

Cross sectional study on Kashmiri tribal population: Their demo-economic status and behavioural risk factors

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ABSTRACT

Background: The demographic particulars of Gujar-Bakarwals are mostly dominant on mountainous regions of Kashmir Valley. Their housing, sanitation, health care facilities are very low sub-standard than other sections of population. Behavioral risk factors including tobacco use and skipping meals are prevalent. **Objective:** The present study focuses on the socio-economic and demographic profile among the tribal population of Kashmir; their major risk factors of some non-communicable diseases. **Methods:** The study is community based cross sectional survey undertaken in selected districts of Jammu and Kashmir. **Results:** Around 94.3% of the tribal population fell under low income groups with an annual income of Rs. <25000 per year. Only 37.1% subjects were educated. 61.0% of tribal subjects lack access to pure drinking water and proper sanitation. Interestingly, 63–66% of the population was younger with a high prevalence of smoking among both males and females (33.3% males and 7.3%, respectively). Among non-communicable diseases, diabetes was less prevalent whereas a comparatively higher prevalence of hypertension, dyslipidemia, thyroid dysfunction, and vitamin D deficiency was present with significant associations with the risk factors. **Conclusions:** There is widespread poverty, illiteracy, and lack of basic amenities among the tribal people which makes it imperative to address these concerns to improve the socioeconomic disparities and health indices of the marginalized population. Smoking and inadequate consumption of meals was prevalent. There is an urgent need to address behavioral risk factors such as smoking and skipping meals through primary prevention.

Keywords: Jammu and Kashmir, risk factors, socio-economic status, tribal population

Introduction

Indigenous people all over the world are historically subjugated and socially disadvantaged, which is explicitly and implicitly affecting their life expectancy and health status.^[1] They usually live within geographically distinct territories; tend to maintain distinct social, economic, and political institutions within their territories; and self-identify as indigenous or tribal.^[2] India has the second largest tribal population in the world with a total of 84.33

million scheduled tribes, constituting 8.6% of the population of the country.^[3]

Jammu and Kashmir (J&K) has a substantial proportion of tribal population and constitutes 11.9% of the total population.^[4] Gujar tribe is the largest tribe in J&K. Gujjars are not original inhabitants of J&K but started their migration in 9th and 10th century from plain areas such as Gujarat, Kathiawad, and Jodhpur where they have been even in power.^[5] Bakarwal is a nomadic pastoral tribe known for livestock farming as the main source of livelihood and is the second largest tribe in the Union territory. The combined population of Gujar and Bakarwal community is around 1093852 constituting 69% of the total tribal population of J&K.^[4]

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Traditionally, the socio-economic status of Gujjar and Bakarwal community has been quite different from the rest of the Kashmiri society. The tribal population of J&K mostly lives in scattered clusters across hilly, in accessible terrains due to which, they have remained beyond the realm of the general development process, lacking the basic facilities like access to healthcare, pure drinking water, and education resulting in the extremely poor socio-economic conditions.^[2] The tribes have also been suffering from various forms of social discrimination and political isolation^[6] but there is significant scarcity of data on this population.

Non-communicable diseases (NCDs) are presently major contributors to mortality globally. Deaths due to NCD deaths are projected to increase by 15% between 2010 and 2020 (to 44 million deaths) with an estimated 10.4 million deaths in South-East Asia. 80% of these will occur in developing countries like our own country India.^[7] Majority of non-communicable diseases have some of the common underlying risk factors which include tobacco use, sedentary life style, and poverty.^[8] Behavioral and clinical risk factors such as high blood pressure, high blood glucose concentrations, dietary habits, physical inactivity, and tobacco use contribute to the prevalence of NCDs.^[9] Other than these, some economic and social crises are also linked to NCDs. High rate of unemployment; unhealthy work environment, low wages, and high work load increase the rate of mood disorders, anxiety, depression, and suicide, and also pose a severe risk of cardiovascular diseases.^[10] Management an NCD is a costly affair and it is reported that by 2030, the financial burden of cancer may exceed \$1 billion per year. In 2015, the treatment for asthma aggregated \$2.6 billion, and 2030, the treatment may exceed \$ 4 billion.^[7]

