

BEHAVIORAL RISK FACTORS OF NON-COMMUNICABLE DISEASES (NCDs) AMONG SECONDARY AND UNDERGRADUATE LEVEL STUDENTS OF KATHMANDU METROPOLITAN CITY

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ABSTRACT

Background: Most NCDs are strongly associated and causally linked with four particular behavioral risk factors: tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol. The prevalence of NCDs is related to unhealthy behaviors and practices typically initiated in adolescence.

Objective: The objective of the study was to assess the occurrence of behavioral risk factors associated with NCDs among secondary and undergraduate level students of Kathmandu Metropolitan City through identification of risk of smoking and alcohol, consumption of fruits and vegetables and level of physical activities.

Materials and Methods: A quantitative cross sectional descriptive study was done from September to December, 2015 among 249 youths of age 14-28 years studying at various school and colleges in Kathmandu Metropolitan city.

Results: The study findings were that 15.6% were smoker, 32.53% alcohol users, 38.96% consumed fruits at least once a day with mean 1.74 serving, 83.53% consumed vegetables at least once a day with mean 2.69 serving, 22.49% and 36.95 % doing vigorous and moderate intensity physical activity at least 3 or more times in a week, 30 minutes at a time. The Chi-square test showed the association of sex of participants, age group of participants, permanent residence, living with family, studying in public and private school/college and family income with different behavioral risk factors.

Conclusion: The study showed high proportions of participants were at risk of developing NCDs. Male were found to be harmful use of alcohol and smoking, and consuming less fruits and vegetables, and female were found to be doing less physical activity. Both male and female were at higher risk, but their behavioral risk seemed to be different according to the sex difference.

Keywords: *Behavioral risk factors, Non-communicable diseases, Youths, Kathmandu*

INTRODUCTION

Common preventable risk factors underlie most of the Non-communicable diseases (NCDs). Most NCDs are strongly associated and causally linked with four particular behaviors: tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol ¹. NCD deaths were projected to increase from 38 million in 2012 to 52 million by 2030. NCD deaths had increased the most in the WHO South-East Asia Region, from 6.7 million in 2000 to 8.5 million in 2012 ². South Asian region was estimated to have NCDs attributed to about 72% of all deaths by 2030 ³. In Nepal, percentage of deaths due to NCDs to total deaths from all causes was 60% and probability of premature death attributed to NCDs was 22% ⁴. The adult risk factors of tobacco smoking was 30% and 2% were using alcohol ⁵. In Nepal, almost all (99%) consumed less than five servings of fruits and vegetables combined on an average day and 3% had low physical activity ⁶.

The prevalence of NCDs is related to unhealthy behaviors and practices typically initiated in adolescence. Research indicated that behaviors associated with two of the key risk factors for NCDs—tobacco and alcohol use—were likely to start or become established during adolescence. Young people who began drinking in their early teens were more likely to become dependent on alcohol within 10 years than those who began drinking in their late teens and early 20s. Other risk factors related to poor diet and insufficient physical activity may begin during childhood, but adolescence was identified as an opportunity to reinforce the benefits of positive behaviors through appropriate messages and programs ³. The study on secondary and undergraduate level students of Kathmandu Metropolitan City and its findings could be helpful to obtain picture about youth related to NCDs and in the pursuit of having healthy and productive youths. The objective of the study was to assess the occurrence of behavioral risk factors associated with NCDs among secondary and undergraduate level students of Kathmandu Metropolitan City.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted among students studying at schools and colleges of Kathmandu Metropolitan City from Sep to Dec 2015. The sample size of the study was 249. The samples were selected using stratified random sampling technique from the list of selected grades e.g. nine to bachelor level at various schools and colleges of Kathmandu Metropolitan City. The eight school and colleges were randomly selected. The self-administered written questionnaire was used to collect data. Before distribution of tool, researcher explained the objectives, rules of questionnaire filling, completeness and consent (Verbal and written consent was taken).

All the independent and dependent variables were analyzed in descriptive form. The socio-demographic variables were listed and compared to dependent variables using Chi-square test.

