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Nutritional knowledge and behaviours among adolescents in Calabar: Towards prevention of diet-related noncommunicable diseases

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Abstract

Background: Non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancer, and obesity are major global health concerns currently. Adolescents are also increasingly exposed to NCD risk factors due to poor dietary habits and lifestyle choices that they are exposed to during this formative period. These unhealthy dietary and lifestyle habits include low fruit and vegetable consumption, frequent intake of sugary, highly processed foods and physical inactivity.
Objectives: This study assessed the level of nutrition awareness and dietary practices related to NCDs among secondary school students in public and private schools in Calabar Municipality, Cross River State, Nigeria.
Method: A descriptive cross-sectional design was adopted. A multi-stage sampling technique was used to select 300 students from both public and private secondary schools. A semi-structured questionnaire was used for data collection; this was analyzed using SPSS version 25. The study findings were presented using frequencies, percentages.
Results: Among the participants, 39.3% had a good understanding of the link between nutrition and NCD risks, 38% scored average, while 22.7% scored low. Only 21.3% reportedly practiced good dietary habits. Furthermore, there was no significant relationship found between nutrition awareness and dietary practices (P = 0.291) or between dietary habits and health status (P = 0.882). Students in private schools showed greater awareness of diet and non-communicable diseases than those in the public schools (P = 0.650).
Conclusion: There was low level of awareness regarding diet and NCD. Consequently, developing nutrition education programmes and strategies aimed at increasing nutrition awareness, healthy dietary choices and practices among adolescents, is highly recommended.

Keywords: NCDs, Nutrition, Awareness, Adolescents, Prevention

Introduction

Non-communicable diseases (NCDs), including cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes, are the leading causes of death globally, accounting for over 70% of total deaths each year[1]. These chronic diseases, once perceived as health issues affecting only high-income nations, are now increasingly prevalent in low- and middle-income countries, where health systems are often under-resourced and preventive strategies are limited. Cardiovascular diseases such

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as ischemic heart disease and stroke remain the highest contributors to the global disease burden[2], followed by cancers, which in 2019 accounted for 24 million new cases and 10 million deaths globally[3]. Similarly, diabetes, particularly type 2, affects more than 500 million adults worldwide[4], and the prevalence of neurodegenerative diseases such as dementia is also rising. By 2050, the global number of adults living with dementia is projected to reach 153 million, up from 57 million in 2019[5].

Numerous studies have identified unhealthy diets and lifestyle behaviors as key modifiable risk factors for NCDs. Diets high in saturated fats, trans-fatty acids, sugars, and sodium, and low in fruits, vegetables, and fiber significantly increase the risk of developing chronic diseases[6]. The diet-heart hypothesis, introduced by Ancel Keys nearly 70 years ago, laid the foundation for dietary guidelines that emphasize reduced intake of saturated fats and cholesterol to lower the risk of ischemic heart disease[7]. Although more nuanced understandings of dietary fat have emerged, the central message remains: poor dietary choices contribute significantly to the burden of NCDs.

Adolescence, as defined by the World Health Organization (WHO) is the period between 10 and 19 years of age, it is a critical developmental phase marked by physical, emotional, cognitive, and behavioral changes. It is during this time that individuals begin forming independent health-related behaviors, including dietary habits and activity patterns. These behaviors, once formed, often persist into adulthood and significantly shape long-term health outcomes[8]. Worryingly, over 80% of adolescents globally do not meet recommended levels of physical activity and healthy eating, a trend that is particularly pronounced in low- and middle-income countries such as Nigeria[9]. In sub-Saharan Africa, adolescent physical inactivity is among the highest globally, and in Nigeria, between 38% and 53.8% of in-school adolescents are reported to be insufficiently active[10].

Moreover, several studies conducted in Nigeria have highlighted concerning dietary patterns among adolescents, including high consumption of sugary beverages and pastries, coupled with low intake of fruits and vegetables[11]. This unhealthy lifestyle, combined with poor access to healthcare services and low health literacy, has led to rising rates of NCDs among young people[12].

