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Research Article

Trends in the Magnitude of NCDs among Schedule Tribe Population of Kashmir with Special Reference to Health and Nutritional

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Abstract

The rising trend in NCD here consonance unremitting surveillance and awareness amongst population. This study aims at access the health and nutritional estimation of Schedule tribes, besides the subject recognition regarding on-communicable diseases and the family history. The effect of malnutrition and other risk factors on non-communicable diseases is also explored. **Materials and Methods:** The present study is a descriptive cross-sectional study conducted in Kashmir valley. Multistage sampling was adopted. Modified WHO-STEPS surveillance questionnaire was used to collect data from 3400 participants of selected districts with prior consent. P-value≤0.05 was considered as statistically significant association. **Results:** Nutrition status was not adequate among the studied population. Education is very unreasonable with 53.6% male and 69.6 female subjects. Hypertension is the only disease of which subjects are to some extent aware about but this proportion of awareness is still very insignificant. There was no significant differences p 0.05 between male and female regarding the awareness and the disease. The awareness regarding family history is significant $p < 0.05$, only less percentage of subject's state about it. **Conclusion:** The findings of the present study reveal that this community lacks the knowledge and awareness due to illiteracy, presently in the middle of this epidemiologic transition where we have to educate the non-communicable diseases concurrently.

Keywords: Schedule tribe population; Nutrition; Awareness; Family history and prevalence

Introduction

The schedule tribe societies in India are considered as the weakest sections of the population in terms of common socio-economic and demographic factors such as poverty, illiteracy, lack of developmental facilities and adequate primary healthcare facilities [1-3]. For last few decades, 'growth with equity and social justice' has remained the top development agenda of developing nations, but from the historical past, Indian society suffers from substantial disparity in education, employment, and income based on caste and ethnicity [4]. According to the Ministry of Schedule tribe Affairs, Government of India, over 84 million people belonging to 698 communities are identified as members of Scheduled Tribes (ST) in India [2]. These tribes mainly live in isolated areas, forest fringes and far away from the modern civilization with their traditional values, customs, beliefs and myth.

Schedule tribe health is one of the important areas for action in the health sector. The major contributors to the increased disease risk amongst schedule tribe communities include- (i) poverty and consequent under nutrition; (ii) poor environmental sanitation, poor hygiene and lack of safe drinking water leading to increased morbidity from water and vector-borne infections; (iii) lack of access to healthcare facilities resulting in the increased severity

and duration of illnesses; (iv) social barriers and taboos preventing utilization of available healthcare services; (v) vulnerability to specific diseases like G-6 PD deficiency, yaws and other endemic diseases like malaria etc. Also, the schedule tribe population, being heterogeneous, there are wide variations in their health status, access to and utilization of health services.

A relatively limited data set available on the health conditions and disease profile of the schedule tribe groups across the country shows that the diseases affecting schedule tribe population vary from area to area, depending on the environmental and social conditions and cultural practices prevalent in each area [3]. Especially vulnerable are the primitive tribes who have some unique health problems and challenges, needing special attention by the government. The attention on schedule tribe health has not been adequate. This is because of the three reasons; namely, (i) there -was a general belief that living close to nature they enjoyed an environment which is conducive to good health, (ii) the schedule tribes have been regarded meekly ready to accept allopathic system of medicine as they still depend very much on supernatural causes and (iii) the difficult terrain where it is difficult to reach health service adequately especially winters in Kashmir valley. Schedule tribe population in general; rely on traditional practices of healing not just for general health issues but also for chronic illness. Tribes are relatively isolated and autonomous groups. The existence of own cultural and medical system is one of the important features of a schedule tribe society. The schedule tribe social structure has its own structural and ethnic specificity and the diseases that inflict upon the schedule tribe people are likewise specific to the attribute of their social structure. Moreover, the knowledge of disease, their classification and etiology are constituents of their cultural system and they develop methods and ways of curing the diseases [5].

