**Research Article**

**The effect of the sociodemographic determinants of self-monitoring of blood pressure**

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**Abstract**

**Introduction:** Self-monitoring of Blood Pressure (BP) among hypertensive patients is a significant for the management and prevention of hypertension related complications such as atherosclerosis, Heart Failure (HF), Coronary Artery Disease (CAD), stroke, kidney disease, and peripheral arterial disease.

**Objective:** The aim of the present study was to determine the effect of the sociodemographic determinants of Self-monitoring of BP in hypertensive subjects.

**Methods:** A cross-sectional survey was done on four hundred hypertensive individuals on follow-up at selected hospitals in Arsi Zone, Ethiopia. The data collection period was from March ten to April eight, 2019.

**Result:** In the present study, four hundred participants were included into the study. Age ≥60 years [AOR=2.01, 95% CI (1.82, 10.05), p=0.012], higher education [AOR=2.97, 95% CI (1.85, 14.33), p=0.002], governmental employed [AOR=1.56, 95% CI (1.08, 7.48), p=0.023], urban residents [AOR =1.61, 95% CI (1.17, 6.67), p=0.007], having a monthly income of > 3500 Ethiopian birr [AOR=2.46, 95% CI (1.87, 9.32), p=0.006] were factors significantly associated with self-monitoring of BP in the multivariable logistic regression analysis.

**Conclusion:** In the present study; young adults, attended lower education, unemployed, rural residents, low monthly income patients were found to have poor self-monitoring of BP practice. Since, these patients are affected in particular, all the concerned bodies should actively participate to prevent or minimize this critical problem. During this, health education and training, on self-monitoring of BP may be required to take place.

**Introduction**

Hypertension is defined as a situation of a higher systemic BP that causes a considerable escalation of cardiovascular risk [1]. It is a systolic BP of ≥ 140 mm Hg and a diastolic BP of ≥ 90 mm Hg [2]. When BP is elevated, it will lead to complications such as; HF, CAD, ischemic and hemorrhagic stroke, renal impairment, peripheral vascular disease, and retinal hemorrhage [3]. Hypertension is the major risk factors for most of various Cardiovascular Disease (CVD) occurred thru lifespan [4]. If it is not controlled, it will elevate risk of incidence of HF and other adverative cardiovascular consequences [5].

Hypertension is among the main and preventable risk factors of hemorrhagic and ischemic stroke, HF, CAD, and chronic kidney disease [6]. Since hypertension is a silent killer
As briefly explained above, the impact of hypertension is rising globally. However, there is a lack of the study that has addressed the effect of the sociodemographic determinants on Self–monitoring of BP in the study area. Therefore, the purpose of the present study was to determine the effect of the sociodemographic determinants on Self–monitoring of BP. The outcome of the present study would alert the hospitals, health professionals, government, stakeholders and the researchers who are willing to done the study on the effect of the sociodemographic determinants on Self–monitoring of BP to manage and control the critical impact of hypertension which is rising overwhelmingly across the worldwide.

**Objectives**

**General objective:** To determine the effect of the sociodemographic determinants on Self–monitoring of blood pressure on hypertensive subjects at selected public hospitals in Arsi Zone, southeast Ethiopia.

**Specific objective:** To identify the effect of the sociodemographic determinants on Self–monitoring of blood pressure on hypertensive subjects at selected public hospitals in Arsi Zone, southeast Ethiopia.

**Methods**

**Study area, period and study design**

A cross–sectional survey was used among hypertensive individuals who were on follow up clinic at selected hospitals of Arsi Zone, which is found in southeast of Ethiopia. The study period was from March ten to April eight, 2019.

**Source population and study population**

The source population of the present study were all adult hypertensive patients visiting hospitals of Arsi zone while study population were selected individuals. During this survey, all subjects aged ≥18 years and on follow–up at least for 6 months and willing to participate were included. Whereas, the study subjects who were excluded during the data collection were, who were severely ill, who were not mentally and physically capable of being interviewed.

