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Knowledge of Non-Communicable Diseases among School Going Adolescents in Kathmandu

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Abstract

This study employed a descriptive cross-sectional design to assess knowledge of non-communicable diseases (NCDs) among adolescents aged 14–19 years (grades 9–12) at Mahindra Rastriya Secondary School in Kathmandu. The school was selected using simple random sampling, and complete enumeration was used for sample selection. A total of 209 respondents were surveyed through face-to-face interviews using a structured questionnaire. Descriptive and inferential statistics were applied in data analysis. Results showed that over 54% of respondents had adequate knowledge of NCDs, with greater awareness of diabetes and cardiovascular diseases. However, knowledge of cancer and chronic respiratory diseases was limited. Although awareness of cardiovascular diseases was relatively higher, only one-third of respondents were familiar with major risk factors. Rural adolescents demonstrated higher levels of knowledge, although no significant associations with socio-demographic factors were observed—contrary to findings in other studies. The study highlights gaps in adolescents' knowledge of NCDs and recommends targeted health education interventions, as well as further research into socio-demographic influences, to enhance awareness and reduce the future burden of NCDs.

Keywords: adolescent, non-communicable diseases, knowledge

Introduction

Adolescence, a critical stage between childhood and adulthood, is marked by significant physical, emotional, and cognitive changes (UNICEF, 2018). This developmental period is characterized by rapid brain growth, equipping adolescents with advanced cognitive skills that support their pursuit of independence and autonomy (Wen et al., 2023). The World Health Organization (WHO, 1965) defines adolescents as individuals aged 10 to 19 years. Globally, there are approximately 1.3 billion adolescents, accounting for 16 percent of the world's population (UNICEF, 2024). In Nepal, adolescents in this age group represent 20.15 percent of the total population (CBS, 2021).

Non-communicable diseases (NCDs) pose a major global health challenge and are now the leading cause of death worldwide. According to the World Health Organization (2016), NCDs were responsible for 71 percent of global deaths. Alarmingly, 78 percent of these occurred in low- and middle-income countries, with 85 percent classified as premature. Major NCDs include cardiovascular diseases (17.9 million deaths, 44 percent of all NCD deaths), cancers (8 million deaths, 22 percent), chronic respiratory diseases

(3.8 million deaths, 9 percent), and diabetes (1.6 million deaths, 4 percent) (WHO, 2018). The Global Burden of Disease Report (2020) highlights that in 2017, more than 2.1 billion young people under the age of 20 were affected by NCDs globally. This underscores the urgent need for early intervention and preventive measures—particularly within families—to reduce the growing burden of these diseases.

Many behavioral risk factors that contribute to NCDs are established during childhood and adolescence (Gore et al., 2011). These behaviors include tobacco use, unhealthy eating habits, and alcohol consumption. Studies show that 90 percent of adult smokers begin smoking before the age of 18, with one in four adolescents initiating tobacco use before the age of 10. Additionally, adolescents who begin drinking alcohol at an early age are significantly more likely to develop alcohol dependence within a decade compared to those who start later (Rashtriya Kishor Swasthya Karyakram, India, 2014). Risky behaviors initiated during adolescence contribute to approximately 70 percent of premature adult deaths, with 70 percent of preventable adult NCD-related deaths linked to risk factors that begin in adolescence (Sawyer et al., 2012). However, adolescence also presents an opportunity to foster healthy behaviors and mitigate harmful ones. Preventive measures taken during this period can yield long-term benefits, as early awareness and intervention can significantly reduce the impact of NCDs in adulthood.

Research on adolescents' knowledge of NCDs shows that school-going adolescents generally have low awareness of common NCD risk factors. However, awareness of obesity and physical inactivity appears to be relatively better. For example, a study by Lorga (2013) among Karen ethnic high school students in rural Thailand, and another by Adhikari et al. (2022) in Chitwan, Nepal, found that over two-thirds of participants were unaware of common NCD risk factors, aside from obesity and physical inactivity.

Understanding the current level of NCD knowledge among adolescents is essential to inform interventions in both the health and education sectors. Despite its importance, limited research has been conducted on adolescents' awareness of NCDs in the Nepalese school context. Therefore, this study aims to assess the level of knowledge about NCDs among school-going adolescents.

