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A descriptive study to assess knowledge related to hypertension and its impact upon exercises and sleep pattern among adults from communities of Uttarakhand

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Abstract:

INTRODUCTION: Hypertension nowadays is a major community health problem. It is high prevalence, which becomes an important area of research which is also a major possibility for circulatory diseases and other complications. It is a silent killer, which does not show any warning sign until a severe medicinal crisis occurs. The study aims to assess the knowledge regarding hypertension and its effect on the amount of exercise and sleep among adults at risk of hypertension from both rural and urban communities of Uttarakhand.

METHODS AND MATERIALS: A descriptive cross-sectional research design with the total sample size was calculated as 542 adults at risk of hypertension. A purposive sampling method was used for sample selection in this study. A semi-structured questionnaire regarding knowledge related to hypertension and amount of exercise and sleep patterns was administered as tools for data collection. Analysis was done by using SPSS 23.0 version software, descriptive statistics with the use of frequency %, inferential statistics with Chi-square test, and P value ≤ 0.05 considered as significant.

RESULTS: Majority (58%) of them were male, living with a nuclear family with very poor educational status. It showed that whenever they have free time, only then they were performing simple work without having any experience with regular exercise and yoga. Less than half of them (45%) were having good knowledge about increased blood pressure is a disease, medical management, and how to prevent it. Knowledge regarding hypertension showed significant association with less amount of exercise (use of a motored vehicle to going to job/work) (p value = 0.0001*) and satisfactory pattern of sleep among adults at risk of hypertension (p value = 0.001*).

CONCLUSION: In this study, a lack of education and very poor knowledge regarding the management of hypertension found to be associated with less amount of exercise but satisfactory sleep among adults at risk of hypertension.

Keywords:

Aerobics, exercises, hypertension, knowledge, sleep

Introduction

According to the recent data, 2021, the progressive disorders that start in childhood and primarily appear in adults include hypertension out of cardiovascular diseases.^[1] Worldwide, hypertension

is the important hazardous factor for illness and death, causing an estimated 9.4 million deaths.^[2] Modifiable risk factors such as lifestyle factors, including physical inactivity, are important for the development of hypertension. Physical activity along with standard

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anti-hypertensive therapy demonstrated high benefits in reducing cardiovascular disease.^[3,4] World Health Organization and American and Europe guidelines for antihypertensive therapy include physical activity and other lifestyle modifications as an important components.^[5] However, the effect of physical activity on hypertension along with heart has been well described. However, the basic mechanism regarding the protective effect of physical activity on the hypertensive heart condition was not well known. Previous reviews show the utmost current evidence for the effect of physical activity on cardiac structure, its function, and hypertension.^[6] Sleep is a well-known biologic process that is vital for lifecycle and ideal health. However, sleep plays a crucial role in brain function and complete body physiology. It includes cellular metabolism, cardiovascular systems, regulation of appetite, and immune and hormonal functions.^[7] Standard healthy sleep is described by adequate time period with good quality, its regularity, and the absence of sleep disturbances.^[8] Even with the significance of sleep, up to 70 million people in the USA and 45 million people in Europe were having a continued sleep disorder that influences everyday working and health. Hence, present study aims to assess knowledge regarding hypertension and its effect on amount of exercises and sleep among adults at risk of hypertension from both rural and urban communities of Uttarakhand. The novelty in the study as it includes the rule of half for assessing hypertension, knowledge, and impact of exercise and sleep pattern upon it was kept in mind while planning the study at rural and urban communities of Uttarakhand. There was no such reported data found in existing literature for Uttarakhand. This study results will provide epidemiological data to the community health dwellers to provide best possible healthcare services and counseling regarding prevention, early diagnosis, and treatment of hypertension to the adults at risk of hypertension from these community areas. The study objectives were 1) to evaluate amount of exercises and sleep taken by adults at risk of hypertensive from both rural and urban communities of Uttarakhand, 2) to assess the knowledge regarding hypertensive adults at risk of hypertension from both rural and urban communities of Uttarakhand, and 3) to determine an association between knowledge regarding hypertension and its effect on amount of exercises, sleep among adults at risk of hypertension from both rural and urban communities of Uttarakhand.

Materials and Methods

Study design

A descriptive cross-sectional research design used in this study.

Study setting

The study setting was rural and urban community at Uttarakhand state.

Study participants

The study samples were human adults (above 18 years of age) who were at risk of hypertension selected from rural and urban communities, Uttarakhand.

