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Kayıhan PALA
Harika GERÇEK
Alpaslan TÜRKKAN

RESEARCH

THE EFFECT OF HOUSE VISITS ON HYPERTENSION CONTROL IN THE ELDERLY: A STUDY FROM BURSA, TURKEY

ABSTRACT

Introduction: The aim of this study was to evaluate the effect of house visits on hypertension control in the elderly.

Materials and Method: In Bursa, the Nilüfer Public Health Training and Research Area conducts a follow-up program for the elderly. Nurses and midwives visit people over 65 years of age every six months, which is a new practice in Turkey. During these visits, they measure blood pressure and ask questions about their patients' health conditions. If the patients' blood pressure is high then they are referred to a physician. In that case, the patients are also re-visited by the nurse or midwife the following month to check whether they consulted a physician and to observe the current condition of the patients' health. Follow-up cards of elderly patients were analysed. People who were visited regularly every six months and who had four blood pressure measurements (1063 women and 713 men) were included.

Results: The prevalence of women with normal blood pressure (normal, prehypertension or controlled) was 34.5% at the first visit and it increased to 46.4% at the fourth visit ($p<0.05$). For men, the corresponding percentages were 41.4% and 54.4%, respectively ($p<0.05$).

Conclusion: In this study, there was a positive effect of house visits by public health nurses and midwives on hypertension management in the elderly.

Key Words: Hypertension; Aged; Midwifery; Turkey.

ARAŞTIRMA

YAŞLILARDA HİPERTANSİYON KONTROLÜNDE EV ZİYARETLERİNİN ETKİSİ: TÜRKİYE, BURSA'DAN BİR ÇALIŞMA

ÖZ

Giriş: Bu çalışmanın amacı yaşlılardaki hipertansiyonun kontrolünde ev ziyaretlerinin etkisini değerlendirmektir.

Gereç ve Yöntem: Bursa'da, Nilüfer Halk Sağlığı Eğitim ve Araştırma Bölgesi'nde yaşlılar için bir izlem programı yürütülmektedir. Türkiye için yeni olan bu uygulamada, hemşire ve ebeler, 65 yaş ve üzerindeki kişileri altı ayda bir ziyaret etmektedir. Bu ziyaretler sırasında, onlar yaşlı kişilerin kan basınçlarını ölçmekte ve sağlık durumları ile ilgili sorular sormaktadır. Hastanın kan basıncı yüksek ise doktora yönlendirilmektedir. Uygulamada, doktora gidip gitmediklerini kontrol etmek ve son sağlık durumlarını gözlemlemek amacıyla hastalar takip eden ay içinde ebe-hemşire tarafından tekrar ziyaret edilmektedir. Bu çalışmada yaşlı takip kartları incelenmiştir. Altı ayda bir düzenli takip edilen ve dört kan basıncı ölçüm sonucu var olan kişiler (1063 kadın ve 713 erkek) çalışmaya alınmıştır.

Bulgular: İlk ziyarette kan basıncı değerleri normal olan (normal, prehipertansiyon ya da kontrol altında) kadınların oranı %34,5 iken bu değer dördüncü ziyarette %46,4'e çıkmıştır ($p<0,05$). Erkekler için ise bu oranlar sırasıyla %41,4 ve %54,4'tür ($p<0,05$).

Sonuç: Bu çalışmada, ebe-hemşireler tarafından yaşlılara yapılan ev ziyaretlerinin hipertansiyonun kontrolünde olumlu bir etkisi olduğu saptanmıştır.

Anahtar Szcükler: Hipertansiyon; Yaşlı; Ebe; Türkiye.

Correspondance

Alpaslan TÜRKKAN
Uludağ University, Faculty of Medicine, Department of Public Health, BURSA

Phone: 0224 295 42 81
e-mail: alpaslanturkkan@gmail.com

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Uludağ University, Faculty of Medicine, Department of Public Health, BURSA

INTRODUCTION

The world's population is gradually aging. In developing countries, this trend increases the importance of health services for the prevention, early diagnosis and therapy of chronic diseases in the elderly.

Hypertension (HT) is an increasingly important medical and public health issue. The prevalence of hypertension increases with age; in fact, more than half of people 60-69 years of age and three-fourths of those 70 years of age and over are affected (1).

