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Knowledge and Attitude Toward Preventive Lifestyle Practices for NCDs Among Hospital Management Students: A Cross-Sectional Study

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ABSTRACT

Non-communicable diseases (NCDs) contribute to 71% of all global mortality, making them the primary cause of death (1), with circulatory problems, cancers, chronic airway diseases, and diabetes being the most common types. The primary reasons for this increase in the disease include inactive lifestyles, unhealthy diets, tobacco and alcohol use, urbanisation, and an ageing population. The most effective way to prevent and manage NCDs is through a healthy lifestyle, which includes diet and exercise. Although medication is used for treatment, non-pharmacological interventions-such as lifestyle changes-are crucial for controlling the disease and improving a patient's life condition.

Objective: The present study aims to evaluate the degree of understanding regarding preventive lifestyle practices for NCDs among hospital management students and to evaluate their attitudes towards embracing healthy living practices to prevent NCDs and to check any association between knowledge and attitude towards preventive lifestyle practices for NCDs among the students.

Materials and methods used: A cross-sectional research design was employed for the study which was conducted in an urban college in Kolkata, the capital of West Bengal. A predesigned, semi structured Google form questionnaire was administered to the students online, to assess their baseline knowledge and attitude towards preventive lifestyle practices for non-communicable diseases. Microsoft Excel and Stata 15 software was used to compile and examine the data and appropriate statistical method like Chi-square test, was applied.

Results: 55.33% of the participants showed high knowledge level regarding NCD risk factors and prevention, while 68% showed positive attitude. Participants with higher levels of knowledge were more inclined to demonstrate a health-seeking attitude. (84.3%), while those with moderate or poor knowledge showed a higher proportion of neutral or negative attitudes.

Conclusion: Worldwide, the prevalence of non-communicable diseases (NCDs)-a leading cause of morbidity and premature death-is growing. Non-contagious illnesses and their threats are largely caused by socioeconomic issues, which can be particularly important in emerging nations like India. Though the current study did not show significant association among types of family, or history of NCD in family or types of living style, due to reduced sample size yet by comprehending these perspectives from the study, researchers hope to create successful interventions that can encourage healthy behaviours at a young age, ultimately assisting in lowering the burden of NCDs in the future and supporting Sustainable Development Goal 3 (SDG 3), which seeks to guarantee everyone's health and well-being.

KEYWORDS: *Non communicable diseases, lifestyle change, prevalence, Sustainable development goals.*

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INTRODUCTION

Non-communicable diseases are those that cannot be spread through contact between individuals or between organisms. The growing challenge posed by non-communicable diseases in developing countries, including India, constitutes 80% and 25% of individuals younger than 60 years have been found to

have NCDs (2). Non-communicable diseases are also known as chronic diseases, or recently, they are popularly known as lifestyle diseases. People from all backgrounds, irrespective of ethnicity, race, class, country or region or even age, are affected by NCDs. More than 40% of disability-adjusted life years (DALYs) in India are caused by non-communicable diseases (NCDs), with cancer, diabetes, and cardiovascular illnesses accounting for 40% of the total. At 32%, NCDs are the major cause of death, even in rural regions, surpassing the 12% rate from traumas and other external factors(3).

The Commission on Chronic Illness in USA has defined "chronic diseases" as "comprising all impairments or deviations from normal, which have one or more of the following characteristics: a) are permanent, b) leave residual disability, c) are caused by non-reversible pathological alteration, d) require special training of the patient for rehabilitation and e) may be expected to require a long period of supervision, observation or care"(4). The four main types of NCDs that can be listed are: cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma), and diabetes (5). The nexus of inheritable traits, physiological, environmental, as well as behavioural factors is considered accountable for these long-duration chronic diseases. Irrespective of age groups, regions, or countries, non-communicable diseases are a leading cause of death, accounting for 82% of premature deaths in middle and low-income countries alone (5). NCDs-including cardiovascular diseases, diabetes, cancers, and chronic respiratory conditions-now contribute to about 63–65% of total deaths in India, showing a sharp increase from 37.9% in 1990 to over 63% in 2023. The 10th International Diabetes Federation (IDF) Atlas, 2021 also reports that 2,294,000 children aged 0–19 years in India are living with type 1 diabetes (12). The prevalence of chronic diseases is causing an immense burden worldwide and is expected to continue growing for several reasons. Primarily, most countries are witnessing a rise in average life expectancy, resulting in an escalating number of aged people, where the risk of chronic diseases is rising simultaneously. Secondly, rapid changes in lifestyle and behaviour are creating conditions that promote the onset of such diseases, even among the young population. Additionally, advancements in medical care are allowing individuals with chronic illnesses to live longer. The impact of these diseases is profound, leading to loss of life or lifelong impairment, family hardship, financial depreciation, and an economic burden on nations on a broader scale. Precautionary strategies to prevent a looming surge of non-communicable diseases are being adopted by developing countries to enhance socio-economic progress and improvements in healthcare.