Sample size and sampling technique

The study sample size was calculated as 542 by using the Winpepi® program to estimate a mean confidence level = 95%, with an acceptable difference = 5. A purposive sampling technique was used for selecting sample for this study.

Data collection tools

A semi-structured questionnaire regarding knowledge of hypertension and amount of exercise and sleep pattern was used as a tool for data collection. **Tool consists of three parts: Part 1** for sociodemographic data, **Part 2** for assess amount of sleep and exercise/aerobics and **Part 3** to assess the knowledge regarding hypertension.

Ethical consideration

This study is ethically approved from Institutional Ethical Committee of the AIIMS, Rishikesh, IEC no-/IEC/IM/RC69/2015/07 (letter provided in the August 2016). Confidentiality and anonymity of the subjects were ensured regarding participant's details such as names, their initials, or hospital numbers. All ethical standards of IEC, AIIMS, Rishikesh, Declaration of Helsinki, ICMR, and good clinical practices were followed in the study.

Data collection technique

Patients were selected by using purposive sampling technique. Informed consent was taken from each subject to enrolled in the study. A semi-structured questionnaire having two sections in it used for data collection for one year from 2016. First section consists of socio-demographic variables of the participants, whereas outcomes reported in second section consist of questions related to amount of sleep and exercises activities and knowledge regarding hypertension. The study participant's age was recorded in form of mean \pm SD, while categorical variables denoted by frequency distribution and association between knowledge regarding hypertension and amount of exercise and sleep activities were analyzed by Chi-square test. For all variables, P values ≤ 0.05 are considered as significant.

Results

For all 542 participants, the response rate was 100%. The data was entered in the MS-EXCEL sheet 13.0 version and analyzed by using SPSS 23.0 version software. The

mean age of the whole group was 51.46 ± 1.44 years. The results were divided into two sections including baseline distribution of socio-demographic characteristics and outcome variables. Then association between both the tools was analyzed by using Chi-square test (χ^2).

Section-I

In Table 1, socio demographic variables of the study showed 542 were total included participants in the study which consists of 58% of them were male. Majority (56%) participants live in nuclear family followed by 37% with joint family and 7% with extend family, and 22% of them were illiterate and 15% having education up to postgraduate and high school followed by 14% completed intermediate, 13% up to graduation, and 11% were studied up to 8th standard. As per employment status of participant’s majority, 32% were house-maker and 27% were employed in formal sector followed by 12% were doing their own employment. However, 12% workers were retired followed by 8% labor, 8% unemployed, and only 1% was only students.

Section-II Outcomes

In Table 2, a questionnaire on level of physical activities while going to job or work showed majority (62%) of the participants were using motored vehicle, whereas only 8% used bicycle during walk. Majority (62%) of them were doing simple work activities while working and only 5% people doing the hard work. During free time, majority (77%) of them were doing light work as physical activities. Eighteen percent of them were doing five days

in a week regular exercise, whereas 61% do not perform exercise, and 13% of people five days in week doing the regular Yoga, whereas 72% do not perform Yoga. Out of 542 participants, 19% were having a very good sleep and 37% only satisfied with the sleep, whereas 8% had bad sleep pattern.

Out of 542 participants, 55% of them do not know why blood pressure is an increased disease [Table 3]. Majority (56%) of them do not know what will happen to BP rising uncontrollably. Most (68%) of them do not know how many years did BP medicine have to be taken. Maximum (57%) do not know what habits can prevent the increase in blood pressure. Majority (65%) of them know the amount of salt in the food related to blood pressure.

Table 4 shows the significant association between all the variables of knowledge regarding hypertension and its effect on amount of exercise and sleep activities variables with *P* value < 0.01. However, knowledge regarding what habits can prevent the increase in BP not found to be significant with do they perform regular exercises, *P* value 0.143. Similarly, knowledge regarding amount of salt in the food related to blood pressure also not found to be significant with level of their activities while working, *P* value 0.066.

Table 5 shows an independent determinant of an extent for practicing exercise by adults at risk of hypertension. Determinants show a significant relationship with exercise’s extent included gender (*p* = 0.0001*, CI: 0.104; 0.230) and educational status (*p*-0.006*, CI: 0.550; -0.090) as an independent predictor to the extent of practicing exercise/aerobics among adults at risk of hypertension.

