Original Article

Investigating the relationship between demographic and socio-economic characteristics on the attendance to comprehensive health services center for blood pressure measurement: a cross-sectional study

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Abstract

Objectives: Many people around the world suffer from hypertension which increases the risk of heart failure and mortality. But most cases are not interested in referring to medical centers to have their blood pressure checked. The aim of this study was to investigate the relationship between demographic and socioeconomic characteristics of attending Barzok Comprehensive Health Services Center for blood pressure measurement.

Methods: The current cross-sectional study was performed in 76 hypertensive patients. Demographic and socioeconomic information was collected and compared based on referral to Barzok Comprehensive Health Services Center for blood pressure measurement.

Results: In this study, out of 76 cases, 10 patients (13.15%) referred to medical centers for blood pressure measurement, 66 cases (86.8%) did not go to medical centers. There was no statistically significant difference in gender and age between the two groups of patients ($p > 0.05$). In addition, the two groups were similar in terms of education level, occupational status, smoking history, and family history of hypertension (P=0.824, P=0.492, P=0.233 and P=0.276, respectively). However, mean systolic blood pressure (118 ± 9.18 mmHg vs 140.55 ± 17.06 mmHg, P<0.001) and diastolic blood pressure (75 ± 8.49 mmHg vs 84.53 ± 8.62 mmHg, P=0.006) in the group of cases referred to Barzok medical center was significantly lower (better) than in cases who did not refer ($p < 0.05$).

Conclusions: People at high risk for hypertension or those with hypertension regardless of their demographic or socio- economic characteristics or even where they live, should be trained to refer to comprehensive health service centers by creating motivation and insight.

Keywords: Blood pressure, Blood pressure measurement, Socio-economic characteristics, Attendance

Introduction

Hypertension (HTN) is a common asymptomatic underlying disease that leads to cardiac and fatal complications (1). The incidence of HTN is increasing as the average age and obesity levels of society. This trend is observed not only in developed countries but also in developing countries (2, 3). According to a study conducted by Hyndrich et al. by 2030,

more than 27 million individuals will suffer from high BP, and its prevalence will be 9.9% higher than in 2010 (4). According to the studies performed in Iran, the prevalence of hypertension was reported about 18% (5) to 20% in adult ages (35-65 years old), that indicates the necessity to identify and control HTN in Iran (6).

Despite the availability of different types of drugs in the treatment of HTN, all have been proven to be effective, the reported rates of controlled- blood pressure are very disappointing. This issue is one of the most important problems for the quality of life of patients with HTN (7).

Furthermore, blood pressure (BP) measurement is fundamental to the diagnosis and treatment of HTN and is routinely used to initiate or rule out costly investigations and long-term therapeutic interventions. The methods by which blood pressure is measured are numerous (8). Office BP (OBP) is measured using different methods (auscultatory, automated, unattended with the patient alone in the office) and out-of-office using ambulatory BP monitoring (ABPM), or home BP monitoring (HBPM), along with measurements in other settings (pharmacies, public spaces). And even in recent years, especially during the corona epidemic, there have been studies on self-measurement (9) and the use of warning and measuring applications (10), which shows the importance of BP measurement in hypertensive patients. Despite the importance of measuring BP in high-risk cases, limited studies have been conducted to identify factors affecting the patients' desire to refer to medical centers for checking their blood pressure. Due to the fact that policy and decision-making to address any health problem requires accurate statistics on the prevalence of each problem and its associated factors. Moreover, inadequate blood pressure monitoring is prevalent in Barzok, according to researchers' experience, with no specific cause reported. This study was conducted to examine factors associated with blood pressure measurements in patients who did not come to the Barzok Health Center. Furthermore, the statistics obtained are intended to assist in policy making, staffing and budget allocation for the implementation of health system transformation plans used at the Barzok General Health Service Center.

Materials and methods

This cross-sectional study was conducted at Barzok Health Center. By December 2017, hypertensive patients who were not referred to the Barzok General Health Center for blood pressure treatment were compared with those who were referred to the Barzok General Health Center. Inclusion criteria were cases with HTN (defined as systolic blood pressure $\geq$140 mmHg and diastolic blood pressure $\geq$90 mmHg), signed informed consent forms for study participation, with the age range of 18-90. Exclusion criteria were patients younger than 18 years or older than 90 years and those dissatisfied with further participation in the study. Patients with incomplete data were also excluded. Data collection consisted of data recorded in the Ministry of Health and Medical Education's Integrated and Comprehensive Sib System and questionnaires containing questions asked in the form of interviews (smoking history, family cardiovascular disease).The questionnaire was completed through a series of interviews. A professional interviewer was in charge of the interviews. Blood pressure was also measured at the same time as filling out the questionnaire. The final step after completing the questionnaire was analyzing the results. All ethical considerations were taken into account in this study.