Despite the growing burden of NCDs, there remains a significant gap between knowledge and practice of healthy behaviors among adolescents. Schools, therefore, represent a vital platform for promoting health education and preventive strategies. This study aims to assess the knowledge, attitudes, and dietary practices related to NCDs among secondary school students in Calabar Municipality, Cross River State, Nigeria. It also seeks to compare these variables between students attending public and private schools and to examine whether greater knowledge correlates with healthier lifestyle choices. Findings from this study are expected to provide actionable insights for stakeholders in education and public health, informing the design and implementation of targeted interventions to promote lifelong healthy habits among Nigerian adolescents.

Methodology

Study Design and Study Area: A cross-sectional study design was adopted for the research using a quantitative approach of data collection among secondary school students in Calabar municipality Local Government Area of Cross River state, Nigeria. Calabar, the capital of Cross River State in the South-South region of Nigeria, comprises urban and peri-urban areas with over 40 public and private secondary schools. Common staple foods include garri, rice, yam, and vegetable soups.

Ethical Approval: The ethical clearance was sorted for and obtained from the Cross River State Research Ethics Committee, Ministry of Health Headquarters, Calabar (Reference Number: CRS/MH/HREC/2024/VOL.2/034).

Study Population and Sample Size Determination: The study population consisted of both male and female students of secondary schools in Calabar municipality Local Government Area of Cross River State. All participating students were enrolled in day schools, as the selected schools for this study primarily cater to day students and had no boarding students during the data collection period. The estimated total population of students across the five selected wards was approximately 700. The sample size was determined using Yamane formular (1967):

Accounting for a 10% non-response rate, adjusted sample size of 283 was obtained and was rounded up to 300 respondents to provide a conservative and

more practical sample size, which can help ensure sufficient statistical power and accommodate for unforeseen issues like additional non-response or data loss during the study. A multistage sampling technique was used to select 300 students for the study. First, five wards were selected by simple random sampling technique from the ten wards in Calabar Municipality. From these, three secondary schools (one public and two private) were chosen using simple random sampling. In each school, two classes in Senior Secondary were sampled – SS1 and 2, for convenience particularly as those two classes had the age range we were targeting (young adolescents). The Junior classes were left out due to the students being of tender ages. Within each selected class, 20 students were selected using systematic sampling, yielding 100 students from the public schools and 200 from the private schools. Eligible participants were students who gave informed assent with parental consent; those absent or unwilling to participate were excluded.

Data Collection: A semi-structured self-administered questionnaire was used to obtain data from 300 respondents. The reliability and validity of the data collection instruments was assessed through expert validation for content and face validity to ensure consistent and accurate measurement of nutritional knowledge and dietary behaviors in the adolescent population. The questionnaire was pre-tested in one secondary school outside the study area, and adjustments were made for clarity and relevance. The instrument demonstrated acceptable internal consistency, with a Cronbach's alpha of 0.75.

Statistical Analysis: Data was collected into Microsoft Excel for sorting and cleaning. Subsequently, Statistical Package for the Social Sciences (SPSS), Version 25.0 was used to analyze the data. Descriptive statistics was used to summarize the demographic characteristics of respondents and study variables while, inferential statistics involving Chi-square tests was conducted to determine associations between study variables. Statistical significance at $P < 0.05$ was accepted. Nutritional knowledge was assessed using 10 questions. Each correct response was scored as 1, and incorrect responses were scored as 0, yielding a total knowledge score range of 0 to 10. Scores were categorized as follows: 0-3 = poor knowledge, 4-6 = average knowledge, and 7-10 = good knowledge.