The ultimate public health goal of hypertension therapy is to reduce cardiovascular and renal disease morbidity and mortality. Treating patients so that systolic blood pressure (SBP) and diastolic blood pressure (DBP) levels are <140/90 mmHg is associated with a decrease in cardiovascular disease complications (2).

Lifestyle modification, pharmacologic treatment, individual blood pressure control and follow-up are important components of hypertension therapy (3).

Hypertension prevalence among the elderly is very high in Turkey, as in many other regions of the world. For example, in Gemlik District, hypertension prevalence was 58.0% and 64.3% among the 60-69 and 70-79 age groups, respectively (4).

Although hypertension among the elderly is a major public health issue, there is no early diagnosis and control program in Turkey. A follow-up program for the elderly is being implemented since 2003 in Bursa, the Nilüfer Public Health Training and Research Area (NPHTRA). According to this program, public health nurse and midwives visit elderly people every six months at their home regularly.

The aim of this study was to evaluate the effect of house visits on hypertension control in the elderly.

METHODS

This cross-sectional study was conducted in the NPHTRA in Bursa, Turkey. The NPHTRA was founded in 2001 by Uludağ University and the Municipality of Nilüfer.

The main philosophy of the NPHTRA is to provide services to people who consult a health worker by visiting people at home, at school and, when necessary, at their workplace. Public health nurses and midwives visit people over 65 years of age every six months at home regularly. During these visits, they measure blood pressure and glucose levels of people and evaluate their health conditions. If the peoples' blood pressure and/or glucose levels are high or they have other health problems, then they are referred to a physician. In that case, the patients are also re-visited by the nurse or midwife the following month to check whether they consulted a physician and to observe the current condition of the patients' health.

From 2003 until to 2014, follow-up cards for elderly were analysed using data from the previous years. People who were regularly visited every six months and who had four blood pressure measurements were included in the study.

Blood pressure was measured using a standard mercury sphygmomanometer. Blood pressure categories were classified in accordance with the guidelines of the Seventh Report of the Joint National Committee (JNC 7) on Prevention, Detection, Evaluation and Treatment of High Blood Pressure as follows: "normal" (<120/80 mmHg), "prehypertension" (120/80–139/89 mmHg), "stage 1" (140–159/90–99 mmHg) or "stage 2" (?160 / 100 mmHg) hypertension (3).

Awareness, Treatment and Control of HT

People who reported having HT were classified as follows: aware but not receiving any treatment, aware but with high blood pressure despite receiving treatment and aware and receiving treatment with blood pressure under control.

Awareness of HT was defined by the self-report of any prior diagnosis of HT by a healthcare professional.

Treatment was defined as the use of any antihypertensive medication.

The term "controlled" was defined as having a BP < 140/90 mmHg.

The study was accepted by the Ethical Committee of Uludağ University Faculty of Medicine (Reference No. 2005-7/2).

Data were analysed using the SPSS 20 program. Chi-square, t–test, RM Anova and Cochran's Q tests were used in statistical analyses.

RESULTS

The study included 1063 women (59.9%) and 713 men (40.1%). The mean age of men was 71.2±5.9 and mean age of women was 71.1±6.0 (p>0.05). Table 1 shows some of the characteristics of the study population.

Average values of both SBP and DBP were higher among women than among men for all measurements (p<0.05). Mean SBP level among men differed statistically significant between follow ups (p>0.05). In men, first follow up SBP

Table 1— Some Characteristics of the Study Population (%).

Follow-up	Average SBP mmHg (95% CI)	Average DBP mmHg (95% CI)
Women (n=1063)		
First	144.4 (142.9-145.9)	85.4 (84.6-86.1)
Second	142.6 (141.1-144.0)	83.9 (83.2-84.6)
Third	140.6 (139.2-142.1)	83.0 (82.3-83.8)
Fourth	138.1 (136.7-139.5)	81.8 (81.2-82.5)
p	<0.05	<0.05
Men (n=713)		
First	139.2 (137.5-140.9)	82.9 (82.0-83.8)
Second	137.0 (135.3-138.7)	81.1 (80.2-81.9)
Third	134.9 (133.3-136.5)	79.9 (79.1-80.7)
Fourth	133.1 (131.4-134.7)	79.8 (79.0-80.7)
p	<0.05	<0.05

