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TO REVEAL THE RISK FACTORS RELATED WITH HYPERTENSION AMONG YOUNG AND AGED PATIENTS: A CROSS-SECTIONAL STUDY

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Abstract:
Objective: *The aim of our study was to define the risk factors related with hypertension in young and aged individuals and knowledge about status of their health.*
Study Design: *A cross-sectional study.*
Place and Duration: *This study was conducted at Outpatient departments (OPDs) of four tertiary care hospitals (Services Hospital, Shalamar Hospital, Jinnah Hospital, Mayo Hospital) of Lahore, Pakistan for the duration of six months starting from March, 2020 to August, 2020.*
Methodology: *In this study we selected a total of 364 patients aging from 18 years to 60 years from OPDs of four tertiary care hospitals of Lahore, Pakistan. Structured survey method was used to collect data regarding demographic details, medical history and blood pressure measurements. We analyzed the data by using Statistical Packages for Social Sciences (IBM SPSS V20).*
Result: *In our study there were 38.70% participants were suffering from hypertension. Among these maximum cases were having age from 40 years to 60 years and having body mass index (BMI) greater than 23/kg^2. Bivariate analysis showed a significant association of age, marital status, gender, weight, and physical activity with hypertension having P-value of less than 0.005.*
Conclusion: *It is concluded that Hypertension is related with several risk factors including age, marital status, gender, weight, and physical activity. While smoking didn't show a significant association with HTN. Although, hypertensive patients were knowledgeable about their health status but were not interested in maintaining good health.*
Key words: *Knowledge, Age, Determinants, Obesity, Hypertension.*

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INTRODUCTION:

Asymptomatic type of hypertension (HTN) is a silent killer. The better understanding of the underlying causes or factors can be beneficial in reducing the mortality and morbidity rate. The occurrence of Hypertension (HTN) in 30% of the world's population has made it a serious health concern [1]. There are many diseases that can induce Hypertension and damage vital organs like heart, brain, kidney, and lungs [2,3]. It is considered as a 3rd leading cause of disability-adjusted life years [4]. A global estimation in 2000 reported that Hypertension is prevailing in 26.4% of the adults and predicted that this trend will increase up to 60% till 2025 [5].

Chronic arterial Hypertension has raised the rate of morbidity and mortality among local masses. As per an estimation made by World Health Organization in 2002, among 7.1 million deaths Hypertension associated mortalities account for 13% of the total deaths annually in the global village [6]. There are many previously published studies available threatening outcomes of Hypertension, its prevalence, that narrate the life pathophysiology and associated risk factors [7,8]. Hypertension is also termed as a silent killer because of its asymptomatic nature. So, the Joint National Commission (JNC) VIII guidelines has mentioned various treatment goals for adult and elderly population.

According to these guidelines, systolic blood pressure (SBP) must be <150 mmHg and diastolic blood pressure (DBP) must be <90 mmHg for geriatrics, while in patients <60 years of age DBP should not exceed from 90 mmHg and SBP should be <140 mmHg. Also, in adult population or patients suffering from chronic diseases SBP should be 140 mmHg and DBP should be 90 mmHg [9]. The balance between cardiac output and arterial resistance is the determinant of blood pressure (BP). But in Hypertension this balance is disturbed with lesser supply of oxygen to cardiac tissues. The strain causes dysfunction of cardiovascular system and kidney failure.

Although risk of Hypertension is associated with various behavioral and physical factors but in various cases demographic characteristics e.g., age, gender, financial status, dietary intake, stress, marital status, and co-morbidities are the major factors responsible for it. Pakistan, a low middle-income country with a total population of 207.7 million, is facing many health crises e.g., cardiovascular diseases induced Hypertension [10]. According to a study conducted by Jaffar et al in 1994 overall 22.7% urban Pakistanis were reported to have Hypertensive versus 18.1% in rural subjects [11]. The number of hypertensive patients is continuously increasing with each passing day but there is no community-based data available regarding hypertensive crises and its risk factors due to lack of reporting system. Therefore, the aim of the present study was to estimate the risk factors of Hypertension and the knowledge of patients about their health status.

METHADOLOGY:

This factual and cross-sectional study was hired according to the objectives of the study between May, 2016 and October, 2016. This study was conducted in the outpatient departments (OPDs) of four tertiary care hospitals (Services Hospital, Shalamar Hospital, Jinnah Hospital, Mayo Hospital) of Lahore, Pakistan. Lahore is a populous city of Pakistan with an approximate population of 12,642,000. Ethical approval was obtained from the ethical committee of all mentioned hospitals.