The health status of schedule tribes is poor compared to that of the general population. Malnutrition is one of the common and has greatly affected the general physique of the population. Malnutrition lowers the ability to resist infection, leading to chronic illness and in the post-weaning period leads to permanent brain impairment. Nutritional intake and dietary practices among schedule tribe pregnant women are comparatively very low to the national recommended standards [6]. Good nutrition is required throughout life and is particularly vital for women to continue to remain in good health and to do everyday household work [7]. Nutritional anemia is generally a major problem for women in Jammu and Kashmir and more particular in the Schedule tribe population.

The morbidity and mortality caused by non-communicable diseases has been steadily increasing over the past few decades. Bulk of the NCD's are heart related , Hypertension, Diabetes, all types of cancers, strokes, chronic kidney ailments and osteoporosis and other types of arthritis . NCDs are causing more deaths than all other causes combined together. According to world health statistics 2021. Each year, 17 million people die from a NCD before age 70; 86% of these premature deaths occur in low- and middle-income countries.

Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.3 million), chronic respiratory diseases (4.1 million), and diabetes (2.0 million including kidney disease deaths caused by diabetes) [8]. Changing lifestyle patterns among schedule tribe people is contributing to triple burden of diseases. Therefore, identifying current health and nutritional status of Gujjar and Bakerwal women and understanding their health seeking behavior is significant in providing insights to policy makers, health officials for improving condition of these women in availing access to quality health care services. However, the general aim of this study was to assess the health and nutritional status of Schedule tribe population of Kashmir, but the specific objectives of the study were to estimate the prevalence of known common non-communicable diseases and assess the awareness regarding family history of these diseases among the target population.

Material and Method

Study population and sample size

The information regarding nutritional status, awareness, family history and demographic background, with prevalence of non-communicable diseases was extracted from the Schedule tribe population of the Kashmir Valley, India from January 2018 till August 2022. The study was approved by the ethical committee of Regional Research of Institute of Unani Medicine (RRIUM). Sample size was calculated using prevalence 19% of NCDs reported from Central Kashmir from a previous with level of significance 5% and e is the absolute error, which has considered 0.02 in this study. Although a large number of subjects agreed to participate in the study and were enrolled, complete data was available for 3400 subjects.

Study Design

Out of 10 districts of Kashmir valley, which has sex ratio of 908, housing schedule tribe population of four districts (Srinagar, Budgam, Ganderbal, and kupwara) was selected based probability proportion to size technique. The number of individuals per district was chosen from randomly selected villages with a maximum cap of 900 (500 female and male) individuals with a ratio of 1.2 (female): 0.8 (male). A study protocol pamphlet (in English and Urdu) was circulated to selected subjects in addition to giving them verbal instructions through village heads (sarpanchs) / health workers and religious heads. An informed consent was obtained from all the participants. Individuals aged from 15 years or above residing in selected study area who gave consent to participate in the study were included. Any participant who could not give complete response due to physical or mental illness and those

in whom anthropometry or biochemical parameters could not be performed were excluded from the study.

Socio demographic characteristics

Modified questionnaire surveillance was used to obtain socio-demographic information of the target schedule tribe population. The standardized questionnaire was prepared in English language and translated to Urdu language. To administer the questionnaire, a face-to-face interview was conducted in local vernacular language by limited number of trained researchers. Revised modified BG Prasad socioeconomic classification scale was used to ascertain socio economic class of the study population [9]. Education was categorized as high (secondary or high school, college, or university) and low (primary education or no education) [10].

Anthropometric and Nutritional status

The body mass index (BMI) was calculated on the basis of anthropometric measurements of height and weight of subjects. BMI was defined as weight (in kilograms) / (height (in Sq. meters) and Asian cut-off for BMI recommended by WHO were used for classification of subjects as malnourished (BMI below 18.5 Kg/m^2), normal (BMI 18.5-22.9 Kg/m^2), overweight (BMI 23.0-24.9 Kg/m^2) and obese (BMI >25 Kg/m^2). The malnourished status was evaluated using Chronic Energy Deficiency (CED) Grade-I (BMI < 16.0), Grade-II (BMI 16.0-16.9) and Grade-III (BMI 17.0-18.4) categories.