India is undergoing a swift health transition characterised by an increasing prevalence of non-communicable diseases (NCDs), resulting in substantial morbidity and mortality across both urban and rural populations, alongside a significant loss of potentially productive years of life. With the present disease burden scenario, the likelihood of dying, between the ages of 30 and 70, from four major NCDs is 23% (27 percent for males and 20% for women percent in women), meaning that a person in their 30s has a one-fourth risk of passing away from these conditions before turning 70(4).

Non-communicable diseases (NCDs) are influenced by multiple risk factors, which can be broadly categorized into self-management, genetic predispositions, environmental determinants, underlying medical conditions, and socio-demographic characteristics. Among these, self-management is particularly significant, as it directly relates to dietary practices and their role in reducing risk and supporting prevention strategies across the lifespan. Nutritional interventions are therefore pivotal to NCD prevention and management. It is anticipated that the most effective prevention strategy is multi-dimensional, encompassing individual-level measures (lifestyle modification), societal initiatives (awareness and education), national-level policies (healthcare and policy decisions), and global strategies (public health frameworks). Key actions such as fostering multi-sectoral collaborations, advancing knowledge and information management, and encouraging innovation are expected to enhance the overall effectiveness of prevention and management efforts. Despite the significant health risks that chronic diseases pose to young adults, the level of knowledge and awareness among adolescents remains insufficient, highlighting a critical gap in early prevention and health education efforts.

Objectives:

- To assess the level of knowledge regarding preventive lifestyle practices for NCDs among hospital management students.
- **To evaluate the level of knowledge** regarding risk factors, prevention, and early detection of NCDs among hospital management students.
- **To assess the attitude** of hospital management students toward adopting healthy lifestyle behaviors to prevent NCDs.

- **To determine the association between knowledge and attitude** toward preventive lifestyle practices for NCDs among the students.

H_0 (Null Hypothesis):
There is **no significant association** between knowledge level and attitude toward preventive lifestyle practices for NCDs among hospital management students.

H_1 (Alternative Hypothesis):
There **is a significant association** between knowledge level and attitude toward preventive lifestyle practices for NCDs among hospital management students.

Methodology:

- **Study Design**: A cross-sectional descriptive study was carried out among the students of BBA(HM) -2nd and 3rd year and MHA students-1st and 2nd year of a renowned institute of Kolkata, West Bengal.
- **Sample Size**: The required sample size was estimated using Cochran's formula for a study conducted in an urban setting. Assuming the expected prevalence of knowledge regarding preventive lifestyle practices for NCDs to be 50% (average prevalence calculated from other studies), taking relative precision of five percent, desired confidence interval level of 95 percent, the sample size arrived at 150.
- **Study Tool:** A pre-tested, closed-ended structured questionnaire, self administered was made in English. The aim of the study was explained to all the study participants. The data was collected in Google forms. The questionnaire consisted of:
  - Section A: Demographics
  - Section B: Knowledge (Multiple choice questions on NCD prevention)
  - Section C: Attitude (Likert-scale items on personal beliefs and practices)

The first part of the questionnaire gathered demographic variables such as age, gender, field of study, family history of non-communicable diseases, and students' diagnosed NCD status.

The second part of the questionnaire consisted of Knowledge based questions toward preventive lifestyle practices for NCDs. The questions rating for knowledge was measured by "True", "False", and "Don't know".