Results

Socio-demographic data of respondents

Table 1 presents the socio-demographic characteristics of the 300 respondents. Females constituted a higher proportion (61.3%) than males (36.7%). The majority of participants were early adolescents, with 117 (39%) aged 14 years and 84 (28%) aged 15 years. Most respondents were in senior secondary classes [SS2: 16 (38.7%); SS3: 117 (39%)]. A significant majority 276 (92%) reported their parents were employed or had a business, suggesting economically active households. Regarding household size, over 80% resided in medium to large households [3-5 members: 123 (41%); 6 or more members: 124 (41.3%)], which may influence food availability and nutritional outcomes.

Knowledge of Nutrition and Non-Communicable Diseases (NCDs)

Table 2 details respondents' knowledge and perception of nutrition and NCDs. Most 198 (66%) correctly defined "good nutrition" as eating healthy foods, and a high proportion 295 (98.4%) agreed on the importance of regular healthy eating for growth. However, perceptions about NCD prevention were mixed, with 140 (46.7%) disagreeing or strongly disagreeing on the role of healthy eating. While 223 (74.3%) were aware of NCDs, common information sources included hospital/health professionals 135 (45%) and the internet 58 (19.3%). Diabetes mellitus 106 (35.3%) and hypertension 84 (28%) were the most 'recognised NCDs. Over half 163 (54.3%) did not know anyone diagnosed with an NCD. A majority believed lifestyle habits 201 (67%) and diet

Table 1: Socio-Demographic Characteristics of Respondents

Variable	Options	Frequency	Percentage
Gender	Male	110	36.7
	Female	184	61.3
Age	Less than 14 years	14	4.7
	14 years	117	39
	15 years	84	28
	16 years	51	17
	17 years	23	7.7
	18 years and above	11	3.7
Class/Grade	SS1	67	22.6
	SS2	116	38.7
	SS3	117	39
Do your parents work or have a business	Yes	276	92
	No	13	4.3
	I can't say	11	3.7
Household size	1-3	53	17.7
	3-5	123	41
	6 and above	124	41.3

Table 2a: Knowledge and Perception of Nutrition and NCD's among Respondents

Variable	Options	Frequency	Percentage
Understanding of the phrase "good nutrition"	Eating healthy foods	198	66
	Eating lots of snacks	2	1
	Drinking only water in the morning	8	2.7
	Including fruits and vegetables in your diet	98	32.7
Belief that eating healthy foods regularly provides essential nutrients for growth and development	Strongly Agree	137	45.7
	Agree	158	52.7
	Disagree	1	0.3
	Strongly Disagree	4	1.3
Belief that eating healthy foods can prevent non-communicable diseases (NCDs)	I strongly agree	50	16.7
	I agree	110	36.7
	I disagree	129	43
	I strongly disagree	11	3.7
Awareness of non-communicable diseases (NCDs)	No	77	25.7
	Yes	223	74.3
Sources of information about non-communicable diseases	Television	34	11.3
	Internet	58	19.3
	Radio	10	3
	Friends/family	55	9.2
	Hospital/Health professionals	135	45
Types of non-communicable diseases known	Diabetes	106	35.3
	Hypertension/high blood pressure	84	28
	Coronary heart disease	18	6
	Cancer	42	14
	Obesity	55	18.3
	Others	12	4
Personal acquaintance with someone diagnosed with an NCD	No	163	54.3
	Yes	106	35.3
	I prefer not to say	31	10.3

Table 2b Continued: Knowledge and Perception of Nutrition and NCDs among Respondents

Variable	Options	Frequency	Percentage
Belief that lifestyle habits like smoking, alcoholism, and inactivity can lead to NCDs	No	43	14.3
	Yes	201	67
	I'm not sure	56	18.7
Belief that diet can contribute to the risk of developing NCDs	No	26	8.7
	Yes	196	65.3
	I don't know	88	29.3
Awareness that adolescents can be at risk of developing NCDs	No	50	16.7
	Yes	162	54
	I don't know	88	29.3
Awareness of ways to prevent diet-related NCDs	No	128	42.7
	Yes	172	57.3
Practices reported for preventing diet-related NCDs	Eating healthy foods	157	52.3
	Drinking alcohol	7	2.3
	Limiting alcohol intake	30	10
	Regular exercise	70	23.3
	Avoiding tobacco intake	35	11.7
	Eating lots of snacks	4	1.3
	Eating late at night	8	2.6
Whether students are taught the importance of good nutrition in school	No	10	3.3
	Yes	290	96.7
Self-rating of knowledge about nutrition and NCDs	Very poor	22	7.3
	Poor	19	6.3
	Average	97	32.3
	Good	88	29.3
	Very good	74	24.8