**Sample size determination, sampling technique and procedures**

During this survey, simple random sampling technique was used to select the four hospitals from seven public hospitals in the zone. Since survey was undertaken, all individuals attending for follow–up at selected hospitals were comprised in the study. The final sample size was four hundred.

**Study variables**

**Dependent variables:** Self–monitoring blood pressure

**Independent variables:** Age, gender, religion, ethnicity, educational level, marital status, occupation, residency, monthly income were socio–demographic variables.

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Operational definitions

Self-monitoring of BP: Is a self-measurement of BP by subjects at home or elsewhere outside the clinic setting. Whereas, they use a personal self-monitoring device for this purpose [10,11].

Self-monitoring of BP: In the present study it was assessed by ‘do you currently self-monitor your BP using a self-monitoring BP device at home?’ [28–30].

Data collection instrument, Data collection procedures and Data quality control

Data were collected by using a semi-structured questionnaire which was prepared by English. It was prepared after reviewing various related literature [28–35]. It has two sections; the sociodemographic characteristics of the participants and Blood pressure self-monitoring practice section. The pretest was done on 5% of the sample size. Training was given for data collectors and supervisors for 2 days. A total of 4 BSc nurses’ data collectors and 2 MSc nurses’ supervisors were employed for this survey. The reliability analysis was done and a Cronbach’s alpha value was 0.85.

Data processing and analysis

Epi-Data version 4.2.0.0 was used for data entering and it was exported to SPSS version 21.0. Tables, figures and texts were used to summarize descriptive statistics. Bivariable and multivariable logistic regression analysis were used to identify independent variables associated with the dependent variables. Hosmer–Lemeshow’s goodness-of-fit test for the dependent variable and the result was p-value = 0.253. Finally, p-values <0.05 was considered as statistically significant in the multivariable logistic regression.

Results

Socio-demographic features of the study subjects

A total of 400 hypertensive participants were included into the study giving the response rate of 97.6%. 142 (35.5%) of them were aged between 20–39 years, 150 (37.5%) of them were aged between 40–59 years, and 108 (27.0%) of them were aged ≥60 years. 225 (56.3%) of them were males and the rest of them were females. 282 (70.5%) were Oromo and 118 (29.5%) were other ethnicities. Concerning to the education, the majority 14 (14.9%) of them had used self-monitoring of BP. From the patients who had higher education, the majority 14 (13.0%) of them used self-monitoring of BP. From the patients who were males, the majority 21 (9.3%) of them used self-monitoring of BP. From the patients who had higher education, the majority 14 (14.9%) of them had used self-monitoring of BP (Table 1).

The likelihood of having self-monitoring of BP in patients who were aged ≥60 years were 2.01 times [AOR=2.01, 95% CI (1.82, 10.05), p=0.012] higher than participants who were aged 20–39 years. The odds of self-monitoring of BP in patients who have attended higher education were 2.97 times [AOR=2.97, 95%CI (1.85, 4.33), p=0.002] higher than who had primary education. Besides, the likelihood of having self-monitoring of BP among patients who were governmental employed were 1.56 times [AOR=1.56, 95%CI (1.08, 7.48), p=0.023] more likely to have self-monitoring of BP when compared to their opposite.

The likelihood of having self-monitoring of BP in patients who were urban residents were 1.61 times [AOR=1.61, 95% CI (1.17, 6.67), p=0.007] more likely to have self-monitoring of BP when compared to their opposite. Further, the patients who got monthly income of >3500 ETB were 2.46 times [AOR=2.46, 95%CI (1.87, 9.32), p=0.006] more likely to have self-monitoring of BP when compared to those who got <2500 ETB (Table 2).

Discussion

The present study was done to determine the effect of the sociodemographic determinants on Self-monitoring of BP on hypertensive subjects. This is because identifying the effect of the sociodemographic determinants on Self-monitoring of BP on hypertensive individuals is a foundation for hypertension management to manage and control the complications, morbidity and mortality related to hypertension.