The minimum sample size was 312, as calculated by using the Rao soft sample size calculator with 99% confidence interval (CI) and 5% margin of error [Equation 1].

Equation No 01:

$$n = N \times \{(N-1)E2+x\}$$

Where N is the population size, x is the CI and E is the margin of error. With an added contingency of 20% for non-response and inappropriate responses, the final sample was calculated to be 364 patients. A systematic random sampling technique was used to select the study participants. In selection of participants of the study, willing adult patients (18 years or older), suffering from Diabetes Mellitus (DM) and OPDs of the healthcare settings were included. Participants were excluded from the study if they were inpatients, <18 years of age, experiencing disease induced Hypertension (fever, gestational Hypertension, Renovascular Hypertension, Glomerular disease, Aldosteronism, Thyroid problems, Cushing syndrome or any other acute illness).

A structured questionnaire was designed and interviews were conducted either directly from the patients or by the head of their family. The data collection tool comprised of two parts: 1 (demographic characteristics and risk factors): 2 (gender, age, weight, educational level, marital status, employment status, smoking, physical activity and salt intake). The awareness of Hypertension among participants, family history and lifestyle were collected in this study. A

standardized mercury sphygmomanometer was used for measuring BP in order to evaluate that either patient is hypertensive or normotensive. Three consecutive readings were obtained in the morning when patient was at rest and in sitting position.

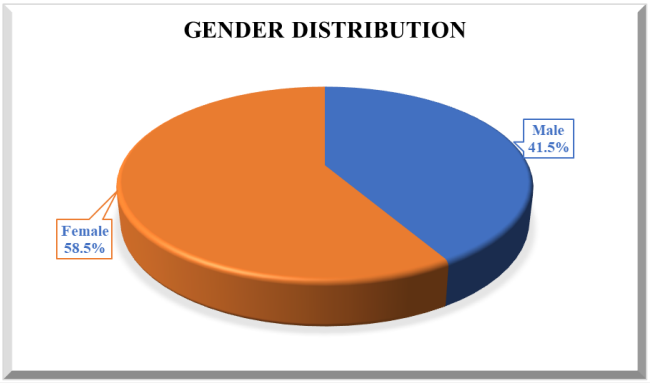
Descriptive statistics such as frequency and percentages were used to present the continuous variables. While Bivariate analysis and Chi square test (p-value <0.05) were used to test the significance of the data. Data were analyzed by using Statistical Packages for Social Sciences (IBM SPSS V20).

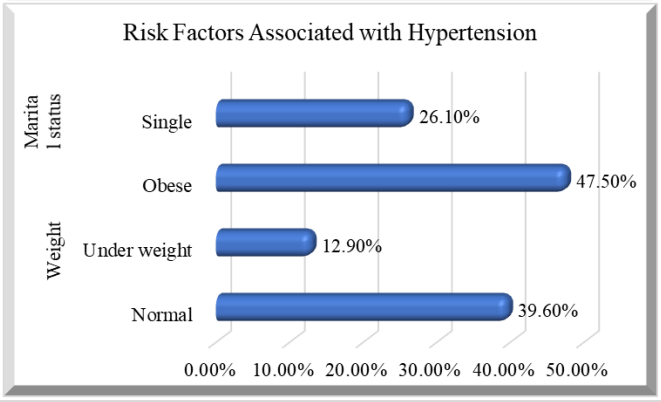
RESULTS:

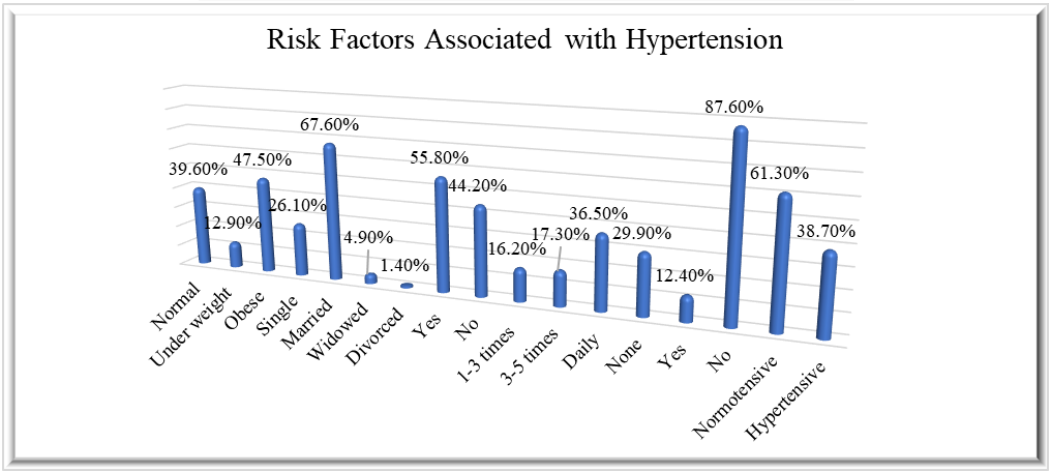
In this study a total number of 364 patients were examined. Among them, 62.6% (n=228) were 18-39 years of age, 45.1% (n=164) had secondary level of education, 32.1% (n=117) were employed, 67.6% (n=246) were married, 47.5% (n=173) were obese and 55.8% (n=203) took reduced amount of salt in diet. Also, 38.7% (n=141) participants were hypertensive (Table-I).