Data was processed through IBM SPSS-20, MS Excel and analyzed. Ethical clearance letter was obtained from Institutional Review Committee on Jan 26, 2015 for the conduction of this study. Respondents were informed about the objectives of the study and instructions were explained clearly. Privacy and anonymity were maintained by using different code number for each respondent. Confidentiality was maintained by not disclosing the information with anybody. None of the respondents were forced to participate or provide information. As the self-administered questionnaire was used, the information bias by respondents may affect the study findings. For the students who could not participate because they were absent were not followed up, rather excluded from the study.

RESULTS

Out of 249 study participants, 140 were male and 109 female. There were 118 participants of age group 14-19 years and 131 participants of age group 20-28 years. The socio-demographic characteristics of participants is illustrated in [Table 1: Distribution of socio demographic characteristics of participants].

Among 249 participants, 15.66 % were current smokers and 4.82 % ex-smoker. Among current smokers, 74.36 % of participants smoked less than 10 stick/times per day. The 32.53% of participants were currently consuming alcohol and 62.65% never consumed alcohol. The details of smoking status and alcohol consumption is shown in [Table 2]. Distribution of diet and physical activity related characteristics of participants is shown in [Table 3]. Only 38.96% of participants consumed fruits at least once a day, similarly 83.53% of participants consumed vegetables at least once a day. The mean number of servings of fruits was 1.74 with sd 1.066 and the mean number of servings of vegetables was 2.69 with sd 1.106. The percentage of participants doing vigorous intensity activities at least 3 or more than 3 times a week, 30 min at a time was 22.49, with 16.87 doing 1 or 2 times a week, 30 min at a time. Similarly, the percentage of participants doing moderate intensity activities at least 3 or more than 3 times a week, 30 min at a time was 36.95, with 30.92 doing 1 or 2 times a week, 30 min at a time.

Table 1: Distribution of socio demographic characteristics of participants

	n=249	
Characteristics	Number	Percentage
Sex		
Male	140	56.22
Female	109	43.78
Age		
14-19 years	118	47.39
20-28 years	131	52.61
Ethnicity		
Brahmin	87	34.94
Chettri	81	32.53
Janajati	57	22.89
Dalit	3	1.20
Other	21	8.43
Religion		
Hindu	228	91.57
Buddhist	14	5.62
Christian	3	1.20
Other	4	1.61
Permanent Residence		
Inside valley	99	39.76
Outside valley	150	60.24
Living with		
Family	177	71.08
Relatives	29	11.65
Friends	24	9.64
Alone	19	7.63
College type		
Public	82	32.93
Private	167	67.07
Family's monthly income (in Nepali Rupees)		
< 20,000	84	33.73
20,000 – 40,000	74	29.72
40,000 – 60,000	52	20.88
> 60,000	39	15.66

**Table 2: Distribution of smoking and alcohol consumption characteristics of participants
n=249**

Characteristics	Number	Percentage
Smoking status		
Ex-smoker	12	4.82
Never smoker	198	79.52
Current smoker	39	15.66
Frequency of smoking among current smokers (n=39)		
Non daily smoker	6	15.38
Less than 10 stick/times per day	29	74.36
10 - 20 stick/times per day	1	2.56
More than 20 stick/times per day	3	7.69
Alcohol consumption		
Never	156	62.65
Ex-user	12	4.82
Current user	81	32.53
Frequency of alcohol consumption among current users (n=81)		
5-6 days per week	4	4.94
3-4 days per week	3	3.70
1-2 days per week	7	8.64
1-3 days per month	18	22.22
Less than once a month	49	60.49

The Chi-square test was used to test association between independent and dependent variables with p-value less than 0.05 to be accepted as significantly significant. Sex of the participants was found to be associated with smoking status (p-value <0.001), alcohol consumption (p-value <0.001), frequency of consumption of fruits (p-value 0.013) and frequency of vigorous (p-value <0.001) and moderate (p-value 0.008) intensity activities. Age group was found to be associated with smoking status (p-value <0.001), alcohol consumption (p-value <0.001), frequency of consumption of fruits (p-value 0.004) and frequency of vigorous intensity activities (p-value 0.033). Permanent residence was found to be associated with frequency of consumption of fruits (p-value 0.008) and vegetables (p-value 0.005). Living with family was found associated with frequency of consumption of fruits (p-value 0.01) and frequency of vigorous (p-value 0.044) and moderate (p-value 0.002) intensity activities. College type was found to be associated with smoking status (p-value 0.01), frequency of consumption of vegetables (p-value 0.001) and frequency of moderate intensity activities (p-value 0.025). Family's monthly income was found to

be associated with frequency of consumption of vegetables (p-value 0.004). The details of the Chi square test is shown in [Table 4] and [Table 5].

