Cardiovascular health risk behaviors among college students of Pokhara, Nepal

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Abstract

Introduction: Cardiovascular diseases (CVDs) are the leading cause of death globally, taking an estimated 17.9 million lives each year. However, most cardiovascular diseases can be prevented by addressing behavioral risk factors. This study aimed to identify cardiovascular health risk behaviors among college students of Pokhara.

Method: Descriptive, cross-sectional, a web-based study was conducted among 390 college students of Pokhara from 10 June to 30 July 2021. An online self-administered structured questionnaire was used for data collection using purposive and snowball sampling techniques. The collected data were analyzed using descriptive (frequency, percentage, mean, standard deviation) and inferential statistics (Chi-square).

Result: In this study, smoking, tobacco use, and alcohol consumption were present among 33(8.5%), 13(3.3%), and 45(11.5%) respondents respectively. Further consumption of junk food was found among 349(89.5%) followed by screen time of more than two hours among 300(76.9%) respondents. A statistically significant association was found in age (p=0.17) and gender (p<0.001) with smoking. Similarly, a statistically significant association was found in gender (p<0.001) with tobacco use and in age (p=0.028), gender (p<0.001), education (p=0.026), and family type (p=0.009) with alcohol consumption.

Conclusion: Cardiovascular health risk behaviors such as smoking, tobacco use, and alcohol intake were found more among male students. Further consumption of junk food and screen time of more than two hours was found among most college students.

Keywords: cardiovascular, college students, health, risk behavior

Introduction

Cardiovascular diseases (CVD) are the number one cause of death, representing 32% of all global deaths.[1] More than four out of five CVD deaths are due to myocardial infarction (MI) and strokes that can affect people at any age.[2] Lifestyle factors such as smoking, substance abuse, physical inactivity, unhealthy diet, harmful use of alcohol, overweight, and obesity are the major risk factors in its occurrence.[1,3] With rapid economic development and increasing westernization of lifestyle, the prevalence of these diseases has reached alarming proportions.[4]

Further college life is a critical time whereby student experience several challenges; such as academic challenges, changes in the environment, new social networks, and autonomy. Some of them adapt to these changes in a healthy way, while others may not.[5,6] Additionally this period is characterized by exploring alternatives along with high susceptibility to media and friends. Therefore, students are prone to engage in behaviors that are associated with increased risk of chronic disease, premature mortality, and disability along with the negative impact on their physical and mental health.[7,8] Moreover some of the inappropriate behaviors established during this period can even continue into adulthood and can directly affect immediate as well as long-term health.[8,9]

However, most cardiovascular diseases can be prevented by addressing behavioral risk factors. Identifying and controlling these factors early will help to reduce the risk of developing heart disease as an adult.[10] This study aimed to assess cardiovascular health risk behaviors among college students of Pokhara.

Method

A descriptive, cross-sectional, web-based study was conducted among the college students of Pokhara from 10 June to 30 July 2021. A minimum required sample size of 308 was determined based on the prevalence of cardiovascular risk factor present among 76.9% of adolescents in Nepalgunj[11], using Cochran's formula.[12] However 390 samples were included in the study adding up to 20% non-response and/or incomplete data. College students who had internet access and voluntarily agreed to participate in the study were selected using purposive and snowball sampling techniques.

An online self-administered structured questionnaire was used for data collection. The tool included two parts: Part I included nine questions related to socio-demographic characteristics, which comprised age, gender, education, residence, ethnicity, religion, type of family, presence of chronic disease, and family history of chronic illness, and part II included nine structured behavior related questions which were developed by the researchers through literature review. In this study, cardiovascular health risk behavior included assessment for alcohol, smoking, and tobacco use, physical activities, and consumption of fruits, vegetables, and fast foods. Alcohol, smoking, and tobacco use were considered present if the participants had a habit of taking them until the past 30 days of data collection. Consumption of fruits, vegetables, and fast foods was assessed for the last seven days.

