

KNOWLEDGE ON CAUSES, MANAGEMENT, PREVENTION AND COMPLICATIONS OF HYPERTENSION AMONG PATIENTS ACCESSING HEALTHCARE IN MEDICAL OUT-PATIENT DEPARTMENT OF OSUN STATE SPECIALIST HOSPITAL OSOGBO, NIGERIA

BELLO, M. A. & EDET GRACE E.

Correspondence address: *ademolabello2007@yahoo.co*; +2348035779434

Abstract

This study assesses the knowledge of the patients attending Osun State Specialist Hospital, Osogbo on the causes and prevention of hypertension with a view to determine the modalities for treatment and possible complications. Descriptive research design was adopted for this study and balloting was used to select 100 respondents. The instrument used was questionnaire divided into two parts. The content and face validity were done by experts in the field while the reliability was determined with Cronbach Alpha and yielded reliability coefficient of 0.787. Data was analysed through descriptive statistics which involve percentages, graph and inferential statistics of chi square analysis, with p value of 0.05. The result of the demographic characteristics shows that most of the respondents are from 42 years and above and are males. Also, majority of the respondents are Christians, Yoruba, married and are retirees. The findings further reveals that the respondents have knowledge of the meaning (58.8%) and causes (65.5%) of hypertension but poor knowledge on the prevention of hypertension (43%). Lastly, this study reveals that the respondents have a good knowledge of the management of hypertension (62%) but poor knowledge of the complication of hypertension (31%) and the sources of the respondents' knowledge are; by routine check-up, mass media and health workers. The findings have shown that there is statistically significant relationship between the effect of hypertension complications and respondents' level of education. It is suggested that regular check-up and the combination of orthodox and traditional ways of managing blood pressure are complimentary.

Keywords: Knowledge: Hypertension: Out-Patient: Prevention.

Introduction

Hypertension is defined as the type of blood pressure that is sustained at a higher level than the generally accepted normal maximum level for a particular age group, for example 20-years 140/90mmHg, at 50-years 160/95mmHg, and at 75-years 170/105mmHg (Smeltzer and Bare, 2010). Researches have shown that hypertension contributes to the global non-communicable disease burden affecting nearly one billion people world wide. It has become a significant public health challenge in both developing and developed countries. (Whelton and Reynolds, 2012). Hypertension (High blood pressure) is a major risk factor for cardiovascular diseases (Hence, 2012), Hypertension has been identified by the world Health Organization (WHO) in the world health report as "the number one Silent Killer". In short, the risk of stroke is four times greater and the risk of myocardial infarction (a heart attack) is two times greater if you have high blood pressure compared with normal blood pressure. The World Health Organization, (2010) reveals that hypertension threatens the socio- economy of families including societies and also imposes burden of diseases cost on people's health. Ezzati, Lopez, Rodgers, Vander Hoorn, and Murray (2002) posit that hypertension is considered as the first and the most common risk factor to cardiovascular diseases,

stroke, and renal diseases. It is also known as a main modulated disability cause around the world. Hypertension is a worldwide problem that affects approximately 15-20 % of all adults (Wang et al, 2008). It is a common chronic disorder, a complex health problem and a major challenge in primary health care. A significant percentage of Nigeria adults are hypertensive and it is more prevalent among the business executives and both sexes are affected (Famakinwa, 2005).

Kofi (2011) holds the view that the cause of high blood pressure is not yet known unless it is secondary hypertension, though there seems to be many causal factors related to the occurrence which include: ageing, excessive salt intake, sedentary lifestyle, as well as, genetic factor. She further states that hormonal changes as a result to ageing can as well can cause high blood pressure and changes as decrease in estrogen production, underactive thyroid and overactive thyroid can as well influence the rise in the blood pressure.

Prevention in this research refers to primary prevention. Primary prevention is the most effective way of preventing illnesses. This type of approach makes health services easily accessible to the general

public. It also promotes health through education, making individuals and the community as a whole to understand and develop skills that help to improve and maintain good health. This allows individuals to get adequate delivery of care, as well as, encouraging people to reduce the risk of acquiring diseases by adopting a healthy lifestyle. (Ndindjock et al. 2011; Neil et al. 2002). Ghana Maternal Health Survey (2007) reveals that there is a need for understanding the disease and controlling it with preventive measures which is the key to the reduction of hypertension. Statistics on cardiovascular diseases (2003) shows that finished meals, such as bread, cheese, butter, sausage, sauces and so on, contribute to high salt intake and must be reduced, thus decreasing high blood pressure.