The odds of self-monitoring of BP in individuals who were aged ≥60 years were 2.01 times [AOR=2.01, 95% CI (1.82, 10.05), p=0.012] higher than participants who were aged 20–39 years. This finding was inconsistent with the cross-sectional study done in Karachi, Pakistan which reported that participants who were between the age of 40 and 59 years had a higher chance of owning a sphygmomanometer and self-monitoring of BP [34].
Table 1: The proportion of Self-monitoring of BP Across Different Sociodemographic Variables among hypertensive patients who were on follow up clinic at selected hospitals in Arsi Zone, southeast Ethiopia, 2019. [n=400].

| Sociodemographic Variables | Category | Self-monitoring of BP | Total |
|---------------------------|---------|-----------------------|-------|
|                           | Monitor N (%) | Nonmonitor N (%) |
| Age                       | 20-39     | 8(5.6%)               | 134(94.4%) | 142 |
|                           | 40-59     | 9(6.0%)               | 141(94.0%) | 150 |
|                           | ≥60       | 14(13.0%)             | 94(87.0%)  | 108 |
| Gender                    | Male      | 21(9.3%)              | 204(90.7%) | 225 |
|                           | Female    | 10(5.7%)              | 165(94.3%) | 175 |
| Ethnicity                 | Oromo     | 22(7.8%)              | 260(92.2%) | 282 |
|                           | Non-Oromo | 9(7.6%)               | 109(92.4%) | 118 |
| Religion                  | Orthodox  | 18(9.6%)              | 169(90.4%) | 187 |
|                           | Muslim    | 8(5.0%)               | 151(95.0%) | 159 |
|                           | Protestant | 5(9.3%)            | 49(90.7%)  | 54  |
| Educational level         | Primary education | 11(5.3%) | 195(94.7%) | 206 |
|                           | Secondary education | 6(6.0%) | 94(94.0%)  | 100 |
|                           | Higher education | 14(14.9%) | 80(85.1%)  | 94  |
| Marital status            | Single    | 5(5.3%)               | 90(94.7%)  | 95  |
|                           | Married   | 14(8.8%)              | 146(91.3%) | 160 |
|                           | Divorced  | 6(6.3%)               | 66(91.7%)  | 72  |
|                           | Widowed   | 6(6.2%)               | 67(91.8%)  | 73  |
| Occupation                | Governmental Employed | 9(9.4%) | 87(90.6%)  | 96  |
|                           | Unemployed | 22(7.2%) | 282(92.8%) | 304 |
| Residency                 | Urban     | 21(8.7%)              | 221(91.3%) | 242 |
|                           | Rural     | 10(6.3%)              | 148(93.7%) | 158 |
| Monthly income in ETB     | <2500     | 11(5.6%)              | 184(94.4%) | 195 |
|                           | 2500-3500 | 6(6.1%)               | 93(93.9%)  | 99  |
|                           | >3500     | 14(13.2%)             | 92(86.8%)  | 106 |

Table 2: Bivariate and Multivariate logistic regression Analysis of Sociodemographic Factors Associated with Self-monitoring of BP in Hypertensive subjects at selected Hospitals in Arsi Zone, southeast Ethiopia, 2019. [n=400].