Data analysis

Data were analyzed and reported only for patients who completed the trial. Statistical analysis of data was performed using SPSS version 22 software (SPSS Inc, Chicago, IL, USA). Chi-square test and Fisher's exact test were performed to compare qualitative variables between groups. The normal distribution of all examined parameters was checked using the Kolmogorov-Smirnov test. Student's t-test was used for normally distributed variables and Mann-Whitney test was performed for non-normal variables. The two tailed p-value < 0.05 were considered significant.
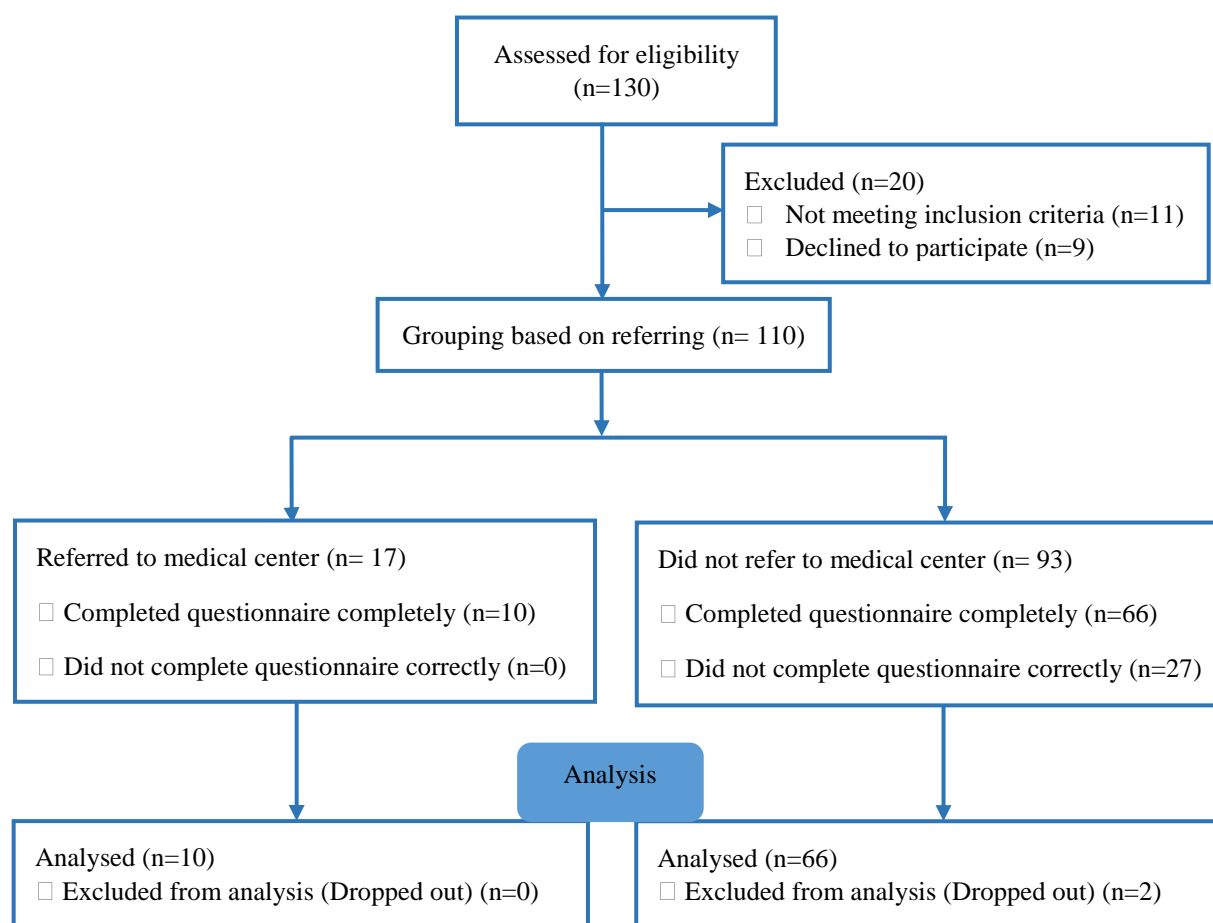
Figure1: Study flowchart

Results

In this study, 10 of 76 (13.15%) patients presented to a medical center for blood pressure measurement, and 66 (86.8%) did not. There were no significant differences in gender and age between the two patient groups (p>0.05). Additionally, both groups were found to be similar in terms of education and professional status (P=0.824 and P=0.492, respectively). Table 1 Furthermore, no significant difference could be observed when comparing both groups based on smoking history and family history of HTN (p=0.233 and p=0.276, respectively). By evaluating different demographic and socio-economic characteristics in both the referred and not referred groups based on binary logistic regression, we did not observ significant effects for each variable on referring to health service center of Barzok (p>0.05).