The rise of NCDs among younger populations may jeopardize many countries' "demographic dividend," including the economic benefits expected to be generated during the period when a relatively larger part of the population is of working age. Instead, these countries will have to contend with the costs associated with populations that are living with longer episodes of ill health. A growing number of young adults are being affected, prompting the conclusion that the country could lose the next generation to chronic disease.^[11] Attempts to "treat the way out" of NCDs will not be affordable for most middle- and low-income countries. Action should be oriented toward curbing the NCD risk factors and promoting healthier lifestyles to reduce NCD incidence rates and push back the age of NCD onset. It is important to note that all these risk factors are manageable to modification through lifestyle changes. For instance, World Health Organization (WHO) estimates that positive changes in health behaviors (mainly, not smoking, eating a healthy diet, maintaining normal weight, and being physically active), can reduce the risk of hypertension, dyslipidemia, vitamin D deficiency and diabetes by about three quarters. The present study was a part of a cross sectional health survey conducted among the scheduled tribes of J&K and attempted to define their socio-economic and socio-demographic status, so as to identify

the risk factors which are responsible for their major health issues and simultaneously recommend suitable measures and economic interventions for rapid socio-economic development of this community.

Materials and Methods

This population based cross-sectional survey was conducted from August 2015 to December 2018; carried out jointly by All India Institute of Medical Sciences (AIIMS), New Delhi, and Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Kashmir India. The research was conducted following the tenets of the Declaration of Human Ethics as approval was received from the Institutional Ethics Committee of Sher-i-Kashmir Institute of Medical Sciences (SKIMS) vide No. SIMS 301-02-09/2014-61. A written informed consent was obtained from the participants before enrolling for the study and the participants were informed of their right to withdraw from the study at any stage if they wished. For children below 18 years, the consent was taken from parents and the questionnaire was filled with their assistance.

Study design

Seven districts (Anantnag, Pulwama, Ganderbal, Kupwara, Srinagar, Rajouri, and Poonch) were selected out of a total of 10 districts, for recruitment of the tribal subjects based on the multi-stage cluster sampling with probability proportional to size (PPS) technique. The number of individuals per district was chosen from randomly selected villages with a maximum cap of 1000 individuals per village. Bedridden patients, patients on prolonged medication, pregnant females, physically disabled individuals, and subjects refusing consent were excluded from this study.

Research team lessoned with village heads and other relevant stake holders after selection of the village. A study protocol pamphlet (in English, Pahadi, Gojri, and Urdu) was circulated to selected subjects in addition to giving them verbal instructions through village heads/health workers/Imams well before the study. On the day of study, the village heads, local members of directorate health service, research staff, etc., started with a general lecture about the purpose and procedures to be adopted for recruiting the subjects on the all village population group. The research team along with the clinicians and others members followed a standard operation procedure to capture clinical data using modified WHO steps questionnaire. A detailed interview was conducted by these trained researchers using the above mentioned pretested validated questionnaire which included personal information including demographic details, age, gender, smoking, diet pattern, house type, income, educational status, family history of any disease etc., Wherever possible/applicable, pictures or show cards were used to enhance the questionnaire comprehension. Data on current occupation (e.g., student, housework, daily labor, government or non-government job, business, and unable to work or retired), marital status, current health problems were also collected during the interview.

All the subjects were also examined by a team medical staff for capturing anthropometric (height, weight, waist circumference), blood pressure and general physical examination. A detailed physical activity and dietary assessment was done as per the study protocol. A fasting blood sample was obtained from all the adult subjects for evaluation of hematological and biochemical parameters.

Statistical analysis

A cluster sampling technique, with proportional allocation to choose about (10%) of population of 10 districts, was adopted. In the first stage, simple random sampling was used to select the cluster from these 10 districts/regions. The sample of subjects selected from each chosen cluster, using simple random sampling without replacement comprising of 6808 tribals and probability proportional to size sampling procedure to meet the feasible acceptance of the results. All the considered questions were adequately reliable with Cronbach's Alpha of 0.76. Data were collected from November 2016 to December 2018 under the guidance of the research coordinator who gave a brief introduction regarding the objectives and relevance of the study. It was ensured that all respondents understood each and every question and completed the questionnaire timely. The responses were collected and analyzed by IBM-SPSS version 21.0. Frequencies and percentages were calculated to summarize qualitative data. Chi square's test was performed to find out the significance of the study results. A two-tailed P value <0.05 was considered statistically significant. Most of the variables in this study are categorical. Statistical significance (Chi-square test and P value) and strength of association (odds ratio and 95% confidence interval) were tested between behavioral risk factors and diseases.

