

Awareness of Cancer Among Adolescents Studying in Secondary School in Pokhara, Nepal

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Article History

Received: 29th March, 2026

Acceptance: 1st July, 2026



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Abstract

Introduction: Cancer is the major global health problem which has currently become the most important barrier to increasing life expectancy worldwide in the 21st century. Cancer is the second leading cause of death worldwide while in adolescents it accounts as the fourth leading cause of death globally. The burden related to cancer incidence and mortality is also in increasing trend in Nepal. Thus, this study aimed to assess the awareness of cancer among adolescents in Pokhara.

Methods: A descriptive cross-sectional study was conducted among 280 adolescents studying in class XI and XII in Pokhara Aadarsha Secondary School, Pokhara using non-probability convenient sampling technique. Data was collected after informed consent through self-administered structured questionnaires on 10th and 11th Sept 2023. Descriptive and inferential (chi square) statistical tests were performed for the data analysis.

Result: The results showed that 84.3% of the adolescents had low level of awareness regarding cancer. Majority of the respondents knew cancer is non-communicable disease (93.9%) followed by lung cancer is caused by excessive smoking (91.8%). There was statistically significant association between level of awareness and gender ($p=0.04$), stream ($p<0.001$) as well as educational status of mother ($p=0.01$) and father ($p=0.03$).

Conclusion: The study concludes that more than three-quarters of the adolescents had low level of awareness regarding cancer. There is statistically significant association of level of awareness with gender, stream as well as educational status of mother and father. This study highlights education is essential for adolescents regarding cancer awareness to promote healthy lifestyles and also for the application of preventive measures on time.

Key words: Adolescents, awareness, cancer

Introduction

Cancer is the major global health problem which has currently become the most important barrier to increasing life expectancy worldwide in the 21st century.^{1,2} According to GLOBOCAN 2022, 1,35,234 new cases has been estimated and 52,186 cancer related deaths were reported among the adolescents aged 10-19 years of age with highest burden seen in Asia.³ Cancer has become second leading cause of death worldwide while in adolescents it accounts as fourth leading cause of death globally.^{4,5} The burden related to cancer incidence and mortality

is also in increasing trend in Nepal.³ It is the fifth leading cause of death with 14,704 deaths and 22,008 new cancer cases reported in 2022.^{3,6}

In the developing countries the burden of cancer is expected to double over the next two decades due to socioeconomic changes, such as increased tobacco use, increasing trend in aging populations and unhealthy lifestyles related factors including food habits, sedentary lifestyle, sexual behavior, and environmental pollution due to industrialization.^{2,7}

Adolescence is considered as the key window period of

How to Cite this Article in Vancouver Style:

Pokharel G, Shrestha K, Shakya N. Awareness of Cancer Among Adolescents Studying in Secondary School in Pokhara, Nepal. Med. J. Pokhara A. Health Sci. 2026;9(1):39-45.

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development wherein adolescents undergo physical, psychological, social, and educational changes. Alongside these changes, responsibility related to health issues takes shifts from the parents to the adolescents. Health-related behaviors that continue into adulthood are often established throughout this phase.⁸ Adolescence has also been recommended as an ideal phase to promote health given the foundation that there is the formation of future health-related lifestyles, behaviors, habits and attitudes during this stage.⁹

Modifying the risk factors that arise during adolescence can potentially prevent one third of cancers. Lack of awareness related to cancer may contribute to unhealthy behaviors, lower uptake of screening program, delayed symptom presentation and late – stage cancer diagnosis hampering successful treatment outcomes.^{10,11}

Awareness in cancer is the key to early detection and diagnosis and results in better health-seeking behavior and treatment modalities as well.¹² Awareness also plays an effective role for the application of preventive measures on time which include life style changes to decrease the cancer risk, vaccines for cancer causing infections, cancer screening and early diagnosis of symptomatic diseases.^{13,14}

A cross-sectional study was conducted on Adolescents' awareness of cancer risk factors and associations with health-related behaviors among 478 adolescents of age group 11 to 17 years. The study revealed that the adolescent's cancer awareness was low.¹⁵

Cancer awareness is low in Nepal as well. A cross-sectional study was conducted among 154 adolescents in Bharatpur Nepal. Low level of awareness was seen among 28.6% respondents.³

Little is known from Nepal regarding cancer awareness. Thus in relation to this context, the study aimed to assess the awareness regarding cancer among adolescents.