Table 3: Distribution of diet and physical activity related characteristics of participants

n=249

Characteristics	Number	Percentage
Frequency of consumption of fruits		
At least once a day	97	38.96
2 or 3 times a week	100	40.16
Once in a week	22	8.84
2 or 3 times in a month	10	4.02
Once in a month	4	1.61
Rarely	16	6.43
<i>(Mean number of servings = 1.74, s d = 1.066)</i>		
Frequency of consumption of vegetables		
At least once a day	208	83.53
2 or 3 times a week	31	12.45
Once in a week	2	0.80
2 or 3 times in a month	1	0.40
Once in a month	1	0.40
Rarely	6	2.41
<i>(Mean number of servings = 2.69, s d = 1.106)</i>		
Frequency of vigorous intensity activities		
At least 3 or more than 3 times a week, 30 min at a time	56	22.49
1 or 2 times a week, 30 min at a time	42	16.87
1 or 2 times a month, 30 min at a time	57	22.89
Less than once in a month, 30 min at a time	94	37.75
Frequency of moderate intensity activities		
At least 3 or more than 3 times a week, 30 min at a time	92	36.95
1 or 2 times a week, 30 min at a time	77	30.92
1 or 2 times a month, 30 min at a time	35	14.06
Less than once in a month, 30 min at a time	45	18.07

Table 4: Details of Chi square test between distribution of socio-demographic characteristics and smoking status, alcohol consumption and frequency of fruit consumption characteristics of participants

n=249

	Smoking status			Alcohol consumption			Frequency of consumption of fruits		
	Current user n (%)	Current non user n (%)	p-value	Current user n (%)	Current non user n (%)	p-value	At least once a day n (%)	Less than once a day n (%)	p-value
Sex									
Male	33 (23.6)	107 (76.4)	<0.001	73 (52.1)	67 (47.9)	<0.001	45 (32.1)	95 (67.9)	0.013
Female	6 (5.5)	103 (94.5)		8 (7.3)	101 (92.7)		52 (47.7)	57 (52.3)	
Age									
14-19 years	8 (6.8)	110 (93.2)	<0.001	16 (13.6)	102 (86.4)	<0.001	57 (48.3)	61 (51.7)	0.004
20-28 years	31 (23.7)	100 (76.3)		65 (49.6)	66 (50.4)		40 (30.5)	91 (69.5)	
Permanent Residence									
Inside valley	17 (17.2)	82 (82.8)	0.598	30 (30.3)	69 (69.7)	0.582	49 (49.5)	50 (50.5)	0.008
Outside valley	22 (14.7)	128 (85.3)		51 (34.0)	99 (66.0)		48 (32.0)	102 (68.0)	
Living with									
Family	25 (14.1)	152 (85.9)	0.337	55 (31.1)	122 (68.9)	0.458	78 (44.1)	99 (55.9)	0.01
Others	14 (19.4)	58 (80.6)		26 (36.1)	46 (63.9)		19 (26.4)	53 (73.6)	
College type									
Public	20 (24.4)	62 (75.6)	0.01	28 (34.1)	54 (65.9)	0.774	26 (31.7)	56 (68.3)	0.128
Private	19 (11.4)	148 (88.6)		53 (31.7)	114 (68.3)		71 (42.5)	96 (57.8)	
Family's monthly income (NRS)									
< 40,000	27 (17.1)	131 (82.9)	0.472	47 (29.7)	111 (70.3)	0.261	55 (34.8)	103 (65.2)	0.081
≥ 40,000	12 (13.2)	79 (86.8)		34 (37.4)	57 (62.6)		42 (46.2)	49 (53.8)	

