Hypertension prevalence, knowledge, attitude & awareness among pharmacists in Jos, Nigeria

Isaac Okoh Abah, Blessing Mary Dare, Hafsat Olufunke Jimoh
Pharmacy Department, Jos University Teaching Hospital, Jos, Nigeria

Corresponding Author: Isaac Okoh Abah
Email: isaacabah@gmail.com, Phone +2348037035932

Abstract

Background: Knowledge and awareness of blood pressure (BP) play an important role in the successful control of hypertension and prevention of hypertension-related complications.

Objectives: The study is aimed at estimating the prevalence, knowledge, awareness, and attitudes of hypertension and its risk factors among pharmacists in Jos, Nigeria.

Methods: A cross-sectional prospective study was conducted during the month of July 2013 among pharmacists in Jos metropolis using a self-administered questionnaire and BP measurement. Factors associated with hypertension knowledge, awareness and attitude were analyzed by Kruskal-Wallis test or student t-test as appropriate while multivariate regression assessed factors associated with hypertension.

Results: In all, 200 pharmacists, median age 35 years (IQR 28-46 years), 72% males participated in the study. The prevalence of hypertension was 8%. Overall, 90% of respondents had good knowledge of hypertension, while 82% had a poor attitude towards hypertension. Inadequate hypertension related knowledge was an independent risk factor for stage 1 hypertension (adjusted odd ratio 10.9; 95% confidence interval: 1.2-54.6), adjusting for age, sex, body mass index, marital status and length of employment.

Conclusion A low prevalence and adequate knowledge of hypertension was observed among pharmacists in Jos, however, the attitude/awareness of hypertension was very poor. Interventions to improve awareness and reduce hypertension risk among pharmacists are needed.

Keywords: Pharmacists, High blood pressure, Awareness, Nigeria

La prévalence de l'hypertension, la connaissance, l'attitude et la sensibilisation des pharmaciens à Jos, au Nigeria

Auteur correspondant: Isaac Okoh Abah
Email: isaacabah@gmail.com, Phone +2348037035932

RÉSUMÉ

Contexte: Connaissance et sensibilisation de la pression artérielle (PA) jouent un rôle important dans le contrôle réussie de l'hypertension et la prévention des complications liées à l'hypertension.

Objectifs: L'étude vise à évaluer la prévalence, les connaissances, la sensibilisation, les attitudes et les facteurs de risque de l'hypertension chez le pharmacien à Jos, au Nigeria.

Méthodes: Une étude prospective transversale a été menée durant le mois de Juillet 2013 chez les pharmaciens en métropole Jos aide d'un questionnaire auto-administré et mesure de la TA. Facteurs associés à la connaissance de l'hypertension, la sensibilisation et l'attitude ont été analysés par KruskalWallis essai ou test t de Student, le cas échéant, si les facteurs de régression multivariée évalués associés à l'hypertension.

Résultats: Au total, 200 pharmaciens, l'âge médian de 35 ans (IQR 28-46 ans), 72% des hommes ont participé à l'étude. La prévalence de l'hypertension était de 8%. Dans l'ensemble, 90% des répondants avaient une bonne connaissance de l'hypertension, tandis que 82% ont eu une mauvaise attitude envers l'hypertension. L'insuffisance hypertension connaissances liées était un facteur de risque indépendant pour hypertension de stade 1 (odd ratio ajusté de 10,9 à 95% intervalle de confiance: 1,2 à 54,6), ajustement pour l'âge, le sexe, indice de masse corporelle, l'état matrimonial et la durée de l'emploi.

Conclusion: Une faible prévalence et une connaissance suffisante de l'hypertension a été observée chez les pharmaciens à Jos, cependant, l'attitude / sensibilisation à l'hypertension était très pauvre. Les

interventions visant à améliorer la sensibilisation et de réduire le risque d'hypertension chez les pharmaciens sont nécessaires.

Mots-clés: Pharmaciens, haute pression sanguine, de sensibilisation.