level were higher than both second and fourth follow up levels (p<0.05); second follow up SBP level were higher both third and fourth follow up levels (p<0.05). Mean DBP level among men differed statistically significant between follow ups (p>0.05). In men, first follow up DBP level were higher than all other follow up levels (p<0.05); second follow up DBP level were higher than third and fourth follow up levels (p<0.05) but there was no statistically significant relationship between third and fourth follow up levels. Mean SBP level among women differed statistically significant between follow ups (p>0.05). In women, first follow up SBP level were higher than both third and fourth follow up levels (p<0.05); second follow up SBP level were higher both third and fourth follow up levels (p<0.05) and third follow up SBP level was higher than fourth follow up level (p<0.05). Mean DBP level among women differed statistically significant between follow ups (p>0.05). In women, first follow up DBP level were higher than all other follow up levels (p<0.05); second follow up DBP level was higher than fourth follow up level (p<0.05) and third follow up DBP level was higher than fourth follow up level (p<0.05). Average SBP and DBP values are shown in Table 2.

The prevalence of women with normal blood pressure (normal, prehypertension or controlled) was 34.5% at the first

Table 2— Average SBP and DBP Values of Participants.

Characteristics		Women	Men	p
Age	65-74	74.7	72.8	>0.05
	75+	25.3	27.2	
Education (years)	≤5	68.6	35.7	<0.05
	>5	31.4	64.3	
Living situation	Alone	16.7	7.3	<0.05
	With spouse	39.9	74.9	
	Other*	43.4	17.8	
Social health insurance	No	23.2	19.6	>0.05
	Yes	76.8	80.4	
The presence of chronic diseases	No	21.3	33.0	<0.05
	Yes	78.7	67.0	
Total	1063 (100.0)	713 (100.0)	1776	

* With his/her children relatives or friends.

Table 3— Blood Pressure Classification of the Participants According to JNC 7 (%).

Follow-up	Normal <120/80mmHg	Pre-hypertension 120/80 -139/89 mmHg	Hypertension Stage 1 140/90-159/99 mmHg	Hypertension Stage 2 ≥160/100 mmHg
Women (n=1063)				
First	74 (7.0)	293 (27.5)	308 (29.0)	388 (36.5)
Second	83 (7.8)	323 (30.4)	331 (31.1)	326 (30.7)
Third	89 (8.4)	350 (32.9)	337 (31.7)	287 (27.0)
Fourth	86 (8.1)	407 (38.3)	346 (32.5)	224 (21.1)
p		<0.05		<0.05
Men (n=713)				
First	82 (11.5)	213 (29.9)	222 (31.1)	196 (27.5)
Second	75 (10.5)	262 (36.8)	222 (31.1)	154 (21.6)
Third	80 (11.2)	284 (39.8)	226 (31.7)	123 (17.3)
Fourth	100 (14.0)	288 (40.4)	212 (29.7)	113 (15.9)
p		<0.05	<0.05	

visit, increasing to 46.4% at the fourth visit (p<0.05). For men, the corresponding percentages were 41.4% and 54.4%, respectively (p<0.05). Hypertension rate in repeated measurements decreased among four follow up both women (p<0.05) and men (p<0.05). The blood pressure classification of the participants, according to the JNC 7 guidelines (3), is shown in Table 3.

At the first visit 629 (74.3%) of women and 288 (57.9%) of men were aware that they had HT. At the second visit, the awareness level increased to over 90% for both men and women (p<0.05).

The prevalence of hypertensive participants who were getting medication increased from 59.7% (first visit) to 68.6% (fourth visit) among women and from 43.7% to 53.3% among men (p<0.05). The proportion of women who received medication was higher than that of men at all visits (p<0.05).

Only 151 of women (17.8%) who reported having HT at the first visit had controlled HT, compared to 324 (38.3%) at the fourth visit (p<0.05). The corresponding percentages were 15.9% (79) and 43.5% (216) among men, respectively (p<0.05).

At the first visit 847 of women (151 of had controlled HT and 696 of had Stage 1 and Stage 2 HT) and 497 of men (79 of had controlled HT and 418 of had Stage 1 and Stage 2 HT) were found that they had HT.

There was no gender difference with respect to having controlled HT at the first visit (p>0.05). At the following visits, however, the ratio of men with controlled HT was higher than the ratio of women (p<0.05). The prevalence of awareness, treatment and control of HT are shown in Table 4.