Table 1: Baseline distribution of the socio-demographic characteristics among adults at risk of hypertension (n=542)

Variable	Category	Frequency (f)	Percentage
Age (in years)	Mean±SD	51.46±1.44	
Gender	Male	317	58
	Female	225	42
Types of family	Nuclear	302	56
	Joint	200	37
	Extend	40	7
Education	Postgraduate	85	15
	Graduate	73	13
	Intermediate	76	14
	High school	79	15
	Junior high school	60	11
	Primary	49	10
Employment	Illiterate	120	22
	Job	147	27
	Unemployed	43	8
	Student	9	1
	Retired	65	12
	Housewife	174	32
	Self-employed	65	12
Labor	39	8	

Discussion

In the present study, it was observed that majority of participants were male, living with the nuclear family with educational status as very poor which belongs to rural area. Majority of them depend upon only house-related work. These study findings are in line with the study conducted by Shikha Singh and Ravi Shankar *et al.*^[9] entitled as “prevalence and associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi.” It showed that majority were male, living with nuclear family among adults at risk of hypertension.

In this study during the assessment of sleep and exercise, majority of them were using motored vehicles while going to job or work. Most of them were doing simple work, and when they are free, only that time they are doing the simple work. Majority of them have no regular exercise and Yoga but satisfied with the sleep. These studies were supported by the study conducted by Dutta A entitled

Table 2: Frequency distribution of amount of exercise and sleep activities n=542

Variable	Category	f	%
What is the level of physical activities while going to Job/work?	Motored vehicle or no work	334	62
	>1 min walking or bicycle walk	81	15
	1-29 min walking or bicycle walk	80	15
	>3 min walk or bicycle walk	47	8
What is the level of your activities while working?	Simple work	335	62
	More than simple work.	176	34
	Hard work.	31	5
Free time What is the level of your physical activities?	Lightly/Simple work	419	77
	More than simple work	95	18
	Hard work	28	5
Do you do regular exercises/aerobics?	Yes, 5 days in week or more.	97	18
	3-4 days in a week.	74	14
	2 days in a week or less days	39	7
	No exercise/aerobics	332	61
Do you do regular Yoga?	Yes, 5 days in week or more	72	13
	3-4 days in a week	50	11
	2 days in a week or less days	27	5
	No Yoga	393	72
How do you sleep?	Very good	102	19
	Good	195	36
	Satisfy	199	37
	Bad	46	8

Table 3: Frequency distribution of knowledge related to blood pressure (n=542)

Knowledge related to blood pressure			
Variable	Category	f	%
You know why blood pressure is an increased disease.	Yes	242	45
	No	300	55
Do you know What will happen to BP rising uncontrollably?	Yes	238	44
	No	304	56
How many years did BP medicine have to be taken?	Yes	172	32
	No	370	68
What habits can prevent the increase in BP?	Yes	232	43
	No	310	57
Is the amount of salt in the food related to blood pressure?	Yes	354	65
	No	188	35

as “Prevalence of hypertension and pre-hypertension in rural women: A report from the villages of West Bengal, a state in the eastern part of India ” which suggests maximum participants were doing simple work and do not know about non-pharmacological management for hypertension like regular exercise, Yoga, etc., and similar findings from Cornelissen V *et al.*^[10,11] These findings were supported by study done by Kalyani CV *et al.*^[12] entitled as, “Undiagnosed elevated blood pressure and its lifestyle related risk factors among adults: cross sectional survey” which revealed that 87% of the participants not doing any exercise showing sedentary lifestyle leads to hypertension like disorders.

In this study, less than half of the (45%) participants were having good knowledge about increased blood pressure is disease and how they can prevent when increasing the

blood pressure. These study findings were supported by the study conducted by Raghupathy Anchala and Nanda K Kannuri *et al.*^[13] Entitled as “hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension” showed that majority of them were having good knowledge about how can they prevent from blood pressure becoming a disease and similar findings from Boutcher Y and Boutcher.^[14] Similarly, a study conducted by Venkatesh U, entitled as “Knowledge, attitude and practice in relation to stroke: Comparative study between hypertensive and non-hypertensive patients attending a tertiary care centre in Gorakhpur, Uttar Pradesh, India” suggests only 6% of them aware of increased blood pressure as warning sign and similar findings from Börjesson M *et al.*; Nascimento L *et al.* which is similar to this study findings, and 54% of the participants agreed that doing exercise can control hypertension which is consistent with the present study findings.^[15-17] In consistent to the present study findings, a study done by Estrada D *et al.*^[18] entitled as, “grade of knowledge of hypertension in hypertensive patients” suggested that 48% of the participants had lack of knowledge of the risk of hypertension that was the problem caused by hypertension in the kidney. Another study done by Susan A Oliveria *et al.*,^[19] Ralapanawa U *et al.*,^[20] Grad I *et al.*,^[21] Sadeq R and Lafta.^[22] in support with this study findings showed that less than of them had knowledge that they had high blood pressure.