INTRODUCTION

Hypertension is the most prevalent non-communicable conditions worldwide, accounting for an estimated 45 and 51% of deaths due to heart disease and stroke respectively. [1] Globally, the overall prevalence of hypertension in adults aged 25 years and over was around 40% in 2008, with Africa having the highest prevalence of 46%. [1] The prevalence of raised blood pressure ranges from 8% to 46.4% in Nigeria. [2-5]

Blood pressure (BP) has been shown to be linearly related to the risk for stroke and coronary heart disease. [6] In some age groups, the risk of cardiovascular disease doubles for each incremental increase of 20/10 mmHg of blood pressure, starting as low as 115/75 mmHg. [7] In addition to heart failure and stroke, complications of hypertension include peripheral vascular disease, coronary heart diseases, renal impairment, retinal haemorrhage and visual impairment. [8] Controlling systolic blood pressure (SBP) and diastolic blood pressure (DBP) to a value below 140/90 mmHg is linked with a decrease in cardiovascular complications. [7-9] Knowledge and awareness of BP play an important role in the successful control of hypertension. [10-11] Health professionals including Pharmacists play a key role; through patient's education, in modifying the attitude and raise awareness to blood pressure control. However, recent studies have shown poor attitude and awareness of hypertension among health workers. [12] Knowledge of the attitude and awareness of hypertension among pharmacists will aid the delivery of effective interventions to prevent and control high BP among these professionals. Accordingly, we assessed the knowledge, attitude and awareness of hypertension among pharmacists in Jos metropolis.

METHODS

A cross-sectional prospective study was conducted during the month of July, 2013 among pharmacists in Jos metropolis. Jos; located in the North Central part of Nigeria, is the administrative capital of Plateau State. There were 320 registered pharmacists in Jos metropolis during the study period. Allowing for 10% attrition, at 95% confidence interval, a total of 200 out of 320 consenting pharmacists were conveniently sampled using Yamane formula $[n=N/(1+N(e)^2)]$,[13] where n is the desired sample size, N the population size, and *e* the desired level of precision. Knowledge, awareness and attitude of participants to hypertension were assessed using a structured questionnaire, in addition to blood pressure measurement.

Data collection instrument: The self-administering questionnaire constructed for this study consists of 53 questions made up of the following parts:

Demographic, BP and job related information: Demographic variables included; gender, age, weight, height, and marital status, while job related information included; area of practice and duration of employment. Other information obtained included respondents BP. Blood pressure reading was made on the right arm with participant in a sitting position, in a quiet environment. Readings were based on *Korotkoff* first and fifth-phase sounds. The average of two BP. BP reading taken 30 min apart was recorded. BP was measured using a mercury sphygmomanometer (Boso, Jungingen, Germany) with a standard-width or large cuff for persons with middlearm circumference ≥34 cm, respectively.

Hypertension risk assessment: Risk factors for hypertension assessed included smoking, alcohol use, family history of hypertension, physical activity level and body mass index (BMI). Smokers were defined as persons reporting current smoking of at least one cigarette per day on average while alcohol consumption was estimated as milliliters of alcohol (ethanol) consumed per day. The level of physical exercise was classified as low, medium, or high based on a previous study[14] which assigned scores to reported daily walking time and the number of sessions dedicated to leisure physical exercise per week. A low level of exercise referred to a walking time of 30 minutes or less per day and participating in leisure physical exercise less than once per week; a high level referred to leisure physical exercise at least 3 times per week or walking at least 50 minutes per day; all other persons were labeled as having intermediate exercise levels. Risk factors were assessed on a scale of 0 to 2, with a score of 0, 1, and 2 representing no risk, one-risk and two or more risk factors reported respectively. The total cumulative risk ranged from 1 to 8. A cumulative total score of 5 to 8 was categorized as high risk while a score of ≤ 4 considered low risk.

Knowledge of Hypertension: Knowledge assessment was performed using 9-items adapted from Oliveria et al., 2004. [15] The items (eight positive and one negative) were scored on a five-point Likert scale ranging from "strongly agree" to "strongly disagree." The sum score for knowledge varying from 1 to 45 was used to compute percentage knowledge score. Thereafter, the variable was categorized into adequate knowledge (≥ 60%) and inadequate knowledge (<60%).

Hypertension Attitude/Awareness:

Attitude/awareness was assessed by 4 items on a threepoint scale ranging from 0 to 2. [15] The sum score for

attitude varies from 0 to 9. Percentage knowledge score was computed using the sum score. Poor attitude was defined as attitude score of <50%, while scores of 50% and above was considered good attitude. **Outcomes measures:** Outcome measures were blood pressure distribution among the pharmacists, knowledge and attitude/awareness of hypertension. Hypertension was defined as having a resting blood pressure of ≥140/90 mm Hg based on JNC 7 guideline and recommendations. [7]

Ethical consideration: Prior to undertaking the study, an ethical waiver was obtained from Jos University Teaching Hospital ethical committee (Ref: JUTH/DCS/127/XXII/5430).