Results

A total of 6808 tribal participants were interviewed during the study. They were recruited from seven districts of Kashmir with majority from Ganderbal (1487), Srinagar (1117), Kupwara (1266) and Anantnag (1214) districts followed by Poonch (400) and Rajouri (350) districts as depicted in Figure 1. Figure 2 shows the age distribution of migratory and non-migratory tribal subjects. The anthropometric, clinical, and biochemical data of the study group is published somewhere else.

Most of the population is young with around 70% of the population in the age group 1–40 years. Of the total population studied, women constituted 57.8% (3936) and men constituted 42.2% (2872). Among the tribal adults (20–59 year) females constituted major population share (68.8%) compared to males (20.6%) so as in elderly people (>60 years) females were more in number compared to males. However, in the case of adolescents (10–19 year) and children (<10 years), the male-female ratio was almost the same. About 94.3% of the study population had a meagre yearly income of <25000 rupees and only 0.7% of population had income >75000 rupees. As far as occupation in study population is concerned 38.8% were self-employed in

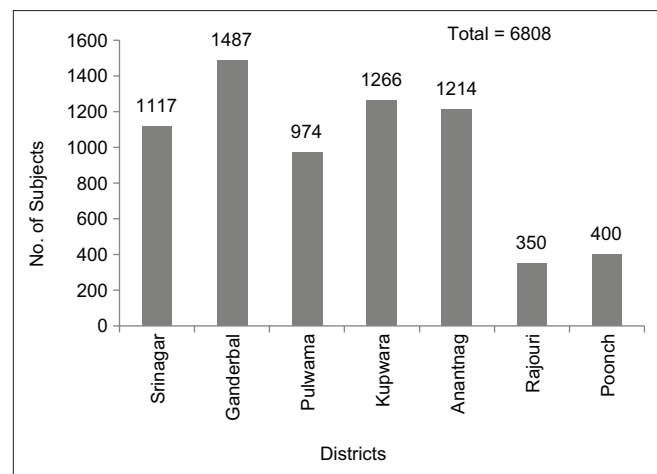


Figure 1: Showing district-wise distribution of recruited study population

agricultural and cattle rearing practices while most females engaged in household chores, 21% were students, 13.3% were unemployed. Majority of tribal subjects were illiterate (62.9%) and only 1.5% and 0.7% were graduates and postgraduates, respectively. Majority of tribal population studied lived in kaccha houses (45.5%) followed by semi-pucca (23.9%) and pucca house (19.7%) and 10.9% of them were living in tents. These tent dwellers were mostly (64.4%) among migratory tribal subpopulation. Tap water (74.9%) was the most common drinking water facility available followed by spring water (15.7%), tube well (7.8%), and lake (1.5%) water are other sources of water in the study population. About 61% of tribal population did not have access to any toilet facility (83% of the migratory type did not have toilet facility when compared to 56.7% non-migratory type) [Table 1].

Comparison of occupational status with respect to gender exhibited that number of self-employed males was higher (42.9%) compared females who mostly engaged in household work (5.4%). When education levels of male and females were compared, females were found to be have more number (2740) of illiterates than males (1540) and males have more number of graduates (60) and post graduates (36) when compared to females with 40 graduates and only 12 post graduates. Nuclear type (53.7%) of family is most common, while 43.8% and 2.4% lived in joint or extended families, respectively. Among the study population 71.8% were married, 25.2% unmarried, 2.1% were widows, 0.7% lived separately and 0.2% was divorced. Around 33.3% males and 7.3% females were active smokers while as 25.7% males and 16.8% females were exposed to passive smoking. Moreover, around 45% subjects had a history of smoking [Table 2]. The odds ratio implies that tobacco use, lower monthly incomes were more likely to be vitamin D deficient and hypertensive. A lower dietary consumption such as skipping meals and un- balanced diet was associated with higher odds of thyroid dysfunction followed by dyslipidemia; and lower physical inactivity was also associated with higher odds of hypertension.