Methods

A descriptive cross-sectional study was carried out to assess the level of awareness regarding cancer among the adolescents. The study adhered to ethical protocols, obtaining clearances from the Institutional Review Committee, Manipal Teaching Hospital (Ref. No. MCOMS/IRC/542). Administrative approval was obtained from the Principal of Pokhara Aadarsha Secondary School (PASS). Sample of the study was 280 students studying in class XI and XII in PASS of Pokhara-01, Nepal. Data was collected on 10th and 11th Sept 2023 after informed consent from parents and assent from students as well ensuring anonymity through structured self-administered questionnaires.

Sample was selected by using non-probability convenient sampling. Inclusion criteria included students who were present during the time of data collection and those willing to participate in the study.

The desired sample size for the research study was 294 which was calculated by taking prevalence of 50% with 5% level of significance. Sample size (n) = Z^2pq / e^2 = 266. After adding 10% non-response rate i.e. 27. The desired sample size was $266.7 + 27 = 293.7 = 294$. Where, $Z = 1.96$ at 95% confidence level, prevalence (p) = 50% = 0.5, $q = 1 - p$ which is $(1 - 0.5 = 0.5)$, margin of error = 6%. Total population size was 428 with 222 students in class XII and 208 students in class XI. Data collection was done from 294 students studying in the afternoon shift. The

questionnaires were distributed to 294 students but 14 of the questionnaires were incomplete so they were not included in the final data analysis. Consequently 280 was the final sample size.

The instruments had three parts. Part I consisted of questions related to socio-demographic characteristics which included age, gender, class, subject, ethnicity, permanent residence, current stay, family type, educational status of father and mother and family history of cancer.

Part II included the source of information on cancer. It was multiple response question. Part III included the awareness questions related to cancer which included definition, common cancer in world and Nepal, risk factors, warning signs, screening tests, treatment modalities and preventive measures.

Cancer awareness level was measured by the use of 16 structured self-administered questionnaires including 12 multiple choice questions and four multiple response questions which included questions related to risk factors, warning signs, treatment modalities and preventive measures of cancer. Each correct answer was scored by 1 and wrong answer by 0. The total score ranged from 0 to 40. In order to determine the level of awareness, the total scores were calculated as a percentage and divided into three groups based on Bloom's cutoff point: high level scores were 80-100%, moderate level scores were 60-79% and low level scores were less than 60%. Through a thorough assessment of literature, peer review and interaction with research experts and oncologists, the validity of the instrument was preserved. To determine the instrument's practicability, 10% (29 students) of the entire sample were pretested while studying in the same environment during the morning shift. The primary study did not include those samples. After that data entry and analysis was done in Statistical Package for Social Science (SPSS) version 20. Data interpretation was done by using descriptive statistics in terms of frequency, percentage, mean and standard deviation and inferential statistics in terms of chi square to find out the association between level of awareness on cancer and selected variables at 5% level of significance.

Result

Out of 280 respondents, more than half (67.5%) of the respondent's age was 15 to 17 years. Respondent's mean age was 17.09 years with the standard deviation ± 0.933 . Regarding gender, 61.4% of the respondents were male. More than half of the respondents (53.9%) were from class XII and 68.2% students were studying in the management stream. Only 13 respondents (4.6%) reported a family history of cancer (Table1).

Table1: Background information of the adolescents n=280

Characteristics	Number (n)	Percentage (%)
Age		
15- 17 years	189	67.5
18 - 19 years	91	32.5
Mean $\pm$ SD =17.09 $\pm$ 0.933		
Gender		
Male	172	61.4
Female	108	38.6
Class		
11	129	46.1
12	151	53.9
Stream		
Science	89	31.8
Management	191	68.2
Ethnicity		
Brahmin/ Chhetri	141	50.4
Janajati	53	18.9
Dalit	56	20.0
Madhesi	30	10.7
Permanent Residence		
Rural municipality	69	24.6
Municipality	72	25.7
Sub-metropolitan city	11	3.9
Metropolitan city	128	45.7
Current stay		
Own house	157	56.1
Rented room	123	43.9
Family type		
Nuclear	198	70.7
Joint/ Extended	82	29.3
Education status of mother		
Illiterate	18	6.4
Can read and write	53	18.9
Basic	68	24.3
Secondary	86	30.7
Bachelor	39	13.9
Post graduate	16	5.7
Education status of father		
Illiterate	8	2.9
Can read and write	41	14.6
Basic	78	27.9
Secondary	86	30.7
Bachelor	42	15.0
Post graduate	25	8.9
Family history of cancer		
Yes	13	4.6
No	267	95.4

Regarding the source of information which was multiple response, more than half (53.9%) of respondents got information through social networking sites (SNS) followed by mass media (34.6%), books/ magazines (18.6%) and health workers (16.8%). (Table 2)