The validity of the instrument was established by reviewing the related literature and consultation with peers and subject matter experts. The reliability of the instrument was maintained by administering the instrument to 30(10%) adolescents which were not included in the main study. The tool was prepared in google forms and then the link was sent to respondents who were connected with the researchers through social media and asked them to forward the link who met inclusion criteria. However, the students studying health subjects were excluded by creating an automated setting in the form.

The data were collected after obtaining ethical approval from the Institutional Review Committee of Manipal Teaching Hospital

(MTH), Phulbari, Pokhara (MEMG/445/IRC). Informed consent was taken from each respondent by describing the study title and objectives of the study on the initial page of the google form and creating an automated setting, whereby further questions were accessible only after voluntary approval of the respondents. The average time taken to complete the form was 12-15 minutes. Confidentiality and anonymity of the data were maintained.

The collected data were edited and coded in the google sheet and then imported to IBMSPSS Software Version 16 for analysis. Descriptive statistics such as frequency, percentage, mean and standard deviation were used. The Chi-square test was used to find out the association between selected socio-demographic characteristics with the cardiovascular health risk behaviors. The level of significance was considered at $p < 0.05$.

Result

The findings of the study demonstrated that most of the respondents 272(69.7%) were from the age group 15-20 y with a mean age of 19.39±2.34 y. Among them 238(61%) were female and 208(53.3%) had an educational qualification of intermediate level. Almost two third of the respondents 246(63.1%) were permanent residents and 288(73.8%) were from a nuclear family. Regarding religion 316(81%) were Hindu and 226(57.9%) belong to the upper caste group. The majority of them 371(95.1%) gave no history of chronic illness and 190(48.7%) reported a family history of chronic illness, Table 1.

In this study, we found that smoking, tobacco use, and alcohol consumption were present among 33(8.5%), 13(3.3%), and 45(11.5%) of the respondents respectively, Table 2. Friends were reported as a major influencing factor for smoking among 26(78.7%), tobacco use among 9(69.23%), and alcohol consumption among 33(73.33%), Table 2.1.

Regarding food consumption patterns, daily fruit consumption was present among 124(31.8%) and daily vegetable consumption was present among 275(70.5%). Additionally, daily junk food consumption was present among 53(13.6%) respondents in the present study, Table 3.

Table 1. Socio-demographic characteristics of college students of Pokhara (N=390)			
Characteristics	Categories	Number	Percentage
Age (in years)	15-20	272	69.7
	21and above	118	30.3
Age y mean±S.D.	19.39±2.34 (range 15-25)		
Gender	Female	238	61.0
	Male	152	39.0
Education	Intermediate	208	53.3
	Bachelor	182	46.7
Residence	Permanent	246	63.1
	Temporary	144	36.9
Ethnicity	Upper caste	226	57.9
	Janajati	145	37.2
	Dalit	19	4.9
Religion	Hindu	316	81.0
	Buddhist	64	16.4
	Others	10	2.6
Family	Joint	102	26.2
	Nuclear	288	73.8
Chronic disease	No	371	95.1
	Yes	19	4.9
Family history of chronic illness	No	200	51.3
	Yes	190	48.7

Table 2. Cardiovascular health risk behaviors of college students of Pokhara: toxic substance consumption (N=390)

Behaviors	Frequency	Percentage
Smoking	33	8.5
Tobacco use	13	3.3
Alcohol	45	11.5

Table 2.1. Influencing factor for toxic substance consumption among college students of Pokhara (N=64)

Factors	Behaviors		
	Smoking	Tobacco use	Alcohol consumption
Friends	26(78.7)	9(69.23)	33(73.33)
Media	3(9.09)	1(7.69)	2(4.44)
Family/relatives	3(9.09)	2(15.38)	9(20)
Seniors	1(3.03)	1(7.69)	1(2.22)

Table 3. Food consumption pattern among college students of Pokhara (N=390)