Puska *et al.* (2003) observe that sedentary lifestyle meaning (little or no physical activity) is dangerous to health because it contributes to most deaths being a result of heart disease. The high rate of sedentary lifestyle could be attributed to economic growth, modernization, urbanization, as well as globalization of food. Most jobs demand sitting behind the desks for long hours during the day coupled with long hours enjoying television or video games at leisure time and all these contributes to hypertension. Statistics on cardiovascular diseases (2003) have shown that obesity, smoking and alcohol consumption is on the increase and has contributed to the growth cardiovascular diseases. Obesity is a major public health problem and it is the excessive storage of body fat and weight. It is one of the causative factors of high blood pressure. Even though genes can put one at risk of gaining weight, the balance of energy intake and exercise is an important determinant. Body Mass Index (BMI) is calculated from weight and height. Mittal & Singh (2010.) state that high consumption of alcohol is related to the rise of blood pressure over the years. Sheldon (2011) opine that excessive use of alcohol elevates blood pressure and this can lead to paralysis from stroke.

Alcohol also makes some people to be overweight. It has long been a contributing factor to overweight due to the number of calories it contains. Therefore, it is necessary to shed weight to prevent hypertension. Lifestyle changes and medications can lower blood pressure and decrease the risk of health complications. Lifestyle changes include weight loss, decreased salt intake, physical exercise, and healthy diet, if lifestyle changes are not sufficient than blood predications are used. Up to three medications can control blood pressure in 90% of people. The treatment of moderately high arterial blood pressure (defined as higher than 160/100mmHg) with medications is associated with an improved life expectancy. The effects of treatment of blood

pressure between 130/80mHg and 160/100mHg are less clear, with some reviews finding benefit and others finding unclear benefit. Furthermore, according to the seventh report of the joint National committee on the prevention, detection, evaluation and treatment of high blood pressure, much of the hypertension cardiovascular, renal disease, and stroke might be prevented if the rise in blood pressure with age could be prevented or reduced. This study, therefore, sets out to examine the level of the knowledge of the patients attending Osun State Specialist Hospital, Osogbo towards determining the causes, management, prevention and complications of hypertension

Objectives of the Study

1. To assess the knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo on the meaning of hypertension.
2. To determine the knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo on the causes of hypertension.
3. To assess the knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo on the prevention of hypertension.
4. To assess the knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo on the management of hypertension.
5. To determine the knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo on other conditions that have complications of hypertension.
6. To identify the sources of knowledge of the patients attending medical outpatient department of Osun State Specialist Hospital Osogbo about hypertension.

Hypotheses

1. There is no significance relationship between effect of hypertension complications and respondents' level of education.
2. There is no significant relationship between respondents age and propensity of hypertension.

Methodology

A descriptive research design was adopted and a simple random sampling technique used. The study was carried out at Osun state specialist hospital, Asubiaro, Osogbo, which was under the state hospital management Board. The hospital has eight (8) wards and outpatient department. The population for this study is all adult patients attending out patient department of Osun state specialist hospital

Asubiaro, Osogbo. Taro Yamen sampling formula was used to determine sample size of 100 respondents that too part in this study. Balloting was used to select 100 respondents from the total population. A self-developed structured questionnaire which consists of two sections namely: (a) socio-demographic data of the respondents (b) knowledge of respondents on causes and (c) prevention of hypertension.

Experts were given for face validation and the reliability was determined through internal consistency; this was found reliable with Cronbach’s Alpha value-0.787. The analysis of data was done using descriptive which involve percentages, graph and inferential statistics of chi square analysis, with P value of 0.05. An informed consent was obtained from the respondents and aim and purpose of the research was made known to them. Information collected by the researcher from the respondents were kept in strict confidence and used for research

purpose only. Also, the management of the Hospital gave approval to conduct the research study.

Results

As presented in Table 1, 28.7% of the respondents are within 20-30 years, 32.7% are within 31-40 years, 37.6% are 41 years and above. Also, 50.5 % of the respondents are males while 48.5% are females. 40.6% of the respondents are Christians, 33.7% are Muslims while 24.8% are traditional worshipper. 52.2% of the respondents are Yorubas, 22.8% are Hausas while 23.8% are Igbos. 20.8% of the respondents are single while 61.4% are married. 31.7% of the respondents are business men, 37.6% are health professionals, while 29.7% are civil servants. The result shows that most of the respondents are from 42 years and above and are males. Also, majority of the respondents are Christians and are Yorubas. However, most of the respondents are married and are retirees.