It is evident that the target population had a higher prevalence of smoking ($p < 0.05$). Unhealthy (skipping meals) dietary

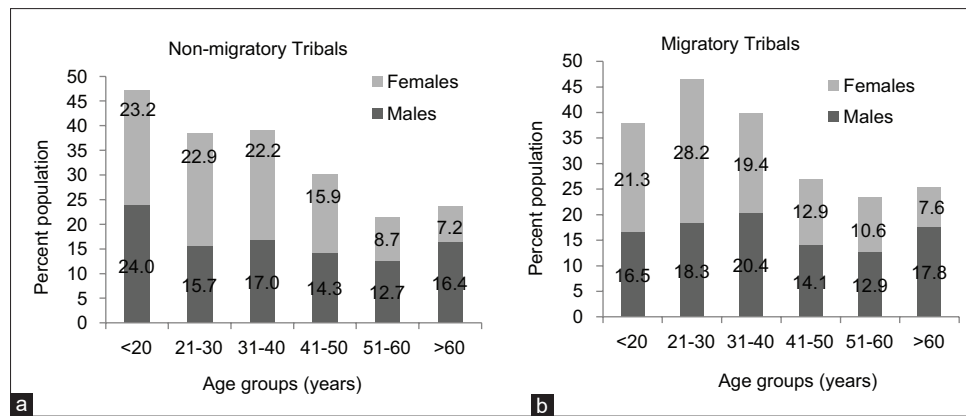


Figure 2: Showing age distribution among males and females among (a) non-migratory and (b) migratory tribals

Table 1: Frequency distribution of various indices of living standard of the subjects

Variables	Migratory	Non migratory	Frequency (%)
Income (per/year)			
<25000	1084 (97.4)	5338 (93.7)	6422 (94.3)
25000-50000	0 (0)	237 (4.2)	237 (3.5)
51000-75000	0 (0)	104 (1.8)	104 (1.5)
>750000	29 (2.6)	16 (0.3)	45 (0.7)
Education			
Illiterate	827 (74.4)	3453 (60.6)	4280 (62.9)
Primary	204 (18.3)	1394 (24.5)	1599 (3.5)
Secondary	54 (4.9)	500 (8.8)	554 (8.1)
Higher Secondary	15 (1.3)	189 (3.3)	204 (3.0)
Graduate	10 (0.9)	90 (1.6)	100 (1.5)
Post graduate	3 (0.3)	45 (0.7)	48 (0.7)
Hafiz Quran	0 (0)	23 (0.4)	23 (0.3)
Occupation			
Govt. employee	31 (2.8)	180 (3.2)	211 (3.1)
Non-govt. employee	63 (5.7)	309 (5.5)	372 (5.5)
Self employed	379 (33.3)	1058 (18.9)	1428 (21.0)
Student	104 (9.4)	1037 (18.5)	1141 (21.0)
Home maker	368 (33.2)	2273 (40.7)	2641 (38.8)
Unemployed (able to work)	119 (10.7)	453 (8.1)	572 (8.4)
Unemployed (unable to work)	55 (5)	281 (5)	336 (4.9)
House type			
Kachcha	352 (31.6)	2743 (48.2)	3095 (45.5)
Semi Pucca	19 (1.7)	1610 (28.3)	1629 (23.9)
Pucca	26 (2.3)	1315 (23.1)	1342 (19.7)
Tent	716 (64.3)	27 (0.5)	743 (10.9)
Toilet facility			
Yes	189 (17)	2468 (43.3)	2657 (39.0)
No	924 (83)	3227 (56.7)	4151 (61.0)
Drinking water facility			
Tap with river	648 (58.2)	4454 (78.2)	5102 (74.9)
Tube well	83 (7.5)	447 (7.8)	530 (7.8)
Lake	7 (0.6)	98 (1.7)	105 (1.5)
Spring	375 (33.7)	696 (12.2)	1071 (15.7)

intake ($p = 0.163$) had been seen more in males compared to the females, whereas with regard to physical activity, 88.2% of the population had a sedentary lifestyle. The proportion of biological risk factors (hypertension, dyslipidemia, thyroid dysfunction, vitamin D deficiency) was significantly higher

in females compared to the males. Biochemical risk factors like diabetes were less prevalent whereas the proportion of hypertension, dyslipidemia, thyroid dysfunction, vitamin D deficiency was significant associations among the risk factors. Use of tobacco was associated with lower odds of being

cholesterol, blood sugar random, and having hypertension. The results are suggestive that the major risk factors such as poverty, tobacco use, imbalanced diet, and physical inactivity were significantly associated with hypertension, dyslipidemia, and thyroid dysfunction [Table 3].

Discussion

Despite certain constitutional provisions, the tribal population in India is backward compared to the general population, their situation being worse than the Schedule Caste (SC) and Other Backward Class (OBC) population.^[12] Similar to general population, the health problems of tribal community are influenced by the interplay of various factors including

demographic, socio-economic variables, biological, and political ones.^[13]

Out of total tribal subjects recruited in this study, majority of the people belonged to non-migratory type and around 15% were living nomadic life. The non-migratory tribes are spread over 10 districts of the Kashmir valley while as migratory tribal's do not cluster at any specific district/region but establish temporary hutments in Srinagar and Ganderbal districts for a brief period of 2–4 months every summer. This gave us the window of opportunity to conduct the survey in these migratory groups.

