Research Article

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Effectiveness of Education Module on Knowledge & Practice Towards Controlling Blood Pressure among Hypertensive Adults

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ABSTRACT
Background: Hypertension is one of the major disease conditions nowadays. The majority of hypertensive adults won't go for proper treatment, and it may lead to multiple complications. Therefore, this experimental study conducted to reduce the associated complications of hypertension.
Methods: One-group, quasi-experimental pre-test-post-test design was used in this study. The sample size comprises 30 hypertensive adults attending medical consultation at BVVS HSK Hospital Research Center, Bagalkot, Karnataka, India. A non-probability convenient sampling strategy was used in the current investigation. A knowledge questionnaire (including sociodemographic data of hypertensive patients and knowledge on blood pressure control) and a self-developed practice scale was used for data collection. Descriptive and inferential statistics were employed to analyze the data.
Results: No association was observed between the levels of post-test knowledge and sociodemographic characteristics such as age, residence, gender, monthly income, occupation, education, family type, marital status, dietary habits, and religion. Post-intervention mean practice scores of hypertensive adults were statistically higher than that of their pre-intervention practice mean score on knowledge [t=-8.8880(p-value=0.0001), p<0.05] and practice [t=-7.5421(p-value=0.0001), p<0.05]. The education module was found effective in controlling blood pressure among hypertensive adults.
Conclusion: The study proved that administering an education module on knowledge and practice to control blood pressure in hypertensive adults is effective in controlling blood pressure among hypertensive adults.

Key-words: Blood pressure, Education module, Effectiveness, Hypertension, Knowledge, Practice

INTRODUCTION

Blood is a fluid that circulates constantly throughout the body. It supplies oxygen and nutrients and removes waste materials from the body. Blood is primarily liquid and is "thicker" than pure water because it contains many cells and proteins.

An average individual has roughly 5 litres of blood [1]. It is critical to maintain appropriate blood pressure ranges. A blood pressure reading between 140/80 and 159/99mmHg is considered stage 1 hypertension [2], while stage 2 hypertension is defined as blood pressure between 160/100 and 179/109mmHg [3]. A blood pressure reading of 180/120mmHg or higher is referred to as hypertensive urgency, whereas a reading exceeding this threshold might result in end-organ damage and potentially fatal symptoms [4]. Secondary hypertension often occurs rapidly and can be more severe than primary hypertension [5].

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The main symptoms of severe hypertension include extremely high blood pressure; other symptoms such as severe headaches, visual disturbances, fatigue or confusion, chest breathing difficulties, nosebleeds, presence of blood in the urine, irregular heartbeat, throbbing in the chest, throat or ears, dizziness, nervous sweating, facial flushing, sleep disturbances, and blood spots in the eyes are also reported [6]. Elevated blood pressure can damage the delicate blood vessels in the eyes, causing impaired blood flow through the vessels and even leading to blood vessel rupture. Peripheral artery disease is associated with hypertension as a risk factor that can result in erectile dysfunction and other symptoms [7].

The body regulates arterial pressure through several methods, including baroreceptors. Low-pressure baroreceptors and high-pressure volume receptors are the two different kinds of baroreceptors. The high-pressure baroreceptors are involved in the production of ADH angiotensin II [8], whose primary function is to enhance the reabsorption of free water in the collecting tubules of the nephrons in the kidney, resulting in enhancement of plasma volume and arterial pressure [9].

Some lifestyle modifications can help control hypertension [10]. Overall, cardiovascular mortality and morbidity are reduced with effective treatment [11]. Antihypertensive drugs can lower both diastolic and systolic blood pressure [12]. Compared to low- and middle-income nations (31.5%, 1.04 billion people), high-income countries had a lower prevalence of adult-onset hypertension (28.5%, 349 million individuals) [13].

