



## EPIDEMIOLOGICAL STUDY OF NON-COMMUNICABLE DISEASES (NCD) RISK FACTORS IN A NCD CLINIC AT A TERTIARY CARE HOSPITAL IN DISTRICT SRINAGAR (J&K): A CROSS-SECTIONAL STUDY

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### ABSTRACT

**Background:** There is paucity of data available on the prevalence of non-communicable diseases (NCD) risk factors among population visiting the NCD clinic situated in SKIMS Srinagar. The epidemiological study of NCD risk factors was done to estimate the burden of NCD risk factors and their risk determinants. **Methods:** The opportunistic screening of the patients as well as attendants above the age of 30 years was done which included anthropometry family history of non-communicable diseases, other risk factors including smoking and physical activity. A total of 836 persons both male and female were screened. **Results:** The total number of the participants was 836, 293(35%)- males, 543(65%)- females. In the age group 30-44 years there were 338 (40.4%) subjects, 375(44.9%) in the age group of 45-59 years, 107(12.8%) in 60-74 years age group. Only 16 (1.9%) were in the age of  $\geq 75$  years. The hypertension was prevalent in 301% (36%) and diabetes in % (%) of the population. Overweight(319)(38.2%), Obese class1(176)(21.1%), Obese class2 (18)(2.2%), Obese class3 (1)(0.1%) were observed in the patients attending the clinic. Smoking was reported in 230(27.5%) among which 129(15.4%) were ex-smokers, 120(14.4%) were passive smokers and 357(42.7%) were non-smokers. Among the participants 172 (20.6%) had moderate physical activity moderate and 656(78.5%) were physically inactive, only 8 subjects (1%) had vigorous physical activity, 281 (33.6%) gave the history of indoor pollution whereas 555(66.4%) did not. Physical inactivity, BMI, and age were independently associated with risk of hypertension, while age was the only determinant of risk of diabetes.

**KEYWORDS :** Obesity, Hypertension, Bmi, Blood Pressure, Skims, Srinagar

### 1. Introduction

The burden of cardiovascular diseases (CVD) is assuming an alarming proportion in developing countries and is turning out to be a leading cause of mortality in India. The CVD contribute about 23% and 30% of the total mortality in rural and urban population, respectively, in India. The rising trends of morbidity and mortality owing to CVD are primarily because of increasing burden of CV risk factors. The rapid urbanization, industrialization, and globalization are the prime drivers of socioeconomic transition that in turn influences the health risk behavior leading to increasing burden of obesity, hypertension, diabetes and dyslipidemia that are well established risk factors for CVD and events. These CV risk factors are measurable and are modifiable, and thus become the important targets for cost effective intervention for prevention and control of CVD risk. The epidemiological studies conducted by a number of investigators at different time period in different parts of the country have demonstrated rising trends of hypertension, diabetes, and obesity. In order to capture the true trends in CV risk factors strong sustainable NCD risk surveillance system is required using validated tools and following correct methods. The surveillance is an important public health tool for estimating the burden, prioritization for formulating health policies and program, and impact evaluation. The surveillance of NCD risk factors predicts the future risk of NCD in the population. However, establishing sustainable surveillance system is resource intensive, thus posing a challenge to its feasibility in low income countries. The NCD clinic is situated in the tertiary care hospital named as SHER I KASHMIR INSTITUTE OF MEDICAL SCIENCES (SKIMS) and receives patients from across the state of Kashmir. The clinic receives patients from other OPDs of ophthalmology, gynecology and obstetrics and dental section of the department of Community medicine Skims. There are no data available about the prevalent health risk behavior and biological risk factors of CVD among the patients visiting this NCD clinic. This paper reports the prevalence of NCD risk factors visiting the NCD clinic for the screening.