Food consumption	Frequency	Percentage
Fruits		
Daily	124	31.8
≥3 d	148	37.9
<3 d	96	24.6
Not at all	22	5.6
Vegetables		
Daily	275	70.5
≥3 d	89	22.8
<3 d	20	5.1
Not at all	6	1.5
Junk food		
Daily	53	13.6
≥3 d	128	32.8
<3 d	168	43.1
Not at all	41	10.5

Table 4. Physical activity and sedentary among college students of Pokhara (N=390)

Behavior	Frequency	Percentage
Participation in outdoor sports		
No	210	53.8
Yes	180	46.2
Moderate to vigorous activity		
Not at all	69	17.7
At least 30 m	185	47.4
At least 60 m and more	136	34.8
Screen time/d		
≤1 h	23	5.9
>1-2 h	67	17.2
>2 h	300	76.9

In this study, 180(46.2%) were found to be involved in outdoor sports. Additionally, only 136(34.8%) were engaged in moderate to vigorous activities for at least 60 minutes and more in a day. Further screen time of more than two hours was reported among 300(76.9%) respondents, Table 4.

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Table 5. Association of Socio-demographic Variables with Toxic Substance Consumption among College Students of Pokhara (N=390)

Variables	Smoking		Tobacco use		Alcohol	
	Yes	No	Yes	No	Yes	No
Age						
15-20	17	255	7	265	25	247
21 and above	16	102	6	112	20	98
p-value		0 .017*		0.33		0.028*
Gender						
Female	5	233	1	237	16	222
Male	28	124	12	140	29	123
p-value		<0.001*		<0.001*		<0.001*
Education						
Intermediate	16	192	7	201	17	191
Bachelor	17	165	6	176	28	154
p-value		0.56		0.97		0.026*
Religion						
Hindu	26	290	9	307	34	282
Buddhist	4	60	2	62	10	54
Others	3	7	2	8	1	9
p-value		0.116		0.11		0.55
Family						
Joint	9	93	5	97	19	83
Nuclear	24	264	8	280	26	262
p-value		0.879		0.48		0.009*
Chronic illness						
No	31	340	12	359	41	330
Yes	2	17	1	18	4	15
p-value		0.740		1.0		0.33

*Statistically significant at p<0.05

In this study, a statistically significant association was found between age (p=0.17) and gender (p<0.001) with smoking. Similarly, a statistically significant association was found in gender (p<0.001) with tobacco use and in age (p=0.028), gender (p<0.001), education (p=0.026), and family type (p=0.009) with alcohol consumption, Table 5.

Discussion

The present study conducted to find out cardiovascular health risk behaviors among college students of Pokhara found alcohol intake among 45(11.5%) college students which are comparable to the findings of a previous study from Lekhnath (16%).[13] However this finding is slightly higher than that of a study from Nepalgunj (6.9%).[11] This might be due to variation in sample characteristics as alcohol consumption is found to be more common among late adolescents and high-standard students.[13] In the above-mentioned study even the school students were included whereas in our study college students are included. In contrast to these findings, 33.5% declared consuming alcohol in a study from Lebanon.[14] These differences can be attributed to variations in sociocultural practices.

This study found that smoking was present among 33(8.5%) of the respondents which are lower than the findings of a study from Lebanon (19%) and Iran (18.5%). [7,15] This might be possibly due to the cultural variation of different countries. However, this finding is in accordance with a study conducted in Nepalgunj (8.4%).[11]

Further tobacco use was found among only 13(3.3%) of the students in our study. Which is lower than that of findings from Nepalgunj (8.4%)[11] and Lekhnath (26%).[13] This could be possibly due to differences in the tool of data

collection as in our study, smoking and tobacco use are addressed separately, whereas in the above-mentioned studies both are kept together.