Statistical analysis: Means and standard deviation (SD) or median and interquartile range (IQR) were computed for continuous variables while categorical variables were described by frequencies and proportions. Bivariate analysis to evaluate factors associated with blood pressure, knowledge and attitude of hypertension was carried out. Categorical variables were compared by chi-square test while continuous variables, depending on the distribution, were compared using appropriate parametric (t-test) and non-parametric test (Kruska-Wallis test). Finally, variables with P ≤0.1 were included in a multivariable logistic regression model to assess predictor of hypertension among pharmacists. All p-values were 2tailed, and a p-value <0.05 were considered significant.

Data analysis was performed with version 20 of Statistical package for social sciences (SPSS) (SPSS Inc, Chicago, Illinois, USA).

RESULTS

In all, 200 pharmacists, consisting of 143 (71.5%) males participated in the study. The median age of participants was 35 years (IQR 28 - 46 years). Majority (47.5%) of the pharmacists work in the hospital and have a median of 7 years (IQR 1- 15 years) work experience.

The mean (95% CI) systolic and diastolic blood pressure was 116 (116 to 120) and 77 (76 to 78) mmHg respectively. Using the JNC 7 classification of blood pressure, [7] the prevalence of hypertension (≥140/≥90 mmHg) among the participants was 8%. Most (54%), participants, were pre- hypertensive, while 38% had blood pressure in the normal range. Sex and age of respondents were not significantly associated with BP categories. BMI was significantly higher in respondents with pre-hypertension compared to those with normal BP. A higher proportion of married respondents had prehypertension compared to single respondents, however stage 1 hypertension was higher among the singles. The prevalence of stage-1 hypertension was higher among pharmacists that work in the industry (20%), followed by hospital pharmacist (13%), while community pharmacists had the least prevalence (1.6%) (Table 1).

Table 1: Socio-demographic characteristics and association with blood pressure categories among 200 pharmacists in Jos, Nigeria

Characteristics	Frequency (%)	Hypertension category†			*P* value
		Normal	Pre-HT	Stage1	
Gender					
Female	143 (72)	49 (34)	80 (56)	14(10)	0.12
Male	57 (29)	27 (47)	28 (49)	2 (4)	
Age, years, Median(IQR)	35 (28-46)	39 (29-48)	34 (29-45)	31 (27-33)	0.06
BMI, Kg/m^2 ,Median(IQR)	26 (22-29)	26 (20-28)	27 (24-29)	23 (20-27)	0.001
Marital status					
Single	82 (41)	30 (37)	37 (45)	15 (18)	<0.001
Married	118 (59)	46 (39)	71 (60)	1 (0.8)	
Area of practice					<0.001
Industry	10(5)	0 (0)	8 (80)	2 (20)	
Community	63(31.5)	24 (38)	38 (60)	1 (1.6)	
Hospital	95(47.5)	38 (40)	45 (47)	12 (13)	
Academics	32(16)	14 (44)	17 (53)	1 (3.1)	
Length of employment, years					<0.001
<2	53(26.9)	20 (38)	22 (42)	11 (210	
2 to 5	42(21.3)	8 (19)	31 (74)	3 (7)	
>5	102(51.8)	45 (44)	55 (54)	2 (2)	
Alcohol consumption					<0.001
Non or occasional drinker	167(83.5)	71 (43)	85 (51)	11 (7)	
Moderate drinker*	30(15)	5 (17)	22 (73)	3 (10)	
Heavy drinker**	3(1.5)	0 (0)	1 (33)	2 (67)	
Exercise level					0.1
High	6(3)	2 (33)	3 (50)	1 (17)	
Intermediate	52(26)	12 (23)	36 (69)	4(8)	
Low	142(71)	62 (44)	69 (49)	11 (8)	
Family history of hypertension					<0.001
No	194(97)	76 (39)	108 (56)	10 (5.2)	
Yes	6(3)	0 (0)	0 (0)	6 (100)	

*†JNC 7 categorization, HT, Hypertension, IQR, interquartile range, *Moderate drinker (1 per day,*

***Heavy drinker (>1 per day)*

Other factors significantly associated with higher SBP included alcohol consumption (P<0.001), and family history of hypertension.