### 2. Methods

**Study population and sample size:** The study population consisted of the patients visiting the NCD clinic from the month of February 2018 to the month of July 2018. The population consists of both rural and urban districts of Kashmir. Total of 836 patients were screened by doctors posted at the clinic. (one senior resident and one junior resident of the department of community medicine SKIMS). The random blood sugar was estimated by capillary blood sample on the visit of patient and the blood pressure estimated using mercury sphygmomanometer. The BP of  $>140/90$  in men and women of  $>30$  years of age was taken as hypertension and random blood sugar of  $>140$  mg/dl was further

evaluated for the confirmation of diabetes. Anthropometric data, recording of BP and blood sugar estimation were done in the NCD clinic. Three readings of BP were recorded with a gap of 2-5 min using appropriate size BP cuff with the subject sitting comfortably on the chair, uncrossed legs resting on the ground after five minutes of rest. The arm was supported on the table at the level of heart. An average of three readings was taken as the BP value. Hypertension was diagnosed, if the average BP was  $\geq 140$  mmHg SBP and or DBP  $\geq 90$  mmHg and patients with Diagnosed hypertension on Medication even if BP was  $\leq 140/90$  mmHg. Height was recorded in centimeters to nearest 0.5 cm without shoes and hat if any, standing erect with closed heels, buttock and occiput touching against the wall using wall mounted Stadiometer Silvii, subject looking straight ahead with aligning tragus of the ear and inferior margin of the orbit parallel to ground. Weight was recorded in light clothing without shoes subject standing erect after correcting for zero error keeping weighing machine on smooth flat hard surface. Weight was recorded in kg to nearest 0.5 kg. Blood sugar was estimated after 8-12 h of fasting with blood sample drawn with finger prick method using sterile lancet with glucometer and displayed reading was recorded. Overweight was diagnosed if BMI was  $\geq 25$  to 29.9 obesity grade 1, when BMI was more than 30-34.99 as grade 2, 35-39.99 as grade 3 and  $>40$  as grade 4. Patients of diabetes were labeled to have controlled blood glucose and BP if their fasting blood glucose was  $\leq 110$  mg/dl and BP of  $\leq 140/90$  mmHg. The NCD risk factor survey was started from 1st week of February, 2018 and continued till end of July, 201. The data entry was started simultaneously and was finished by the end of August. The data was entered in Excel spread sheet. This was followed by data cross checking for any out of the range values entered by using the data filter and any value found out of range was reconfirmed from the source document and appropriate correction was made. Once the data cross checking was complete, the data was locked for analysis.

### CONCLUSION:

The obesity is found to be the associated factor of diabetes and hypertension which conforms to most of the similar studies. Grade 1 and grade 2 obesity is more in males than females in contrast to most of other similar studies. The physical activity has protective effects against obesity and thus diabetes, hypertension. Family history of non-communicable diseases appears to be an association in this study. Smokers are prone to hypertension and diabetes and other NCDs as compared to non-smokers which are depicted by most of the earlier similar studies. Among the rural population indoor air pollution appears as a determinant of the NCD, s. These findings are consistent with the findings of many similar studies previously done. More females were found to be having sedentary lifestyle than males. This may be partly due to the cultural influences in the society.

**Table 1: NCD Risk factors in the Study Population**

	Frequency	Percent
<b>Age</b>		
30-44 years	338	40.4
45-59 years	375	44.9
60-74 years	107	12.8
≥ 75 years	16	1.9
<b>Gender</b>		
Male	293	35.0
Female	543	65.0
<b>BMI</b>		
Under weight	11	1.3
Normal	311	37.2
Overweight	319	38.2
Obesity I	176	21.1
Obesity II	18	2.2
Obesity III	1	.1
<b>Raised BP</b>		
Yes	301	36.0
No	535	64.0
<b>Family history of NCD</b>		
Yes	628	75.1
No	208	24.9
<b>Comorbidity</b>		
Yes	446	53.3
No	390	46.7
<b>Smoking history</b>		
Smoker	230	27.5
Ex-smoker	129	15.4
Non smoker	357	42.7
Passive smoker	120	14.4
<b>Physical activity</b>		
Sedentary	656	78.5
Moderate	172	20.6
Heavy	8	1.0
<b>Indoor air pollution</b>		
Yes	281	33.6
No	555	66.4

Among the total 836 subjects in the study population 543(65%) were females and 293(35%) were males . The study population was divided into four age groups.1: 30-44 years , 2: 45-59 years , 3: 60-74 years , 4:>75 years.338 (40.4%) belonged to group 1, 375 (44.9%) belonged to group 2 , 107 (12.8%) subjects to group 3 and 16 subjects i.e 1.9% were in the group 4.