In this study, the association between knowledge regarding hypertension and amount of exercises, sleep

Table 4: Association between knowledge regarding to hypertension and amount of exercises, sleep activities among adults at risk of hypertension (n=542)

Variables	What is the level of physical activities while going to Job/work? χ^2	What is the level of your activities while working? χ^2	Free time What's the level of your physical activities? χ^2	Do you do regular exercises/aerobics? χ^2	Do you do regular Yoga? χ^2	How do you sleep? χ^2
You know why blood pressure is an increased disease?	24.469 (<i>P</i> <0.001)*	8.226 (<i>P</i> -0.016)*	14.598 (<i>P</i> -0.001)*	8.500 (<i>P</i> -0.037)*	11.202 (<i>P</i> -0.01)*	18.922 (<i>P</i> <0.001)*
Do you know What will happen to BP rising uncontrollably?	31.275 (<i>P</i> <0.001)*	14.392 (<i>P</i> <0.001)*	21.525 (<i>P</i> <0.001)*	11.829 (<i>P</i> -0.008)*	10.321 (<i>P</i> -0.01)*	11.747 (<i>P</i> -0.008)*
How many years did BP medicine have to be taken?	21.563 (<i>P</i> <0.001)*	20.760 (<i>P</i> <0.001)*	23.274 (<i>P</i> <0.001)*	13.195 (<i>P</i> -0.004)*	10.078 (<i>P</i> -0.01)*	17.702 (<i>P</i> <0.001)*
What habits can prevent the increase in BP?	6.897 (<i>P</i> <0.001)*	14.263 (<i>P</i> -0.001)*	16.254 (<i>P</i> <0.001)*	5.43 (<i>P</i> -0.143)	8.536 (<i>P</i> -0.03)*	11.543 (<i>P</i> -0.009)*
Is the amount of salt in the food related to blood pressure?	19.070 (<i>P</i> <0.001)*	5.433 (<i>P</i> -0.066)	11.213 (<i>P</i> -0.004)*	8.036 (<i>P</i> -0.045)*	7.979 (<i>P</i> -0.046)*	8.362 (<i>P</i> -0.039)*

Chi-square test, **P* value considered as significant ≤ 0.05 .

Table 5: Binary logistic regression model showing independent predictor for extent of exercise/aerobics among adults at risk of hypertension (n=542)

Outcome variable	Variables	Categories	β (Beta)	95% Lower CI	95% Upper CI	<i>P</i>
Extent of exercise	Gender	Male	0.224	0.104	0.230	0.0001*
		Female				
	Education	Postgraduate	-0.117	-0.550	-0.090	0.006*
		Graduate				
		Intermediate				
		High school				
		Junior high school				
Primary						
Illiterate						

P<0.05 considered as significant, unadjusted *R*²=0.053

was significant among adults at risk of hypertension from both rural and urban communities of Uttarakhand. However, knowledge regarding what habits can prevent the increase in blood pressure variable does not found significantly associated with regular exercises which is supported the study conducted by Eslavath Rajkumar and John Romate.^[23] Entitled as “Behavioral Risk Factors, Hypertension Knowledge, and Hypertension in Rural India” reported that the knowledge regarding hypertension was significantly associated with amount of exercises, sleep among adults at risk of hypertension and similar findings reported from Sabbahi A *et al.*,^[24] Cornelissen V and Smart^[25] and Mohebbi B *et al.*^[26]

Strength of the study is the high sample size which was appropriately calculated as to generalize the findings of the study. Logistic regression analysis has been performed to assess predictors of extent of exercises/aerobics performed.

Limitation and recommendation

These can be study design could have been experimental design and control group can be adopted for better comparison of the results. The present study is limited to community levels of the healthcare facilities; otherwise

hospital-based research can show different aspects of these variables.

This study recommends future awareness programs regarding knowledge of blood pressure and its emphasis on exercise and sleep activities for adopting in a healthy lifestyle to prevent hypertension-related future risks.

Conclusion

Our study concluded that the majority of the population were having no knowledge regarding blood pressure management due to lack of education which was strongly associated with amount of exercises, sleep among adults at risk of hypertension from both rural and urban communities of Uttarakhand. This study recommends future awareness programs regarding knowledge of blood pressure and its emphasis on exercise and sleep activities for adopting in a healthy lifestyle to prevent hypertension-related future risks.

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Authors declaration for this article

All authors have declared that this work originally belongs to AIIMS, Rishikesh.

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Conflicts of interest

There are no conflicts of interest.

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