This classification categorizes prevalence according to percentage of a population with BMI<18.5.

(1) Low (5-9%): warning sign, monitoring required.

(2) Medium (10-19%): poor situation.

(3) High (20-39%): serious situation.

(4) Very high (≥40%): critical situation.

Disease awareness

To assess the awareness of subjects regarding different NCDs and family history of these NCDs, both open and close ended questionnaires were adopted. For effectively administering the questionnaire, a face-to-face interview was conducted in local vernacular language by trained research staff.

Statistical analysis

The variables in this study are categorical. The prevalence of NCD risk factors has been presented in the form of frequencies and percentages. P-value ≤ 0.05 was considered as statistically significant. Chi-square test was tested between the disease knowledge and responses. All tests were two-tailed, and the level of significance was set at P≤5%. The statistical package SPSS, version 21, for Windows (San Diego, CA, USA) was used in the analyses.

Results

A total of 3400 subjects (1802 women and 1598 men) were recruited for the study. The mean age of the subjects observed is 35.4 years (42.67 men and 32.17 women). The details of various study parameters are given as below.

Characteristics of Studied population

These tribes largely exhibit nuclear family setup (53.7%) with very less (2.4%) extended families. Illiteracy is very high with 53.6% male and 69.6% female subjects. The school dropout rate is very alarming as out of primary education (29% male and 19.5% female), only a meagre proportion (1.3% male and 0.3% female) students reach to the university level education. The majority of the subjects (70.9% male and 72.5% female) are married, but a large section of unmarried subjects (27.2% male and 23.7% female) were also found. Divorcees are found least (4% male and 0.2% female) in these schedule tribe populations. The majority of male subjects (42.4%) are self-employed while as unemployment (69.5%) is largely prevalent among female subjects of these tribes with a small section of population (5.4% male and 1.4% female) is in government employment. The economic condition is extremely low with majority of subjects (79.4% male and 82% female) of population having household income below rupees one lakh per annum (Table 1).

Variable	Status	Male n=1598		Female n= 1802		
		Frequency	Percentage	Frequency	Percentage	p - value
Education level	Illiterate	856	53.6	1254	69.5	P < 0.05
	Primary	463	29.0	351	19.4	
	Secondary	158	9.9	123	6.8	
	Higher secondary	57	3.6	45	2.4	
	Graduate	33	2.1	18	1.0	
	Post graduate	21	1.3	8	0.7	
	University	8	0.5	3	0.2	
Marital status	Single	436	27.2	427	23.7	P < 0.05
	Married	1133	70.9	1306	72.5	
	Separated	13	0.8	11	0.6	
	Widowed	14	0.9	54	3.0	
	Divorced	2	0.1	4	0.2	
Occupation	Government employee	198	12.4	25	1.4	P < 0.05
	Non-government employee	146	9.1	65	3.6	
	Self employed	678	42.4	96	5.3	
	Student	308	19.3	269	14.9	
	unemployed	268	16.8	1347	74.8	
Yearly income (Rs.)	< 100,000	1267	79.3	1478	82.0	P < 0.05
	100,001 – 150,000	209	13.0	240	13.3	
	100,501 – 200,000	102	6.4	38	2.1	
	> 200,001	20	1.3	5	0.3	

Table 1: Socio-demographic characteristics of population.

Nutritional status

Out of 862 (33.8%) men and 1016 (28.5%) women subjects were malnourished and 1072 (42%) men and 1428 (40.2%) women subjects are having normal BMI. The study also showed that 247 (9.7%) of male subjects and 404 (11.4%) of female subjects were overweight, whereas 371 (14.5 %) male and 703 (19.8 %) female subjects were obese.