In this study, friends were reported as a major influencing factor for smoking among 26(78.7%). This finding is in line with a previous study from Nepal whereby cigarette smoking by friends was the major reason behind smoking among 68.6%[16] since adolescents is a period when they want to feel accepted and valued by their friends. So their behavior is shaped by peer influence.[17] However, these findings suggest the need to focus on prevention strategies such as health education, awareness, and health promotion to prevent its detrimental effect on their health as well as academic performance.

Regarding food consumption, only 124(31.8%) reported having a daily intake of fruits in this study, which is slightly higher than that of a study from Malaysia (18%).[18] In contrast to these findings, 67.3% of Lebanon reported having daily consumption of fruits.[14] Further daily consumption of vegetables was found among 275(70.5%) of the respondents in the present study. Whereas in a study from Lebanon and Malaysia, only 31.8% and 42.5% respectively reported daily intake of vegetables.[14,18] This disparity can be due to variations in food practices, availability, and health awareness. In addition to this daily consumption of junk food was found among 53(13.6%) in our study. However, only 1% reported having daily consumption of junk food among university students in Malaysia.[18] In contrast to these findings, 83.1% stated consumption of soft drinks and fast food one or more times a day in a study from Lekhnath.[13] This implies the need for health education and awareness among college students regarding dietary habits to promote their health since eating junk food regularly can lead to obesity and chronic diseases like cardiovascular disease, type 2 diabetes, liver disease, and cancers.[19]

Regarding physical activity, only 180(46.2%) were reported to be involved in outdoor sports which is in line with a previous study (40-45%)[20], but this finding is slightly lower than the study of Lebanon (58.9%).[14] Since the variation in the context of a study conducted can be the reason for these differences as the present study was conducted during the Covid-19 pandemic. Further screen time of more than two hours was found among 300(76.9%) of the respondents, which is higher than that of a previous study, where computer stay of more than two hours was found among 50.4% of students.[14] Since the use of digital devices for online learning, completing schoolwork and staying in touch with friends and family during the pandemic could be the reason for the increase in screen time.[21] Even though, this finding is very alarming as prolonged screen time can lead to obesity, sleep problems, physical strain on eyes and body, depression, and anxiety in children.[22] Therefore, there is a need to create a conducive environment at home as well as in college for making healthy choices through access to sports and extracurricular activities.

In this study, a statistically significant association was found in age (p=0.17) with smoking as smoking was found more among the 21y and above group. This finding is supported by a previous study whereby tobacco use was found higher among late adolescents.[13] Further statistically significant associations were found in gender with smoking (p<0.001) and tobacco use (p<0.001). These findings are in accordance with other studies from Nepal and India, whereby tobacco use was found more among boys than girls.[13,23]

This study found a statistically significant association in age (p=0.028), gender (p<0.001), and education (p=0.026) with alcohol consumption. Alcohol intake was more among 21 y and above age group, male and bachelor-level students. These findings are consistent with the finding of a previous study in India, whereby alcohol use was significantly increased with an increased level of education and male students.[23] However no association was found in the level of

education with alcohol intake in another study from Nepal.[13]

The limitation of this study is that due to the pandemic situation only those who had internet access were included in the study and also the information was based on self-reporting, so there is the possibility of answers having socially desirable response bias. Regarding food consumption pattern, a serving of fruits and vegetables are also important, which is not included in our study.

Conclusion

The study concludes that cardiovascular health risk behaviors such as smoking, tobacco use, and alcohol intake were more among male students. Similarly, smoking and alcohol intake were more among older age students. Educational level and family type were also found to be associated with alcohol consumption. Whereby friends were identified as a major influencing factor for such behavior. Further consumption of junk food along with screen time of more than two hours was reported among three fourth of the students in this study.

Author Contribution
Concept, design, planning: KS, CS; Literature review: KS; Data collection/analysis: KS, NS, GP; Draft manuscript: All; Revision of draft: All; Final manuscript: All; Accountability of the work: All.