The third section of the questionnaire comprised attitude-based questions related to preventive lifestyle practices for NCDs. The level of attitude was assessed using a Likert scale with the options: "Strongly disagree", "Disagree", "Neutral", "Agree", and "Strongly agree". Responses of "Strongly agree" and "Agree" indicated a positive attitude, while any other response reflected a negative view toward preventive lifestyle practices for NCDs. However, two questions (17 and 18) in this section required critical thinking, where individual perspectives may vary, and in these cases, responses of "Strongly agree" or "Agree" signified a negative attitude.

- **Study population:**

Inclusion criteria:
1. Those who are studying BBA(HM) in 2nd year and 3rd year and MHA 1st year and 2nd year.
2. Those willing to participate in the study

Exclusion criteria:
1. Those who are from other departments.
2. Those who did not wish to participate.

- **Type of Sampling:**

Random sampling.

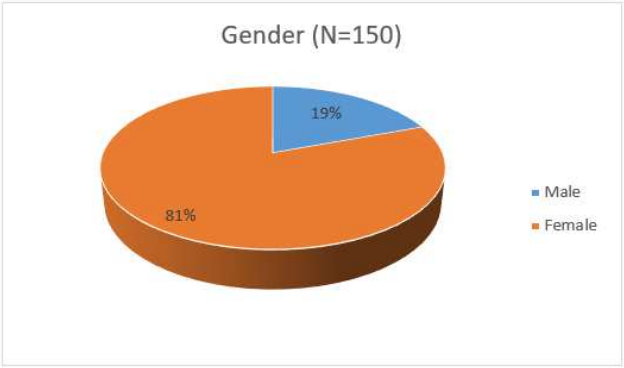
Data analysis:
The data obtained from the respondents in the Google sheet was linked to Microsoft Excel, to get the idea of knowledge and attitude toward preventive lifestyle practices for NCDs. After data collection, the data was analysed using Microsoft Excel 2019 and STATA 15 software and further analysis was done as required.

Results:

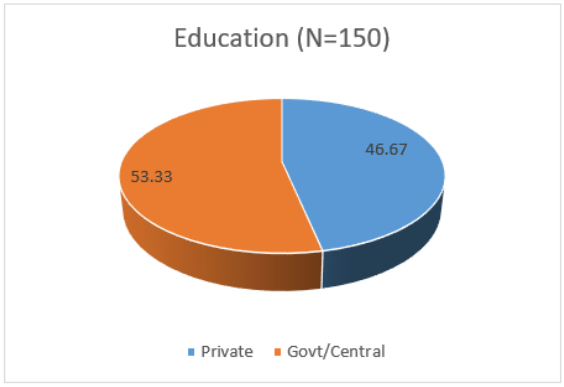
1. **Socio-demographic data are presented in the following graphs and tables:**

A. Distribution of age groups of the participants

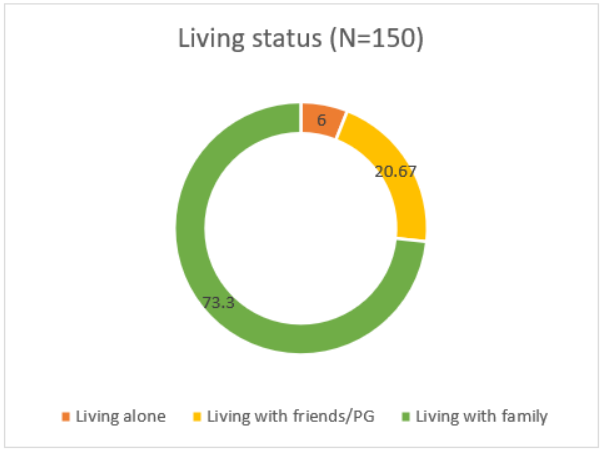
B. Distribution of the gender of the participants



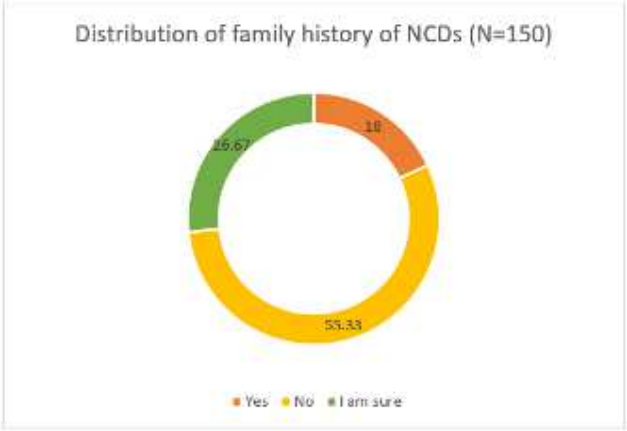
C. Distribution of the education status of the participants