TABLE 1: Results on the demographic Information of the respondents

S/N	Items	Description	N	%
1	Age of the Respondents	20-30years	29	28.7
		31-40years	33	32.7
		41 years and above	38	37.6
		Total	100	99.0
2	Sex of the Respondents	Male	51	50.5
		Female	49	48.5
		Total	100	99.0
3	Religion of the Respondents	Christian	41	40.6
		Islam	34	33.7
		Traditional	25	24.8
		Total	100	99.0
4	Ethnicity	Yoruba	53	52.5
		Hausa	23	22.8
		Igbo	24	23.8
		Total	100	99.0
5	Marital Status	Single	21	20.8
		Married	62	61.4
		Divorced	17	16.8
		Total	100	99.0
6	Occupation Distribution	Businessman	32	31.7
		Retirees	38	37.6
		Civil Servant	30	29.7
		Total	100	99.0

Table 2 shows that 55% of the respondents agree that hypertension is an increase in blood pressure while 45% disagree. 77% of the respondents agree that hypertension is a silent killer disease while 23% disagree. 22% of the respondents agree that it is a disease of the body while 78% disagree. 60% of the respondents agree that high blood pressure is due to nonspecific lifestyle and genetic factors while 40%

disagree. 80% of the respondents agree that hypertension is associated with headache. From the result of this study, it is revealed that 58.8% of the respondents are knowledgeable on the meaning of hypertension.

Table 2: Knowledge on The Meaning of Hypertension. (Tick the correct answer (√))

S/N	Items	Yes	No
1	An increase in blood pressure	55(55%)	45(45%)
2	A silent killer disease	77 (77)	23(23%)
3	Disease of the body	22(22%)	78(78%)
4	High blood pressure is due to nonspecific lifestyle and genetic factors	60(60%)	40(40%)
5	Hypertension is associated with headache	80(80%)	20(20%)
		58.8%	41.2%

From table 3, we can see that 60% of the respondents agree that smoking is a cause for hypertension while 40% disagree, 55% agree that being overweight is a cause of hypertension while 45% disagree, 77% agree that alcohol is a cause while 23% disagree, 60% of the respondents agree that sedentary lifestyle is a cause of hypertension while 40% disagree, 80% agreed that physical inactivity is a cause while 20% disagree, 71% of the respondents agree that diet is a cause while 29% disagree, 87% of the respondents agree that age is a cause of hypertension while 13% disagree, 80% of the respondents agree that genetic disposition is a cause of hypertension while 20% disagree, 56% agreed that race is a cause while 44% disagree, 62% of the respondents agree that anxiety is a cause of hypertension while 38% disagree, 65% of the respondents agree that excessive intake of salt in diet is a cause of hypertension while 35% disagree while 70% of the respondents agree that emotional stress is a cause of hypertension while 30% disagree. The result reveals that the respondents have a high knowledge (65%) on the causes of hypertension.

Table 3: Knowledge on the causes of hypertension. (Tick the correct answer (√))

S/N	Items	Yes	No
	Hypertension can be caused by		
1	Smoking	60(60%)	40(40%)
2	Overweight	55(55%)	45(45%)
3	alcohol	77 (77)	23(23%)
4	sedentary lifestyle	60(60%)	40(40%)
5	physical inactivity	80(80%)	20(20%)
6	Diets	71(71%)	(19%)
7	age factor	87(87%)	13(13%)
8	genetic predisposition	80(80%)	20(20%)

9	Race	56(56%)	44(44%)
10	Anxiety	62(62%)	38(38%)
11	Excess salt intake in the diet	65(65%)	35(35%)
12	Emotional stress	70(70%)	30(30%)
	Total	65%	35%

From table 4, 78% of the respondents agree that decreased salt intake can prevent hypertension while 22% disagree, 40% of the respondents agree that weight loss can prevent hypertension while 60% disagree, 20% of the respondents agree that physical exercise can prevent hypertension while 80% disagree, 19% of the respondents agree that a healthy diet can prevent hypertension while 81% disagree, 56% of the respondents agree that medications that can lower blood pressure can prevent hypertension while 44% disagree. The result from this study shows that the respondents have poor knowledge (43%) on the prevention of hypertension.