Table No 01: Assessment of Risk Factors Associated with Hypertension and The Knowledge of Outpatients About their Health Status

Gender	Male	151	41.5%
	Female	213	58.5%
Age(years)	18-39	228	62.6%
	40-59	104	28.6%
	≥ 60	32	8.8%
Education	Illiterate	133	36.5%
	Primary	41	11.3%
	Secondary	164	45.1%
	Tertiary	26	7.1%
Financial Status	Employed	117	32.1%
	Unemployed	189	51.9%
	Student	28	7.7%
	Retired	30	8.2%
Weight	Normal	144	39.6%
	Underweight	47	12.9%
	Obese	173	47.5%
Marital status	Single	95	26.1%
	Married	246	67.6%
	Widowed	18	4.9%
	Divorced	5	1.4%
Intake of salt in diet	Yes	203	55.8%
	No	161	44.2%
How often do you do physical activity?	1-3 times a week for ≥30 minutes	59	16.2%
	3-5 times a week for ≥30 minutes	63	17.3%
	Daily	133	36.5%
	None	109	29.9%
Do you smoke cigarettes?	Yes	45	12.4%
	No	319	87.6%
Distribution of Hypertension study population as per JNC VIII criteria	Normotensive	223	61.3%
	Hypertensive	141	38.7%







Among all the hypertensive patients (n=141), 86.5% (n=122) were aware of their health status. In 64.5% (n=91) of the cases HTN affected the patient's ability to perform their daily routine, 90.8% (n=128) were taking hypertensive medicines regularly, 41.8% (n=59) patients had family history of HTN and 66.7% (n=94) patients had no interest in their health (Table-II).

Table No 02: Comparison Among Hypertensive Patients Who Take Medicine Regularly and Those Who had no Interest in their Health		
Variables		**N%**
Has your doctor told that you have hypertension?	Yes	122 (86.5)
	No	19 (13.5)
How often do you see your doctor for blood pressure checkups?	Once in a month	14 (9.9)
	Four times a month	6 (4.3)
	Regularly	37 (26.2)
Do you take blood pressure at home?	Yes	53 (37.6)
	No	88 (62.4)
Does high blood pressure affect the ability to perform daily activities?	Yes	91 (64.5)
	No	32 (22.7)
	Not known	18 (12.8)
Have you ever been in emergency for high blood pressure?	Yes	64 (45.4)
	No	77 (54.6)
Do you take any medication to control your blood pressure?	Yes	128 (90.8)
	No	13 (9.2)
Do you have blood relatives with the history of hypertension?	Yes	59 (41.8)
	No	33 (23.4)
	Don't know	49 (34.8)
Do you have diabetes? If yes, which type?	Type 1	16 (11.4)
	Type 2	33 (23.4)
	None	92 (65.2)
What are your health goals and interest?	Eating better	13 (9.2)
	Exercising	7 (4.9)
	Losing weight	8 (5.7)
	Reducing stress	19 (13.5)
	No interest	94 (66.7)

Bivariate analysis showed the association between HTN and several risk factors (Table III). It was found that age, gender, marital status, financial status, weight, educational background and lifestyle had significant association with HTN.