Methodology

Research Design

A descriptive cross-sectional design was used to assess the level of knowledge among school-going adolescents aged 14–19 years, studying in grades 9 to 12 at a government secondary school. The study was conducted at Mahindra Rastriya Secondary School, Baluwatar, located in Ward No. 4 of Kathmandu Metropolitan City. This is a government-run, co-educational institution offering classes from Early Childhood Development (ECD) through grade 12, including technical education in grades 11 and 12. Students from various parts of the country are enrolled at this school.

Sampling Technique and Sample

Mahindra Rastriya Secondary School was selected as the study site from a list of 56 secondary schools in Kathmandu Metropolitan City using a simple random sampling method (lottery approach). A complete enumeration sampling technique was then used to select participants. All students aged 14–19 years, enrolled in grades 9 to 12, were included in the study. The sample size was calculated using Cochran's formula, yielding a required sample of 252. However, only 209 students were present during data collection, resulting in a final sample size of 209.

Study Instruments

A structured questionnaire was used for data collection. It consisted of two parts: the first captured socio-demographic information, and the second assessed knowledge related to non-communicable diseases (NCDs). The questionnaire was developed based on the study objectives, literature review, and expert consultation. It was

prepared in both English and Nepali to ensure accessibility, reliability, and consistency.

A pre-test was conducted among a group of students who were later excluded from the main data collection. Based on the pre-test results, necessary modifications were made to improve clarity and comprehension, with technical terms and jargon minimized. Data were collected through face-to-face interviews using the finalized structured questionnaire. Ethical approval was obtained in advance, and the purpose of the study was clearly explained to all respondents. Each interview lasted approximately 15 minutes.

Operational Definitions

School-going Adolescents

Adolescents aged 14–19 years enrolled in grades 9–12 at Mahindra Rastriya Secondary School, Baluwatar, Kathmandu.

Knowledge about Non-communicable Diseases (NCDs)

In this study, knowledge about NCDs refers to the understanding of key concepts including the definition of NCDs, common risk factors, examples of major NCDs, and related preventive measures. It also includes adolescents' awareness of and participation in physical activities that help prevent NCDs. The questionnaire was designed around these domains to evaluate respondents' knowledge.

Scoring and Grading of Knowledge

The level of knowledge was assessed using a questionnaire with a maximum score of 72. Single-response questions were scored as 1 for a correct answer and 0 for an incorrect answer. For multiple-response questions, 1 point was awarded for each correct response.

Grading was based on the following cut-off scores:

- A score of 1–35 (<36) was categorized as inadequate knowledge.
- A score of 36–72 (≥36) was categorized as adequate knowledge.

The mean score was 36.

Analysis

The collected data were checked for completeness, coded, and entered into SPSS version 20 for analysis. Univariate analyses (frequency, percentage, mean, and standard deviation) were used to describe single variables. Bivariate analysis, specifically the chi-square test, was conducted to examine associations between knowledge level and selected demographic characteristics such as age, sex, grade level, mother's education, and permanent address.

Dependent Variable

The dependent variable was knowledge of non-communicable diseases (NCDs), measured as a composite score based on respondents' knowledge of cardiovascular diseases, diabetes, cancer, chronic respiratory diseases, consequences of NCDs, and engagement in preventive physical activity.

Independent Variables

Independent variables included socio-demographic characteristics that could influence NCD knowledge. These were age, sex, religion, family type, ethnicity, permanent address, current living status, grade level, and parents' education and occupation. Sources of information about NCDs were also considered independent variables.

Ethical Considerations

Ethical protocols were strictly followed throughout the study. Written informed consent was obtained from participants aged 18 and above. For those under 18, assent forms were provided to parents or guardians before data collection, and written approval was secured through signatures.

Results and Discussion

This section presents the findings of the study. The socio-demographic characteristics of the respondents are summarized in Tables 1 and 2. Knowledge-related findings are presented in Tables 3 and 4, and the association between knowledge level and selected demographic variables is shown in Table 5.

Table 1

Socio-demographic Characteristics of Respondents

Variables	Number (n= 209)	Percent
Age		
14- 16 years	116	55.5
17 - 19 years	93	44.5
Mean= 16.37		
SD=1.31		
Sex		
Male	122	58.4
Female	87	41.6
Religion		
Hinduism	165	78.9
Buddhism	29	13.9
Islam	2	1.0
Christianity	10	4.8
Others	3	1.4
Type of family		
Nuclear	111	53.1
Joint	84	40.2
Extended	12	5.7
Ethnicity		
Brahmin/Chetri	101	48.3
Janajati	70	33.5
Dalit	7	3.3
Others	31	14.3
Permanent address		
Urban	104	49.8
Rural	105	50.2
Currently living status		
With parents and siblings	173	82.8
With relatives	29	13.9
Others	6	2.9
Missing	1	1.5
Study grade		
Grade 9	43	20.6
Grade 10	52	24.9
Grade 11	57	27.3
Grade 12	57	27.3
Total	209	100.0