196 (65.3%) contribute to NCD risk. Similarly, 162 (54%) acknowledged adolescents' NCD risk. Among those aware of preventive measures 172 (57.3%), eating healthy foods 157 (52.3%) and regular exercise 70 (23.3%) were most cited. Despite 290 (96.7%) reporting nutrition education in school, overall knowledge levels varied, with 118 (39.3%) demonstrating good knowledge, 114 (38%) average, and 68 (22.7%) poor knowledge (Table 3).

Table 3: Summary of Level of Knowledge of Nutrition and NCD

Level of Knowledge	Frequency	Percentage
Good knowledge	118	39.3
Average knowledge	114	38
Poor knowledge	68	22.7
Total	300	100

Comparison of Level of Knowledge on Nutrition and NCDs Between Private and Public-School Students

Table 4 presents a Chi-square test of independence conducted to assess differences in the knowledge of nutrition and NCDs between students in private and public secondary schools. Since the P-value of 0.650, we do not have enough evidence to reject the null hypothesis, therefore we conclude that there was no statistically significant difference between the knowledge in nutrition and NCDs between students in private secondary schools and public secondary schools, (χ^2 cal = 0.860, df = 2, P = 0.650).

Table 4: Chi-Square Test of Independence Showing Differences in Nutrition and NCD Knowledge Between Students in Private and Public Secondary Schoolsz

Variables	Private schools	Public schools	Total	Df	χ^2 cal	χ^2 tab	P value
Good knowledge	57	61	118	2	0.860	5.991	0.650
Average knowledge	49	65	114				
Poor knowledge	29	39	68				
Total	135	165	300				

Significance level=0.05, df=2, χ^2 cal.=0.860, χ^2 crit. =5.991, p-value=0.650

Dietary Practices Among Secondary School Students

Table 5 outlines the dietary practices of respondents. Most students, 159 (53%), consumed fruits and vegetables 2-5 times per week, while 101 (33.6%) did so only once, and just 40 (13.4%) exceeded five times weekly. Although 280 (93.3%) reported liking fruits and vegetables, only 50 (16.7%) regularly consumed them as snacks, with 201 (67%) preferring pastries, 120 (40%) peanuts, and 86 (28.7%) biscuits. Fewer consumed sugary drinks 44 (15%) or sweets/gums 35 (11.7%). Despite this, 50 (16.7%) reported fruit as a frequent snack. Regarding physical activity, 114 (38%) engaged once weekly, 84 (28%) twice or daily, and only 18

Table 5: Dietary Practices among Secondary School Students

Variable	Option	Frequency (n)	Percentage (%)
Frequency of fruit and vegetable intake per week	Once	101	33.6
	2-5 times	159	53.0
	More than 5 times	40	13.4
Preference for eating fruits and vegetables	No, I don't like to	5	1.6
	Yes, I like to	280	93.3
	Not sure	15	5.0
Allergic reactions when eating fruits	No	250	83.3
	Yes	50	16.7
Preference for snacks during lunch break	No	80	26.6
	Yes	220	73.4
Commonly consumed snacks	Pastries	201	67.0
	Biscuits	86	28.7
	Peanuts	120	40.0
	Sugary drinks	44	15.0
	Sweets and gums	35	11.7
	Fruits	50	16.7
Participation in physical activities per week	Once	114	38.0
	Twice	84	28.0
	3-6 times	18	6.0
	Daily	84	28.0
Frequency of eating at restaurants or fast-food outlets	Few times a week	42	14.0
	Once in a while	180	60.0
	Never	77	26.0
Tendency to replace water with sugary drinks	No	124	41.4
	Yes	94	31.3
	Once in a while	82	27.3
Dietary Practice Level	Good Practices	64	21.3
	Moderate Practices	138	46
	Poor Practices	98	32.7