Table 4: Knowledge on The Prevention of Hypertension. (Tick the correct answer (√))

S/N	Items	Yes	No
	Hypertension can be prevented by		
1	decreased salt intake	78(78%)	22(22%)
2	weight loss	40(40%)	60(60%)
3	physical exercise	20(20%)	80(%)
4	a healthy diet	19(19%)	81(81%)
5	medications that can lower blood pressure	56(56%)	44(44%)
	Total	43%	57%

Result from table 5 shows that 87% of the respondents agree that hypertension can be managed by weight loss while 13% disagree, 55% agree that it can be managed by decreased salt intake while 45% of the respondents disagree, 56% of the respondents agree that physical exercise can help manage hypertension while 44% disagree, 22% of the respondents agree that a healthy diet can help manage hypertension while 78% disagree, 60% of the respondents agree that the use of medications that can control blood pressure can be used to manage hypertension while 40% disagree, 80% of the respondents agree that the monitoring of blood pressure can help in managing hypertension while 20% disagree. Also, 71% of the respondents agree that keeping hospital

appointment can help manage hypertension while 29% disagree. This study showed that the respondents had a high knowledge (62%) of the management of hypertension.

Table 5: Knowledge on The Management of Hypertension (Tick the correct answer (√))

S/N	Items	Yes	No
	Hypertension can be Managed by		
1	weight loss	87(87%)	13(13%)
2	decreased salt intake	55(55%)	45(45%)
3	physical exercise	56(56%)	44(44%)
4	a healthy diet,	22(22%)	78(78%)
5	Use of medications can control blood pressure	60(60%)	40(40%)
6	Monitoring of blood pressure	80(80%)	20(20%)
7	Keeping hospital appointment	71(71%)	(29%)
	Total	62%	38%

From Table 6, this study reveals that 40% of the respondents agree that diabetes is a complication of hypertension while 60% disagree. 20% agree that kidney failure is a complication of hypertension while 80% disagree. 19% of the respondents agree that chronic kidney disease is a complication of hypertension while 81% disagree. 22% of the respondents agree that narrowing of the kidney arteries is a complication of hypertension while 78% disagreed. 45% of the respondents agree that endocrine disorder is a complication of hypertension while 55% disagree. 41% of the respondents agree that retinopathy is a complication of hypertension while 56% disagree. 30% of the respondents agree that increasing cardiovascular mortality is a complication of hypertension while 70% disagree. The result of this study reveals that the respondents have a poor knowledge (31%) of the complication of hypertension.

Table 6: Knowledge on The Complications of Hypertension. (Tick the correct answer (√))

S/N	Items	Yes	No
	Complications of Hypertension		
1	Diabetes	40(40%)	60(60%)
2	Kidney failure	20(20%)	80(80%)
3	Chronic kidney disease	19(19%)	81(81%)

4	Narrow of the kidney arteries	22(22%)	78(78%)
5	endocrine disorder	45(45%)	55(55%)
6	retinopathy	41(41%)	56(56%)
7	increasing cardiovascular mortality.	30(30%)	70(70%)
	Total	31%	69%

From table 7, this study reveals the sources of knowledge of the patients. 53% of the respondents get their knowledge from routine check-up, 47% got their knowledge from books, 65% got their knowledge from mass media, 35% got their knowledge from friends, 67% got their knowledge from health workers, 33% got their knowledge from dailies while 28% got their knowledge from other sources. This study shows that the main source of knowledge of the patients are by routine check-up, mass media and health workers

Table 7: Sources of Knowledge of The Patients

S/N	Items	Yes	No	Sig
1	Routine check-up	53(53%)	47(47%)	**
2	Books	47 (47%)	53(53%)	
3	Mass media	65 (65%)	35(35%)	**
4	Friends	35 (35%)	65(65%)	
5	Health workers	67 (67%)	33(33%)	**
6	Dailies	33(33%)	67(67%)	
7	Others	28 (28%)	28(28%)	

Hypothesis one

There is no significant relationship between respondents' age and propensity of hypertension.

As presented in Table 8, there is no statistically significant relationship between respondents' age and propensity of hypertension. The calculated R-value of 0.112 is less than the critical R-value of 0.198 at p-value of 0.266 (>0.005). Thus, the null hypothesis is retained.