Table 1 summarizes the socio-demographic characteristics of the respondents. Among the 209 participants, the majority (55.5%) were between 14 and 16 years of age, and 58.4% were male. More than two-thirds (78.9%) identified as Hindu, and over half (53.1%) were from nuclear families. Additionally, 48.3% belonged to the Brahmin/ Chettri community. A majority (52.2%) resided in rural areas, 82.3% lived with their parents and siblings, and 27.3% were from grade 11 and another 27.3% from grade 12. These demographic findings provide insight into the diversity of the sample, which includes a balanced representation of students from different grades, family types, and geographical backgrounds.

The age distribution of the participants is particularly significant, as adolescents in the 14–16 age group are undergoing rapid developmental changes that may influence their perception of health risks and preventive behaviors. Gender representation in the study also suggests a slightly higher male participation, which may affect the interpretation of results, especially in gender-sensitive health issues. The predominance of Hindu respondents is reflective of Nepal's religious demographics, while the majority living in nuclear families suggests a shift from traditional joint family systems in urban and semi-urban settings.

Table 2

Respondents' Parents Education Status

Variables	Number	Percent
Mother's Education		
Cannot read and write	59	28.2
Can read and write	42	20.1
Up to grade 8	33	15.8
Grade 8-10	35	16.7
More than grade 10	40	19.1
Father's education		
Cannot read and write	46	22.0
Can read and write	34	16.3
Up to grade 8	38	18.2
Grade 8-10	43	20.6
More than grade 10	48	23.0
Total	209	100

Table 2 presents the educational backgrounds of the respondents' parents. Among mothers, 28.2% were unable to read or write, followed by 20.1% who could read and write, 19.1% who had education beyond grade 10, and 15.8% who had education up to grade 8. For fathers, 23% had education at grade 10 or above, 22% were illiterate, 20.6% had completed grades 8 to 10, and 18.2% had education up to grade 8. These findings highlight a notable disparity in educational attainment between fathers and mothers, reflecting broader national trends of gender-based educational inequality. Parental education, particularly maternal literacy, is often correlated with health awareness in children and may influence adolescents' knowledge levels, although this study found no statistically significant association.

Table 3

General Knowledge of Respondents about Non-communicable Diseases

Variables	Number of "Yes Responses" n=209)	Percent
Definition of NCDs		
Yes	176	84.2
Risk factors		
Unhealthy diet	117	56
Physical inactivity	109	52.2
Tobacco use and smoking	120	57.4
Harmful use of alcohol	107	51.2
Overweight/Obesity	53	25.4
Air pollution	52	24.9
Examples NCDs		
Cardiovascular disease	82	39.2
Diabetes	130	62.2
Cancer	161	77
Chronic kidney disease	78	37.3
Hypertension	67	32.1
Asthma	60	28.7
Chronic respiratory diseases	54	25.8
Depression	80	38.3
Major NCDs		
Cardiovascular disease	83	39.7
Diabetes	108	51.7
Cancer	142	67.9
Chronic respiratory diseases	73	34.9

Table 3 presents the respondents' general knowledge about non-communicable diseases (NCDs). Of the 209 respondents, 84.2% were aware of the definition of NCDs. Regarding risk factors, 57.4% identified tobacco use and smoking, followed by unhealthy diet (56%), physical inactivity (52.2%), harmful alcohol use (51.2%), overweight (25.4%), and air pollution (24.9%). This indicates limited awareness of overweight and air pollution as NCD risk factors. Regarding knowledge of examples of NCDs, 77% identified cancer, while only 25.8% recognized chronic respiratory diseases. For major NCDs, 67.9% mentioned cardiovascular diseases, 51.7% cited diabetes, and 39.7% mentioned chronic respiratory diseases, with only 34.9% recognizing chronic respiratory diseases as a major NCD.

These findings suggest that while awareness of some risk factors like tobacco and poor diet is relatively high, misconceptions or lack of awareness persist about less obvious contributors such as air pollution and being overweight. It also appears that certain NCDs, particularly chronic respiratory diseases, are underrecognized by adolescents, which may point to gaps in public health education and school-level awareness programs. Moreover, cancer—despite being widely reported in the media—was associated with lower knowledge scores, potentially indicating limited understanding beyond basic identification.