| Sociodemographic Variables | Category | Self-monitoring of BP | COR (95% CI) | AOR (95% CI) | p-value |
|---------------------------|---------|-----------------------|--------------|--------------|---------|
|                           | Monitor | Nonmonitor            |              |              |         |
| Age                       | 20-39   | 8(5.6%)               | 134(94.4%)   | 1 (Ref.)     | 1 (Ref.) |
|                           | 40-59   | 9(6.0%)               | 141(94.0%)   | 1.07(0.40, 2.85) | 1.04(0.59, 5.05) | 0.325 |
|                           | ≥60     | 14(13.0%)             | 94(87.0%)    | 2.50(1.01, 6.18) | 2.01(1.82, 10.05) | 0.012 |
| Gender                    | Male    | 21(9.3%)              | 204(90.7%)   | 1.70(0.78, 3.71) | 1.21(0.51, 2.87) | 0.660 |
|                           | Female  | 10(5.7%)              | 165(94.3%)   | 1 (Ref.)     | 1 (Ref.) |
| Ethnicity                 | Oromo   | 22(7.8%)              | 260(92.2%)   | 1.03(0.46, 2.30) | 1.12(0.45, 2.75) | 0.809 |
|                           | Non-Oromo | 9(7.6%)          | 109(92.4%)   | 1 (Ref.)     | 1 (Ref.) |
| Religion                  | Orthodox | 18(9.6%)            | 169(90.4%)   | 1.04(0.37, 2.96) | 1.01(0.32, 3.14) | 0.989 |
|                           | Muslim  | 8(5.0%)               | 151(95.0%)   | 0.52(0.16, 1.66) | 0.646(0.18, 2.32) | 0.503 |
|                           | Protestant | 5(9.3%)        | 49(90.7%)    | 1 (Ref.)     | 1 (Ref.) |
| Educational level         | Primary education | 11(5.3%) | 195(94.7%) | 1 (Ref.)     | 1 (Ref.) |
|                           | Secondary education | 6(6.0%) | 94(94.0%)  | 1.13(0.41, 3.15) | 1.07(0.54, 5.73) | 0.349 |
|                           | Higher education | 14(14.9%) | 80(85.1%)  | 3.10(1.35, 7.13) | 2.97(1.85, 14.33) | 0.002 |
| Marital status            | Single   | 5(5.3%)               | 90(94.7%)    | 1 (Ref.)     | 1 (Ref.) |
|                           | Married  | 14(8.8%)              | 146(91.3%)   | 0.62(0.18, 2.12) | 1.88(0.61, 5.80) | 0.273 |
|                           | Divorced | 6(6.3%)               | 66(91.7%)    | 1.07(0.39, 2.91) | 2.10(0.55, 8.10) | 0.278 |
|                           | Widowed  | 6(8.2%)               | 67(91.8%)    | 1.02(0.31, 3.31) | 1.66(0.43, 6.31) | 0.460 |
| Occupation                | Governmental Employed | 9(9.4%) | 87(90.6%)  | 1.33(0.59, 2.99) | 1.56(1.08, 7.48) | 0.023 |
|                           | Unemployed | 22(7.2%) | 282(92.8%) | 1 (Ref.)     | 1 (Ref.) |
| Residency                 | Urban    | 21(8.7%)              | 221(91.3%)   | 1.41(0.64, 3.07) | 1.61(1.17, 6.67) | 0.007 |
|                           | Rural    | 10(6.3%)              | 148(93.7%)   | 1 (Ref.)     | 1 (Ref.) |
| Monthly income in ETB     | <2500    | 11(5.6%)              | 184(94.4%)   | 1 (Ref.)     | 1 (Ref.) |
|                           | 2500-3500 | 6(6.1%)          | 93(93.9%)    | 1.08(0.39, 3.01) | 1.06(0.34, 3.39) | 0.911 |
|                           | >3500    | 14(13.2%)             | 92(86.8%)    | 2.55(1.11, 5.83) | 2.46(1.87, 9.32) | 0.006 |

Note: Figure in bold shows a statistically significant (p < 0.05)
Abbreviations: COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio; CI: Confidence Interval; ETB: Ethiopian birr

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This finding was also inconsistent with a study done in west Midlands, UK which has been reported that participants aged between 18 to 60 years were 1.5 times more likely to measure their own BP than older people (over 60 years) [30]. The difference might be due that the variation in the population characteristics the study conducted on.

The odds of self-monitoring of BP among patients who had higher education were 2.97 times [AOR=2.97, 95% CI (1.85, 14.33), p=0.002] higher than who had primary education. This finding was supported by the study conducted in Ghana, Karachi, Pakistan and Lombardy, a northern Italian region [34,36,37] respectively. The possible justification is that the higher education provides the update of knowledge regarding to the self-monitoring of BP and the morbidity and mortality associated with the hypertension. Furthermore, the education supports to the patients to be alert of their full health status. In fact, education is the power of change.