Table 5: Details of Chi square test between distribution of socio-demographic characteristics and frequency of vegetables consumption and frequency of vigorous and moderate intensity activities characteristics of participants

n=249

	Frequency of consumption of vegetables			Frequency of vigorous intensity activities (30 min at a time)			Frequency of moderate intensity activities (30 min at a time)		
	At least once a day	Less than once a day	p-value	At least 3 or more than 3 times a week	Less than 3 times a week	p-value	At least 3 or more than 3 times a week	Less than 3 times a week	p-value
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
Sex									
Male	111 (79.3)	29 (20.7)	0.057	46 (32.9)	94 (67.1)	<0.001	62 (44.3)	78 (55.7)	0.008
Female	97 (89.0)	12 (11.0)		10 (9.2)	99 (90.8)		30 (27.5)	79 (72.5)	
Age									
14-19 years	103 (87.3)	15 (12.7)	0.171	34 (28.8)	84 (71.2)	0.033	43 (36.4)	75 (63.6)	0.896
20-28 years	105 (80.2)	26 (19.8)		22 (16.8)	109 (83.2)		49 (37.4)	82 (62.6)	
Permanent Residence									
Inside valley	91 (91.9)	8 (8.1)	0.005	21 (21.2)	78 (78.8)	0.758	42 (42.4)	57 (57.6)	0.180
Outside valley	117 (78.0)	33 (22.0)		35 (23.3)	115 (76.7)		50 (33.3)	100 (66.7)	
Living with									
Family	151 (85.3)	26 (14.7)	0.26	46 (26.0)	131 (74.0)	0.044	76 (42.9)	101 (57.1)	0.002
Others	57 (79.2)	15 (20.8)		10 (13.9)	62 (86.1)		16 (22.2)	56 (77.8)	
College									
Public	59 (72.0)	23 (28.0)	0.001	20 (24.4)	62 (75.6)	0.63	22 (26.8)	60 (73.2)	0.025
Private	149 (89.2)	18 (10.8)		36 (21.6)	131 (78.4)		70 (41.9)	97 (58.1)	
Family monthly income									
< 40,000	124 (78.5)	34 (21.5)	0.004	32 (20.3)	126 (79.7)	0.274	53 (33.5)	105 (66.5)	0.173
≥ 40,000	84 (92.3)	7 (7.7)		24 (26.4)	67 (73.6)		39 (42.9)	52 (57.1)	

DISCUSSION

Out of total study participants, 15.66 % of youths were found to be currently smoking. The national STEPS survey showed 11.4% of age 15-29 smoking or using tobacco⁷, the study showed similar result. The two study among adolescents of Chitwan district however showed higher use of smoking i.e. 31.5 %⁸ and 26.55%⁹. This possibly showed adolescents use excess of smoking or tobacco among youth groups. The study of 14-17 years adolescents from Pakistan showed 14.3% adolescents were currently smoking¹⁰. The use of alcohol by youths of Kathmandu district was at 32.53%. The national surveys showed only 2% of harmful alcohol consumption⁷, while the study among adolescents of Nepal showed the use rate of 22.5 %⁸ and 19.91%⁹. The study from Myanmar also showed 34.5 % youths consumed alcohol¹¹. The study showed only 38.96% youths consumed fruits at least once a day with mean serving of only 1.74. Similarly, 83.53% of youths consumed vegetables at least once a day with mean serving of 2.69. The combined serving of fruits and vegetables was 4.43. The daily recommended serving of both fruits and vegetable was 4 each. The national data showed 99% with inadequate consumption of fruits and vegetables⁷. Only 22.49% of youths were engaged in vigorous intensity physical activity and 36.95% were engaged in moderate intensity physical activities, 30 minutes at a time for 3 or more than 3 days in a week. The similar study among adolescents showed 31.12 % in moderate activity and 8.71% in vigorous activity⁹, of minimum requirement recommended to prevent NCDs. The study from India shows 25.66 % youths were engaged in vigorous intensity physical activity 3 or more days, 60 minutes at a time and 22.3 % youths were engaged in moderate intensity physical activity 5 or more days 30 minutes at a time¹².

