Food and Nutrition Sciences, 2025, 16(11), 1623-1651
https://www.scirp.org/journal/fns
ISSN Online: 2157-9458
ISSN Print: 2157-944X

Nutrition Communication and Dietary Practices of Medical Students at Kenyan Public Tertiary Institutions

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How to cite this paper: Onsomu, M.E., Riany, K.G. and Linus, A.M.M. (2025) Nutrition Communication and Dietary Practices of Medical Students at Kenyan Public Tertiary Institutions. *Food and Nutrition Sciences*, **16**, 1623-1651.
https://doi.org/10.4236/fns.2025.1611095

Received: September 23, 2025
Accepted: November 7, 2025
Published: November 10, 2025

Abstract

As future healthcare providers, medical students are supposed to model and advocate for healthy eating. Recognizing this, the study addresses the paradox of suboptimal dietary habits observed among this population despite their medical training. The study is based on the Social Cognitive Theory and the Health Belief Model. It determines the influence of nutrition communication on the dietary practices of final-year medical students enrolled in nutrition programs at Kenyan public tertiary institutions. A descriptive cross-sectional correlational design was adopted, targeting final-year nutrition students across selected public tertiary institutions in Kenya. By use of stratified random sampling, a total of 422 respondents were selected, with data collected through structured, self-administered questionnaires. The instruments were pretested for reliability and validity. Descriptive and inferential statistics tested the study's hypotheses. Most of the students were female (81.7%), living off campus (61.8%), from middle-income backgrounds (52.2%), and receiving a monthly income of Kshs. 0 - 5000 (84.5%). The mean Body Mass Index of the respondents was 22.47, falling within the normal nutrition ranges. Most of the respondents did not have a meal plan (78.8%) and did not have any specific dietary preferences (78.6%). While knowledge was strong in core areas of nutrition, there is a clear need to enhance awareness in culturally specific nutrition practices and food literacy skills. Dietary practices were significantly and positively associated with all the independent variables examined. There was a strong relationship between nutrition communication strategies and dietary practices among the respondents ($r = 0.691$, $p = 0.001$). The model yielded an R value of 0.715, indicating a strong positive correlation between the set of independent variables and dietary practices. Nearly 51.1% of the variance in dietary practices (R^2

= 0.511) means that over half of the variation in dietary behavior can be attributed to the combined effects of nutrition communication strategies, sources, content, channels, and individual factors. The null hypotheses were rejected except for nutrition communication channel, which was not significantly associated with dietary practices among the respondents. In conclusion, communication content, channels, sources, strategies, and individual factors around nutrition, if well implemented, are more likely to improve the dietary behaviour of medical students in public tertiary institutions.

Keywords

Dietary Practices, Health Belief Model, Medical Students, Public Tertiary Institutions, Nutrition Communication, Social Cognitive Theory, Self-Efficacy

1. Introduction

Necessary for promoting optimal health, nutrition is useful in preventing non-communicable diseases (NCDs), and supports cognitive and physical performance [1]-[3]. As potential healthcare providers, medical students are expected to model and advocate for healthy dietary behaviors. Despite the medical students' nutritional habits affecting academic performance and wellbeing, [4] emphasizes that it also shapes credibility in promoting healthy lifestyles.

As trusted sources of health information, healthcare professionals, who include medical students, can influence community norms around nutrition [5]. Studies show that healthcare providers are more likely to recommend effective dietary practices to their patients if they maintain individual healthy habits themselves [6]. Nutrition communication is a vital tool for shaping dietary behavior, and studies show that the use of strategic communication approaches can influence and inform individual and community decisions related to nutrition and health [7]. It spans a range of channels, including lectures, digital media, peer education, public campaigns, and interpersonal communication. Effective nutrition communication not only enhances awareness of healthy eating but also builds competencies essential for future roles in patient counseling [8].