Table 2: Source of information regarding cancer on adolescents n= 280

Source	Number (n)	Percentage (%)
Mass media	97	34.6
Health workers	47	16.8
Family members	21	7.5
Books/ Magazines	52	18.6
Friends	20	7.1
Social Networking Sites(SNS)	151	53.9

Multiple response

Out of 280 respondents, majority knew cancer is non-communicable disease (93.9%) followed by lung cancer is caused by excessive smoking (91.8%). Most of them (83.2%)

believed tobacco consumption/smoking causes cancer and avoiding smoking and alcohol consumption can prevent cancer (74.6%). Less than half (35.7%) of the respondents knew Human Papillomavirus (HPV) vaccine is given for the prevention of cervical cancer. Very few knew aging (6.4%) can cause cancer and cancer is hereditary (10.0%). (Table 3)

Table 3: Awareness regarding cancer among adolescents n=280

Correct responses	Number (n)	Percentage (%)
Cancer is non communicable disease	263	93.9
Cancer is a disease where there is abnormal and uncontrolled cell division	188	67.1
Most common cancer in male in world is prostate cancer	215	76.8
Most common cancer in female in world is breast cancer	213	76.1
Most common in male in Nepal is lung cancer	205	73.2
Most common cancer in female in Nepal is cervical cancer	91	32.5
Older people at great risk for developing cancer	123	43.9
Risk factors of cancer [#]		
Aging	18	6.4
Having close relative with cancer	28	10.0
Tobacco consumption/ Smoking	233	83.2
Alcohol consumption	143	51.1
Excessive intake of red meat, salty, oily and spicy foods	75	26.8
Being overweight	35	12.5
Not doing enough exercise/ physical activity	35	12.5
Environmental pollution	79	28.2
Lung cancer is caused by excessive smoking	257	91.8
Stomach cancer related to high salt intake	39	13.9
Warning signs of cancer [#]		
Change in bowel or bladder habits	44	15.7
A sore that does not heal	73	26.1
Unusual bleeding or discharge	118	42.1
Thickening or lump in the breast or elsewhere	115	41.1
Indigestion or difficulty in swallowing	50	17.9
Obvious change in a wart or mole	48	17.1
Nagging cough or hoarseness	45	16.1
Unexplained weight loss	113	40.4
Anemia	54	19.3
Pap smear test is done to detect cervical cancer	58	20.7
Breast cancer can be detected through Breast Self Examination(BSE) and Mammography	182	65.0
Treatment modalities for cancer [#]		
Surgery	115	41.1
Chemotherapy	124	44.3
Radiation therapy	97	34.6
Immunotherapy	52	18.6
Preventive measures of cancer [#]		
Eating enough green leafy vegetables and fruits	110	39.3
Getting regular exercise at least 30 minutes per day	137	48.9
Avoiding smoking and alcoholism	209	74.6
Avoiding red meat, burnt and stale food	126	45.0
Using mask, sunscreen, hat and protective clothing while working outdoors	77	27.5
Maintaining healthy weight	102	36.4
Doing regular medical check up	138	49.3
Human Papillomavirus (HPV) vaccine is given to prevent cervical cancer	100	35.7

Multiple Response

In relation to cancer awareness, result showed that majority of the respondents (84.3%) had low level of awareness whereas (15.7%) had moderate level of awareness. The mean awareness score was 16.2 with the standard deviation $\pm$ 5.464. The maximum score was 32 and minimum was seven with the range 25.(Table 4)

Table 4: Level of awareness on cancer among adolescents n=280

Level	Number (n)	Percentage (%)
Low level (<60%)	236	84.3
Moderate level (60-79%)	44	15.7

Table 5: Association between level of awareness regarding cancer and selected variables n=280