Hypertension is a significant public health concern in India, affecting both rural and urban populations. However, an alarming increase is reported in the rural population [14]. The overall prevalence of hypertension in India is reported as 29.8% [15], with an exceptionally high predominance in Karnataka, which is one of the largest states of southern India [16]. It was shown that a significant risk factor for hypertension is psychological stress [17]. Blood pressure is under control in this frequently challenging-to-treat population of hypertensive patients taking antihypertensive medication, and it may be possible to determine those theoretical areas which are linked to more successful interventions and also those areas that have not been the focus of intervention development [18-20].

MATERIALS AND METHODS

Research Design- A one-group, pre-test-post-test quasi-experimental design was considered for the present study. The study subjects consisted of 30 hypertensive adults who met the inclusion criteria and attended the Medical O.P.D. of BVVS HSK Hospital and Research Centre, Bagalkot, Karnataka, India. Non-probability convenient sampling technique was employed in this study.

Data Collection- The adult hypertensive patients were selected based on nonprobability convenient sampling technique. The sociodemographic variables of hypertensive patients and a self-administered knowledge questionnaire regarding blood pressure control were obtained from all the study subjects. Additionally, a self-constructed attitude scale on controlling blood pressure was acquired from the study subjects. A pretest on knowledge level and practice on blood pressure control was conducted on hypertensive adults. The knowledge level was evaluated using a structured questionnaire, and a self-constructed practice scale was used to assess the practice level. After that, an education module was administered to the subjects, which included lectures, video clippings, pamphlets, and diagrams for 20 minutes. After 7 days, the studied subjects' knowledge level and practice score were evaluated using the same questionnaire and a self-generated practice scale.

Development of Education Module- The educational module was developed considering the study's aims. The overall content of the educational module was prepared by using the educational module and charts as audio-visual aids. To ensure content authenticity, the educational module was created and shown to the experts. The specialists were consulted regarding their thoughts and recommendations regarding the training module's content. The last draft was produced. The content area of the education module was divided into definitions of blood pressure, causes, diagnostic evaluation, clinical manifestations, side effects of blood pressure and management.

Statistical Analysis- Pretest and post-test mean knowledge and practice scores of hypertensive adults were assessed to indicate the effectiveness of the education module in controlling blood pressure among

hypertensive adults using a t-test (p<0.0001). Chi-square and Yates correction were computed to determine the relationship between post-test knowledge scores of hypertensive adults regarding blood pressure control and the selected sociodemographic variables.

Ethical Approval- Ethical clearance was obtained from the Medical Superintendent, BVVs HSK Hospital, Bagalkot, Karnataka, India. Written informed consent was obtained from all of the 30 study subjects.

RESULTS

The sociodemographic characteristics of study subjects (N=30), such as age group, gender, residence, monthly income, educational qualification, type of family, marital status, religion, and dietary pattern, were collected and presented (Table 1). The majority of hypertensive subjects were 50 years and above (46.67%), were males (60%), resided in rural setting (53.33%), had monthly income of more than Rs.20,000 (40%), were degree holder or postgraduate (23.33%), were employed (43.33%), resided in nuclear family (56.67%), were married (70%), had mixed dietary pattern (46.67%), and were non-Hindus (56.67%).

Table 1: Sociodemographic profile of subjects

Sociodemographic characteristics	Frequency	Percentage (%)
Age group (Years)		
31-40	10	33.33
41-50	6	20
50 & above	14	46.67
Gender		
Female	12	40
Male	18	60
Residence		
Rural	16	53.33
Urban	14	46.67
Monthly income (Rs.)		
Below 10,000	10	33.33
10,001-20,000	8	26.67
20,001+	12	40.00
Education received		
Not attended school	5	16.67
Primary	6	20
Secondary	5	16.67
Degree	7	23.33
Postgraduate	7	23.33
Occupation		
Employed	13	43.33
Housewife	5	16.67
Business	8	26.67
Others	4	13.33
Family setup		
Nuclear	17	56.67
Joint	13	43.33
Marital status		
Married	21	70
Single	9	30
Dietary pattern		
Vegetarian	5	16.67
Non-vegetarian	11	36.67
Mixed	14	46.67
Religion		
Hindu	13	43.33
Non-Hindu	17	56.67

The effectiveness of the education module on knowledge level and practice score in controlling blood pressure was assessed in hypertensive adults. The pretest and post-test knowledge scores were compared to control blood pressure among hypertensive adults using a dependent 't' test (Fig. 1).