The likelihood of having self-monitoring of BP among patients who were governmental employed were 1.56 times [AOR=1.56, 95% CI (1.08, 7.48), p=0.023] more likely to have self-monitoring of BP when compared to their opposites. This finding was consistent with a study done in west Midlands, UK and Ghana [30,37] respectively. This could be due to that since the participants were employed, they had a salary which helps them to afford the cost of the self-monitoring BP device. So that, they would monitor their BP because they own the devices needed to do so.

The likelihood of having self-monitoring of BP in patients who were urban residents were 1.61times [AOR=1.61, 95% CI (1.17, 6.67), p=0.007] more likely to have self-monitoring of BP when compared to their opposites. This might be due to that the participants living in the urban residents are highly accessible to health-related information than that of the rural resident participants. This is true that information had the power to change the awareness of the communities towards the certain diseases and this is why health education program is created most of the time to alert the community regarding certain public issues.

The patients who had a monthly income of > 3500 ETB were 2.46 [AOR=2.46, 95% CI (1.87, 9.32), p=0.006] more likely to have self-monitoring of BP when compared to those who got < 2500 ETB. This finding was supported by a research done in Singapore, Asia and Ghana [35,37] respectively. The possible justification could be due to that if the participants had no scarcity of money to buy the devices, it is true that they will buy and monitor their own BP considering the seriousness of the disease. In fact, lack of money could be the barriers for the utilization of self-monitoring BP which is now evidenced by the association of the participants’ high monthly income and the use of self-monitoring BP.

**Limitation of the study**

Finally, the accomplishment of the present study was not without limitations. There is no study conducted that show the effect of the sociodemographic determinants of self-monitoring of BP in Ethiopia and also in different counties adequately and this made the comparison problematic. However, hopefully this study could minimize such problem being a baseline for other researchers who will be willing to undertake the same study.

**Conclusion**

In the present study; age, education level, occupation, residency, and monthly income were factors that an association with self-monitoring of BP. The present study offers a foundation to support health professions for the management of hypertension. This can help them by giving insight about the factors that to be considered while intervening these patients. Through this it provides a significant information for the help of the societies’ health and to prevent this problem. Finally, we suggest the government, healthcare provider, stakeholders, non-governmental organizations, and any other concerned bodies should actively participate to prevent or minimize this critical problem. During, this health education and training on self-monitoring of BP may be required to take place.

**Ethics approval and consent to participate**

The ethical clearance was obtained from the institutional review board of Addis Ababa University. Then, official letter was sent to the selected hospitals and permission was received. All the study participants were informed about the objectives of the study. Furthermore, they were insured about the confidentiality issue. Finally, verbal consents were obtained from each of them.

**Author contributions**

Addisu Dabi Wake, Daniel Mengistu Bekele, Yohannes Ayalew Bekele, Techane Sisay Tuji, and Desalegn Tariku Jaleta had contributed to conception of the study, data analysis and manuscript writing. Finally, all authors provide the final approval of the version to be published.

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**References**

1. Guidelines on Clinical and Programmatic Management of Major Non Communicable Diseases (2016) FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA MINISTRY OF HEALTH: Addis Ababa. [Link: https://bit.ly/3weLatL]
2. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National Heart, Lung and Blood Institute; National High Blood Pressure Education Program. 2004. [Link: https://bit.ly/3f0DZJ0]
3. National Strategic Action Plan (NSAP) For Prevention & Control Of Non-Communicable Diseases in Ethiopia; Federal Democratic Republic of Ethiopia Ministry of Health; 2014-2016. [Link: https://bit.ly/3db7Zo]
4. Kjeldsen SE (2018) Hypertension and cardiovascular risk: General aspects. Pharmacol Res 129: 95-99. [Link: https://bit.ly/3aKgQy]
5. Iyer AS, Ahmed MI, Filipatos GS, Ekundayo OJ, Aban IB, et al. (2010) Uncontrolled hypertension and increased risk for incident heart failure in older adults with hypertension: findings from a propensity-matched prospective population study. J Am Soc Hypertens 4: 22-31. [Link: https://bit.ly/3mBBKQR]
6. Walegnw Y, Yadeta D, Feleke Y, Kebede T (2016) Guidelines on Clinical and Programmatic Management of Major Non Communicable Diseases: Federal Democratic Republic of Ethiopia Ministry of Health, Addis Ababa. Link: https://bit.ly/3m7v6X