On stratification of malnourished group, the 422 (49.0%) of male and 463 (45.6%) of female subjects fell in CED grade-III, while as 145 (16.8%) male and 172 (16.9%) female subjects fell in CED grade-II. The CED grade-I comprises 295 (34.2%) male and 381 (37.5%) female subjects (Figure 1).

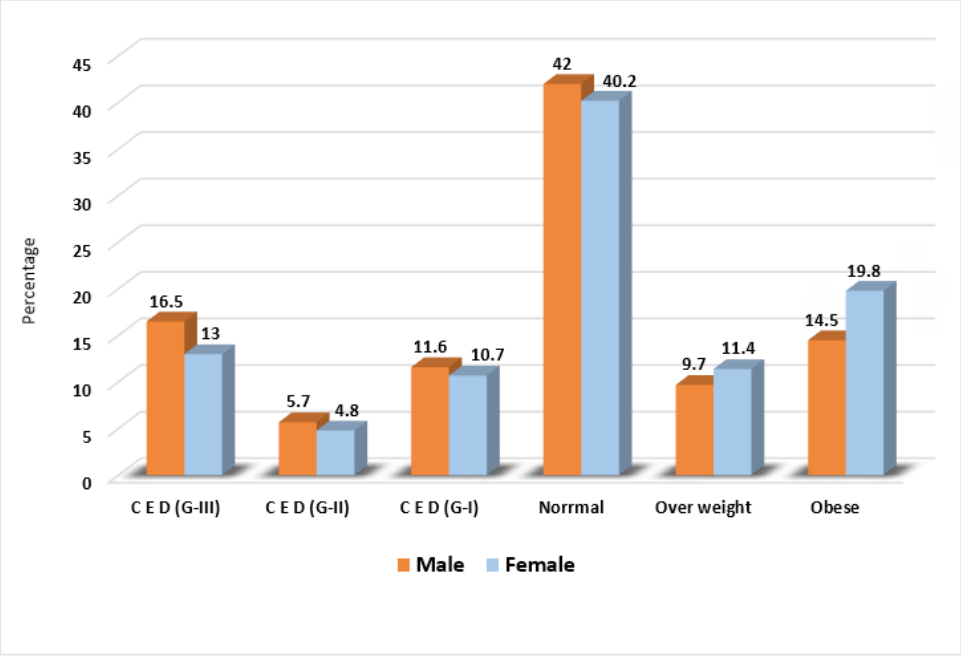

Figure 1: Nutritional status.

Disease awareness

This study showed that only 2.6 % male and 5.3% female subjects are aware about thyroid dysfunction, 4.7% male and 3.2% female subjects are aware about dyslipidemia, 5.3% male and 4.7% female subjects are aware about diabetes and, 5.7% male and 5.3% female subjects are aware about heart diseases. Hypertension is the only disease of which subjects are more aware about with 19% male and 20.3% female subjects but this proportion of awareness is still very marginal (Figure 2).