Table No 03: Association between Hypertension and several risk factor

Variables		Qty	%age	Hypertensive Patients	%age
Gender	Male	151	41.5%	32	22.7%
	Female	213	58.5%	109	77.3%
Age (years)	18-39	228	62.6%	34	24.1%
	40-59	104	28.6%	86	60.9%
	≥60	32	8.8%	21	14.9%
Education	Illiterate	133	36.5%	49	34.8%
	Primary	41	11.3%	22	15.6%
	Secondary	164	45.1%	61	43.3%
	Tertiary	26	7.1%	9	6.4%
Marital status	Single	95	26.1%	12	8.5%
	Married	26	67.6%	111	78.7%
	Widowed	18	4.9%	15	10.6%
	Divorced	5	1.4%	3	2.1%
Financial status	Employed	117	32.1%	27	19.1%
	Unemployed	189	51.9%	99	70.2%
	Student	28	7.7%	11	7.8%
	Retired	30	8.25%	4	2.85%
Smoking	Yes	45	12.4%	5	3.6%
	No	319	87.6%	136	96.5%
Salt restricted diet	Yes	203	55.8%	114	80.9%
	No	161	44.2%	27	19.1%

DISCUSSION:

Globally, HTN is the leading cause of 7.1 million mortalities [12]. Majority of the previously published literature is based on the findings of prevalence and HTN associated risk factors. This problem has worsened the health status of individuals living in under developed countries. In this study, 38.7% patients were suffering from HTN. In contrast to other studies, the number of hypertensive patients is quite high. A study in Hyderabad revealed that 18.5% of the participants were hypertensive [13], while another study revealed that 18.1% of backs and 23.8% of whites in Cuba were suffering from HTN [14]. Similar to our findings a study reported prevalence of HTN among 30% of the population worldwide [15]. Also, another study reported 32.3% of hypertensive cases among the study population in Zambia [16]. The results of present study revealed that most of the participants had poor educational background but many of them were employed.

Majority of the hypertensive patients were illiterate and unemployed. These financial crises can cause hindrance towards the better control on their hypertensive state. Similar to our findings, a study found that illiteracy is one of the major determinants for HTN [17]. Besides this factor, many patients were well aware of their hypertensive status but ignorant about its management. Healthy and active lifestyle can be beneficial for hypertensive patients. But in this study, most of the patients were living a sedentary lifestyle because they were not involved in any physical activity. Thus, modification in lifestyle can be attributed as a non-pharmacological therapy for HTN [18].

HTN can be induced by stress. In this study most of the hypertensive patients were married and the family stress caused their BP to deviate from normal to higher level. This fact is evident from a previously published study where increased chronic stress has showed a direct relationship with HTN [19]. We also found that HTN is significantly associated with age. It means that risk of HTN increases with the advancement in age. This fact is evident from the study conducted on US population wherein most of the hypertensive agents were elderly (60%) people as compared to adults (4%) [20]. This is because of the reason factors like higher level of stress and lesser involvement in physical activities are associated with elderly patients. Similar to our findings a study conducted in Peshawar, Pakistan demonstrated age as a determinant of HTN [21].

BMI is also associated with HTN. Our findings revealed a positive correlation with HTN because most of the hypertensive patients were obese. Similarly, a study reported that HTN was more prevalent among obese individuals as compared to those who had normal BMI [22]. Another study also showed a significant association of age and higher BMI with HTN [23]. If the BMI of obese patient is shifted towards normal then risk of HTN can be lessened [24]. A study also revealed age and BMI as the major determinants of HTN [25]. HTN is an inheritable characteristic. This is the reason that most of hypertensive patients in this study had a family history of HTN. This factor is also evident from a previously published study conducted in Chennai wherein most of the hypertensive adults' patients had hypertensive parents [26]. In this study majority of the hypertensive patients took their medications regularly. This demonstrates a concern of patients towards their health status and good patient compliance with the medication. But a survey-based study reported lower number of patients who were concerned about their medication and health status [27].

HTN can be induced from other chronic diseases like DM. In this study a small number of hypertensive patients are also suffering from DM. Like our findings, a study reported that 17.9% of the hypertensive patients were suffering from DM [28]. Findings also suggest that nearly half of the hypertensive patients were brought to the emergency department because of the sudden rise in their BP. Moreover, more than half of these patients were unable to perform their routine activities and majority of them showed less interest in their health conditions. Hence, it is recommended that proper counseling of hypertensive patients about weight, diet and lifestyle modification is mandatory. Such system must be introduced which ensure the self-management of HTN by the patients. The better understanding of HTN associated risk factors is also crucial for attaining patient adherence and good therapeutic outcomes. Also, various strategies should be adopted by the healthcare professionals through which interest of the patients about their health status can be provoked.

CONCLUSION:

The major elements of hypertension include increase in age, obesity, sedentary lifestyle, genetics, diabetes mellitus (DM) and lack of health concerns. Although patients are knowledgeable of their poor health status but make little or no efforts in controlling and preventing hypertension. Also, some of the patients

were not taking antihypertensive agents. Thus, proper counseling can be beneficial in reducing the risk factors and disease burden of HTN.

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