Sania Shakeel
Assistant Professor, Department of
Home Science, Government College
for Women, M. A. Road, Srinagar,
J&K

Naila Irshad
Assistant Professor. Institute of
Home Science, University of
Kashmir, Hazratbal, Srinagar,
J&K

Lifestyle patterns and the prevalence of hypertension among the teachers of Kashmir University (Age 35 To 60 Yrs.)

Sania Shakeel and Naila Irshad

Abstract
Background
Lifestyle factors are critical determinants of blood pressure levels. With urbanisation and increasing prosperity, prevalence of hypertension is on rise, about 60% population of Kashmir is hypertensive and lifestyle is an important risk factor for it. Hypertension thus becomes an increasingly important clinical problem.

Objectives
- To study the prevalence of high blood pressure among the teachers of Kashmir University (age group 35+).
- To compare the lifestyle of cases and controls, so as to prove that healthy lifestyle prevents hypertension.

Methods
106 participants (age 35+ to 60 years) from Kashmir University undertaken for the study were examined using both questionnaires as well as monitored twice a day (before and after work) for their blood pressures to check the diurnal variations. This study was a case- control study. The analysis of the data was done using t-test, χ^2-test, p-value, and odd ratios respectively.

Results
The prevalence was 31% and more in males. A strong relationship was found between workload and diurnal variations in blood pressure (p-value <0.01). Physical inactivity, skipping of meals, type of the salt was found to have a direct relationship in the development of hypertension (p-value < 0.05). However other parameters like high socio economic status, stress, waistline obesity, high body mass index (BMI), sleeping patterns, work hours, smoking, and intake of fat, salt and dietary patterns were important risk factors which could be the contributors in the development of hypertension.

Conclusion
It was thus concluded that a healthy lifestyle helps in preventing hypertension. And lifestyle modifications like physical activity, reduction of weight, reducing dietary sodium, stress free life and a good diet can surely help in maintain controlled blood pressure

Keywords: hypertension, diet, lifestyle, stress, lifestyle diseases, obesity.

1. Introduction

Hypertension is a major risk factor for the development of cardiovascular disease, and as many as 58 million people in United States have elevated blood pressure or are taking antihypertensive medications (JNC, 1985).

In both normotensive and hypertensive individuals cardiovascular diseases risk is related to the height of both the systolic and diastolic blood pressure (Castelli, 1984). An understanding of the relationship between diet and blood pressure has important implications for the prevention and treatment of hypertension. With appropriate dietary modification, it may be possible to treat hypertensive patients with fewer drugs and with lower doses. In a significant percentage of hypertensives, particularly patients with mild hypertension, dietary modifications may totally obviate the need for drug therapy (Shills, *et al.* 1994) [16].

Several lifestyle modifications can lower, prevent and control hypertension. Weight control, physical activity, and a low fat diet rich in fruits and vegetables, with non-fat dairy foods and nuts incorporated have been shown to lower blood pressure (Krause, 2010).

With urbanisation and increasing prosperity, prevalence of hypertension is on rise, and age is

Correspondence
Sania Shakeel
Assistant Professor, Department of
Home Science, Government College
for Women, M. A. Road, Srinagar,
J&K

an important risk factor for it. Hypertension thus becomes an increasingly important clinical problem. Thus the scope of the study is clear to its importance in the identifying the hypertensive in middle aged teachers of Kashmir University, and assessment of their lifestyle, as healthy lifestyle is the cornerstone of treatment for hypertension.

2. Objectives of the Study
1. To study the prevalence of high blood pressure among the teachers of Kashmir University (age group 35+).
2. To compare the lifestyle of cases and controls, so as to prove the hypothesis that healthy lifestyle is an important factor for the prevention of lifestyle diseases like hypertension.

The procedure adopted is as follows:

2.1 Ground Work
The ground work for the present study was done for a couple of weeks before the start of collection of data and structuring of questionnaire cum interview schedule. Various published papers from journals &websites, recommendations and stress scales were obtained so to frame an authentic and a standard questionnaire.

2.2 Data Source
In the present study, the data was collected from two sources:
1. Primary
2. Secondary

2.3 Primary source
The primary data was collected from the sample selected, using a structured questionnaire cum interview schedule. A sphygmomanometer was used to monitor the blood pressure of the respondents who were already diagnosed of having hypertension, so as to check the diurnal variation from morning (before work) to evening (after work).

2.4 Secondary source
Collection of data through secondary source, included information obtained from books, unpublished dissertations and journals from Iqbal library, local newspapers, and different websites on internet, etc. The secondary data helped in structuring the questionnaire well.