Variables	Level of awareness		Chi-square	p-value
	Low n(%)	Moderate n(%)		
Age in years				
≤ 17 years	157(83.1)	32(16.9)	0.65	0.42
> 17 years	79(86.8)	12(13.2)		
Gender				
Male	151(87.8)	21(12.2)	4.13	0.04
Female	91(78.7)	17(21.3)		
Class				
XI	109(84.5)	20(15.5)	0.08	0.92
XII	127(84.1)	24(23.7)		
Stream				
Science	60(67.4)	29(32.6)	28.03	<0.001
Management	176(92.1)	15(7.9)		
Ethnicity				
Brahmin/ Chhetri	114(80.9)	27(19.1)	2.58	0.27
Janajati	47(88.0)	6(12.0)		
Dalit and Madhesi	75(87.2)	11(12.8)		
Current stay				
Own house	133(84.7)	24(15.3)	0.04	0.82
Rented room	103(83.7)	20 (16.3)		
Type of family				
Nuclear	168(84.8)	30 (15.2)	0.16	0.68
Joint/Extended	68(82.9)	14(17.1)		
Educational status of mother				
Illiterate and can read and write	64 (90.1)	7(9.9)	8.91	0.01
Basic and secondary	134(84.4)	20(15.6)		
Bachelors and above	38(69.0)	17(31.0)	6.49	0.03
Educational status of father				
Illiterate and can read and write	44 (89.7)	5(10.3)	0.66	0.41
Basic and secondary	142(86.6)	22 (13.4)		
Bachelors and above	50(74.6)	17(25.4)	0.66	0.41
Family history of cancer				
Yes	12(92.3)	1(7.7)	0.66	0.41
No	224(83.9)	43(16.1)		

There is statistically significant association between level of awareness and gender ($p=0.04$) indicating female students have more awareness. In stream ($p<0.001$) students studying Science had more level of awareness. In educational status of mother ($p=0.01$) and father ($p=0.03$) respondent's mother and father whose education was Bachelors and above had more level of awareness. Conversely there is no statistically significant association between level of awareness and age, class, ethnicity,

current stay, family type and family history of cancer. (Table 5)

Discussion

This study assessed the awareness regarding cancer among adolescents in Pokhara. The findings revealed that majority of the respondents (84.3%) had low level of awareness. In relation to the present study slightly lower finding was found as 68% had poor awareness in Bardiya, Nepal¹⁶ and 73.9% of the adolescents had poor level of knowledge in Italy.¹⁷ Awareness of cancer was low in Australia,⁸ Ireland,¹⁸ Chandigarh, India,¹⁹ Oman,² Poland,²⁰ United States²¹ and Britain.²² Supporting the findings of the present study it was also found from systematic review that adolescents had low cancer awareness.⁹ Lower cancer awareness might be related to personal characteristics like age, gender, residence or insufficient educational background among the respondents. Lack of access to information and up-to-date cancer guidelines, unequal or limited exposure to educational resources related to cancer such as books or magazines and also lack of interest or motivation towards cancer among the respondents might be related to low cancer awareness as well.

In the present study none of the adolescents had high level of awareness. In contrast to the present study 8.4% of the adolescents had high level and 63% had moderate level of awareness on cancer in Bharatpur, Nepal.³ Respondents had good knowledge regarding cancer in Central Uganda.²³ Moderate cancer awareness was seen in Turkey.²⁴ Awareness might be affected by the residence of the respondents leading to the exposure of the learning experiences regarding cancer as well as access to the information related to cancer such as social networking sites and mass media.²⁵ Variation in health care delivery system of different countries might also have led to disparities in findings as well.

The current study revealed that majority correctly responded on cancer is non-communicable disease (93.9%) which is in line with the study conducted in Bharatpur, Nepal where 94.8% responded cancer is non-communicable disease.³ Slightly lower finding was found in Central Uganda where 87% of the respondents knew cancer is non-communicable disease.²³

In the present study, the responses for causative factors for cancer were tobacco consumption/ smoking (83.2%), drinking alcohol (51.1%), older age (43.9%) intake of red meat, salty, oily and spicy food (26.8%), overweight (12.5%), not doing enough exercise/ physical activity (12.5%) and family history (10%). Similar findings were seen in UK where causes for cancer were smoking (87.8%), drinking alcohol (46.5%), older age (21%), eating red meat (15.0%), overweight (58.4%), low exercise (25.5%) and family history (41.2%).¹²

Warning signs of cancer were reported as unusual bleeding or discharge (42.1%), thickening or lump (41.1%), unexplained weight loss (40.4%), a sore that does not heal (26.1%), difficulty in swallowing (17.9%), change in mole or wart appearance(17.1%), nagging cough or hoarseness (16.1%) and change in bowel and bladder habit (15.7%) in the present study. These findings are supported by the study conducted in Oman where warning signs were unexplained bleeding (41.0%), unexplained lump or swelling (70.1%), unexplained weight loss (38.3%), a sore that does not heal (39.9%), difficulty in swallowing (20.4%) change in mole appearance (54.3%), persistent cough or hoarseness (21.4%) and persistent change in bowel/bladder habits (28.7%).²