Scientific insights on healthy diets have progressed from simple healthy messages to evidence-based approaches [9]-[11]. Although this evolution continues to be appreciated in various socio-demographics and catalyzed by scholars, the impact among medical students in institutions of higher learning remains underexplored as [12]-[13].

Globally, over 11 million deaths annually are due to communicable diseases associated with poor dietary practices, such as the consumption of highly processed and energy-dense foods [14]. Similarly, in Sub-Saharan Africa, overnutrition and undernutrition intensify the risk of NCDs, especially among urban youth and students. The WHO reports that adolescent overweight and obesity have increased

by over 50% in the past decade in the African region, Kenya included, which gives rise to nutrition-related health risks [15]. More than 35% of urban women aged 15 - 24 years are obese or overweight compared to the national statistics of 33% in the same age group [16]. Additionally, concerns have been raised about health role models, as 63.4% of healthcare workers in Kenya have a BMI above 25 kg/m^2, and 28.4% are classified as obese [17].

Eating habits are known to affect the nutritional status of individuals, with traditional foods such as *ugali, sukuma wiki,* and *nyama choma* being preferred by Kenyan citizens, reflecting their cultural identity and supporting sustainable nutrition [18] [19]. However, urbanization and lifestyle changes have shifted dietary practices towards energy-dense and processed foods among the youth, raising the cases of NCDs and obesity among them [20]. Public tertiary institutions are expected to supplement the dietary intake of students by offering nutritious and affordable meals, contributing to healthier lifestyles while on campus [21].

Individual factors among medical students expose them to dietary challenges such as reliance on fast foods, stress due to academic workload, and time constraints. For example, 50% of the students at Kenya Medical Training College (KMTC) may be malnourished [22]. Additionally, nutritional challenges are increased by inconsistent nutrition education and institutional barriers that hinder the promotion of healthy eating [23] [24]. An understanding of the institutional environment and specific nutrition communication interventions is essential in mitigating the challenges and supporting dietary choices. Creating supportive settings within campuses is essential for improving student well-being and advancing public health outcomes in Kenya [25]. To address these challenges effectively, this research aimed to fill the gaps by investigating the influence of nutrition communication on dietary practices of medical students at Kenyan public tertiary institutions.

2. Problem Statement

The overall well-being of medical students at public tertiary institutions is supported by healthy dietary practices, which emanate from adequate nutritional knowledge, balanced meal intake, and informed food choices [26]-[28]. Upon graduation, the students are expected to disseminate sound dietary advice to their would-be clients. As future healthcare providers, they are expected to model and promote healthy lifestyles, yet poor dietary habits among medical students remain a growing concern.

According to [29], many medical students engage in unhealthy eating behaviors despite being equipped with biomedical knowledge. They consume high-calorie snacks and take low portions of fruits and vegetables. This raises important questions about the effectiveness and reach of nutrition communication within medical education settings. A substantial number of medical students in Kenya's public tertiary institutes struggle with maintaining healthy dietary habits, which diverges significantly from the expected norms [30]. Due to limited access to nutritious options on campus, a total of 48.9% of medical students consume fast foods, which

are high in sugars and unhealthy fats [31].

This practice compromises the health and academic performance of medical students due to suboptimal nutritional intake. The consequences of the dietary challenges are profound and widespread [32]. The academic performance of the students is also affected by decreased cognitive functions, increased levels of stress, as well as fatigue [33]. Additionally, [34] reported that long-term implications included increased levels of non-communicable diseases like diabetes, cardiovascular disorders, and obesity among students. To address these challenges effectively, this research aimed to fill the gaps by investigating the influence of nutrition communication on dietary practices of medical students at Kenyan public tertiary institutions.

3. Objectives

To determine the influence of nutrition communication on the dietary practices of medical students at Kenyan public tertiary institutions. Specifically, the study sought to:

1) Assess the influence of nutrition communication content on the dietary practices of medical students at Kenyan public tertiary institutions.