2.5 Selection of Sample
The information regarding the Faculty details was collected prior to the study, from DIQA (Directorate of Internal Quality Assurance, University of Kashmir). The total number of teachers working in University of Kashmir was 291. Out of this the teachers who were below 35 yrs of age were excluded from the study. The total number of the study population (faculty above age of 35 yrs) in Kashmir University was found out to be 263. Out of this, 106 teachers (40%) were randomly and purposively selected for the present study from different departments of the University. This population was proportionally divided into a ratio of 26:14:13, which was doubled so as to get the approximate 40% of the total population (52:28:26).

2.6 Tools Used
During the study, a questionnaire cum interview schedule was used to collect information from the respondents. The questions were based on many scales, classifications and recommendations from various sources like psychological scale by Cohen, *et al.* (1983) [5], physical activity classified as

per WHO global recommendations (18-64 yrs), (2001), sleeping disorders and patterns by Williams, *et al.* (1974) [19], normal work classification by Harrington, (2001) [10], smokers classifications as per a study done by Becher, (2000) [1] and alcohol intakes as per guidelines by Hand, (2012) [9]. The food frequency list was prepared thoroughly by the standard methodology (Bharati, et al (2008) [2]. The questionnaire was framed in simple and easy to understand form.

Anthropometry like weight, height, BMI, WHR was measured. Various parameters of lifestyle were assessed like stress, sleep and work hours, smoking and alcohol intake, and physical activity. The dietary pattern of the subjects was also assessed using food frequency list along with their attitude towards health.

3. Data analysis
The data so obtained was first organized in a master chart, then tabulated and presented with the help of tables and figures. The analysis of the data was done using t-test, χ^2-test, p-value, and odd ratios respectively. Manual interpretations as well as the software were used {SPSS (version 16.0)} for the analysis of data.

4. Results and Discussion
As the study was a case control, both hypertensive and normotensive were included. The following results were obtained.

5. Prevalence
Out of the total population selected, 31% were having hypertension. The majority among the hypertensive were males (64%) from urban areas (97%) living in nuclear families (67%).

Table 1: Distribution of respondents as per the prevalence.

Total	No of hypertensive	No of normotensive
106	33	73
Prevalence	31.13%	68.86%

Socio economical status:-

The most common indicators of socio-economic status used in epidemiological surveys are education, occupation and income (Kalpan, *et al.* 1993) [11]. Out of the hypertensive respondents majority (85%) was having doctorates, followed by 12% that were post graduates and the rest 3% were master in philosophy.

Majority of the hypertensives were assistant professors (39.3%) followed by associate professors (33.3%) and the rest 27.2% were designated as professors. Majority of the hypertensives were having an monthly family income between 1-2 lakhs (48.4%) and followed by 27.2% having income between 40,000- 1 lakh, while the rest 24.2% having more than 2 lakhs. Statistically, there was an insignificant association (p-value>0.05) between different parameters of socioeconomic status and hypertension.

Table 2: Distribution of the respondents as per the education

Educational qualification	Hypertensives (%)	Normotensives (%)	χ^2	p-value
Post graduate	4 (12.1)	7 (9.5)		
Masters in philosophy	1 (3.03)	2 (9.5)	0.168	>0.05
Doctorate(PhD)	28 (84.8)	64 (87.6)		
Total	33	73		

Table 3: Distribution of the respondents as per the designation

Designation	Hypertensives (%)	Normotensives (%)	$\chi^2=$	P value
Professors	9(27.2%)	17(23.2%)		
Associate professors	11(33.3%)	17(23.2%)	0.126	>0.05
Assistant professors	13(39.3%)	39(53.4%)		
Total	33	73		

Table 4: Distribution of the respondents as per their income (Rs).

Income (Rs)	Hypertensives (%)	Normotensives (%)	$\chi^2=$	p-value
40,000-1 lakh	9 (27.27)	30(41.09)		
1-2 lakh	16(48.48)	30(41.09)	1.941	>0.05
2 lakhs- more	8(24.24)	13(17.8)		
Total	33	73		

6. History of disease

24% of the respondents had the onset of hypertension in the age group of 40-45 yrs and 50-54 yrs out of whom 45% of the hypertensive had a family history, 54% were suffering from other diseases other than hypertension among which diabetes and obesity was the most common. Headache (44%) and fatigue (36%) was the most common presenting symptom. Eighty five percent of hypertensive was on medication as well as dietary modification and the system of medication was allopath (80%).

8. Anthropometry

According to BMI classification among the hypertensives, the majority (61%) was classified as overweight, followed by 36% as normal, and the small group was having grade I obesity (3%), however none were having grade II obesity.

Table 5: Distribution of the respondents as per the BMI classification.