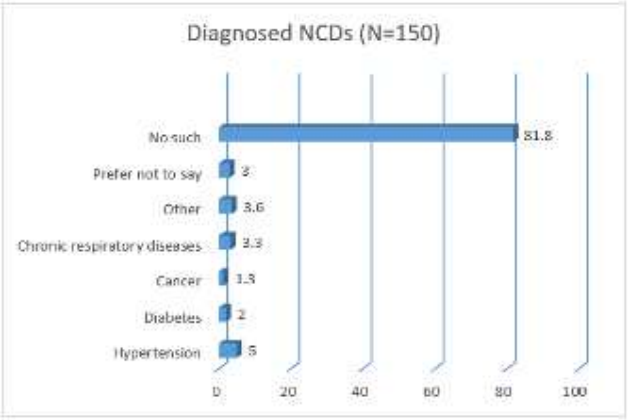
D. Distribution of the course of study among the participants



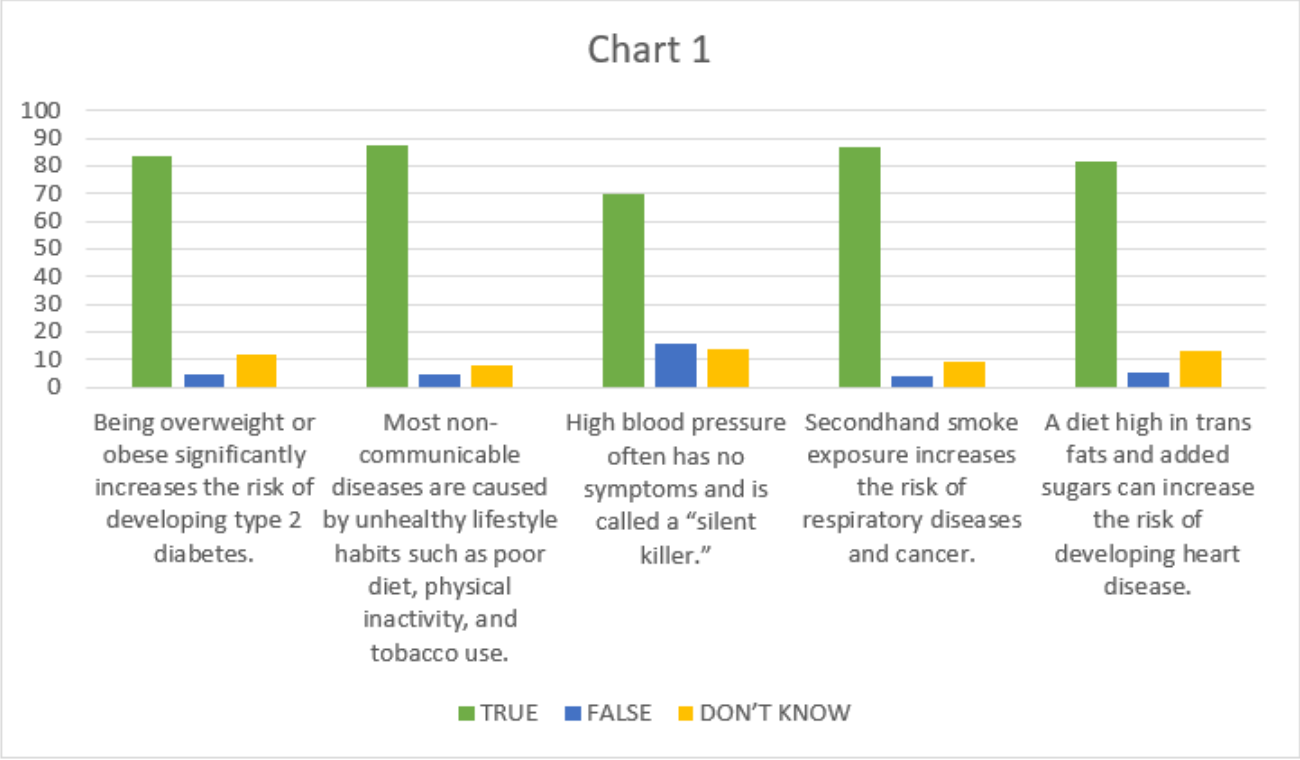
E. Distribution of family history of any Non-Communicable Disease among the participants