2) Examine the influence of nutrition communication channels on the dietary practices of medical students at Kenyan public tertiary institutions.

3) Establish the influence of nutrition communication sources on the dietary practices of medical students at Kenyan public tertiary institutions.

4) Determine the influence of nutrition communication strategies on the dietary practices of medical students at Kenyan public tertiary institutions.

5) Investigate the moderating effect of individual factors on the relationship between nutrition communication and dietary practices of medical students at Kenyan public tertiary institutions.

4. Hypotheses

1) H_{01}: Nutrition communication content does not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.

2) H_{02}: Nutrition communication channels do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.

3) H_{03}: Nutrition communication sources do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.

4) H_{04}: Nutrition communication strategies do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.

5) H_{05}: Individual factors have no moderating effect on the relationship between nutrition communication and dietary practices of medical students at Kenyan public tertiary institutions.

5. Theoretical Framework

This study used the Health Belief Model (HBM) as well as the Social Cognitive

Theory (SCT) and their respective constructs to explain how communication strategies shape dietary practices.

5.1. Social Cognitive Theory

Proposed by [35], Social Cognitive Theory (SCT) explains behavior through reciprocal determinism, emphasizing self-efficacy, observational learning, and reinforcement. Demonstrating the role of self-efficacy in information seeking, the theory has been applied within the higher education sector, health, and maternal contexts [36]-[38]. Critics argue SCT overemphasizes individual agency and neglects cultural and socioeconomic factors [39]-[41]. Nonetheless, it remains a valuable framework for promoting healthy behaviors, especially when contextual factors are integrated. In this study, SCT helps explain how medical students in Kenyan public institutes shape dietary practices through nutrition communication, influenced by peers and mentors (observational learning), personal beliefs, and institutional environments. It therefore provides a basis for designing interventions that strengthen self-efficacy and encourage healthier eating.

5.2. Health Belief Model

The Health Belief Model (HBM) is a framework for understanding health behaviors [42]-[44]. It emphasizes constructs such as perceived susceptibility, severity, benefits, barriers, self-efficacy, and cues to action. Cues to action is one of the HBM constructs considered useful for peer influence, motivating change, and designing strategies that raise risk awareness. Susceptibility to diseases related to dietary intake, benefits or barriers of healthy eating, and severity of these conditions shape their nutrition choices. While HBM has its proponents, it is critiqued in equal measure for its oversimplistic nature [45] [46]. Moreover, according to [47] [48], the theory most often focuses on individual beliefs and rational decision-making, while overlooking society, culture, and environment [49]. In this study, HBM is used to examine how Kenyan medical students respond to nutrition communication.

6. Limitations of the Study

This study had several key limitations. The use of self-administered questionnaires could have introduced self-report bias, but trained research assistants were present to clarify questions and encourage honest responses. Additionally, the cross-sectional design limited the ability to draw causal conclusions, but the study was well planned, multi-stage sampling was done, and inferential analysis was conducted. Further, the study only included final-year nutrition students from Kenyan public tertiary institutions; therefore, the results may not apply to other contexts, but the study recommended further studies in private institutions.

7. Methodology

To determine whether the dietary practices among final-year nutrition students

in Kenyan public tertiary institutions are influenced by nutrition communication, the study employed a descriptive cross-sectional design. This enabled systematic data collection on communication variables and dietary behaviors, and facilitated hypothesis testing through statistical analysis of associations.

The study population comprised students enrolled in nutrition programs at public tertiary institutions, medical training colleges, national polytechnics, and technical training institutes. The target population was final-year nutrition students, chosen due to their advanced training and established dietary practices. Using the Cochrane formula, a sample size of 384 was estimated, with 10 percent added to account for non-response, yielding 422 respondents.