Males were found to be more associated with smoking (p value <0.001) and use of alcohol (p value <0.001). Another study among adolescents of Chitwan showed 38.01% male and only 15% female using tobacco, likewise 28.92 % male and only 10.83% female consuming alcohol⁹. The study of young black South Africans also showed that 21.6 % male were daily/occasional smokers and 1% female were daily/occasional smokers¹³. The study among Brazilian adolescents also showed male were more associated with alcohol consumption than female¹⁴. This showed male youths were at risk of high consumption of tobacco products and alcohol. Also, males were associated with less consumption of at least once in a day of fruits (p value 0.013). The study of Brazil shows that among youths of age 18-24 years, 28.5% female consumed fruits daily and 40.9% female consumed vegetables daily while 25.4% male consumed fruits daily and 32.8% male consumed vegetables daily¹⁵. This shows the male were at high risk of smoking, alcohol and diet related risk factors. Similarly, the study showed female were less likely to do moderate (p value 0.008) and vigorous (p value <0.001) intensity physical activities at least 30 minutes at a time, 3 or more than 3 day in a week. The national study showed more male with low physical activity (5%) than female (2%)⁷. While the study among adolescents of Chitwan district showed similar result with 20% male and only 5% female engaged in highly physical active life⁸. The result showed the

disparity in physical activity level between overall population and youths. Although, in overall population female did more physical activities but at youth age females were at high risk in physical activity related risk factor.

The study participants with permanent residence outside the valley were found to consume less amount of fruits (p value 0.008) and vegetables (p value 0.005). The study participants with permanent residence outside valley were at high risk of developing NCDs. The association may be due to weak economy or due to no supervision for youths by parents of family to encourage consuming more fruits and vegetables. The study participants not living with family were also found to consume less fruits (p value 0.01) than those living with family in Kathmandu. The participants living with family were associated in doing more vigorous (p value 0.044) and moderate (p value 0.002) intensity activities than youth not living with family. The possible explanation may be, participants living with family are involved in some household chores or other activities that makes them to do adequate physical activity. Hence the participants not living with family consumed less fruits and engaged in less amount of physical activity. This shows the participants not living with family and youths with permanent residence outside Kathmandu district were at more risk of developing NCDs. The students of public educational institution were found to be at high risk of smoking (p value 0.01) than of private institutes. Also, the students of public institution consume less vegetables (p value 0.001) at least once a day and did less moderate intensity physical activities (p value 0.025). This showed the participants studying in public schools and college smoke more and consumes less vegetable at least once a day. The chi square test showed the association of monthly income of family, with income less than 40,000 and 40,000 or more, to consumption of vegetable. The family with monthly income less than 40,000 rupees were less likely to consume vegetables (p value 0.004) than those of family with monthly income RS. 40,000 or more. A study in Kerala also showed that low socio-economic background was found to be a high predictor (high risk group) for habit of unhealthy diet¹⁶. The economic status directly affects the adequate consumption of fruits and vegetables or at least once day of consumption of fruits and vegetables.

CONCLUSION

The study showed high proportions of secondary and undergraduate level students of Kathmandu Metropolitan city were at risk of developing NCDs. Many participants were currently smoking (15.66%), currently used alcohol (32.53%), consuming less fruits (38.96%) and vegetables (83.53%) at least once in a day. The median serving of fruits (1.74) and vegetables (2.69) was also low than the daily requirement. Similarly, low number of participants did adequate vigorous (22.49%) and moderate (36.95%) intensity physical activities. The participants with permanent residence out of Kathmandu district, not living with the family, studying in public institution and with low family income were found to be at increased behavioral related risk of developing NCDs.

Male were found to be using more alcohol and smoking and consuming less fruits and vegetables and female were found to be doing less physical activity. Both male and female were at high risk, but their behavioral risks seemed to be different according to the sex difference. The secondary and undergraduate level students of Kathmandu Metropolitan city need to be encouraged to stop smoking and alcohol, start consuming more vegetables and fruits and start engaging in more physical activities. Female, students with permanent residence out of Kathmandu district, not living with family, studying in public institution and students from low family income should be focus of such efforts.

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