The calculated t-value was -8.8880, which was highly significant (p<0.0001). The post-intervention means knowledge scores of hypertensive adults about controlling their blood pressure are higher than their pre-intervention mean score. Hence, it is clear that there is a statistically significant difference between the pretest and post-test mean knowledge scores of hypertensive adults, indicating that the education module is effective in controlling blood pressure among hypertensive adults (Fig. 1).
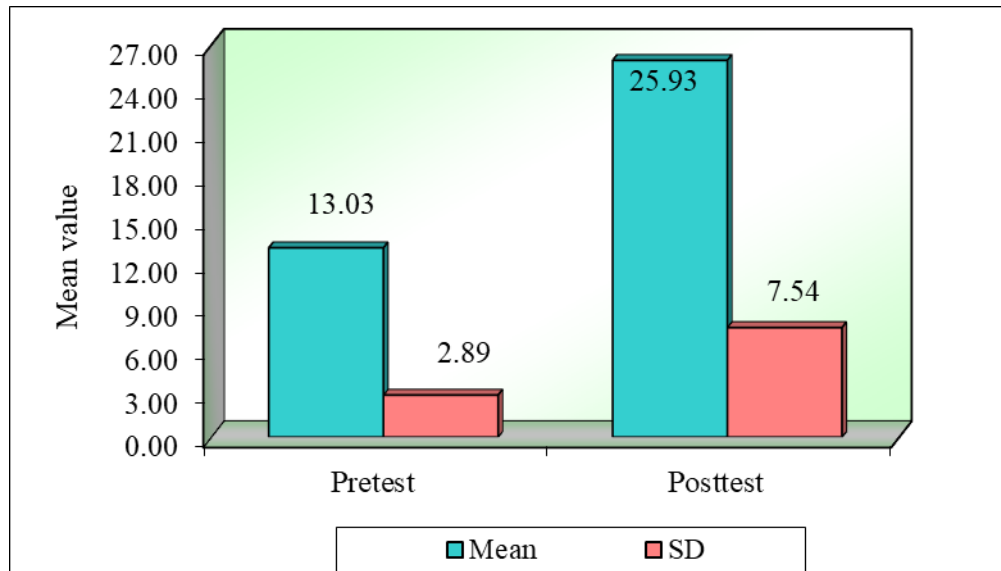

Fig. 1: Comparison of post-test and pretest knowledge scores towards blood pressure control in hypertensive adults

A comparison of pretest and post-test practice scores towards controlling blood pressure among hypertensive adults was made by using a dependent 't' test. The mean, S.D. and paired 't' test of pre- and post-test knowledge scores of blood pressure in hypertensive adults were assessed (Fig. 2).

The calculated 't' value of -74.55 was significant (p<0.0001). The post-intervention mean practice scores of hypertensive adults about controlling their blood pressure are higher than that of their pre-intervention mean score. Hence, a significant difference is evident between the pretest and post-test mean practice scores of hypertensive adults, indicating that the education module effectively controls blood pressure among hypertensive adults (Fig. 2).
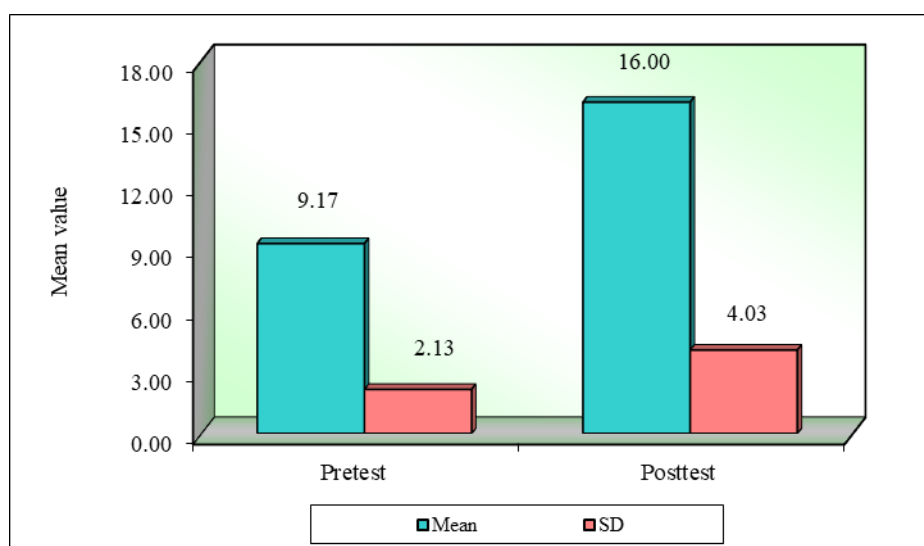