7. Schlein L (2018) WHO Targets High Blood Pressure. VOA. Link: https://bit.ly/39yT2A

8. World Health Day (2013) A global brief on Hypertension: Silent killer, global public health crisis. World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland. Link: https://bit.ly/3UCJyH

9. The Sixth Session of the African Union Conference of Ministers of Health. Status Report on Hypertension in Africa. Addis Ababa Ethiopia.

10. Centers for Disease Control and Prevention (2014) Self-Measured Blood Pressure Monitoring: Actions Steps for Clinicians. Atlanta, GA: Centers for Disease Control and Prevention. US Dept of Health and Human Services. Link: https://bit.ly/3d1V67

11. Goldstein A (2013) Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services. Link: https://bit.ly/3wJWPvP

12. George J, MacDonald T (2015) Home Blood Pressure Monitoring. Eur Cardiol 10: 95-101. Link: https://bit.ly/3waylUj

13. Abdullah A, Sajaratulnisa O (2011) The influence of self-owned home blood pressure monitoring (HBPM) on primary care patients with hypertension: A qualitative study. BMC Fam Pract 12: 143. Link: https://bit.ly/3mOZv

14. Akinese OA, Akineseyi LI (2015) Home Blood Pressure Monitoring and Hypertension Control: Primary Health Care. S: 182.

15. Bromfield S, Muntner P (2013) High blood pressure: the leading global burden of disease risk factor and the need for worldwide prevention programs. Curr Hypertens Rep 15: 134-136. Link: https://bit.ly/2PHosRm

16. Dzudie A, KIngue S, Dzudie A, Sliwa K, Mayosi B, et al. (2017) Roadmap to achieving 25% hypertension control in Africa by 2025. Cardiovasc J Afr 28: 261-272. Link: https://bit.ly/39v83zi

17. Kibret KT, Mesfin YM (2015) Prevalence of hypertension in Ethiopia: a systematic meta-analysis. Public Health Reviews 36: 1-12. Link: https://bit.ly/3cCD0XF

18. Mills KT, Stefanescu A, He J (2020) The global epidemiology of hypertension. Nat Rev Nephrol 16: 223-237. Link: https://bit.ly/318wln1

19. Forouzanfar MH, Liu P, Roth GA (2017) Global Burden of Hypertension and Systolic Blood Pressure of at Least 110 to 115 mm Hg, 1990-2015. JAMA 317: 165-182. Link: https://bit.ly/3zD57u

20. Nguyen Manh T, Bui Van N, Le Thi H, Vo Hoang L, Nguyen Si Anh H, et al. (2019) Pregnancy with Heart Disease: Maternal Outcomes and Risk Factors for Fetal Growth Restriction. Int J Environ Res Public Health 16: 2075. Link: https://bit.ly/3wv85z

21. Forouzanfar MH, Liu P, Roth GA, Ng M, Biryukov S, et al. (2017) Global Burden of Hypertension and Systolic Blood Pressure of at Least 110 to 115 mm Hg, 1990-2015. JAMA 317: 165-182. Link: https://bit.ly/3m6sWCA

22. Adeloye D, Basquill C (2014) Estimating the Prevalence and Awareness Rates of Hypertension in Africa: A Systematic Analysis. PLoS One 9: e104300. Link: https://bit.ly/3c6Suqm