Table 4

Level of Knowledge of Non-communicable Diseases among Respondents

Level of Knowledge of Major NCDs	Number	Percent
Cardiovascular disease		
Inadequate	104	49.8
Adequate	105	50.2
Diabetes		
Inadequate	92	44
Adequate	117	56
Cancer		
Inadequate	127	60.8
Adequate	82	39.2
Chronic Respiratory diseases		
Inadequate	112	53.6
Adequate	97	46.4
Overall Level of Knowledge		
Inadequate	96	45.9
Adequate	113	54.1

Table 4 shows the overall level of knowledge of NCDs among school-going adolescents. In terms of specific diseases, 50.2% demonstrated adequate knowledge of cardiovascular diseases, 56% for diabetes, 39.2% for cancer, and 46.4% for chronic respiratory diseases. Among the four major NCDs, cancer had the lowest knowledge level, followed by chronic respiratory diseases. Overall, 54.1% of respondents had an adequate level of knowledge about NCDs, indicating that more than half were reasonably informed about these conditions. This suggests that while a majority of students are familiar with common NCDs and their associated risks, there is a significant portion who remain uninformed or misinformed, particularly regarding less-discussed conditions like chronic respiratory diseases. The findings reinforce the importance of integrating comprehensive NCD education into the school curriculum to ensure a holistic understanding of disease prevention and health promotion.

Table 5

Association between Level of Knowledge about Non-communicable Diseases and Selected Socio-demographic Characteristics of Respondents

Variable	Level of Knowledge		p-value
	Inadequate No. (%)	Adequate No. (%)	
Age			
14-16 years	58(50)	58(50)	0.119
17-19	38(40.86)	55(59.19)	
Sex			**0.101**
Male	51(41.80)	71(58.19)	
Female	45(51.7)	42(48.2)	

Variable	Level of Knowledge		p-value
	Inadequate No. (%)	Adequate No. (%)	
Study grade			**0.206**
Grade 9	25(58.1)	18(41.8)	
Grade10	19(36.53)	33(63.46)	
Grade 11	27(47.36)	30(52.63)	
Grade12	25(43.85)	32(56.1)	
Mother's education			**0.108**
Cannot read and write	30(50.84)	29(49.15)	
Can read and write	12(28.57)	30(71.42)	
Up to grade 8	19(57.57)	14(42.42)	
Grade 8-10	17(48.57)	18(51.42)	
More than grade 10	18(45)	22(55)	
Place of residence			**0.147**
Urban	53(50.9)	51(49.03)	
Rural	43(40.9)	62(59.04)	

Table 5 reveals no statistically significant association between the level of NCD knowledge and the following demographic variables: age ($p = 0.188$), sex ($p = 0.156$), grade level ($p = 0.206$), mother's education ($p = 0.108$), and permanent address ($p = 0.147$). The lack of significant associations suggests that factors beyond basic socio-demographic variables may play a larger role in influencing adolescents' knowledge levels. These findings imply a need for broader, more inclusive health education strategies that target all demographic groups rather than focusing solely on specific subgroups.

This study assessed the level of knowledge about non-communicable diseases (NCDs) among school-going adolescents in a government secondary school in Kathmandu Metropolitan City. The study found that 58.4 percent of the respondents were male, which aligns with findings from a study by Sitaula et al. (2022) in Nepal, where 51.1 percent of the respondents were male. This result is also consistent with the report by Islam et al. (2020), which indicated that over two-thirds (70.49 percent) of the respondents were male, suggesting that male students may have higher enrollment rates at the secondary school level compared to female students.

Regarding age, the majority of respondents (55.5 percent) were between 14 and 16 years old, a finding supported by Akter et al. (2023). The age distribution in this study corresponds to the expected range for secondary school students, affirming that the target population was appropriately sampled.

The study also found that 84.2 percent of the respondents correctly defined NCDs. In contrast, a study conducted in Bangladesh reported that more than two-thirds (71.9 percent) of secondary school students were unaware of the correct definition of NCDs (Akter et al., 2023). In terms of knowledge about major NCDs, the results revealed that fewer than 40 percent of the respondents were aware that cardiovascular diseases and chronic respiratory diseases are major types of NCDs. This suggests that, overall, the level of knowledge about NCDs among adolescents in this study was relatively low. Despite the significant global burden of NCD-related deaths, adolescents in this context appear to have limited awareness of these diseases and their basic concepts. This finding highlights the need for increased education and awareness about NCDs among school-going adolescents.