Fig. 2: Comparison of pretest and post-test practice scores towards controlling blood pressure among the hypertensive adults

The association between post-test knowledge score and post-test practice towards blood pressure control among hypertensive adults was assessed. The 'r' value computed was 0.5110, less than the table value 3.1458. Therefore, a favorable correlation was observed between post-test knowledge and practice scores in controlling blood pressure among hypertensive adults.

The pretest and post-test levels of knowledge towards controlling blood pressure in hypertensive subjects were evaluated and depicted in Fig. 3. Out of 30 subjects, 22 (73.33%) hypertensive adults had a high level of knowledge in the post-test, while 26 (86.67%) subjects in the pretest had a low level of knowledge towards blood pressure control.
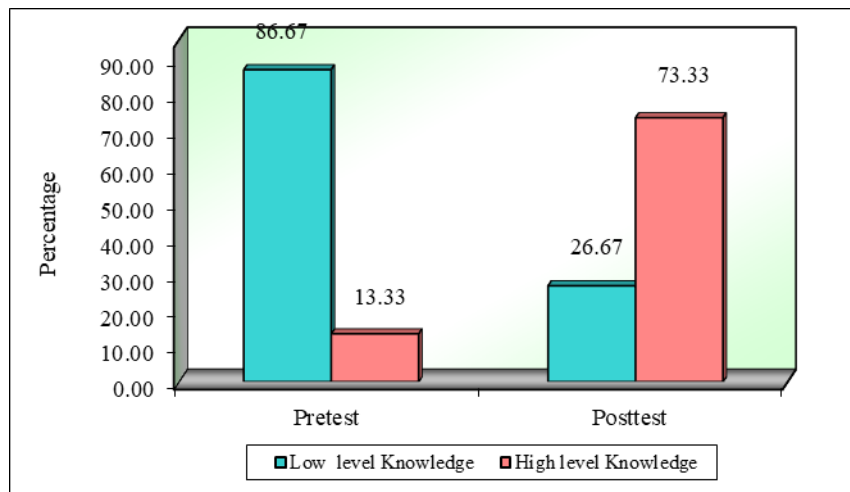

Fig. 3: Pretest and post-test levels of knowledge towards controlling blood pressure among hypertensive adults

The pretest and post-test levels of practice towards blood pressure control in hypertensive adults were evaluated by categorizing the practice of hypertensive adults towards blood pressure control into two groups, low-level practice and high-level practice.

A total of 24 (80%) hypertensive adults had high practice scores in the post-test, while 25 (83.33%) subjects had low levels of practice in the pretest towards controlling their blood pressure (Fig. 4).
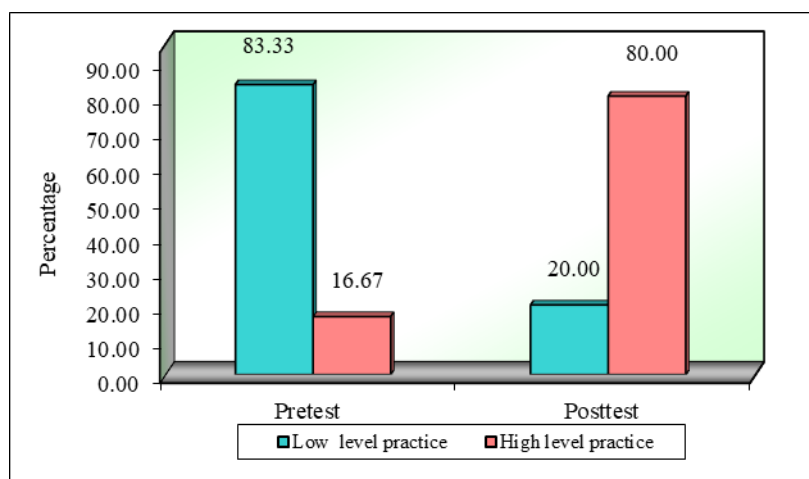