Overall 77% and 23% of respondents were categorized as having low and high-risk factors for hypertension respectively. Low level of exercise was the most prevalent risk factor reported by 71% of the respondents. 100% of the respondents reported not smoking and 1.3% reported heavy drinking. Most (47%) of participants were overweight, and the mean BMI of the participants was 26 kg/m^2 [95% confidence interval (CI): 22 to 29]. Hypertension risk factors were not significantly associated with respondent's knowledge (P=0.32) of hypertension, whereas it was associated attitude/awareness (P=0.04) (Table 2). Median percent knowledge score of respondents was 64% (range 53-73%). In all, 90% had good knowledge of hypertension, while 11% had poor knowledge. Ninetytwo percent of the pharmacists accurately identify blood pressure targets in healthy individuals, and 73% accurately identified non-drug measures to reduce raised blood pressure.

Whether weight reduction results in a reduction in BP, 15% of respondents strongly agreed, 37% agreed, 30% were neutral, and 18% strongly disagreed. Furthermore, almost all the respondents (96%) accurately identified the complications of hypertension and 63% believed that a combination therapy was more effective in lowering blood pressure, while 34 and 4% were undecided and strongly disagreed respectively. Female pharmacists reported greater percent knowledge of hypertension compared to their male

counterpart (Table 2). Other socio-demographic variables such as age, marital status, area of practice, and length of employment were not significantly associated with hypertension knowledge score. Respondents who were not married had a higher overall attitude score compared to the married (p=0.02) (Table 2). Awareness of hypertension was poor among the respondents. No respondent had checked their blood pressure within the last six months; 31% and 59% last checked within 6-12 months and 1–4 years ago respectively, while 10% never checked.

*SD,Standard deviation, *Fisher's exact test*

Table 2: Bivariate analysis for factors associated with knowledge and attitude of hypertension among 200 pharmacists in Jos

Parameter	Group	% Knowledge	*P* value	% Attitude/Awareness	*P* value
		Mean (SD)		**Mean (SD)**	
Sex	Male	64.6 (4.5)	0.03	54.1 (11.7)	0.61
	Female	66.1 (4.4)		53.2 (10.2)	
Age	<45	65.4 (4.7)	0.13	54.3 (11.5)	0.51
	>=45	64.5 (4.3)		53.2 (11)	
Married	No	65.7 (4.6)	0.09	56.1 (11.6)	0.02
	Yes	64.6 (4.4)		52.2 (10.8)	
Area of practice	Industry	64.9 (4.5)	0.88	55 (13.1)	0.13
	Community	64.5 (4.4)		53.4 (13.1)	
	Hospital	65.2 (4.7)		54.8 (9.9)	
	Academics	65 (4.3)		51.3 (10.6)	
Length of Employment	<2	67.8 (3.9)	0.16	55.5 (6.8)	0.09
	2-5	66.2 (4.2)		53.4 (11.1)	
	>5	64.3 (4.5)		53.8 (11.5)	
Hypertension Risk	Low	65.1(4.1)	0.86	42.3(10.7)	0.04*
	High	65.0(4.3)		40.9(11)	

The proportion of respondents currently receiving treatment for hypertension was 10% which compares favorably with the proportion (8%) of respondents that are hypertensive. In the final multivariate model (Table 3), the odds of having stage1 hypertension was increased 10 times in pharmacists with inadequate hypertension related knowledge compared to those with adequate knowledge [adjusted odd ratio (AOR) 10.9; 95% confidence interval: 1.2 to 54.6]. Other independent risk factor for hypertension were male gender (AOR 7.19; 95% CI: 1.17 to 44.1), and not having a marriage partner (AOR 22.68; 95% CI: 1.8-285.60).

Table 3: Logistic regression for factors associated with stage 1 hypertension among 200 pharmacists in Jos

Parameter	Group	Stage 1 hypertension			
		OR (95% CI)	***P*-Value**	**AOR (95% CI)**	***P* value**
Sex	Male	2.98 (0.66-13.58)	0.16	7.19 (1.17-44.1)	0.03
	Female	1		1	
Age, years	<45	4.6 (1.0-20.8)	0.05	0.56 (0.04-7.96)	0.57
	≥45	1		1	
BMI (median, IQR), Kg/m^2	26 (22-29)	0.96 (0.76-0.98)	0.03	0.96 (0.86-1.09)	0.57
Married	No	26.19 (3.38-202)	0.01	22.68 (1.8-285.60)	0.01
	Yes	1		1	
Area of practice	Industry	7.75(0.62-96.62)	0.11	NI	
	Community	0.50 (0.03-8.27)	0.63		
	Hospital	4.48 (0.56-35.92)	0.15		
	Academics	1			
Length of Employment, Years	<2	13.10(2.78-61.65)	0.001	5.23 (0.33-82.78)	0.24
	2-5	3.85 (0.62-23.91)	0.15	1.93 (0.10-36.06)	0.65
	>5	1		1	
Knowledge	Inadequate	4.77 (1.47-15.45)	0.01	10.92 (2.2-54.65)	0.01
	Adequate	1		1	
Attitude	Good	1.05 (0.29-3.92)	0.94	NI	
	Poor	1			