F. Distribution of diagnosed non-communicable diseases (NCDs) among the participants



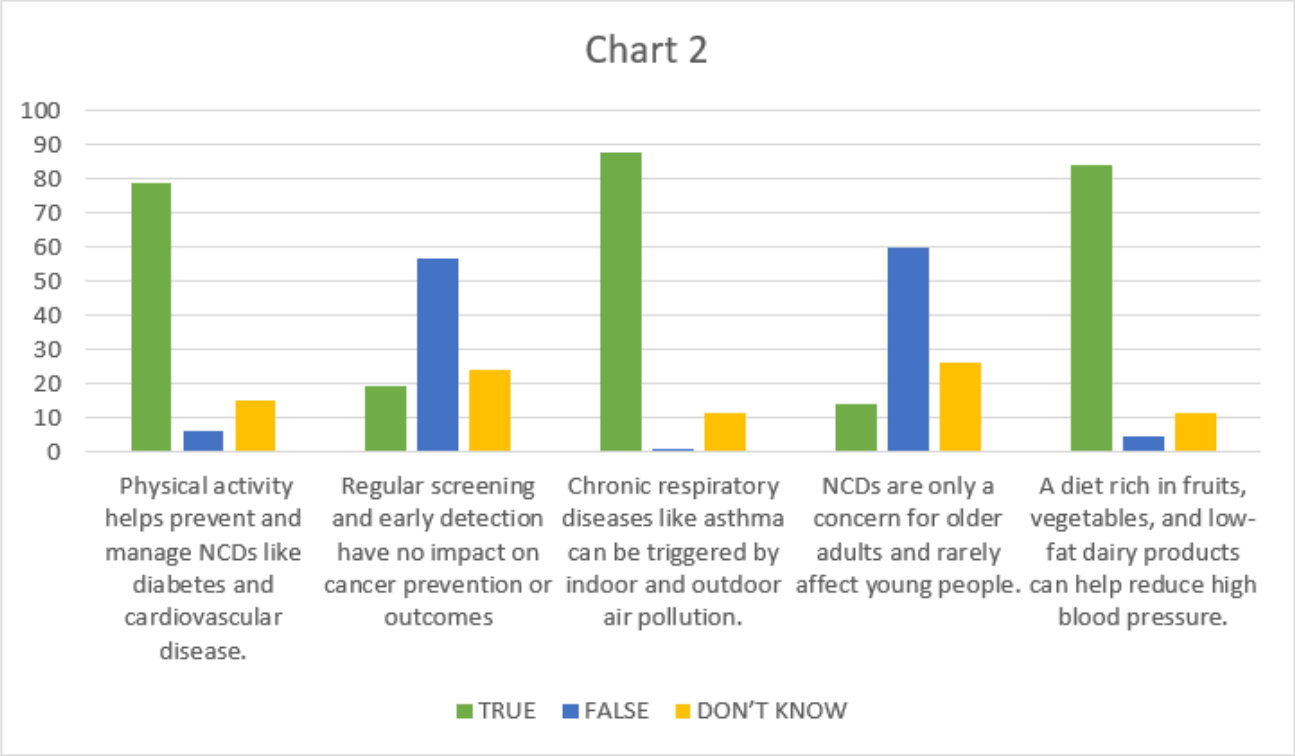
2. Level of Knowledge about Preventive Lifestyle Practices for NCDs



➢ The Chart 1 shows that the majority (83.3%) responded TRUE (correct), indicating good understanding of obesity as a risk factor. Around 85% marked TRUE, showing strong awareness of lifestyle-NCD link. About

70% chose TRUE, while 15–20% were unsure or incorrect, indicating a knowledge gap regarding asymptomatic hypertension. Over 80% selected TRUE, showing high awareness of secondhand smoke risks. Roughly 80% responded TRUE, reflecting good knowledge of diet-related risks.