Fig. 4: Pretest and post-test levels of practice towards controlling blood pressure among hypertensive adults

The association between post-test knowledge scores of hypertensive adults regarding blood pressure control with the selected sociodemographic variables was calculated using Chi-square and Yates correction by using a contingency table. The findings are depicted in Table 2.

The calculated Chi-square value and Yates correction were less than the table value for sociodemographic variables such as age ($\chi^2=1.1200$, P=0.5710), gender ($\chi^2=1.0230$, p=0.3120), residence ($\chi^2=1.0990$,

p=0.2950), monthly income (χ2=0.0850, p=0.09580), education (χ2=1.4850, p=0.8290), occupation (χ2=2.4750, P=0.4800), type of family (χ2=1.4930, p=0.2220), marital status (χ2=0.1300, p=0.7190), dietary pattern (χ2=0.8850, p=0.6420), religion (χ2=0.1970, p=0.6570) in post-test, so no significant relationship was established (Table 2).

Table 2: Correlation between the selected sociodemographic variables and post-test knowledge level

Sociodemographic variables	D.F.	Chi-square	p-value
Age	2	1.1200	0.05710
Gender	1	1.0230	0.3120
Residence	1	1.0990	0.2950
Monthly income	2	0.0850	0.9580
Education	4	1.4850	0.8290
Occupation	3	2.4750	0.4800
Type of family	1	1.4930	0.2220
Marital status	1	0.1300	0.7190
Dietary pattern	2	0.8850	0.6420
Religion	1	0.1970	0.6570

DF: degree of freedom; Table value=3.84

Chi-square and Yates correction were used to establish a relationship between post-test practice scores of hypertensive adults with the selected sociodemographic variables by using contingency table. The calculated Chi-square and Yates correction value was less than the table value for sociodemographic variables such as gender (χ2=1.0230, p=0.3120), residence (χ2=1.0990, p= 0.2950), monthly income (χ2=0.0850, p=0.09580), education (χ2=1.4850, p=0.8290), occupation (χ2=2.4750, p=0.4800), type of family (χ2=1.4930, p=0.2220), marital status (χ2=0.1300, p=0.7190), dietary pattern (χ2=0.8850, p=0.6420), and religion (χ2=0.1970, p=0.6570). Whereas the calculated Chi-square and Yates correction value was more than table value for age (χ2=1.1200, p=0.5710). Therefore, it was concluded that in the post-test, the calculated Chi-square and Yates correction values were less than the table value for all the sociodemographic variables, and in the case of age

(χ2=4.2860), the calculated chi-square value was more than the table value (Table 3).

Table 3: Association between levels of post-test practice with the selected sociodemographic variables

Sociodemographic variables	D.F.	Chi-square	p-value
Age	2	4.2860	0.1170*
Gender	1	1.7010	0.1920**
Residence	1	1.2050	0.2720**
Monthly income	2	0.4690	0.7910**
Education	4	1.9350	0.7480**
Occupation	3	5.0120	0.1710**
Type of family	1	2.1720	0.1410**
Marital status	1	0.6350	0.4260**
Dietary pattern	2	0.0410	0.9800**
Religion	1	1.6630	0.1970**

*DF: degree of freedom; *: significant; **: Nonsignificant; Table value=3.84*

DISCUSSION
The current study assessed the efficacy of the education module based on the knowledge level and practice score towards controlling blood pressure among 30 hypertensive adults attending the medical O.P.D. of HSK Hospital & Research Center, Bagalkot, Karnataka, India. Evaluation of practice levels of hypertensive adults in the post-test revealed that 20% of subjects had low practice scores, and the majority (80%) had high practice scores. The findings aligned with a study by Sheikh *et al.* to analyze the effect of I.E.C. intervention on hypertension management. Information on hypertension and recurrent health education workshops were given to the individuals. Following the intervention, it was discovered that patients' understanding, attitudes, and practices regarding managing their hypertension had greatly improved [21].