Table 8: Relationship Between Effect of Hypertension Complications And Level of Education

	N	M	SD	R-value	Sig.
Propensity of hypertension	100	5.22	0.16	0.112	.226
Age	100	4.47	0.21		

Hypothesis two

There is no significance relationship between effect of hypertension complications and respondents' level of education.

As presented in Table 9, there is statistically significant association between effect of hypertension complications and respondents' level of education. this result is so because the calculated r-value of 0.543 (with the p-value of 0.001 (<0.05) is greater than the critical R-value of 0.198. this result implies that, the null hypothesis which states that there is no significance relationship between effect of hypertension complications and respondents' level of education is rejected while the alternate hypothesis is upheld.

Table 9: Relationship Between Effect of Hypertension Complications And Level of Education

	N	M	SD	R-value	Sig.
effect of hypertension complications level of education	100	8.22	1.30	0.543	.001
	100	6.47	0.87		

Discussion

This study examines the knowledge of the patients attending Osun State Specialist Hospital, Osogbo on the causes, management, prevention and complications of hypertension. The result of the demographic characteristics shows that most of the respondents are from 42 years of age and above and are males. Also, majority of the respondents are Christians and are Yorubas. However, most of the respondents are married and are retirees.

It is found that respondents are knowledgeable about the meaning of hypertension. This finding lends credence to Sayed, Chaman, Sayed Rashid, Zafar, Mohamad, Ahmad Ali and Amin (2015) who report that over 50 percent of patients have average knowledge on hypertension in Iran. Besides lending credence to the aforementioned scholars, this finding is seen to be at variance with that of Dorobantu, Darabont, Badila, and Ghiorghe, (2010) including Efstratopoulos et al. (2006). They see low levels of knowledge on hypertension among their patients. It is further discovered that, respondents have a high knowledge (65%) on the causes of hypertension. This result correlate Kofi (2011) whose result shows that respondents' knowledge on the causes of hypertension is on the average.

The result from this study shows that the respondents have poor knowledge on the prevention of hypertension (43%). This study shows that the

respondents have a high knowledge of the management of hypertension (62%). Sayed, Chaman, Sayed Rashid, Zafar, Mohamad, Ahmad Ali and Amin (2015) who observe that their respondents show high knowledge in the treatment of hypertension.

The result of this study reveals that the respondents have a poor knowledge of the complication of hypertension (31%). This study is in agreement with Kofi (2011) who shows that participants have low level of knowledge on the effect of high blood pressure even though other cardiovascular diseases are mentioned. This study is not consistent with Sayed, Chaman, Sayed Rashid, Zafar, Mohamad, Ahmad Ali and Amin (2015) who reveal that their respondents show high knowledge in hypertension side effects.

This study reports that the sources of knowledge of the patients are by routine check-up, mass media and health workers. This study is consistent with Kofi (2011) who observe that health care professional (nurses, physicians, midwives, public health nurses, community nurses and so on) are known to be the leading source of information. Respondents also receive their information from the pharmacy, relatives and friends. This study observes that there is no statistically significant difference between age of the respondents and knowledge of hypertension. This study is not in line with Sayed, Chaman, Sayed Rashid, Zafar, Mohamad, Ahmad Ali and Amin (2015) who indicates that there is a statistically significant correlation between patient's age and knowledge of the disease. Also, there is statistically significant association between the effect of hypertension complications and respondents' level of education. This study supports Sayed, Chaman, Sayed Rashid, Zafar, Mohamad, Ahmad Ali and Amin (2015) who reports that findings from their study suggest a statistically significant correlation between hypertension control and patients' education.

Conclusion and recommendations

Patients who have suffered hypertension are aware of the level of normal blood pressure, anti-hypertensive drugs to use to maintain and manage the level of normal blood pressure. The study also concludes that respondents are aware of the meaning, symptoms, causes, as well as management of hypertension as a way of reducing the level of mortality due to latent and manifest symptoms of high blood pressure (such as excess salt intake alcohol, cigarette, obesity and birth control pill) that can predispose rise in blood pressure in human body. This can be used to reduce the level of mortality due to high blood pressure among dependent and

working population, pregnant women, aged, among others before, during and after detection.

There are suggested recommendations for the nursing profession to curb the menace and reduce it to barest minimum which includes: government policy to all ministries, departments and agencies to make provision of monthly check-up at the working post. Also, there should be policy to compel the private organization/parastatals to make provision for routine check-up for their staffs in their working place/post. Awareness message or announcement that should be made to traders, businessmen and women and other working class outside the formal setting to help understand the severity of the menace.