Most of them were either engaged in agriculture work or some form of self-employment, and only 8% were employed either in government or non-government sectors, because of which more than 90% of the study population had a meager yearly income of < 25000 rupees. Similar observations of one of the study on the Bakarwal tribe of Kashmir valley,^[14] only half of the surveyed population had access to proper sanitation facilities with majority still devoid of access to clean water, there by using river water as a major source of drinking water. Analysis of socio-demographic variables in the study population revealed a statistically significant association with the tribal types (migratory/non-migratory). Because of nomadic lifestyle majority of the migratory subjects live in tents, whereas the non-migratory tribals are comparatively living better life with most of their children receiving primary education.

Overall, the women were present in a significant proportion forming 57% of the total studied population. Similar to observations of Dondapati *et al.*, 2016, most of the respondents belonged to the adult age group followed by adolescent and elderly, with children forming the least share of the population.^[13] The challenges in the provision of educational services are similar to those faced by other rural and marginalized households in the region,^[15] which is aggravated by a lack of access to modern means of information, other linguistic, and geographical barriers. More than 60% of recruited tribals were illiterate while as just one fourth of them were educated up to a primary level. These observations are in congruence to those of Butt and Gupta, 2014.^[3] Further, we found a significant association between tribal gender and their socio-demographic characters including age, educational status, occupation, and marital status. Comparatively,

Table 2: Gender-wise comparison of different parameters in Kashmiri tribal population

Parameters	Frequency (%)		P
	Males	Females	
Age classification			
Children	153 (5.4)	138 (3.5)	<0.05
Adolescent	435 (15.3)	623 (16.0)	
Adults	1624 (20.6)	2687 (68.8)	
Elders	636 (22.3)	655 (16.6)	
Education Level			
Illiterate	1540 (53.6)	2740 (69.6)	<0.05
Primary	832 (19.0)	767 (19.5)	
Secondary	285 (9.9)	269 (6.8)	
Higher secondary	104 (3.6)	100 (2.5)	
Graduate	60 (2.1)	40 (1.0)	
Post graduate	36 (1.3)	12 (0.3)	
Religious studies	15 (0.5)	8 (0.2)	
Occupation			
Govt. employee	156 (5.5)	55 (1.4)	<0.05
Non-govt. employee	232 (8.2)	140 (3.6)	
Self employed	1218 (42.9)	210 (5.4)	
Student	555 (19.6)	586 (15.2)	
Home maker	211 (7.8)	2420 (62.6)	
Unemployed (able to work)	257 (9.1)	315 (8.2)	
Unemployed (unable to work)	199 (7.0)	137 (5.0)	
Smoking Status			
Active Smokers	930 (33.3)	273 (7.3)	<0.05
Passive Smokers	696 (25.7)	607 (16.8)	
History of smoking	1094 (38.7)	331 (8.6)	

Table 3: Association between selected risk factors and NCDs studied

Variables	Responses	Frequency (%)	Hypertension OR (95% CI)	Diabetes OR (95% CI)	Dyslipidemia OR (95% CI)	Vitamin D deficiency OR (95% CI)	Thyroid dysfunction OR (95% CI)
Smoking status; n=6379	Present	1182 (18.6)	8.79 8.12-9.54	0.0576 0.05-0.07	5.5943 5.1681-6.0556	5.5943 1.2765-1.5105	1.3885 1.2765-1.5105
	Absent	5197 (81.4)					
Physical activity; n=6456	Present	761 (11.7)	14.9704 13.67-16.39	0.0980 0.078-0.123	9.5218 8.7065-10.4135	14.5243 13.2641-15.9041	2.3634 2.1516-2.5960
	Absent	5695 (88.2)					
Skipping routine meals; n=6489	Present	867 (13.4)	12.9717 11.88-14.16	0.0849	8.2505 7.5703-8.9919	12.5851 11.5325-13.7338	2.0478 1.8705-2.2420
	Absent	5622 (86.6)		0.0680-0.1060			
Income per year; n=6808	Below poverty level	6422 (94)	0.1200 0.11-0.13	0.0008 0.001-0.0010	0.0765 0.0683-0.0857	0.1167 0.1041-0.1308	0.0190 0.0169-0.0213
	Above poverty level	386 (6)					

Note: OR=Odd Ratio, NCD=Noncommunicable disease

men had a higher educational status in comparison to their female counterparts and the number of self-employed men was higher than self-employed females.