- **Key Insight from Chart 1:**
  Most participants demonstrate strong knowledge about major NCD risk factors. The only noticeable gap is in understanding asymptomatic nature of hypertension.



- The Chart 2 shows nearly 78.7% responded TRUE, confirming good awareness of physical activity benefits. Around 55% marked FALSE (correct), but nearly 30% marked TRUE, showing confusion regarding the role of screening**.** 88% responded TRUE, indicating strong awareness of environmental triggers. About 50–55% marked FALSE (correct), but nearly half either agreed or were unsure, revealing a significant misconception about age vulnerability**.** Around 80% answered TRUE, showing good knowledge about diet in blood pressure control.

- Key Insight from Chart 2:

Awareness is generally high, but two areas need attention:

- Misunderstanding about cancer screening benefits (Q7).
- Belief that young people are not at risk of NCDs (Q9)

Overall, the knowledge level regarding NCD risk factors and prevention was **generally high** among the participants, with most respondents correctly identifying key lifestyle contributors such as diet, physical inactivity, smoking, and obesity. However, **notable misconceptions** were observed regarding the importance of early screening (Q7) and the belief that NCDs primarily affect older individuals (Q9). These represent **critical gaps** that may hinder early preventive action among young adults.

Categorizing Knowledge

Category	n (out of 150)
Good Knowledge (8–10 correct)	83
Moderate Knowledge (5–7)	52
Poor Knowledge (0–4)	15

3. Attitude toward Preventive Lifestyle Practices for NCDs

Questions	Measure of effect, n (%)
1. I am personally motivated to follow a healthy lifestyle to prevent NCDs	
Strongly disagree	6 (4)
Disagree	2 (1.3)
Neutral	30 (20)
Agree	68 (45.3)
Strongly agree	44 (29.3)
2. Maintaining a healthy weight is important to reduce the risk of heart disease and other NCDs.	
Strongly disagree	4 (2.7)
Disagree	4 (2.7)
Neutral	22 (14.7)
Agree	64 (42.7)
Strongly agree	56 (37.3)
3. I consider mental well-being and stress management as important in preventing chronic illnesses.	
Strongly disagree	4 (2.7)
Disagree	4 (2.7)
Neutral	25 (16.7)
Agree	56 (37.3)
Strongly agree	61 (40.7)
4. I believe regular physical activity is essential for preventing lifestyle-related diseases like diabetes and hypertension.	
Strongly disagree	2 (1.3)
Disagree	0
Neutral	25 (16.7)
Agree	58 (38.7)
Strongly agree	65 (43.3)
5. Preventive healthcare is more effective than treating NCDs after diagnosis	
Strongly disagree	3 (2)
Disagree	7 (4.7)
Neutral	55 (36.7)
Agree	55 (36.7)
Strongly agree	30 (20)
6. I would actively seek health information and resources to reduce my risk of NCDs.	
Strongly disagree	3 (2)
Disagree	3 (2)
Neutral	36 (24)
Agree	72 (48)
Strongly agree	36 (24)
7. Eating healthy all the time sounds ideal, but I believe occasional indulgence has no real effect on long-term health	
Strongly disagree	2 (1.3)
Disagree	12 (8)
Neutral	53 (35.3)
Agree	69 (46)
Strongly agree	14 (9.3)
8. I agree that NCDs can be prevented, but I don't think young people need to worry about them right now.	
Strongly disagree	21 (14)
Disagree	55 (36.7)
Neutral	40 (26.7)
Agree	28 (18.7)

Strongly agree	6 (4)
9. Early detection plays an important role in NCD prevention and control	
Strongly disagree	0
Disagree	1 (0.7)
Neutral	30 (20)
Agree	73 (48.7)
Strongly agree	46 (30.7)
10. Young people should be taught about NCD prevention and healthy lifestyle practices early in life.	
Strongly disagree	2 (1.3)
Disagree	1 (0.7)
Neutral	26 (17.3)
Agree	57 (38)
Strongly agree	64 (42.7)

The attitude of participants was assessed using ten Likert-scale items. Responses were scored on a five-point scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Two negatively framed statements- "Eating healthy all the time sounds ideal, but I believe occasional indulgence has no real effect on long-term health" and "I agree that NCDs can be prevented, but I don't think young people need to worry about them right now"-were reverse coded to maintain consistency, ensuring that higher scores reflected a positive attitude.