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Supplements

Self-Administered Questionnaire Schedule

PART I: SOCIO-DEMOGRAPHIC CHARACTERISTICS
1. Age in years (completed years):………….
2. Gender
a. Male   b. Female   c. Others
3. Educational level
    a)   Intermediate level   b) Bachelor level
4. Residence:
    a)   Permanent residents of Pokhara   b) Temporary residents of Pokhara
5. Ethnicity
    a)   Dalit   b) Janajati   c) Upper caste groups (Brahmin, chetri, thakuri)
6. Religion
    a)   Hindu   b) Buddhist   c) Muslim   d) Christian
7. Type of family
    a)   Joint   b) Nuclear
8. Do you have any chronic illness such as diabetes, asthma, heart disease, kidney disease, skin disease etc?
    a)   Yes   b) No
8.1 If yes, what chronic disease do you have? (please mention) ....
9. Do you have any family history of cardiovascular disease such as high blood pressure, heart attack, angina, high cholesterol etc?
    a)   Yes   b) No

PART-II: CARDIOVASCULAR HEALTH RISK BEHAVIOURS RELATED QUESTIONS

A. **Questions Related to toxic substance consumption: smoking, tobacco use and alcohol consumption**

1. Do you currently or within past 30 days smoked any tobacco products such as cigarette, bidi, cigar etc?
a. Yes   b. No

If yes, please answer the following questions.
1.1 From whom you were influenced to start smoking?
  a. Friends
  b. Media (TV, movies, magazines etc)
  c. Family members
  d. Seniors in school/College
  e. Relatives/ neighbours
  f. Other specify…………

2. Do you currently or within past 30 days used any smokeless tobacco products such as [Khaini, Surti, Gutkha, Pan masala, etc]?
a. Yes   b. No

If yes, please answer the following questions.
2.1 From whom you were influenced to start smokeless tobacco products?
  a. Friends
  b. Media (TV, movies, magazines etc.)
  c. Family members
  d. Seniors in school/College
  e. Relatives/ neighbours
  f. Other specify…………

3. Do you currently or within past 30 days consumed any alcoholic drink such as beer, wine, whiskey, brandy, local wine etc?
a. Yes   b. No

If yes, please answer the following questions.
3.1 From whom you were influenced to start alcohol consumption?
  a) Friends
  b) Media (TV, movies, magazines etc.)
  c) Family members
  d) Seniors in school/College
  e) Relatives/ neighbours
  f) Other specify…………

B. Questions Related to Dietary Habits.

4. How often did you have fruits in the past 7 days?
  a) Daily
  b) 3 or more than 3 days in a week
  c) Less than 3 days in a week
  d) Did not have at all.

5. How often did you have vegetables in the past 7 days?
  a) Daily
  b) 3 or more than 3 days in a week
  c) Less than 3 days in a week
  d) Did not have at all.

6. How often did you have junk food high in salt such as noodles, Lays, Kurkure, salty biscuit, dry meat, Titaura, preserved pickle, bhujia, papad in the past 7 days?
   a) Daily
   b) 3 or more than 3 days in a week
   c) Less than 3 days in a week
   d) Did not have at all

C. Questions Related to Physical Activity.

7. Are you engaged in any type of physical activities such as running, cycling, swimming, playing games such as football, volleyball, basketball, cricket etc. in the past 30 days?
a. Yes   b. No

If yes, please answer the following questions.
7.1 How often you are engaged in such activities in a week?
   a. Very rarely
   b. At least 2 days in a week
   c. At least 3 days and more in a week.
   d. Daily

8. For how long you are engaged in moderate to vigorous intensity activities such as walking, dancing, gardening, doing household chores, running, cycling, swimming, playing games such as football, volleyball, basketball, cricket, karate etc. in a day?
   a) At least 30 minutes
   b) At least 60 minutes
   c) More than 60 minutes
   d) Not at all

9. How much time do you spend on watching television, laptop, and playing mobile in a day (24 hours)?
   a) Less than 1 hour
   b) Approximately 1 hour
   c) Approximately $1^{1/2}$ to 2 hours
   d) More than this