According to BMI 11 subjects (1.3%) were underweight , 311 (37.2%) had normal BMI , 319(38.2%)were overweight , 176(21.1%) were class 1 obese , 18(2.2%) were class2 obese and 1(.1%) was class 3 obese.

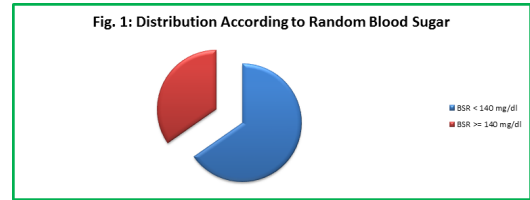
301 study subjects (36%) among the study subjects were hypertensive and 535(64%) were normotensives. Among the subjects with raised BP 628(75.1%) gave the positive family history of NCDs whereas 208(24.9%) had no family history of non-communicable diseases.(NCD).

446 (53.3%) subjects had other comorbid conditions whereas 390 subjects said that they did not have any such comorbidities.

Among the study population 656(78.5%) subjects said that they had sedentary life lifestyle , 20.6% i.e. 172 subjects said that they had physical activity of moderate intensity and 8 (1%) had heavy physical activity.

There were 230(27.5%) smokers , 129(15.4%) ex-smokers , 357(42.7%) non-smokers and 120(14.4%) passive smokers in the study.

281(33.6%) subjects gave the history of indoor air pollution whereas 555(66.4%) did not give any such history.



59(20.1%) subjects in the study had high blood sugars.777 (79.9%) had random blood sugar less than 140 mg/dl.

**Table 2: Gender wise Distribution of Various NCD Risk Factors**

	Gender		Total	OR (95% CI)	p-value
	Male	Female			
<b>BMI</b>					
Normal	125	186	311	Constant	
	42.7%	34.3%	37.2%		
Under weight	8	3	11	3.968 (1.032-15.247)	0.031
	2.7%	0.6%	1.3%		
Overweight	142	177	319	1.193 (0.869-1.638)	0.272
	48.5%	32.6%	38.2%		
Obesity I	11	165	176	0.099 (0.051-0.190)	0.000
	3.8%	30.4%	21.1%		
Obesity II	7	11	18	0.946 (0.357-2.508)	0.912
	2.4%	2.0%	2.2%		
Obesity III	0	1	1	2.018 (0.081-49.956)	0.667
	0.0%	0.2%	0.1%		
<b>Smoking History</b>					
Non smoker	111	246	357	Constant	
	37.9%	45.3%	42.7%		
Smoker	87	143	230	1.348 (0.951-1.909)	0.092
	29.7%	26.3%	27.5%		
Exsmoker	56	73	129	1.700 (1.123-2.572)	0.011
	19.1%	13.4%	15.4%		
Passive smoker	39	81	120	1.067 (0.685-1.661)	0.773
	13.3%	14.9%	14.4%		
<b>Physical activity</b>					
Sedentary	244	412	656	0.084 (0.010-0.691)	0.005
	83.3%	75.9%	78.5%		
Moderate	42	130	172	0.046 (0.005-0.386)	0.000
	14.3%	23.9%	20.6%		
Heavy	7	1	8	Constant	
	2.4%	0.2%	1.0%		
<b>Raised BP</b>					
Yes	71	230	301	0.435 (0.317-0.597)	0.000
	24.2%	42.4%	36.0%		
No	222	313	535		
	75.8%	57.6%	64.0%		
<b>Comorbidity</b>					
Yes	190	256	446	2.068 (1.543-2.772)	0.000
	64.8%	47.1%	53.3%		
No	103	287	390		
	35.2%	52.9%	46.7%		
<b>Blood Sugar (R)</b>					
< 140 mg/dl	234	312	546	2.936 (2.106-4.094)	0.000
	79.9%	57.5%	65.3%		
≥ 140 mg/dl	59	231	290		
	20.1%	42.5%	34.7%		

**Table 3: Relationship between Blood Pressure and Various NCD Risk Factors**

	Raised BP		Total	OR (95% CI)	P-value
	Yes	No			
<b>BMI</b>					
Normal	42	269	311	Constant	
	13.5%	86.5%	100.0%		
Under weight	3	8	11	2.401 (0.612-9.414)	0.195
	27.3%	72.7%	100.0%		
Overweight	153	166	319	5.903 (3.987-8.740)	0.000
	48.0%	52.0%	100.0%		
Obesity I	90	86	176	6.702 (4.319-10.401)	0.000
	51.1%	48.9%	100.0%		
Obesity II	13	5	18	16.652 (5.646-49.108)	0.000
	72.2%	27.8%	100.0%		
Obesity III	0	1	1	0.473 (0.019-11.805)	0.648
	0.0%	100.0%	100.0%		