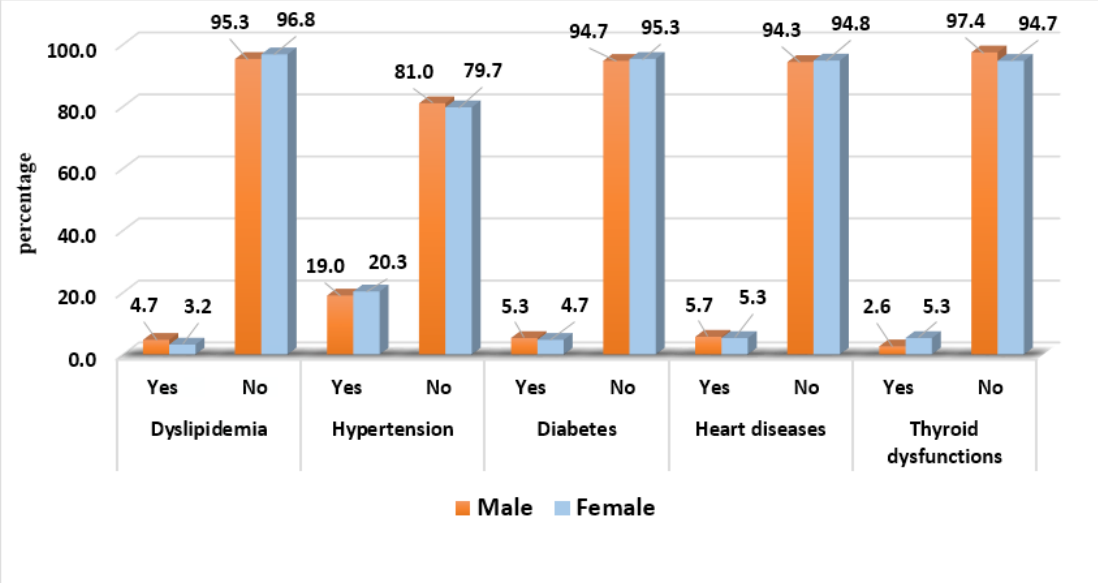

Figure 2: Gender wise subject awareness regarding NCDs (% age).

As far as the awareness regarding family history of NCDs is concerned, only a less proportion of subjects affirmed about it. Irrespective of gender differentiation, it is the subject age group of 21-40 which shows some awareness about the family history of different diseases except the osteoporosis where it is subject age group of 41-60 which shows a little more awareness. Hypertension related family history awareness is comparatively more than that of any other disease with 9.7% male and 10.4% female subjects confirmed it while the 53.6% male and 61.2% female subjects denied it and the rest of 36.6% male and 28.4% female subjects are unaware about it. Family history awareness of cancer is the least among the subjects with 0.2% male and 0.3% female subjects affirming it, 58.1% male and 71% female subjects denying it while the rest of 41.5% male and 28.6% female subjects are unaware about it (Table 2).

Diseases	Response	Male n (%)	Female n (%)	p-value
Obesity	Yes	107 (3.8)	160 (4.1)	< 0.05
	No	1761 (62.1)	2683 (69.3)	
	Don't Know	969 (34.2)	1029 (26.6)	
Hypertension	Yes	276 (9.7)	403 (10.4)	< 0.05
	No	1523 (53.7)	2367 (61.2)	
	Don't Know	1037 (36.6)	1097 (28.4)	
Diabetes	Yes	63 (2.2)	84 (2.2)	< 0.05
	No	1598 (56.4)	2664 (68.9)	
	Don't Know	1173 (41.4)	1120 (29.0)	
Cancer	Yes	8 (0.3)	13 (0.3)	< 0.05
	No	1649 (58.2)	2744 (70.9)	
	Don't Know	1176 (41.5)	1111 (28.7)	
Stroke	Yes	11 (0.4)	21 (0.5)	< 0.05
	No	1638 (57.8)	2706 (70.0)	
	Don't Know	1185 (41.8)	1137 (29.4)	
Cataract	Yes	51 (1.8)	51 (1.3)	< 0.05
	No	1606 (56.7)	2678 (69.4)	
	Don't Know	1173 (41.4)	1132 (29.3)	
Osteoporosis	Yes	75 (2.6)	99 (2.6)	< 0.05
	No	1583 (55.9)	2625 (68.0)	
	Don't Know	1173 (41.4)	1138 (29.5)	

Table 2: Family history awareness of NCDs.

Gender wise and age group wise prevalence of known common disorders

As for as prevalence of some common NCDs is concerned, hypertension is significantly prevalent and especially in 41-60 age group of both male (N=185) and female (N=279) subjects, while as dyslipidemia which is mostly prevalent in male (N=70) subjects of age group of 41-60 and female (N=95) subjects of 21-40 age group. Diabetes is mostly prevalent in both male (N=50) and female (N=52) subjects of 41-60 age group (Table 3).