The composite mean attitude score across all ten items was 3.81 (on a 1–5 scale), indicating an overall positive attitude toward adopting preventive lifestyle practices for NCDs among the respondents.

The composite attitude score was derived by assigning numerical values to each Likert response, where "Strongly Disagree" = 1 and "Strongly Agree" = 5. For two negatively framed items, reverse coding was applied to ensure that higher scores consistently represented a positive attitude. After computing the average across all ten items for each participant, the overall mean composite score for the group was 3.81 out of 5, which is above the neutral value of 3. This indicates that respondents generally hold a positive attitude toward preventive lifestyle practices for NCDs.

Cut-off Criteria for Attitude Categories

- Positive Attitude: Composite score ≥ 3.5
- Neutral Attitude: Composite score between 2.5 and 3.49
- Negative Attitude: Composite score < 2.5

Category	N (out of 150)
Positive Attitude	102
Neutral Attitude	30
Negative Attitude	18

Table: Association Between Knowledge Level and Attitude Toward Preventive Lifestyle Practices (n = 150)

Knowledge Level	Positive Attitude	Neutral Attitude	Negative Attitude	Total
Good	70	10	3	83
Moderate	26	14	12	52
Poor	6	6	3	15
Total	102	30	18	150

A Chi-square test was performed to examine the relationship between knowledge level and attitude toward preventive lifestyle practices for NCDs. The association was found to be statistically significant ($\chi^2 = 14.72$, df = 4, p = 0.005).

Students with good knowledge were more likely to display a positive attitude (84.3%), while those with moderate or poor knowledge showed a higher proportion of neutral or negative attitudes. **This indicates that higher levels of knowledge are strongly associated with more favourable attitudes toward NCD prevention.**

DISCUSSION

Adolescence and early adulthood represent phases of rapid physical, emotional, and psychological change, making college students particularly susceptible to external influences. During this stage, curiosity, trial, and error of new things often shape lifestyle behaviours, some of which may evolve into long-term habits that increase the risk of non-communicable diseases (NCDs). Because of this vulnerability, assessing students' understanding of NCDs and their perceptions of associated risk factors becomes essential. Hospital management students, as future healthcare leaders, constitute an important group whose understanding and perception of preventive health practices can influence both personal habits and future professional roles. Strengthening awareness through continuous, structured educational initiatives can guide young individuals toward healthier choices. Regular exposure to accurate health information and preventive practices forms the foundation of effective long-term strategies to reduce the future burden of chronic illnesses.

In the present study, a majority of participants demonstrated **good knowledge** regarding key NCD risk factors and preventive strategies, with 83 out of 150 students falling into the "good knowledge" category. Awareness was particularly strong for well-established risk factors such as obesity, diet, physical inactivity, and tobacco exposure, with over 80% answering these items correctly. These findings align with Naaz (2021) (1), who also reported high awareness of lifestyle determinants of chronic diseases among young adults and educated populations. Similarly, previous studies conducted among university students in India and other LMICs have shown moderate to high knowledge about diet, exercise, and unhealthy habits as contributors to NCD risk. However, important gaps emerged. Nearly half of the students were unaware of the critical role of **screening** in early detection of diseases such as cancer, and a substantial proportion believed that **young people are at minimal risk of developing NCDs**, reflecting a common misconception. These gaps mirror findings from Higuchi (2021) (9) and Omotayo et al. (2024) (10), who observed that while general awareness of NCDs is improving, misconceptions persist regarding age-related risk and the role of preventive screenings. In another study, it reported strong overall awareness of lifestyle links (diet, exercise, smoking) but identified **significant gaps in understanding early detection**, particularly regarding hypertension and other silent NCDs (11), which we can also see in our study, where 55% participants are in dilemma for screening tests for early detection. Although, this present study did not find any difference in attitude or knowledge between the genders or among participants who lived with or without family.

