) 9-12 years of schooling, 4) college degree. SPSS version 16.0 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 as statistical significant. The reliability was assessed using Cronbach’s alpha coefficient and found to be 0.83.

Results
Totally, 3497 subjects (1740 men, 1747 women) with the mean age of 39.5±14.3 years were evaluated. Hypertension was detected in 346 (19.8%) men and in 395 (22.6%) of women. Totally, 21.2% had hypertension. There was a significant inverse correlation between literacy and hypertension, the illiterate people were two times more hypertensive that those with tertiary or third level of education (p=0.001). From the hypertensive patients 435 (58.7%) were aware and significantly seen in illiterate people more than the educated people (p=0.001).

Only 378 (86.9%) cases of the awareness patients used an antihypertensive medication. Control rate was 273 (62.8%) cases and in educated people was two times more than the illiterate (68.8% vs 32.4%) (p=0.011) (table 1).
Multiple logistic regressions were used to identify the educational levels that contributed to hypertension. The odds ratio estimated for hypertension was 3.093 [95% CI: 2.265-4.225] for illiterate people compared to educated people was 1.480 [95% CI: 1.061-2.065] only when age was adjusted (table 2).

Table 2. Odds Ratios and 95% CI obtain from crude and age adjusted logistic regression.

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Crude OR (95% CI)</th>
<th>p-value</th>
<th>Age adjusted OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>College (Ref)</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>3.093 (2.265-4.225)</td>
<td>0.001*</td>
<td>1.480 (1.061-2.065)</td>
<td>0.021*</td>
</tr>
<tr>
<td>1-9 years schooling</td>
<td>1.339 (0.986-1.818)</td>
<td>0.062</td>
<td>1.286 (0.935-1.770)</td>
<td>0.122</td>
</tr>
<tr>
<td>9-12 years schooling</td>
<td>0.828 (0.597-1.150)</td>
<td>0.260</td>
<td>1.099 (0.780-1.550)</td>
<td>0.589</td>
</tr>
</tbody>
</table>

Ref=Reference category  * There is a statistical significant difference.

Discussion

In the present study, hypertension investigation of adults in Golestan province was 21.2%, the prevalence of hypertension in entire Iran and Isfahan was reported to be 23.3% (19.8% in men and 26.9% in women) and 18.0%, respectively (21, 22). The prevalence in other countries such as America, France and Singapore was reported to be 20.1%, 37% and 24%, respectively (23-25). In agreement with the results of other studies, one-fifth of the adults were hypertensive in northern Iran. The illiterate people in comparison to the educated people were more aware about their morbidity, but control disease in this group was lower than the others.

The role of educational level in cardiovascular disease varied in the different studies. In some studies, the educational level had a positive correlation with cardiovascular disease but in others, illiteracy was included a risk factor (26, 27).

This way, awareness rate was more in the educated people than the illiterate and cardiovascular disease risk factors had been seen in deprived or less developed regions more than the developed countries (28-35). A study conducted in China had shown an inverse correlation between education and both awareness and treatment rate, but normalization of blood pressure in this group was better than the others and the low control hypertension had been seen in illiterate patients as compared with the educated patients (20, 36).

According to the health promotion policy in the last decades in Iran, primary health care had been expanded in rural areas and was strongly covered by health education. This was possibly the way this procedure resulted to raise awareness about hypertension, although, they had little knowledge and low attitude about the risk of hypertension because of illiteracy and poverty.

A similar study in Austria showed that not only awareness but also the warning over dangers of hypertension were necessary (32).

We did not investigate all of the factors related to hypertension, such as quantity and quality of diet, duration of hypertension morbidity and ethnicity in this area which are the weaknesses of our study.

In conclusion, hypertension has been seen as a health problem in adults in Golestan Province northern Iran. At least one-fifth of them are suffering from it. Illiteracy is a risk factor for poor hypertension control. The other associated factors leading to hypertension increase need to be identified and public action is necessary to reduce adult hypertension especially among the illiterate people in this area.

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