Our study also aimed to identify NCD risk indicators in this community. Overall the prevalence of hypertension was found to be highest among NCDs and this prevalence was higher than other schedule caste groups.^[16] Besides, vitamin D deficiency was equally prevalent in males as well as females. However, thyroid dysfunction was higher among females as compared to males, similar to the trends in general population. There is a sizeable deviation between the areas due to demographic differences and unemployment as they have a direct impact on the health status of the community. The study indicates that this population is more prone to developing hypertension and dyslipidemia,^[8] the most prevalent factors being unhealthy dietary pattern, skipping meals, and use of tobacco by any means. It is a well-established fact that tobacco use is the most common cause of non-communicable diseases such as lung cancer. By 2020, WHO assesses that tobacco will be the reason for 7.5 million deaths per annum or it approximates one in per ten mortality rates.^[7,8] Smoking is an established risk factor for hypertension, thyroid dysfunction, Vitamin D deficiency, diabetes as well as cancer.^[17] While both genders engaged in some form of smoking as previously reported by others as well,^[11,18] the number of active male smokers was thrice more than females. However, the lack of ventilated houses put females at more risk of exposure to passive smoking. About 1.3% prevalence of diabetes mellitus have been reported in this study which is lower than the ICMR-WHO STEPs study self-reported diabetes prevalence was 3.1% in rural areas and was higher to the National Family Health Survey report of 0.4% for women and 0.5% for men among tribal population in India.^[19-21]

Skipping meals is also a major problem in the population. It has been found that 24% in rural and 13% of the population are skipping at least one meal, mostly mid meal due to work in upper reaches, financial reasons, and this was associated with greater odds of being hypertensive and having dyslipidemia. This behavior was reported mostly in young people and gives rise to the growth of NCDs among the population.^[7,15] Poor lifestyle and dietary habits may be responsible for the high prevalence of NCDs that hinders people's quality of life and productivity.^[9]

Although the study had many limitations such as multistage cluster sampling, capture of lesser number of socio-demographic and clinical variables, lack of detail evaluation of health system etc., nonetheless it delivers the first and most comprehensive evidence linking behavioral risk factors with increased occurrence of some of non-communicable diseases in this community. Consequently, it is important to address the results of these behavioral habits that jeopardize health making a case for suitable measure is combined with stronger and sustainable plans to change these behaviors and their use. Accordingly the major strength of the study are: (a) the sample size of target population was sufficient as recommended by WHO, (b) overall risk factor estimates for the age group of 18–70 yr for men and women have not been

affected by this sample size as sample allocation method has been adopted and (c) most of the risk factors as suggested by WHO have been captured. Education is viewed as a standout amongst the most essential and potential instrument for the advancement of society. It is imperative that the causes, circumstances, and consequences of this situation are studied and analyzed in detail in order to design appropriate interventional measures to remedy the current state of affairs for this population.

Conclusion

There is widespread poverty, illiteracy, and lack of basic facilities among the tribal people as compared to the general population. Smoking in any means in this population is very high. Therefore, culturally appropriate tobacco cessation services integrated with health services delivery are urgently required to enhance quit rate in this population. Skipping meals and unhealthy diet were more prevalent among the illiterates which could be resolved by better education. Increasing awareness about NCDs through locally accepted and culturally appropriate strategies need to be implemented in the target areas.

Recommendations

The combination of these key NCD indicators in national health surveys will enhance existing data in order to achieve proper planning and future projections for NCD prevention and control. Significant public health interventions at primary level should be implemented to reduce these exposed behaviors and thereby lower the prevalence of common NCDs risk factors to which they can lead, such as hypertension, dyslipidemia, and thyroid dysfunction. Our findings highlighted the importance of reaching out to these poor communities with messages regarding the impact of hypertension skipping meals, smoking, or tobacco consumption on general health.

Ethical and institutional permission

Ethical issues (Including plagiarism, Informed Consent, data fabrication and/or falsification, redundancy, etc.) have been completely observed by the authors.

Declaration of patient consent

The authors certify that they have obtained all appropriate participant consent forms. The subjects were assured that their names will not be published and due efforts will be made to conceal their identity.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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