OR, odd ratio, AOR, adjusted odd ratio, CI, confidence interval, NI, not included in the model, IQR, interquartile range

hypertension was very poor. Hypertension was significantly associated with married respondents and those with inadequate hypertension knowledge. The prevalence of hypertension among pharmacists in Jos was low compared to the Nigerian national prevalence [6,16] and prevalence of hypertension among health workers in other studies, [13, 17] however, majority were pre-hypertensive. The prevalence of prehypertension, coupled with the preponderance of hypertension risk factors such as low level of physical exercise, overweight and alcohol consumption in our study participants demonstrates the need for BP control

Discussion

This study observed a low prevalence of hypertension among pharmacists in Jos. While the knowledge of hypertension was adequate, attitude/awareness of

intervention programs targeted at pharmacists. Such programs should emphasize regular BP monitoring. The JNC-7 guideline [7] recommends yearly screening for persons that are pre-hypertensive. Lifestyle modification such as increase exercise level, reduction in alcohol consumption, weight reduction strategies

and diet modification should form a significant component of interventions to control BP targeted at pharmacists.

As expected, hypertension related Knowledge was adequate among the respondents. An adequate knowledge of hypertension is consistent with the training of pharmacists. However, we found a small percentage of pharmacists who were not conversant with hypertension treatment guidelines. Hypertension related knowledge was not influenced by age, work experience, or field of practice of respondents, but by gender. More disturbing was the finding that adequate knowledge of hypertension did not translate into a better attitude to blood pressure monitoring and awareness as only less than a quarter of the respondents reported an overall good attitude. Particularly of concern was that pharmacists did not monitor their BP regularly, and about 10% had never checked their blood pressure. Sub-optimal Attitude/awareness of hypertension by health professionals have been reported in other studies. [13] This findings highlights the need for behavioral intervention and motivation to improve blood pressure monitoring among pharmacists in view of the importance of early recognition and management of hypertension. BP measurement can identify adults at increased risk for cardiovascular disease due to high-blood pressure. [18] Hypertension risk factors were significantly related to attitude/awareness, but not knowledge of hypertension. However, poor hypertension related knowledge was a predisposing factor to stage 1 hypertension among pharmacists. An association between poor knowledge of hypertension and hypertension has been reported in other studies. [19] Importantly, this is a modifiable risk factor for hypertension. Education, retraining and distribution of guidelines on individualized BP targets, are interventions that can improve hypertension related knowledge. Like in the general population, [15] male pharmacists were more predisposed to hypertension compared to females. Also the prevalence of hypertension was highest among industrial pharmacists. This group includes ethical detailers who often are under tremendous pressure to meet sales targets set by their companies. Surprisingly we found that pharmacists who were not married were more prone to hypertension compared to the married. A plausible explanation to this could be that the unmarried were younger pharmacists at the early stages of their career and hence exposed to more work related stress. However, this is very subjective, and more research is required to investigate the association between marital status and hypertension among professionals.

Knowledge, attitude and awareness (KAA), surveys customarily pose the problem of social desirability, whereby respondents are reluctant to admit socially poorly acceptable KAA to avoid giving a negative impression. [20] The fact that 100% of the respondents reported not smoking suggests likely bias toward socially expected norms, which currently tend to correspond to healthy ones. Deliberate attempt was made to limit socially desirable answers by embedding specific sensitive topics like alcohol consumption and smoking among questions relating to other issues. [21] In conclusion, pharmacists need to stay healthy to take good care of their patients; hence the present study is a step towards improving the control of high-blood pressure among this group of professionals. Since hypertension is often asymptomatic, frequent surveillance and screenings are critical for early detection, and, therefore, highly desired. Positive attitudinal change to blood pressure control and awareness among this subset of health professionals can be achieved by motivation through reminders, guideline distribution, conferences and frequent health assessments.