Regarding the level of knowledge about major NCDs, the results indicated that respondents had

adequate knowledge of diabetes and cardiovascular diseases, while their knowledge of cancer and chronic respiratory diseases was inadequate. One possible explanation for the higher level of awareness about diabetes and cardiovascular diseases could be the frequency with which these conditions are discussed within families, among relatives, or in the community—often influenced by the health conditions of parents or grandparents. However, a study conducted in Sri Lanka by Gamage and Jayawardana (2018) reported that overall knowledge of diabetes and other NCDs was poor among students, indicating variability in NCD awareness across different settings and countries.

With respect to the risk factors of NCDs, the results showed that more than fifty percent of respondents mentioned tobacco use and smoking (57.4 percent), followed by an unhealthy diet (56 percent), physical inactivity (52.2 percent), and harmful alcohol consumption (51.2 percent) as risk factors. This finding aligns with the World Health Organization (2018), which identified tobacco use, harmful alcohol use, physical inactivity, and unhealthy diet as the leading behavioral risk factors associated with the four major NCDs. Furthermore, these results are supported by studies conducted in Kenya, which also identified alcohol use and smoking as major NCD risk factors (Akter et al., 2023; Kiplagat et al., 2023).

Concerning the overall level of knowledge about NCDs, more than half of the respondents (54.1 percent) demonstrated an adequate level of understanding. This result is somewhat comparable to the findings of Islam et al. (2020), in which 57.9 percent of respondents had a good level of knowledge. However, in contrast, a study conducted in Sri Lanka by Gamage and Jayawardana (2018) revealed that overall knowledge of NCDs was poor, with only 42.9 percent of students demonstrating adequate awareness.

When focusing on knowledge of individual NCDs, the results again showed that awareness of diabetes and cardiovascular diseases was higher than that of cancer and chronic respiratory diseases. A possible reason for this may be that respondents frequently hear about diabetes and cardiovascular diseases through personal or family experiences. Nonetheless, Gamage and Jayawardana (2018) reported poor knowledge of these diseases among Sri Lankan students, suggesting that cultural, educational, and societal differences significantly affect NCD awareness.

Regarding cardiovascular diseases specifically, the findings showed that two-thirds of the respondents correctly identified the definition of cardiovascular diseases. However, only about one-third were aware of the main risk factors, which include diabetes, overweight, physical inactivity, excessive alcohol consumption, and stress. This indicates that while many adolescents understand what cardiovascular diseases are, their knowledge of how to prevent them is limited. A similar study in Nepal by Yadav and Wagle (2018) found that only 36.8 percent of respondents had good knowledge of cardiovascular disease risk factors, aligning with the current study's results.

In examining the association between the level of knowledge and socio-demographic characteristics—particularly place of residence—the study found that rural adolescents exhibited higher knowledge levels, although the statistical analysis did not show a significant association. One possible explanation is that while these adolescents are from rural areas, they may be residing in urban settings for educational purposes, thereby gaining greater exposure to health-related information. This contrasts with findings from a study in India by Bhaskaran (2021), which reported higher knowledge levels among urban adolescents.

Finally, the study found no statistically significant association between the level of NCD knowledge and variables such as age, sex, grade level, place of residence, or mother's education. This contrasts with a study conducted in Bangladesh by Islam et al. (2020), which found that knowledge levels were significantly associated with age, gender, education, and parents' occupation. These differences may reflect contextual variations in public health education, curriculum content, and access to health information across countries.

Conclusion

This study on knowledge of non-communicable diseases (NCDs) among school-going adolescents in Kathmandu revealed a generally satisfactory level of understanding, with over half of the respondents demonstrating adequate awareness—particularly regarding diabetes and cardiovascular diseases. However, notable gaps remain, especially in understanding the risk factors associated with these conditions, such as poor diet, physical inactivity, tobacco use, and alcohol consumption. Interestingly, rural adolescents exhibited better knowledge than their urban counterparts.

The study also found no significant associations between knowledge levels and variables such as age, gender, grade level, place of residence, or mother's education. These findings underscore the need for targeted educational interventions to address existing knowledge gaps. Further research is recommended to explore the underlying factors that influence adolescents' understanding of NCDs, particularly in relation to socio-demographic characteristics. Future studies should also examine how tailored interventions can be designed to suit different communities and achieve more effective health outcomes.

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