Family history of NCD					
Yes	216	412	628	0.759 (0.550-1.047)	0.092
	34.4%	65.6%	100.0%		
No	85	123	208		
	40.9%	59.1%	100.0%		
Smoking history					
Non smoker	94	263	357	Constant	
	26.3%	73.7%	100.0%		
Smoker	96	134	230	2.004 (1.409-2.851)	0.000
	41.7%	58.3%	100.0%		
Ex-smoker	64	65	129	2.754 (1.813-4.183)	0.000
	49.6%	50.4%	100.0%		
Passive smoker	47	73	120	1.801 (1.165-2.785)	0.007
	39.2%	60.8%	100.0%		
Physical activity					
Sedentary	239	417	656	9.752 (0.560-169.715)	0.118
	36.4%	63.6%	100.0%		
Moderate	62	110	172	9.615 (0.545-169.423)	0.122
	36.0%	64.0%	100.0%		
Heavy	0	8	8	Constant	
	0.0%	100.0%	100.0%		
Indoor air pollution					
Yes	117	164	281	1.438 (1.070-1.934)	0.016
	41.6%	58.4%	100.0%		
No	184	371	555		
	33.2%	66.8%	100.0%		

**Table 4: Relationship between Random Blood Sugar and Various NCD Risk Factors**

	BSR		Total	OR (95% CI)	P-value
	< 140 mg/dl	≥ 140 mg/dl			
BMI					
Normal	147	164	311	Constant	
	47.3%	52.7%	100.0%		
Under weight	9	2	11	5.020 (1.067-23.613)	0.030
	81.8%	18.2%	100.0%		
Overweight	274	45	319	6.793 (4.618-9.992)	0.000
	85.9%	14.1%	100.0%		
Obesity I	103	73	176	1.574 (1.083-2.286)	0.016
	58.5%	41.5%	100.0%		
Obesity II	13	5	18	2.900 (1.009-8.332)	0.039
	72.2%	27.8%	100.0%		
Obesity III	0	1	1	2.690 (0.108-66.546)	0.545
	0.0%	100.0%	100.0%		
Family history of NCD					
Yes	410	218	628	0.996 (0.716-1.384)	0.979
	65.3%	34.7%	100.0%		
No	136	72	208		
	65.4%	34.6%	100.0%		
Smoking history					
Non smoker	219	138	357	Constant	
	61.3%	38.7%	100.0%		
Smoker	160	70	230	1.440 (1.012-2.049)	0.042
	69.6%	30.4%	100.0%		
Ex-smoker	112	17	129	4.151 (2.388-7.216)	0.000
	86.8%	13.2%	100.0%		
Passive smoker	55	65	120	0.533 (0.351-0.809)	0.002
	45.8%	54.2%	100.0%		
Physical activity					
Sedentary	425	231	656	0.613 (0.122-3.063)	0.719
	64.8%	35.2%	100.0%		
Moderate	115	57	172	0.672 (0.131-3.437)	1.000
	66.9%	33.1%	100.0%		
Heavy	6	2	8	Constant	
	75.0%	25.0%	100.0%		
Indoor air pollution					
Yes	172	109	281	0.764 (0.567-1.029)	0.076
	61.2%	38.8%	100.0%		
No	374	181	555		
	67.4%	32.6%	100.0%		

Among subjects with normal BMI 42(13.5%) had raised blood pressure and 269 (86.5%) were normotensives. Among 11 underweights , 3 (27.3%)were hypertensives 8 (72.7%) had normal blood pressure. 153(48%) overweight individuals had raised blood pressure and 166

(52%) had blood pressure in the normal range.

90 people with grade 1 obesity had raised blood pressure and 48.9% that is 86 people with grade 1 obesity were normotensives.

13 grade 2 (51.1%) obese individuals had raised BP and 5(48.9%) were normotensives among the total of 18 grade obese subjects.

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