However, the results showed that the mean systolic (118 ± 9.18 mmHg vs. 140.55 ± 17.06 mmHg, p<0.001) and diastolic (75 ± 8.49 mmHg vs. 84.53 ± 8.62 mmHg, P=0.006) BP in the group of cases referred to the health service center of Barzok were significantly lower (better) than those cases who did not go (p<0.05) Table1.

Table1: Sample demographic and socio-economic characteristics in both the referred and not referred groups

Variables	Group	Referred (n=10)	Did not refer (n=66)	OR (CI 95%)	*p*-value
Gender	Male	6 (60)	29 (49.6)	1.59 (0.41- 6.17)	0.736
	Female	4 (40)	34 (51.5)		
Age (year)		68.9 ± 11.48	68.24 ± 12.65	-	0.87
Age	≤60	2 (20)	24 (36.4)	0.43 (0.08- 2.23)	0.479
	>60	8 (80)	42 (63.6)		
Educational Status	Illiterate	4 (40)	24 (36.4)	1.16 (0.29- 4.55)	0.824
	Literate	6 (60)	42 (63.6)		
Job status	No job or Home maker	5 (50)	24 (36.4)	1.75 (0.46- 6.66)	0.492
	Have job	5 (50)	42 (63.6)		
Smoke	No	8 (80)	60 (92.3)	0.33 (0.05- 2.01)	0.233
	Yes	2 (20)	5 (7.7)		
Family History	No	5 (50)	44 (67.9)	0.47 (0.12- 1.83)	0.276
	Yes	5 (50)	21 (32.3)		
Blood Pressure (mmHg)	Systolic	118 ± 9.18	140.55 ± 17.06	-	<0.001
	Diastolic	75 ± 8.49	84.53 ± 8.62	-	0.006

Discussion

The study is one of the first in the world to assess one of the key public health indicators in newly established cities. In this study, 86.84% of patients did not visit Barzok General Health Center for blood pressure measurement. Despite theim portance of measuring hypertension and studying its influencing factors, limited research has been conducted to identify risk factors for the lack of desire to attend to health centers for blood pressure measurements. One study (6) concluded that several indicators (such as age, gender, and level of education) are associated with a patient's desire to go to the clinic for a blood pressure measurement. In addition, several studies found that lower education (11, 12), older age (13), or occupational status (14) increased the risk of referring patients to a general medical center for blood pressure measurement. However, in our survey, we could not observe any differences in terms of demographic and socioeconomic characteristics of the attendance. Differences in these results may be due to differences in sample size, location and time of study performed, sampling differences, and control of confounding factors. However, we found that blood pressure (both systolic and diastolic) was higher in the non-referred group compared to the referred group. Several studies have shown that elevated systolic blood pressure has a significant impact on disease progression and independently increases the risk of adverse cardiovascular events (15).

However, the clinical trial has demonstrated the benefits of treating elevated BP (16).
Therefore, individuals at high risk for, or suffering from, HTN, regardless of demographic or socioeconomic characteristics or even where they live, should be motivated and insightfully referred to general health service centers (17). The importance of blood pressure monitoring in hypertensive patients worldwide is emphasized annually by the International Society of Blood Pressure (18) and measures are being taken worldwide in Europe (8). To this end, a national blood pressure control campaign was conducted in Iran as early as 2022, as HTN is one of the major risk factors for premature death and complications in Iran (19) (20).This study had some limitations. First social desirability bias may occur during the collecting of some covariates (such as smoking) by the interview technique. Moreover, the physical activity status of the participants, their underlying diseases, and body mass index (BMI) were not evaluated. It is recommended that future studies consider these variables in addition to the variables mentioned in this studyat the level of newly established cities around the world.

Conclusion

Regardless of demographics, socioeconomic characteristics, or even where they live, people who are at high risk for or who have hypertension should be motivated to visit general

health service centers. Future studies should identify more indicators that influence referral of blood pressure patients to general health centers for blood pressure measurements.

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