BMI(class)	Hypertensives (%)	Normotensives (%)
Underweight	0(0)	1(1.36)
Normal	12(36.36)	29(39.72)
Overweight	20(60.6)	43(58.90)
Obese I	1(3.03)	0(0)
Obese II	0(0)	0(0)
Total	33	73

According to WHR classification among the hypertensives, the majority (55%) was "not at risk" and the rest (45%) were "at risk". Among the normotensives, the majority (71%) was "not at risk" while the rest (29%) were "at risk". Statistically (p value>0.05) there was an insignificant association between WHR and hypertension.

The odd ratio calculated from the given data is 2.06.

Table 6: Distribution of the respondents as per WHR

WHR(classification)	Hypertensives (%)	Normotensives (%)	χ^2	p-value
At risk	15(48.3	21(28.76)		
Not at risk	18(54.5)	52 (72.6)	2.822	>0.05
Total	33	73		

7. Lifestyle assessment
Mental stress and work

Table 7a: Distribution of the respondents as per the physical activity (30 minutes of moderate intensity exercise done in a day/ week).

Days	Hypertensives (%)	Normotensives (%)	$\chi^2=$	P value
<1 day/week	3(9.09)	9(12.32)		
1 day/week	2(6.06)	3(4.10)		
2 days/week	11(33.3)	3(4.10)		
3 days/week	3(9.09)	10(13.69)	17.751	<0.01
4 days/week	4(12.12)	11(15.06)		
5 days or more	10(30.30)	37(50.68)		
Total	33	73		

Table 7b: Distribution of respondents as per the physical activity (aerobics done for about 10 minutes day/ week).

Days	Hypertensives (%)	Normotensives (%)	$\chi^2=$	P value
<1 day/week	25(75.7)	37(50.68)	12.503	<0.05
1 day/week	0(0)	8(10.95)		
2 days/week	4(12.12)	9(12.32)		
3 days/week	3(9.09)	3(4.10)		
4 days/week	1(3.03)	6(8.21)		
5 days or more	0(0)	10(13.69)		
Total	33	73		

Some parameters of good lifestyle are moderate intensity exercise at least three to four days a week, 6-7 hours of sleep per night, 6-7 hours of work per day, and three meals a day at regular timing without missing meals, minimum use of alcohol, avoiding smoking and maintaining ideal weight.

Among the hypertensive, the majority (70%) were physically inactive (classified as per WHO global recommendations), (table 3) and the rest 30% were physically active. Statistically (p- value <0.05) there is a significant association between the physical inactivity and hypertension. (Odd ratio 2.36). The main observed reason behind being physically inactive was lack of time, as managing home as well as workplace was a double effort job.

Table 7c: Distribution of the respondents as per the physical activity (yoga/ stretches done for 5 minutes per day/ week).

Days/week	Hypertensive (%)	Normotensive (%)	$\chi^2=$	p-value
<1 day/week	30(90.9)	52(71.23)	4.154	>0.05
1 day/week	0(0)	1(1.36)		
2 days/week	2(6.06)	1(1.36)		
3 days/week	0(0)	5(6.84)		
4 days/week	0(0)	6(8.21)		
5 days or more	1(3.03)	8(10.95)		
Total	33	73		

Among hypertensives, the majority (61%) used to sleep for normal sleep hours, and the rest (39%) had a disturbed sleeping pattern according to the classification given by William, *et al.* (1974). The odd ratio calculated is 1.1.

Among the hypertensives majority (54%) used to work for 7 hours/day and the rest either for more hours or for less than 7 hours/day. Majority of the respondents (86%) worked for extra hours occasionally (66%) other the official work hours. Statistically there was an insignificant association between the hypertension and work hours.

Table 8: Distribution of the respondents as per the work hours. (job strain)

Hours(hrs)	Hypertensives (%)	Normotensives (%)	$\chi^2=$	P value
6 hrs	4(12.12)	17(23.28)	3.327	>0.05
7 hrs	18(54.54)	27(36.98)		
8 hrs or more	11(33.3)	29(39.72)		
Total	33	73		

About 88% of the hypertensives used to work at desk, so their lifestyle was considered sedentary.

Among the hypertensives, majority (84.8%) of the respondents were suffering from stress while the rest 15.2% were not stressed. Statistically there is an insignificant association (p-value>0.05) between stress and hypertension, but the odd ratio calculated is 1.9.

Table 9: Distribution of the respondents as per the stress levels.

Stress level	Hypertensives (%)	Normotensives (%)	$\chi^2=$	P - value
No stress	5(15.1)	19(26.0)	11.291	>0.05
Mild stress	1(3.03)	18(1.36)		
Moderate stress	7(21.2)	8(10.95)		
Severe stress	20(60.06)	28(38.35)		
Total	33	73		

9. Smoking and alcohol

Among the hypertensives 18% were smokers, while the majority was not. The odd ratio calculated was 1.1. Among the respondents none was alcoholic.