(6%) did so 3-6 times weekly. Eating out was occasional for 180 (60%), while 42 (14%) did so a few times weekly and 77 (26%) never. Alarmingly, 94 (31.3%) often replaced water with sugary drinks, while 82 (27.3%) did so occasionally and 124 (41.4%) did not. Overall dietary practice levels showed that 64 (21.3%) had good practices, 138 (46%) moderate, and 98 (32.7%) poor.

Health Status of Students

Table 6 details students' health status and risk behaviors. Nearly half, 149 (49.6%), received health check-ups only when needed, and 56 (18.7%) never. While 184 (61.3%) described their general health as "just okay," 23 (7.7%) felt "not physically strong" and 15 (5%) "quite sickly." Most, 212 (70.6%), had no diagnosed serious health challenges. Alcohol consumption was reported by 96 (32%) of students, with a small percentage drinking daily (5 [1.7%]) or a few times per week (12 [4%]). Family history of NCDs was notable, with 49 (16.3%) reporting diabetes and 38 (12.7%) hypertensions in their family. These factors, combined with inconsistent health monitoring, indicate potential vulnerability to NCDs.

Association Between Level of Knowledge and Dietary Practices

Table 7 presents no statistically significant association between students' level of knowledge of nutrition and NCDs and their dietary practices (X^2 = 4.96, p = 0.291). This suggests that despite some students with higher knowledge demonstrating better dietary habits, overall, the data does not show a consistent or statistically significant trend linking the two variables.

Relationship Between Dietary Practices and Health Status

Table 8 shows no statistically significant association between students' dietary practices and their self-reported health status (X^2 = 2.377, p = 0.882). This indicates that, within the study's scope, students' current dietary habits do not have an immediate, observable impact on their perceived health, potentially due to the lagging effect of diet on long-term health outcomes.

Table 6: Health Status of Students

Variable	Options	Frequency	Percentage
Frequency of health check-ups	Once in 3 months	58	19.3
	Once in 6 months	14	19
	Once in a year	23	7.7
	Only when needed	149	49.6
	Never get it done	56	18.7
Self-assessment of general health wellbeing	I'm in top shape	78	26
	I'm just okay	184	61.3
	I'm not physically strong	23	7.7
	I'm quite sickly	15	5
Diagnosis of any serious health challenge	No	212	70.6
	Yes	65	21.7
	I don't know	23	7.7
Alcohol consumption	No	204	68
	Yes	96	32
If yes, frequency of alcohol consumption	Everyday	5	1.7
	Few times a week	12	4%
	Not often	15	5%
Awareness of family history of the following NCDs	Diabetes	49	16.3
	Hypertension	38	12.7
	Obesity	11	3.7
	Cancer	9	3
	stroke	9	3

Table 7: Association Between Level of Knowledge and Dietary Practices

Level of Knowledge/Practice	Good Practice	Moderate Practice	Poor Practice	Total	Df	X cal	X crit	p - value
Good Knowledge	31	49	44	124	4	4.96	9.488	0.291
Average Knowledge	23	55	31	109				
Poor Knowledge	10	34	23	67				
Total	98	138	64	300				

Significance level=0.05, df= 4, X^2 cal. =4.96, X^2 crit.= 9.488, p=0.291

Table 8: Relationship between Practice and Health Status

	Good Health	Poor Health	Total	df	X cal	X crit	p – value
Good Practice	57	7	64	6	2.377	12.592	0.882
Moderate Practice	123	15	138				
Poor Practice	82	16	98				
Total	262	38	300				

Significance level=0.05, df= 6, X2 cal. =2.377, X2 crit.= 12.592, p=0.882

Table 9: Relationship between Level of Knowledge and Class of Secondary School Students