Having social health insurance did not affect access to medication among men, but women with social health insurance were more likely to obtain medication than women without social health insurance (p<0.05). Using medication rate in repeated measurements increased among four follow up both women who had social health insurance (p<0.05) and men who had social health insurance (p<0.05) and also increased women without social health insurance (p<0.05) and men without social health insurance (p<0.05). The association between having social health insurance and using medication is shown in Table 5.

Discussion

The high prevalence and low awareness and control of HT make it an important public health problem in both developing and developed countries (5). The management of HT is especially poor for older people who have a higher prevalence of HT than their younger counterparts (6).

To help patients successfully change their lifestyles and control their HT, clinicians should collaborate with other health workers. Public health nurses and community outreach workers in high-risk communities are also helpful through their efforts to screen and identify cases, refer and track follow-up appointments and educate patients (3).

In our study, HT prevalence at the first visit was 79.7%

Table 4— Awareness Treatment and Control of Hypertension Among Study Population.

Follow - up	Awareness n (%)	Treatment** n (%)	Control*** n (%)
First	629 (74.3)	506 (59.7)	151 (17.8)
Second	781 (92.2)	531 (62.7)	249 (29.4)
Third	810 (95.6)	563 (66.5)	289 (34.1)
Fourth	820 (96.8)	581 (68.6)	324 (38.3)
p	<0.05	<0.05	<0.05
Men (n=497)			
First	288 (57.9)	217 (43.7)	79 (15.9)
Second	464 (93.4)	246 (49.5)	169 (34.0)
Third	476 (95.8)	260 (52.3)	201 (40.4)
Fourth	481 (96.8)	265 (53.3)	216 (43.5)
p	<0.05	<0.05	<0.05

* Those who are aware that they are hypertensive.
** Those using medication among hypertensive.
***SPB <140 mmHg and DBP <90 mmHg.

Table 5— The Relation Between Having Social Health Insurance and Using Medication.

		Social Health Insurance (%)		
Patients using medication	Follow - up	No	Yes	p
Women	First (n=506)	99 (49.3)	407 (63.0)	<0.05
	Second (n=531)	106 (52.7)	425 (65.8)	<0.05
	Third (n=563)	119 (59.2)	444 (68.7)	<0.05
	Fourth (n=581)	124 (61.7)	457 (70.7)	<0.05
Men	First (n=217)	38 (38.8)	179 (44.9)	>0.05
	Second (n=246)	43 (43.9)	203 (50.9)	>0.05
	Third (n=260)	48 (49.0)	212 (53.1)	>0.05
	Fourth (n=265)	51 (52.0)	214 (53.6)	>0.05

for women and 69.7% for men. These prevalence are higher than those found in studies from Delhi (7) and Thailand (8) and they are similar to findings from China (9), Bangladesh and India (10) and various regions of Turkey (11, 12). They are slightly lower than the results from studies conducted in Trabzon (13) and New York City (14), as well as findings from the Jackson Hearth Study (JHS) (15) and the PatenT study, which represents Turkey in general (16).

Disparities in the prevalence of hypertension among different studies should be assessed together with the methods of study and characteristics of study participants in terms of hypertension risk factors like socioeconomic and racial disparities, being overweight and obese, too much salt intake etc. For example, the age of the participants in Delhi (7) and Thailand (8) studies began 60 years of age instead of 65. Many previous studies have indicated that HT prevalence increases with age and is higher among women (4, 9, 13-15). The high prevalence among older women may be explained by hormonal factors and postmenopausal weight gain.

In this study, HT awareness at the first visit was 74.3% among women and 57.9% among men. These prevalence rates are higher than those found in studies conducted in Delhi (7), Thailand (8) as well as Bangladesh and India (10), and similar to the results from other studies in Turkey (13, 16) and lower than the results from the JHS (15), studies conducted in Balçova (11) and New York City (14). HT aware-

ness levels in our study may be lower than those found in Balçova (11), New York City (14) and the JHS (15) due to the higher development levels of these regions. However, at the second visit, the HT awareness level in our study was found to be higher than those found in the aforementioned studies.

In a New York City study (14), HT awareness was similar for men and women. In contrast, many other studies found that awareness was higher among women than among men (7-10, 15, 16). In previous studies, HT awareness has been found to increase with age, years of education, physician contact in the last year and receiving preventive services (14, 15). In our study, after beginning preventive services, the HT awareness level increased to over 90% for both men and women and the gender difference disappeared.