10. Dietary assessment

About 60% of the hypertensive used to skip meals, mainly lunches (75%), and there was a significant association (p-value <0.05) found between hypertension and skipping of meals. The odd ratio calculated was 1.8 (Table 5)

Table 10: Distribution of the respondents as per the skipping of meals.

Response	Hypertensive (%)	Normotensive (%)	$\chi^2=$	P value
Yes	20(60.60)	33(45.2)	2.156	<0.05
No	13(39.4)	40(54.7)		
Total	33	73		

The diet consumed was non vegetarian (91%). Majority of the hypertensive (38.5%) consumed snacks between the meals occasionally. Tea was the most consumable beverage (63%), mostly tea with sugar and milk (27%), and about 2-3cups/day (57.5%) were consumed, but there was an insignificant association found between the two.

About 45.4% of hypertensive consumed milk (60% skimmed milk), and there was an insignificant association between the hypertension and the consumption of milk.

About 88% of hypertensives consumed fats and oils (80% refined oil), but there was an insignificant association between the two.

Among the hypertensives, the majority consumed eggs(44%), and chicken (33%) daily, chicken (46%)and meat (31%) alternately, meat (29%) and cheese (25%) weekly, fish(44%) and pulses(36%) monthly, fish (31%) and beef(19%) yearly.

Among the hypertensives, the majority consumed onion (28%) and kale (20%) daily, spinach (8%), knoll khol (7%) and tomato (6%) weekly, turnip (11%), ladies finger (11%), and bitter gourd (10%) monthly, and tinda (19%) yearly.

Among hypertensives, the majority consumed orange (31%) and apple (13%) daily, grapes (11%), apple (11%) and mango (10%) weekly, dates (12%) and raisins (10%) monthly, musk melon (9%) and water melon (9%) yearly.

Among the hypertensives, the majority (39%) consumed rice (23%) and wheat refined daily, and 22% consumed refined wheat, (22%) whole wheat and (16%) cornflakes weekly, 29% consumed semolina and (20%) wheat (brown bread) monthly, and 47% consumed pasta/noodles/macaroni and (27%) maize yearly.

Among the hypertensive 97% used to take salt, and there was an insignificant association found between salt consumption and hypertension. However the odd ratio calculated was 0.4.

The majority of the hypertensives (70%) used to take common table salt while the rest 30% used to take low sodium salt. A significant association was found between the type of the salt and hypertension. The odd ratio calculated is 0.36.

Table 11: Distribution of the respondents as per cooking with salt.

Response	Hypertensives	Normotensives	$\chi^2=$	p-value
Yes	29(87.8)	63(86.3)	0.049	>0.05
No	4(12.1)	10(13.6)		
Total	33	73		

Majority (81%) of hypertensives used to take sugar.
Majority (46%) of the hypertensives used to drink 3-4 glasses of water/day.

11. Knowledge and Attitute

100% of the hypertensives said that good health is a priority and among the hypertensives, the majority (33%) considered the stress free life as important for good health, followed by 32% who said its physical activity, and 30% said that its good diet and the rest 5% said that medication is important.

Among the hypertensive the majority (67%) said that they were taking care of their health, followed by 21% did not take care of their health, and the rest 12% partially took care of their health.

About 98% of the respondents said the investigation was worth considering.

12. Summary and conclusion

From the above findings and analysis it was observed that among 31% of the hypertensive, the majority were males from urban areas living in nuclear families, having high educational qualifications (Phd) and belonged to high income group.

Majority had the onset of the hypertension in middle age and was not having any family history of high blood pressure. In addition they were having other diseases/ disorders as well.

A sedentary lifestyle was a common factor associated with hypertension. Besides being overweight, having central obesity, smoking habits, extra work and severe stress were also observed to be the related risk factors. Mostly lunch was skipped and the same was replaced by high consumption of tea. The dietary patterns varied and the consumption of variety of foods was observed. Among the hypertensive a busy schedule and lack of time along with high job status and high responsibilities was the main reason because of which they were unable to follow a healthy lifestyle.

However majority managed to work towards good health.

It was concluded that there is a significant relationship between different parameters (like workload, physical inactivity, skipping of meals, type of salt) of lifestyle and hypertension. However, high socio economic status, stress,

disturbed sleep patterns, intake of fat, salt, and high waist hip ratio may be the other contributors (risk factors) in the development of hypertension.

Based on the above results, it can be concluded that a sedentary lifestyle, low physical activity, skipping of meals are the chief causes of hypertension among the teachers of University of Kashmir.

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14. Conflict of interest

The authors declare that there is no conflict of interest and that the funding of the study was done personally by the first author herself, for the partial fulfilment of requirement for degree of Masters in Home science.

15. Ethical approval

This study was undertaken for the partial fulfilment of requirement for degree of Masters of Home Science. The confidentiality of the subjects was maintained, and the information gathered was used for academic purpose only.

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