Class - Knowledge	Good Knowledge	Average Knowledge	Poor Knowledge	Total	df	X cal	X crit	p - value
SS1	22	32	13	67	4	7.963	9.488	0.093
SS2	57	36	23	116				
SS3	45	41	31	117				
Total	124	109	67	300				

Significance level=0.05, df= 4, X^2 cal. =7.963, X^2 crit.= 9.488, p=0.093

Relationship Between Level of Knowledge and Class of Secondary School Students

Table 9 reveals no statistically significant association between students' knowledge of nutrition and NCDs and their class level (SS1, SS2, SS3) ($X^2 = 7.963$, $p = 0.093$). While SS2 students showed slightly higher good knowledge, this variation was not statistically significant, suggesting that knowledge acquisition in these areas may be influenced more by external factors rather than formal curriculum progression alone.

Discussion

This study assessed the level of nutritional knowledge and dietary practices related to non-communicable diseases (NCDs) among secondary school students in Calabar Municipality, Nigeria. The socio-demographic characteristics of the 300 respondents offer important context in this study. A higher proportion were female (61.3%), which reflects the gender distribution in the selected schools at the time of data collection not due to refusal by male students. This is also consistent with prior research indicating that adolescent girls often show greater interest in health and nutrition-related issues[13]. The age distribution predominantly 14- and 15-year-olds places the majority of participants in early adolescence, a period 'recognised for the formation of long-term dietary habits[14,15]. Most students were in senior secondary classes (SS2: 38.7%; SS3: 39%), suggesting a developmental stage where cognitive ability and school-based exposure to health information could enhance nutrition-related decision-making. A significant majority (92%) came from economically active households, indicating a potentially better capacity to afford nutritious foods. However, consistent with Ikujenlola and Adekoya[16], stable income does not necessarily equate to healthy dietary choices, as adolescent autonomy, peer influence, and access to food options also play critical roles. Furthermore, over 80% of respondents lived in medium to large households with three or more members, a factor that may influence food quantity, sharing patterns, and overall nutritional outcomes[13,17].

The findings on nutrition and NCD knowledge present a nuanced picture. While a majority (66%) correctly defined "good nutrition" and 'recognised the importance of healthy eating, overall knowledge levels were distributed across good (39.3%), average (38%), and poor (22.7%) categories. This is comparable to Gadanya et al.[18], who reported a similar distribution of knowledge. A notable knowledge gap persists regarding the role of healthy eating in NCD prevention, with 46.7% of respondents disagreeing or strongly disagreeing, consistent with findings that adolescents may not fully grasp the link between dietary choices and health[13,15]. Despite high reported school nutrition education (96.7%), these gaps suggest a disconnect, possibly due to insufficient teaching time or inadequate resources in school health programs[19]. These challenges collectively emphasize the need for more effective, targeted educational interventions.

The marginal difference in nutrition and NCD awareness between private (42.2% good knowledge) and public (37% good knowledge) school students is noteworthy, diverging from prior research that often highlights more significant disparities in nutritional status[14,20] and socio-economic influences on dietary habits[13,16]. The shared presence of average and poor knowledge levels in both settings (57.8% private, 63% public) underscores a universal need for enhanced health education efforts across all schools.

The study reveals predominantly moderate (46%) to poor (32.7%) dietary practices among students, with only 21.3% demonstrating good habits. While slightly more favourable than some reports[14], this remains concerning. Despite the fact that a high proportion of respondents stated preference for fruits and vegetables (93.3%), actual frequent consumption (more than five times weekly) is low (13.4%), consistent with other studies on low daily intake[15,16]. A significant concern is the high preference for snacks during school lunch breaks

(73.4%), dominated by less healthy options like pastries and sugary drinks. This inclination towards processed foods aligns with observations of children's natural preference for sweet tastes and unhealthy snacks[21,22,23], often influenced by affordable, nutritionally poor options from unregulated school vendors[13,17,24,25], where ease of access profoundly shapes dietary habits[26]. These findings underscore a heightened NCD risk among adolescents, aligning with concerns regarding health consequences of poor dietary habits[14]. Therefore, comprehensive nutrition education and behavioural change interventions are urgently needed.