In the present study, breast cancer and cervical cancer

screening was known by 65% and 20.7%, respectively. Similarly breast cancer screening was known by 70.3% but in contrast to present study cervical cancer screening was known by 59.1% in Ireland.¹⁸ Treatment modalities of cancer were reported as chemotherapy (44.3%), surgery (41.1%), and radiation therapy (34.6%) which is supported by a study conducted in Malaysia which revealed chemotherapy (61.5%), surgery (51.9%) and radiotherapy (37.7%) were the treatment modalities.²⁶

Regarding the awareness on preventive measures of cancer, 74.6% knew avoiding smoking and alcohol consumption can prevent cancer followed by doing regular checkup (49.3%), getting regular exercise at least 30 minutes per day (48.9%), avoiding burnt red meat and stale food (45%), eating enough green leafy vegetables and fruits (39.3%), maintaining healthy weight (36.4%) and using mask, sunscreen, hat and protective clothing (27.5%). In contrast to the findings of the present study higher findings were found in Bharatpur, Nepal where 97.4% said avoiding smoking, 88.3% said avoiding alcoholism, doing regular checkup (96.8%), getting regular exercises (83.8%), avoiding burnt red meat and stale food (90.3%), eating enough green leafy vegetables and fruits (87.7%), maintaining healthy weight (82.5%) and using mask, sunscreen, hat and protective clothing (70.8%) are the preventive measures for cancer.³ The differences might be due to differences in sample characteristics like sample size, age of the respondents and study site.

In the current study there was statistically significant association between level of awareness and gender ($p=0.04$) indicating females had moderate level of awareness which is supported by the study conducted in Tamil Nadu, India where female students showed higher knowledge scores on cancer compared to males.²⁷ Awareness of cancer significantly differed in the level of knowledge in favor of females in Jordan.²⁸ Cancer awareness was more in females (81.2%) than males (79.4%) in Korea.²⁹ Cancer risk factors and/or symptoms were significantly recognized more by girls compared to boys in Oman.² Females had greater awareness than males in Ireland.¹⁸ Similarly the effect of interventions regarding cancer was greater among females in UK.¹² Females might have more awareness as compared to males due to interplay of different factors such as educational levels, socioeconomic disparities, variations in cancer risk factors specific mainly to the female gender and prevalence of female focused awareness programs like pap smear test and BSE. This is supported by the fact that females regularly engaged in specific healthy behaviors to prevent cancer.³⁰ In contrast males had poor use of primary prevention strategies of cancer.³¹ Likewise males engaged less frequently than females in cancer prevention.²⁹ Other factors for variation might be societal gender norms and cultural perceptions of health related to females. This is supported by the fact that females are the gatekeepers of healthy behaviors in their families and their such efforts benefits their children in the long run.³⁰ Furthermore this is supported by the findings of our study as well where adolescents whose mothers had attained bachelors and above education level had a moderate level of awareness.

There was also statistically significant association between level of awareness and educational status of mother ($p=0.01$) indicating adolescents whose mother's education status was bachelors and above had moderate level of awareness. This finding is supported by the study conducted in Tamil Nadu,

India where children of graduate/ postgraduate educated mothers showed significantly higher knowledge scores related to cancer.²⁷ This might be because educated mothers are more likely to know about good health habits and practice them also, which can lead to better child health outcomes thus improving the awareness level in them as well.

There was also statistically significant association between level of awareness and stream ($p<0.001$) as well as educational status of father ($p=0.03$). In contrast to the present study there was significant association between level of awareness and age in United States²¹ and between knowledge of cancer and residence in Tamil Nadu, India.²⁷

This study provides valuable insights into the cancer awareness among adolescents indicating there is low cancer awareness recommending educational interventions are needed to improve the cancer awareness among the adolescents. Standardized data collection was ensured by the use of structured questionnaires. However, self-reported data may introduce bias, with participants potentially overestimating their awareness and cross-sectional design limits the ability to infer causation. Additionally, the study's non-probability convenient sampling technique which was conducted in a single institution limited the generalizability of its findings.

Conclusion

The overall findings of the study conclude that most of the adolescents had a low level of awareness regarding cancer. Awareness level tends to be affected by gender, stream as well as educational status of mother and father. This study highlights education is essential for adolescents regarding cancer as the best time to start health education is during adolescence when a person is cognitively aware of negative effects of participating in health risk behaviors. Education should be focused to boys and students studying management stream. Secondary schools can be an ideal setting to empower adolescents for raising cancer awareness, promoting healthy lifestyles and avoiding health risk factors linked to cancer development in later life.

Acknowledgement

The researchers are thankful to PASS for the permission to conduct the study, Principal of PASS Mr. Narayan Neupane for his constant support during the research process and the research participants for their valuable time and cooperation during the data collection.

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