A multistage sampling approach was used. First, a sampling frame was developed comprising all government-recognized public tertiary institutions offering nutrition programs. Institutions were stratified into universities and middle-level colleges, then ten institutions were purposively selected to ensure representativeness by type and geography. Proportionate sampling was used to select the four technical and six medical colleges. Final-year nutrition students were purposively selected for the study. Simple random sampling was used to select the individual study participants. A total of 422 participants were involved in the study. Figure 1 illustrates the sampling process. Inclusion criteria required students to be in their final year, enrolled in nutrition programs, present during data collection, and willing to consent.

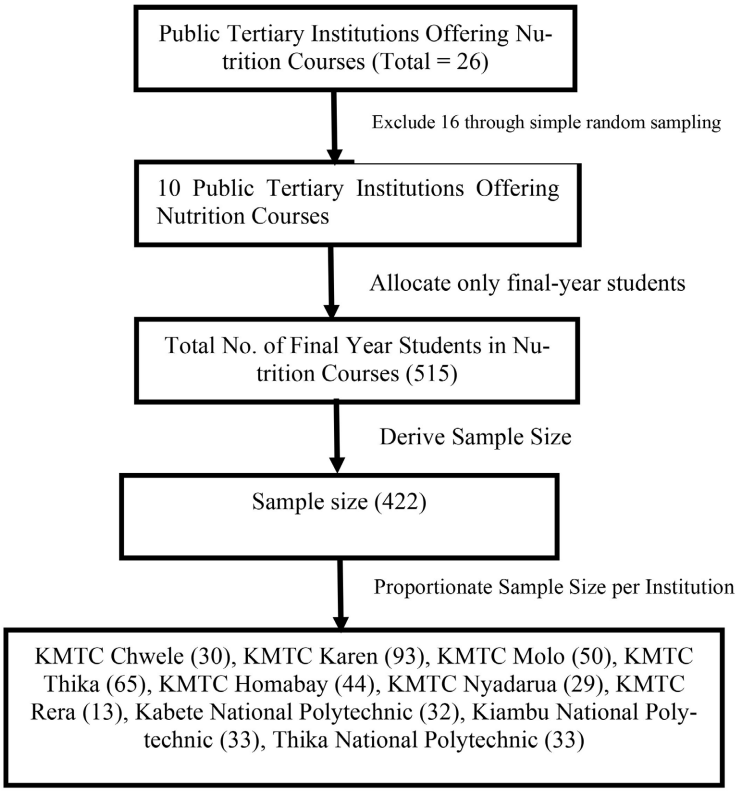

Figure 1. Sampling process.

Data were collected using a structured, self-administered questionnaire. The study heavily borrowed the structure of the component of the Diet, Anthropometry and Physical Activity Measurement Toolkit (DAPA), including the methods described on dedicated pages [50]. The variables covered were: content, channels, sources, and strategies of nutrition communication, as well as individual factors affecting dietary practices. The tool was pretested and refined for clarity, relevance, and flow. Internal validity and reliability were tested. A Cronbach's Alpha test yielded a coefficient of more than 0.7 for all constructs, as shown in Table 1.

Table 1. Reliability results.

No.	Summary of Reliability Results			
	Constructs	Cronbach Alpha	No. of Items	Comment
1	Nutrition Communication Content	0.891	12	Accepted
2	Nutrition Communication Channels	0.878	12	Accepted
3	Nutrition Communication Sources	0.838	12	Accepted
4	Nutrition Communication Strategies	0.843	12	Accepted
5	Individual Factors	0.843	12	Accepted

Data were sorted, coded, and analyzed using SPSS version 28. Descriptive statistics summarized demographic and key variables, while correlations and multiple regression tested relationships between nutrition communication and dietary practices. Ethical approval and permits were obtained from relevant institutions. Participation was voluntary, with informed consent, confidentiality, and anonymity assured.

Ethical approval for this study was obtained from the Kenya Medical Training College (KMTC) Ethics and Research Committee (Approval No. KMTC/ADM/74/VOL VII (427)). The research was also authorized by the National Commission for Science, Technology and Innovation (NACOSTI), reference No. 284379. All participants provided informed consent before data collection.