References

- Efstratopoulos, A. D., Voyaki, S. M., Baltas, A. A., et al., (2006). Prevalence, awareness, treatment and control of hypertension in Hellas, Greece: the hypertension study in general practice in hellas (HYPERTENSHELL) national study," *American Journal of Hypertension*, 19 (1) 53–60
- Amin (2015) Knowledge, Treatment control, and Risk factors for Hypertension among adult in southern Iran.
- American Heart Disease and Stroke Statistics (2010). A report from the American Heart Association. Dalla, Texas, AHS.
- Brain, A. J., Silman S. A., Lock C. (2011). Evaluation of the effectiveness of a low sodium diet in the treatment of mild hypertension. *Lancet*.
- Bambell, N. R. C., Burgess E., Taylor G, Wilson E, Cleroux J. (2010). Lifestyle changes to prevent and control hypertension, 160, 134-143.
- Cambell N.R.C, Mckay D. W. (2008). Accurate blood pressure measurements in screening for hypertension *Epidemiology*; 117, 429-442 (Pubmed).
- Carretoro O. A, & Oparil, S. (2008). Essential hypertension part I, Definition and ethicology.
- Famakinwa T. T. (2005). A synopsis of medical surgical Nursing. A systematic review. Krisbec Publications, Agbor.
- Graphycems Movarra, Sprain, London. J.N.C. (2007) National institute of Health publication 3, 50-57
- Hendrixs M.E, wit F.W.N.M, Roos M.T.L, et al (2014) Hypertension in sub-Saharan African, a cross-sectional survey in four rural and urban communities.
- Hence O. A. (2012). hypertension the silent killer" by world Health organization (WHO).
- Indind Jock et-al prevalence and Associated Risk factors of hypertension A cross-section study in urban Varanasi.
- Kofi J. O. (2011). Prevention and Management of Hypertension: A study on knowledge and attitudes of women of childbearing age thesis central Ostrobothnia university of applied sciences degree Programme in Nursing.
- Kofi W. B. (2019). Hypertension in older adults in Africa systematic review and meta-analysis.
- James, N. D. (2005). Evidence based hypertension.
- Ovisu V. O. (2011). Treatment of hypertension in rural and urban tropical communities. 1, 22-3.
- Mabadeje A. F. (1999) WHO-ISH Guideline for the management of Hypertensive implementation in Africa the Nigerian experience 21, 671-681.
- Dorobantu, M. Darabont, R. O. Badila, E. & Ghiorghe, S. (2010). "Prevalence, awareness, treatment, and control of hypertension in Romania: results of the SEPHAR Study," *International Journal of Hypertension*. 2010, 1-6.
- Ezzati, M.; Lopez, A. D.; Rodgers, A.; Vander-Hoorn, S. & Murray, C. J. L. (2002). "Selected major risk factors and global and regional burden of disease," *The Lancet*. 360, (9343), 1347–1360.
- Porth, A.S, Carol S. C. & Matfin, P., (2009). Complication of hypertension.
- Sayed Fazel Zinat Motlagh, Reza Chaman, Sayed Rashid Ghafari,Zafar Parisay, Mohamad Reza Golabi Ahmad Ali Eslami & Amin Babouei (2015). Knowledge, Treatment, Control, and Risk Factors for Hypertension among Adults in Southern Iran *International Journal of Hypertension*. 2015, 1-8
- Sheldon W. T. (2017). The dream global study incorporates mobile health innovations in technology with SMS.
- Sneltz and Bare's (2019). How are patients diagnosed with hypertension.
- Wang E A. (2008). The fifth joint national committee on the detection. Evaluation and treatment of high blood pressure (JNCV).
- Wang, J. (2014). prevalence, awareness, treatment and control of Hypertension in China: Results from a national Survey.
- Welton and Reynolds (2012). What is the significance of hypertension in prevalence of hypertension and determinant of its risk factors.
- WHO (2017). Prevalence and associated risk factors of hypertension, a cross-sectional study in urban Varanasi.
- Neil et-all 2015 Hypertension: Genetic advances in some rare causes of Hypertension.
- Puska *et-al*(2009). The effects of awareness, treatment and control of hypertension on cardiovascular and all course mortality-based population. *Journal of human hypertension* 23, 808-816.
- World Health Organization, (2010), *Global Recommendations on Physical Activity for Health*, World Health Organization, Geneva, Switzerland, 1st edition, 2010.