Diseases	Gender	Observation	Age groups										P-Value
			Less than 20		20-40		41-60		61-80		More than 80		
			n	%age	n	%age	n	%age	n	%age	n	%age	
Hypertension	Male	Yes	11	0.17	80	1.21	185	2.79	155	2.34	9	0.14	<0.05
		No	621	9.36	866	13.05	575	8.66	293	4.42	14	0.21	
	Female	Yes	19	0.29	215	3.24	279	4.20	97	1.46	5	0.08	<0.05
		No	862	12.99	1520	22.91	649	9.78	171	2.58	10	0.15	
Diabetes	Male	Yes	4	0.06	15	0.23	50	0.76	33	0.50	3	0.05	<0.05
		No	629	9.50	933	14.09	707	10.68	412	6.22	20	0.30	
	Female	Yes	2	0.03	37	0.56	52	0.79	17	0.26	0	0.00	<0.05
		No	880	13.29	1699	25.66	862	13.02	252	3.81	15	0.23	
Dyslipidemia	Male	Yes	15	0.22	51	0.76	70	1.04	38	0.56	4	0.06	<0.05
		No	627	9.29	913	13.52	698	10.34	413	6.12	19	0.28	
	Female	Yes	32	0.47	95	1.41	74	1.10	21	0.31	2	0.03	<0.05
		No	861	12.75	1674	24.80	877	12.99	254	3.76	13	0.19	

Table 3: Gender wise and age group wise prevalence of known common NCDs.

Discussion

Education plays an important role in the knowledge of awareness. Health education is often indicated to accommodate an individual approach by substituting the three domains of health "healthcare, disease prevention, and health promotion". Health assessment of schedule tribe population is of prime concern as studies revealed that literacy level of these Schedule tribe are significantly low. The prevalence of CED among the adult subjects of this population is a ''High'' public health problem as per World Health Organization criteria (CED=20-39%), with about 33.8% males and 28.5% of females with CED, respectively which is a serious situation [8]. The reason of this situation may be attributed to consumption of low nutrient food due to poverty and low family income of a section of this population. The schedule tribe populations in the present world couldn't remain unaffected from urbanization. There is conspicuous prevalence of obesity with 14.5% males and 19.8% of females and overweight with 9.7% males and 11.4% of females among the adult subjects of Schedule tribe population of Kashmir valley, which may be attributed to change of life style or environmental induced metabolism. While another study of western Rajasthan show a ''very high'' CED prevalence with about 42% males and 52% of females respectively which is a critical case [10].

The present study reported the awareness rate regarding hypertension is 19% in males and 20.3% in females. This is slightly different to the meta-analysis by 19. Global Burden of Disease Collaborative Network [10] which revealed the awareness of prevalence, treatment, and control of hypertension as 25.3%, 25.1% and 10.7% respectively for rural Indians; and 42.0%, 37.6% and 20.2% respectively for urban Indians [11]. While a recent review by Desai and Kulkarni [4], revealed that hypertension awareness rate has almost doubled from less than 30% in 1980 to around 60% at present among urban populations and less than 10% in 1980s to 35-40% presently among rural population. However, the treatment and control status were still low at around 30% in urban and 20% in rural areas [12]. The subject awareness regarding diabetes is significantly low as it is known as a "silent disease," as no symptoms occur until it progresses to severe target organ damage [13].

Awareness regarding family history of different NCDs revealed that hypertension is the highest known disease among the target population with 9.7% (n=276) men and 10.4% (n=403) women subjects affirming it which may be due to clear symptomatic nature of hypertension. The awareness regarding family history of all the other NCDs like obesity, diabetes, cancers, stroke, cataract and osteoporosis is very low and this may be attributed to the poor subject health awareness and insufficient healthcare facilities available in the past. Another reason for less awareness may be the widespread illiteracy (Men= 53.6% and women=69.6%) and low economic conditions (with 80% households<25000 INR/year) of these schedule tribe populations.