8. Data Presentation, Analysis, and Interpretation

8.1. Characteristics of the Respondents

Out of the 422 questionnaires administered, 387 questionnaires (91.7%) were returned. [51] recommend a return rate of 60% and above. The high return rate was attributed to effective data collection procedures and the involvement of research assistants (Table 2).

Table 2. Questionnaire return rate.

No.	Summary of Questionnaire Return Rate.		
	Item	Frequency	Percentage
1	Administered Questionnaires	422	100
2	Returned Questionnaires	387	91.7
3	Non-Responsive Questionnaires	35	8.3

The respondents' sociodemographic characteristics are presented in **Table 3**. Among the ten institutions, 79.8% were enrolled in Kenya Medical Training College campuses. Most students were pursuing diploma programs (69.8%), while 30.2% were in certificate programs. The sample was predominantly female (81.7%), single (85.5%), and aged between 17 and 26 years (95.4%). More than half (52.5%) reported a middle-income background, and the majority (84.5%) received a monthly allowance below Kshs. 5000. In terms of residence, most students (61.8%) lived off-campus.

Table 3. Social demographics characteristics of the respondents.

	Summary of Social Demographic Characteristics of the Respondents.			
	Characteristics	Category	Frequency (N = 387)	%
1	Institution	Kabete-National Polytechnic	21	5.4
		Kiambu-National Polytechnic	25	6.5
		KMTC-Chwele	26	6.7
		KMTC-Homabay	42	10.9
		KMTC-Karen	93	24
		KMTC-Molo	48	12.4
		KMTC-Nyandarua	23	5.9
		KMTC-Rera	12	3.1
		KMTC-Thika	65	16.8
		Thika-Technical Training Institute	32	8.3
2	Programme	Certificate	117	30.2
		Diploma	270	69.8
3	Gender	Female	316	81.7
		Male	68	17.6
		Prefer not to say	3	0.8
4	Residence	Off-campus accommodation	239	61.8
		On-campus hostel	118	30.5
		Prefer Not to Say	2	0.5
		Rentals	2	0.5
		With family	26	6.7

Continued

5	Age	17 - 21	191	49.4
		22 - 26	178	46
		27 - 31	14	3.6
		32 - 36	3	0.8
		37 - 41	1	0.3
6	Marital status	Married	18	4.7
		Prefer Not to Say	38	9.8
		Single	331	85.5
7	Socioeconomic background	High	10	2.6
		Low	89	23
		Medium	203	52.5
		Prefer Not to Say	85	22
8	Monthly allowance	Kshs. 0 - 5000	327	84.5
		Kshs. 10,001 - 15,000	9	2.3
		Kshs. 15,001 - 20,000	10	2.6
		Kshs. 5001 - 10,000	41	10.6

Table 4 indicates the Body Mass Index (BMI) of the respondents. The mean BMI was 22.47 (SD = 3.28) with a range of 16.0 to 35.6. This placed most students within the normal weight category, although some cases of underweight and overweight were observed.

Table 4. Respondents' Body Mass Index (BMI).

Summary Respondents' Body Mass Index (BMI)					
Item	N	Minimum	Maximum	Mean	Std. Deviation
BMI	387	16.00	35.60	22.47	3.28

8.2. Respondents' Nutritional Preferences and Level of Knowledge on Nutritional Content

As indicated in Table 5, the majority of respondents (78.8%) did not follow a meal plan, and a similar proportion (78.6%) indicated no specific dietary preferences. Among the 21.4% who did report preferences, vegetarianism (9.8%) and gluten-free diets (4.1%) were the most common, with smaller proportions identifying as vegan (1%) or lactose intolerant (0.3%). The respondents had low consideration for religion and culture in relation to dietary practice. Over 19.4% of respondents were primarily related to Christianity (9%), avoidance of pork (4.4%), or halal food requirements (2.1%). These findings indicate that only a minority of respondents structured their diets around specific plans, restrictions, or cultural influences.