Student health status, primarily perceived as "just okay," contrasts with objective measures linking underweight to health issues[14], suggesting a potential discrepancy between self-perception and actual health. Inconsistent routine health check-ups and a notable alcohol consumption rate (32%), higher than some undergraduate studies[16], raise concerns. The significant presence of family NCD history (e.g., 16.3% diabetes, 12.7% hypertension) highlights genetic predisposition. These factors, combined with risk behaviours, increase NCD vulnerability, echoing broader discussions of NCD determinants[13,26]. This necessitates comprehensive health interventions, including screenings, risk counselling, and prevention strategies for adolescents.

The study found no statistically significant association between students' nutrition and NCD knowledge and their dietary practices. This consistency with previous research, specifically Gadanya et al.[18] who also found no significant association, reinforces that knowledge alone may not be a sufficient determinant of dietary behaviour. This suggests that external factors like environmental influences, food accessibility, socio-economic conditions, behavioural skills, and peer dynamics may play a more dominant role[13,26]. Therefore, interventions must adopt a multi-faceted approach addressing not only knowledge gaps but also these broader influences.

Similarly, no statistically significant association was found between students' dietary practices and self-reported health status. This suggests a potential lagging effect of diet on health outcomes, as NCDs typically manifest over longer periods, or it may reflect limited awareness of subtle symptoms. While this study shows no immediate impact, previous research strongly establishes profound long-term links between dietary patterns and health outcomes, with poor practices leading to conditions like underweight and associated health issues[14]. Inadequate dietary intake is also linked to malnutrition and poor academic performance[13]. Socio-economic factors influencing dietary habits[13,17,24,25,26] directly impact nutritional status, a key health indicator. Therefore, despite the current study's immediate findings, interpreting them in light of the well-established scientific consensus on chronic dietary patterns and long-term health is crucial. The outcome serves as a reminder that adolescents may not yet perceive the health consequences of their choices, underscoring the importance of promoting healthy dietary practices as a critical preventive measure for future health.

No statistically significant association was found between students' level of nutritional and NCD-related knowledge and their class level, indicating that progression through secondary school does not necessarily correspond with improved knowledge in these areas. This suggests that formal classroom instruction alone may not be the primary driver of students' nutritional awareness. Instead, knowledge acquisition may be more heavily influenced by external sources such as family practices, media exposure, or individual interest. This finding highlights a possible gap in the effectiveness or consistency of school-based health education, particularly as it relates to nutrition and NCD prevention. It aligns with existing concerns about the implementation quality of health education programs and the limited time allocated for nutrition topics within the school curriculum[19]. To enhance effectiveness, nutrition education should be consistently reinforced across all class levels using interactive and age-appropriate methods.

Conclusion and Recommendations

The importance of nutrition awareness and dietary practices in disease prevention cannot be overemphasized. Based on the study findings, the knowledge, attitude, and dietary practices of secondary school students in relation to diet and NCDs showed room for improvement, particularly in translating awareness into healthier habits. However, greater efforts are required to establish a comprehensive system for NCD risk factor surveillance and to implement targeted awareness

programmes within Secondary schools for this population group. To this end, it is therefore important to develop nutrition intervention measures and strategies aiming to promote nutrition knowledge, healthy dietary choices and practices among adolescents. Nutrition Education - either as a course or part of a subject syllabus, can also be introduced into the school curricula; advocacy campaigns to promote consumption of fresh foods and school gardening are also highly recommended. Stakeholders including parents, caretakers and teachers should encourage the consumption of wholesome foods by making them available to children both when they are at home and in school. These will go a long way in ensuring that the young ones while growing and studying, also learn to eat and live right, from an early age thereby reducing the risks of chronic diseases in adulthood.

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