ACKNOWLEDGEMENT

We are grateful to members of the Pharmaceutical Society of Nigeria (PSN), Plateau State chapter who volunteered to participate in the study.

REFERENCES

1. WHO (2010). WHO's *Global status report on non communicable diseases 2010. Available from http://www.who.int/nmh/publications/ncd_report_full_en.pdf Accessed April 15, 2014.*

2. Oviasu VO. Arterial blood pressures and hypertension in a rural Nigerian community. *Afr J Med Med Sci* 1978; 7: 137-143

3. Onwuchekwa AC, Mezie-Okoye MM, Babatunde S. Prevalence of hypertension in Kegbara-Dere, a rural community in the Niger Delta region, Nigeria. *Ethn Dis* 2012; 22: 340-346

4. Sani MU, Wahab KW, Yusuf BO, Gbadamosi M, Johnson OV, Gbadamosi A. Modifiable cardiovascular risk factors among apparently healthy adult Nigerian population - a cross- sectional study. *BMC Res Notes*

2010; 3: 11 5. Ekwunife IO, Aguwa NC (2011). A Meta-analysis of prevalence rate of hypertension in Nigerian populations. *J Res Pharm Pract* 3: 604-607

6. Whitworth JA (2003). World Health Organization/International Society of Hypertension statement on management of hypertension. *J Hypertens* 21: 1983-1992.
7. Chobanian AV, Bakris LG, Black RH (2003). The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA* 289: 2560-2572.
8. Williams B, Poulter NR, Brown MJ (2004). British Hypertension Society guidelines for hypertension management (BHS-IV): summary. *BMJ* 328:634-640.
9. Brown IJ, Tzoulaki I, Candeias V, Elliott P (2009). Salt intakes around the world: implications for public health. *Int J Epidemiol* 38: 791-813. 10. Kjellgren KI, Svensson S, Ahlner J (1997). Hypertensive patients' knowledge of high-blood pressure. *Scand J Prim Health Care* 15:188-192.
11. Wizner B, Grodzicki T, Gryglewska B, et al.(2000). Knowledge about hypertension and blood pressure level [in Polish]. *Przegl Lek.* 57: 402–405. 12. Mitwalli HA, Harthi AA, Mitwalli H (2013). Awareness, attitude, and distribution of high blood pressure among health professionals. *J Saudi Heart Assoc* 25:19-24.
13. Glenn DS. Determining Sample Size, IFAS, University of Florida. PEOD-6. 2013. Available fromhttp://edis.ifas.ufl.edu/pdffiles/PD/PD00600.pdf Accessed July 26, 2014.
14. Aubert L, Bovet P, Gervasoni J, Rwebogora A, Waeber B, Paccaud F (1998). Knowledge, Attitudes, and Practices on Hypertension in a Country in Epidemiological Transition. *Hypertension.* 31:1136-1145
15. Oliveria SA, Chen SR, McCarthy DB, Davis CC, Hill NM (2005). Hypertension Knowledge, Awareness, and Attitudes in a Hypertensive Population. *J Gen Intern Med* 20: 219-225.
16. Ogah SO, Okpechi I, Chukwuonye II (2012). Blood pressure, prevalence of hypertension and hypertension-related complications in Nigerian Africans: A review. *World J Cardiol* 4:327-340
17. Aguirre RC, Aguilera MR, Aguirre RF, Rowe PD (1999). Cardiovascular risk factors in health workers. *Revista Cubana de Medicina* General Integral 2:115-122.
18. U.S. Preventive Services Task Force (2014). *Screening for High Blood Pressure: Clinical Summary of U.S. Preventive Services Task Force Recommendation*. Available from: http://www.uspreventiveservicestaskforce.org/uspstf07/hbp/hbpsum.htm Accessed December 15, 2007.
19. Dennison RC, Peer N, Steyn K, Levitt SN, Hill NM (2007). Determinants of Hypertension Care and Control among Peri-Urban Black South Africans: The HiHi Study. *Ethnicity & Disease* 17
20. Nothwehr F, Elmer P, Hannan P (1994). Prevalence of health behaviors related to hypertension in three-blood pressure treatment groups: the Minnesota Heart Health Program. *Prev Med* 23:362-368.

Parker DR, Derby CA, Usner DW, Gonzales S, Lapane KL, Carleton RA (1996). Self-reported alcohol intake using two different question formats in Southeastern New England. *Int J Epidemiol* 25: 770-774.