Table 5. Respondents' nutritional preferences.

No.	Summary of Respondents' Nutritional Preferences			
	Variable	Category	Frequency (N = 387)	Percentage
1	Meal plan	No	305	78.8
		Yes	82	21.2
2	Dietary Preferences	No	304	78.6
		Yes	83	21.4
3	Specification of dietary preferences	Gluten-free	16	4.1
		Halal	24	6.2
		Lactose intolerant	1	0.3
		Not applicable	304	78.6
		Vegan	4	1
		Vegetarian	38	9.8
4	Religious/Cultural Preferences	No	312	80.6
		Yes	75	19.4
5	Religious/Cultural Preferences (Specify)	Chicken	1	0.3
		Christian	35	9
		Fish	1	0.3
		Halal certified food	8	2.1
		Meat	5	1.3
		Milk	2	0.5
		Not applicable	312	80.6
		Pork	17	4.4
		Seafood	5	1.3
		Vegetables	1	0.3

The respondents had a high knowledge of the nutritional value of foods (74.8%), weight management (73.2%), and nutrition in disease prevention (71.7%), as shown in Table 6. However, there was low knowledge reported on the importance of breakfast (45.5%), cultural or local dietary tips (32.2%), and food label interpretation (31.9%). The results indicate that there was substantial knowledge in the key areas of nutrition.

8.3. Nutrition Communication

8.3.1. Nutrition Communication Content

As shown in Table 7, respondents expressed strong confidence in the scientific validity of nutrition content. A majority agreed that institutional materials were scientifically credible (43.2% agreed, 24.8% strongly agreed, M = 3.83, σ = 0.94). Similarly, course content was considered to be supported by up-to-date research (M = 3.94, σ = 1.00).

Table 6. Knowledge of nutrition content by respondents.

No.	Summary of the Knowledge of Nutrition Content by Respondents					
1	Variable	Percentage	Percentage of Cases	Mean	Standard Deviation	Level of Knowledge
2	Nutritional value of foods	15.40	74.80	0.74	0.437	High
3	Importance of breakfast	9.40	45.50	0.45	0.498	Low
4	Healthy snack options	9.80	47.80	0.48	0.50	High
5	Meal portioning	11.70	56.90	0.57	0.496	High
6	Nutrition and disease prevention	14.80	71.70	0.71	0.453	High
7	Cultural and local dietary tips	6.60	32.20	0.32	0.467	Low
8	Weight management	15.10	73.20	0.73	0.445	High
9	Food label interpretation	6.60	31.90	0.32	0.466	Low
10	Special diets	10.60	51.40	0.51	0.501	High
11	Other	0.10	0.50	0.00	0.00	Low
	Total	100.0	486.00*	0.483		

NB: *-Cumulative percentage of cases.

Table 7. Nutrition communication content.

No	Summary of Nutrition Communication Content								
	Nutrition Communication content	Statements	SD	Nutrition Communication content	Statements	SD	Nutrition Communication content	Statements	SD
1	Scientific Validity	The nutrition information provided is based on scientific facts.	3.6	5.9	24.5	35.9	30.0	3.82	1.04
		I trust the scientific credibility of the nutrition communication content shared in institutional materials.	2.3	5.2	24.5	43.2	24.8	3.83	0.94
		The nutritional content provided in my course materials is supported by up-to-date research evidence.	2.8	5.7	19.1	39.3	33.1	3.94	1.00
2	Cultural Relevance	The nutrition messages I receive reflect the dietary habits of my local culture.	5.9	15.8	26.9	32.3	19.1	3.43	1.14
		The nutrition communication content is sensitive to the cultural values of diverse communities.	3.1	11.4	23.3	42.6	19.6	3.64	1.02