23. Egan BM, Kjeldsen SE, Grassi G, Eiser M, Mancia G (2019) The global burden of hypertension exceeds 1.4 billion people: should a systolic blood pressure target below 130 become the universal standard? J Hypertens 37: 1148-1153. Link: https://bit.ly/2PssUQ

24. van de Vliet S, Akinhi Y, Oti S, Olajide A, Agyemang C, et al. (2013) Status report on hypertension in Africa - Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's. Pan Afr Med J 16: 38. Link: https://bit.ly/3mBBH2u

25. Hill JR, Conner RS (2016) Use of Home Monitoring to Improve Blood Pressure Control. Journal for Nurse Practitioners 12: e423–425. Link: https://bit.ly/31B6goZ

26. McGrath BP (2015) Home monitoring of blood pressure: Diagnostic Test. Australian prescriber 38: 16-18. Link: https://bit.ly/3sH2aa0

27. Lai E, Kaczorowski J, Karwalajtys T, Dolovich L, Levine M, et al. (2006) Blood Pressure Awareness and Self-Monitoring Practices among Primary Care Elderly Patients. Can Pharm J 139: 34-41. Link: https://bit.ly/3fwoD2v

28. Hadithi DA, Nazim AS, Khan SA (2012) Self Monitoring of Blood Pressure (SMBP) among Hypertensive patients in Muscat- A pilot study. Journal of Applied Pharmaceutical Science 2. Link: https://bit.ly/3sMsUWM

29. Viera AJ, Cohen LW, Mitchell CM, Sloane PD (2014) Use of Home Blood Pressure Monitoring by Hypertensive Patients in Primary Care: Survey of a Practice-Based Research Network Cohort. J Clin Hypertens (Greenwich) 10: 280-286. Link: https://bit.ly/3u6f3t0

30. Baral-Grant S, Haque MS, Nouwen A, Greenfield SM, McManus RJ (2012) Self-Monitoring of Blood Pressure in Hypertension: A UK Primary Care Survey. Int J Hypertens 2012: 58206. Link: https://bit.ly/3XStKvM

31. Huanhuan H, Gang L, Takashi A (2013) How hypertensive patients in the rural areas use home blood pressure monitoring and its relationship with medication adherence: A primary care survey in China. 3: 510-516. Link: https://bit.ly/3mBWFPX

32. Breaux S, Tonya L, Brown KC, Erica R (2012) Prevalence of Blood Pressure Self-Monitoring, Medication Adherence, Self-Efficacy, Stage of Change, and Blood Pressure Control Among Municipal Workers With Hypertension. Workplace Health Saf 60: 1-13. Link: https://bit.ly/3zVJlxA

33. Ostchega Y, Zhang G, Kit BK, Nwanwko T (2017) Factors Associated With Home Blood Pressure Monitoring Among US Adults: National Health and Nutrition Examination Survey, 2011–2014. Am J Hypertens 30: 1126-1132. Link: https://bit.ly/3m8F8Ec

34. Zahid H, Amin A, Amin E, Waheed S, Asad A, et al. (2017) Prevalence and Predictors of Use of Home Sphygmomanometers Among Hypertensive Patients. Cureus 9: e1155. Link: https://bit.ly/3wHIHdH

35. Tan NC, Khin LW, Pagi R (2005) Home blood-pressure monitoring among hypertensive patients in an Asian population. J Hum Hypertens 19: 559-564. Link: https://bit.ly/3d4WM8

36. Cuspidi C, Meani S, Fusi V, Salerno M, Valerio C, et al. (2004) Home blood pressure measurement and its relationship with blood pressure control in a large selected hypertensive population. J Hum Hypertens 18: 725-731. Link: https://bit.ly/3wH5v5

37. Konlan KD, Afam-Adjei CJ, Afam-Adjei C, Oware J, Appiah TA, et al. (2019) Practice and Sociodemographic Factors Influencing Self-Monitoring of Blood Pressure in Ghanaians with Hypertension. Int J Chronic Dis 1-7. Link: https://bit.ly/3rzMGDrn