The main determinant of HT awareness is blood pressure measurement, and there is a strong relationship between the frequency of measurements and HT control (17). Although the percentage of people who never had a blood pressure measurement was below 1.0% in the New York City study (14), the percentages were 25.8% among women and 41.4% among men in Turkey (4). This difference between men and women may help explain the higher awareness among women found in our study. Some people had very infrequent measurements. Of the people who had blood pressure measurements, 14.5% had their last measurement at least two years ago (16). Never having a BP measurement taken or having measurements taken very rarely decreased both HT awareness and control.

In our study, the percentage of people who were getting treatment at the first visit was higher, compared with findings from the Delhi (7), Thailand (8), Bangladesh and India (10) and PatenT (16) studies, but lower than in the New York City study (14) and the JHS (15). Although treatment percentages increased for both men and women during regular visits, they were still lower at the fourth visit than those in the New York City study and the JHS.

Lack of treatment despite HT awareness may be explained by social factors, such as the lack of guidance and knowledge about the risks of HT or financial hardship (9).

In our study, as in many other studies, the percentage of women who received treatment was higher than that of men (7, 9,10,13,15,16). Preventive services increase the probability of treatment (15). We found that preventive services led to an increase in treatment for both genders, but the discrepancy between men and women remained.

The prevalence of controlled HT at the first visit in our study was lower than the corresponding prevalence in the New York City study (14) and the JHS (15), but higher than the prevalence found in the Trabzon (13) and Bangladesh and India (10) studies. Our results were similar to those of the Delhi (7) and PatenT (16) studies. The prevalence of controlled HT was higher at the fourth visit, but it was still lower than in the JHS.

The controlled HT is closely related with raising awareness and getting treatment. Both awareness and treatment rates were higher than our study in the New York City study (14) and JHS (15).

At the first visit, there was no gender difference in having controlled HT, which is consistent with the findings of the Thailand (8), Bangladesh (10) and New York City (14) studies. At the follow-up visits, the percentage of controlled HT was higher among men. Although the treatment of HT was higher among women in our study, HT control was lower. This might be explained by the higher rate of lifestyle change among men versus women.

Continuing preventive services increased the prevalence of HT awareness to that of developed countries. Although the prevalence of HT treatment and control also increased during the survey, they were below those found in developed countries. This might be due to the fact that HT treatment and control are related to socioeconomic factors. Lifestyle change and access to health care are important factors for BP control in the elderly (14,17). The present study found that hypertensive people who visited the same health care facility or had the same health care provider had 2- to 5-fold higher odds of controlling their hypertension. Access to high-quality healthcare is considered the most important factor for HT control (17). Uncontrolled HT might indicate limited access to care or a low quality of care (8).

HT prevalence is not related to social health insurance (11); however, people without social health insurance might have fewer BP measurements and physician visits. Additionally, they might not seek healthcare until they are seriously ill. Social health insurance and having a routine source of care has been found to increase access to preventive care (18). Awareness, treatment and control of HT are lower among people without social health insurance and a routine place of care (14,17,19-21). Not having social health insurance is related to the use of antihypertensive and it is one of the main determinants of medication use. Uninsured patients have higher BP, independent of age or known physiologic and socioeconomic factors (22). Lack of insurance is an independent risk factor for BP control in young and middle-aged people (23) and it is also a barrier to care (24). In our study, ther-

apy was higher among women with social health insurance, but there was no difference among men with or without social health insurance. Between the first and fourth visits, medical therapy increased for both men and women, independent of having social health insurance.

In this public health program, midwives visit elderly people every six months. It is recommended that patients should be followed up every 2-4 weeks until medicine titration is regulated. Patients with low cardiovascular disease risk and mild HT should be followed up every 6 months (25).

There were some limitations of our study; firstly we could not evaluate HT risk factors, such as body mass index or smoking, as there were no data for these factors in our records; secondly the details of the procedures used for HT detection (place of referral, laboratory findings) and medical treatment (medication, dosage) were not recorded.

In conclusion, home visits by public health workers had a positive effect on HT management in the elderly, regardless of the subject's risk situation.

Conflict of Interest

The authors have no financial disclosures to declare and no conflicts of interest to report.

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