This study employed Karl Pearson's correlation coefficient to determine the association between blood pressure control knowledge and practice. The "r" value of the post-test was 0.5110, showing a positive association between knowledge level and practice scores. This indicates that the practice scores of hypertensive subjects towards controlling blood pressure improved with increased knowledge about hypertension

management. The research conducted by Manju V. supported these conclusions by evaluating the attitudes and understanding of hypertension patients regarding lifestyle modifications. The study indicated that the knowledge level was positively and moderately associated with the attitude toward lifestyle modifications. The study showed that the attitude score increased moderately when the knowledge score was increased [22].

Non-significant relationship was noticed between the post-test knowledge levels and sociodemographic characteristics such as gender, age, residence, monthly income, occupation, education, type of family, marital status, dietary pattern, and religion. Contradictory findings were reported by Erkoc *et al.*, who researched to develop a hypertension knowledge scale. The hypertension knowledge-level scale was developed based on criteria such as face, construct validity, content, internal consistency, test-retest reliability, and discriminative validity procedures. Knowledge of hypertension was shown to be significantly correlated with gender, age, educational qualification, and family income. Non-significant association was observed between working at an income-generating job and post-test knowledge level [23].

A positive association was found between post-test practice scores and age demographic characteristics. In contrast, no relationship was found between the post-test practice scores and other sociodemographic factors such as gender, residence, monthly income, education, occupation, type of family, marital status, dietary pattern, and religion. These findings agreed with a study by Aubert et al. on the awareness, perspective, and hypertension management practice in hypertensive patients of developing countries. The study's results demonstrated a substantial correlation between the age and educational status of the patients and their attitude towards managing hypertension [24].

CONCLUSIONS

The present study is useful in determining the overall impact of the education module on knowledge level and practice score in controlling blood pressure among hypertensive adults. Education module was administered, and significant variation between the knowledge scores on the pretest and post-test was discovered. Thus, the current research findings demonstrated that the education module was very helpful in enhancing knowledge and practice towards controlling blood pressure.

The results of the current study established the importance of education modules in blood pressure control among hypertensive adults. Additionally, it might provide a more engaging discussion between the user and an intelligent tutoring system for hypertension patients and give them more tailored instructions in other areas.

CONTRIBUTION OF AUTHORS

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Article editing- Pavitra M Benakattimath
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REFERENCES

[1] WebMD.com [Internet]. Hoffman M. Human Anatomy Medically Reviewed by Carol DerSarkissian; 2020 June 28.

[2] Whelton PK, Aronow WS, Carey RM, Collins KJ, Casey DE, et al. ACC/AHA/ACPM/AGS/AAPA/ABC/APhA/ASH/ASPC/NMA/PCNA Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: Executive summary: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Cardiol., 2018; 71(19): e127-e248.

[3] Reboussin DM, Griswold ME, Allen NB, Guallar E, Hong Y, et al. Systematic review for the 2017, ACC/AHA/AAPA/AGS/APhA/ASH/ABC/ACPM/ASPC/NMA/PCNA Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: A report of the American College of Cardiology/American Heart Association Task Force

on Clinical Practice Guidelines. Circulation. 2018; 138(17): e595-e616.

[4] Aronow WS. Treatment of hypertensive emergencies. Ann Transl Med., 2017; 5(Suppl 1): S5.

[5] Healthline.com [Internet]. Rishe J, Holland K. Everything you need to know about high blood pressure (hypertension); 2020 Jun 17.