Attitude reflects a person's tendency to respond in a particular manner when faced with a specific situation. A positive attitude denotes a willingness to acknowledge health concerns, accept accurate information, and respond constructively. It is linked with timely help-seeking, better health behaviours, and proactive engagement in prevention. The results indicate an overall **positive attitude**, with a mean composite score of 3.81 out of 5. More than two-thirds of participants expressed strong motivation to engage in healthy lifestyle behaviors such as regular physical activity, weight management, and stress reduction. This aligns with findings from similar studies, which show that health-related students tend to exhibit favourable attitudes due to increased exposure to health information. Interestingly, attitudes toward dietary indulgence and the perceived vulnerability of young people to NCDs displayed mixed responses. For example, nearly half agreed that occasional unhealthy eating has little long-term impact, and about one-fifth felt that young adults need not worry about NCDs presently. These attitudes, although less severe than in the general youth population, are consistent with literature suggesting that young adults often underestimate long-term health risks (8). Psychological optimism bias-where individuals perceive themselves as being less at risk than others-may play a key role in shaping these responses. Another interesting finding was about 80% participants stated they would like to be taught about NCD prevention and healthy lifestyle practices early in life. This is indeed a positive attitude from the college students, who showed interest in knowing these diseases. 78% of the participants showed a positive attitude in considering mental well-being and stress management to be essential in preventing chronic illnesses.

A statistically significant association ($\chi^2 = 14.72$, $p = 0.005$) was observed between knowledge level and attitude. Students with **good knowledge** were far more likely to exhibit **positive attitudes** toward NCD prevention, while those with poor or moderate knowledge showed higher rates of neutral or negative attitudes. This supports existing evidence that knowledge is a key determinant of preventive practices. For example, Engelgau et al. (2016) (14) emphasised that increased awareness significantly enhances the willingness to engage in health-promoting behaviours. Studies conducted in university settings in India, Nigeria, and Malaysia have also consistently found that higher knowledge

correlates with healthier lifestyle choices and greater concern for long-term disease prevention. In the present study, no significant association was observed between participants' belief that preventive healthcare is more effective than treatment and the presence of a family history of non-communicable diseases (NCDs) ($\chi^2 = 4.54$, $p = 0.805$). This suggests that individuals' attitudes toward the value of preventive healthcare are generally consistent, regardless of whether they have a family history of NCDs. The very high p-value indicates that any variations across groups are likely attributable to chance. These findings highlight that awareness about the importance of preventive measures may already be widespread and not necessarily influenced by personal or familial disease experience. This may also be because the study was conducted in the hospital management students in an esteemed college of urban area, where students had better awareness of preventable NCDs, and it doesn't effect whether or not they have family history of NCDs. This study result was different from a study done among secondary and preparatory high school students in Wolaita Zone of Ethiopa, which is a town, where family history of NCDs were a factor that significantly associated with the knowledge level of NCDs among the students. (15) Such variation in results is likely influenced by differences in both the study setting and the population involved.

The association between gender and the belief that physical activity helps prevent non-communicable diseases (NCDs) was examined using a chi-square test, where females were more likely to agree with this statement (N=97, p value=0.054). The result indicates that gender does not have a statistically significant influence on participants' beliefs about the role of physical activity in NCD prevention; however, the p-value (0.054) is close to the conventional significance threshold of 0.05, suggesting a trend toward significance, that is not strong enough to establish a meaningful association. Additionally, the study did not reveal any differences in knowledge regarding how respiratory diseases, such as asthma, can be triggered by both indoor and outdoor air pollution between students from private schools and public schools. This finding is different from the study done in Himachal Pradesh where the results depicted private school students (M=22.14) reported significantly higher knowledge (t=2.575, p< .01) from government school students (M=20.48) (13).

LIMITATIONS OF THE STUDY

1. The study was conducted on a relatively small sample size of 150 participants, which is lower when compared to similar studies carried out in other settings.
2. Most respondents reported a positive attitude toward preventive health practices; however, these self-reported responses could not be independently verified and may not accurately reflect actual attitudes or behaviors.
3. Additionally, the majority of participants were drawn from urban areas, which may have contributed to a higher level of knowledge and thus introduced potential selection bias.

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