Hypertension is the leading risk factor for global mortality and important risk factor for CVD [14]. Prevalence of hypertension has increased dramatically in the last few decades [15]. Population growth, ageing, increasing behavioral risk factors like tobacco use, alcohol use, un healthy diet, persistent stress and lack of physical activity are the factors attributed for this high prevalence. Being leading risk factor for deaths globally, about one billion people are affected by hypertension which caused 9.7 million deaths in 2010 and 7 percent of disease burden (DALYs) were contributed by hypertension [16]. In the year 2000, it has been estimated the global prevalence of hypertension as 26.5 per cent and 972 million people were estimated to have hypertension and, is projected to increase to 1.56 billion by 2025 [17]. Hypertension runs in families and has strong genetic connections [18]. Men whose parents are hypertensive have 2.4 times more risk of developing hypertension than others, 1.5 and 1.8 times if mother and father respectively is hypertensive. Men have 20 times higher risk of hypertension if parents had hypertension before the age of 35 years. In this study the prevalence of hypertension is reported approximate 8%, 6.65% in males and 9.27% in females, which is lower than reported from various schedule tribe populations from other parts of India which has been reported 16-26%.

A known prevalence of diabetes in our study has been estimated 1.6%. It increases with increase in age, common in the 41-60 years age group. The same has been reported in developing countries and for older age group (>65 years) as well [19]. The reason for lower assessment of diabetes maybe that Kashmir valley being part of a developing country, only few people are likely to volunteer for diagnostic testing in early stages of the disease, screening provides for a cost-effective way of reducing the burden of disease.

In the present study, the prevalence of dyslipidemia has been estimated 2.64 in males and 3.32% in females. Studies have shown that dyslipidemia is an independent risk factor for hypertension. Total cholesterol levels, HDL, TC/HDL ratio are good predictors of incident hypertension and future research is needed as limited studies are available. The global prevalence of high cholesterol is 39 percent. According to the Lipid Association of India, prevalence of hypercholesterolemia is 10-15 percent in rural and 25-30 percent in urban populations [4]. ICMR-INDIAB study revealed that prevalence of dyslipidemia among Indian population was 79 percent. The prevalence of hypercholesterolemia was 14 percent, high LDL11 percent, low HDL 72 percent and hyper triglyceridemia 30 percent. Raised cholesterol is estimated to cause 2.6 million deaths annually; it increases the risks of heart disease and stroke and is highest in high-income countries [17]. According to a study done among schedule tribes in Kashmir valley, prevalence of high total cholesterol was 21.2 percent, 39.4 percent had high triglycerides, 45.4 percent had high LDL and 87.9 percent had low HDL [1]. In an another study, two schedule tribe populations in north east India, prevalence of high triglycerides was more among males (27-64.7 percent) than females (23.4-36.6 percent) and prevalence of low HDL among females was higher (66-100 percent) than males(33-82 percent) [5].

Numerous factors influence dyslipidaemia, including age, smoking, body mass index (BMI), alcohol intake, lifestyle, etc. [20]. One of the possible mechanisms is that smoking leads to dyslipidaemia and endothelial injury, and further accelerates atherosclerosis, cardiovascular disease and stroke. High body mass index (obesity) was found to be significantly associated with dyslipidaemia revealed by a good number of studies conducted in past to know this association. The analytical statistics revealed significant difference between the subject stream and the awareness of the importance of family history ($p < 0.05$), Gender was not found to be having any notable significant influence on any studied factors [21].

Limitations of the Study

We recorded the anthropometric measurements of height and weight to assess the nutritional status and were not able to collect other measurements such as middle upper arm circumference, fat fold, and skin fold at different sites. However, the finding of high rates of CED as defined by BMI classification adds strength to our conclusions about insufficient nutrient intake in this population.

Conclusion

The study revealed that in general there is a poor awareness about the importance of family history among the population. Health knowledge is important component of disease awareness. Further, it revealed that generally, the knowledge on NCDs was impoverished and the preventive measures were not practiced by a significant numbers of total populations. Therefore, it implies that the preventive campaigns need to address this population fraction on the above issues. Early intervention at this point of time is needed to save this community from these incurable diseases.

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