[6] WebMD.com [Internet]. Beckerman J. Symptoms of High Blood Pressure; 2020 Jul 16.

[7] Healthshots.com [Internet]. LeBrun N. Complications of High Blood Pressure; 2020 Sep 7.

[8] InStatPearls [Internet]. Shahoud JS, Aeddula NR. Physiology, Arterial Pressure Regulation; 2019 Feb 11. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538509/ (last accessed 4.3.2020).

[9] Magder S. The meaning of blood pressure. Critical Care., 2018; 22(1): 257. Available from: https://ccforum.biomedcentral.com/articles/10.1186/s13054-018-2171-1.

[10] WebMD.com [Internet]. Beckerman J. An Overview of High Blood Pressure Treatment; 2019 Dec 4.

[11] InStatPearls [Internet]. Fountain JH, Lappin SL. Physiology, Renin-Angiotensin System; 2019 May 5. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470410/.

[12] The Editors of Encyclopaedia. Blood pressure. U.S.A.; Encyclopedia Britannica: 2022. Available from: https://www.britannica.com/science/blood-pressure.

[13] Mills KT, He J, Stefanescu A. The global epidemiology of hypertension. Nat Rev Nephrol., 2020; 16(4): 223-37. doi: 10.1038/s41581-019-0244-2.

[14] Saxena T, Rajeev KH. Prevalence of hypertension in a rural community of coastal Karnataka: a cross sectional study. Int J Community Med Public Health, 2017; 4: 2774-77. doi: 10.18203/2394-6040.ijcmph20173321

[15] Anchala R, Pant H, Khan H, Kannuri NK, Franco OH, et al. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. J Hypertens., 2014; 32(6): 1170-77. doi: 10.1097/HJH.0000000000000146.

[16] Jayanna K, Ramanaik S, Pati MK, Swaroop N, Kar A, et al. Designing a comprehensive Non-Communicable Diseases (N.C.D.) programme for hypertension and diabetes at primary health care level: evidence and experience from urban Karnataka, South India. BMC Public Health, 2019; 19(1): 409p. doi: 10.1186/s12889-019-6735-z.

[17] Momiin MH, Desai VK, Kavishwar AB. Study of Sociodemographic profile & prevalence of hypertension among bank employees in Bagalkot city. Ind J Public Health., 2012; 56(1): 44-48.

[18] Maraboto C, Ferdinand KC. Update on hypertension in African-Americans. Progress Cardiovascular Dis., 2020; 63(1): 33-39. doi: 10.1016/j.pcad.2019.12.002.

[19] Paudel P, Chalise S, Neupane DR, Adhikari N, Paudel S, et al. Prevalence of Hypertension in a Community. JNMA., 2020; 58(232): 1011-17. doi: 10.31729/jnma.5316.

[20] Morrissey EC, Durand H, , Navarro T, Nieuwlaat R, Haynes RB, et al. Effectiveness and content analysis of interventions to enhance medication adherence in hypertension: a systematic review and meta-analysis protocol. Systematic Reviews, 2016; 5: 96. doi: 10.1186/s13643-016-0278-5.

[21] Shaikh S, Memon S, Ahmed I, Amna, Manzoor R, et al. Impact of an I.E.C. (Information, Education, and Communication) intervention on key family practices of mothers related to child health in Jamshoro, Sindh. Pak J Med Sci., 2014; 30(3): 611-18.

[22] Manju V. Study to assess the knowledge and attitude on lifestyle modification among hypertensive patients attending O.P.D. in Srinivasa hospital, Bangalore. J Adv Healthc Res., 2021; 5(6): 224-31.

[23] Erkoc SB, Isikli B, Metintas S, Kalyoncu C. Hypertension knowledge-level scale (HK-LS): a study on development, validity and reliability. Int J Environ Res Public Health, 2012; 9(3): 1018-29.

[24] Aubert L, Bovet P, Rwebogora AP, Waeber B, Gervasoni JP, et al. Knowledge, attitude, and practices on hypertension in a country in epidemiological transition. Hypertension, 2008; 31(5): 1136-45.