Continued

		The examples used in nutrition education resonate with culturally accepted foods and practices.	3.1	9.6	23.0	39.5	24.8	3.73	1.03
3	Conciseness	The nutrition information is presented in a way that is easy to understand.	2.3	4.9	20.4	38.0	34.4	3.97	0.97
		Visual aids and illustrations used in nutrition education help to simplify complex ideas.	2.3	3.9	20.4	36.2	37.2	4.02	0.97
		The flow of the nutrition messages enhances understanding and retention.	1.3	3.4	24.8	41.9	28.7	3.94	0.89
4	Validation Testing	The information disseminated appears to have been pre-tested or reviewed previously.	3.1	8.8	28.2	41.9	18.1	3.63	0.98
		Student feedback is collected regularly to assess the effectiveness of nutrition communication strategies.	10.9	14.0	22.7	31.5	20.9	3.38	1.26
		The format and content of the materials suggest that quality assurance processes are followed.	5.2	8.0	27.1	39.3	20.4	3.62	1.06

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, M = Mean, σ = Standard Deviation.

Cultural relevance was moderately rated, with 39.5% agreeing and 24.8% strongly agreeing that nutrition examples reflected culturally accepted practices (M = 3.73, σ = 1.03). In contrast, fewer respondents felt that content reflected local dietary habits (M = 3.43, σ = 1.14). Conciseness received higher ratings, with 38% agreeing and 34.4% strongly agreeing that information was easy to understand (M = 3.97, σ = 0.97). Visual aids were also rated effective (M = 4.02, σ = 0.97). Validation testing, however, showed mixed perceptions. While 41.9% agreed and 18.1% strongly agreed that materials were pre-tested, fewer acknowledged student feedback being integrated into communication (M = 3.38, σ = 1.26).

8.3.2. Nutrition Communication Channels

Table 8 shows that the respondents perceived nutrition communication channels positively across written, oral, digital, and interactive formats.

Table 8. Nutrition communication channels.

No.	Summary of Nutrition Communication Channels								
	NCC	Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	M	σ
1	WC	I find written nutrition materials (e.g., brochures, leaflets) clear and easy to understand.	3.6	9.6	24.5	34.6	27.6	3.73	1.08
		Written communication helps me retain nutrition information better than other formats.	2.6	6.7	21.7	41.1	27.9	3.85	0.99
		Written nutrition messages are accessible and available when I need them.	4.7	9.6	22.7	36.7	26.4	3.71	1.10
2	OC	I understand nutrition information better when it is delivered verbally.	2.6	4.4	21.4	35.4	36.2	3.98	0.99
		I am more likely to follow dietary advice after receiving it through oral presentations.	3.4	6.5	24.5	35.1	30.5	3.83	1.04
		I find face-to-face nutrition education more engaging than reading printed materials.	3.6	2.6	15.5	28.2	50.1	4.19	1.02
3	DC	I frequently access nutrition information through digital platforms (e.g., websites, apps, social media).	2.1	7.0	23.8	34.6	32.6	3.89	1.01
		Digital communication makes it easier for me to stay updated on current nutrition guidelines.	2.8	3.6	20.9	33.3	39.3	4.02	1.00
		I prefer digital methods for receiving nutrition messages because they are convenient.	2.6	9.0	22.5	37.5	28.4	3.80	1.03
4	IC	Interactive sessions (e.g., labs, workshops, simulations) help me to understand nutrition concepts more effectively.	1.6	5.4	19.1	34.9	39.0	4.04	0.97
		I retain nutrition knowledge better when I actively participate in the learning process.	2.1	3.6	17.3	29.2	47.8	4.17	0.98
		Interactive methods make learning about nutrition more practical and relevant to my daily life.	2.1	3.9	17.3	31.5	45.2	4.14	0.98

Key: NCC = Nutrition Communication Channels, WC = Written Communication, OC = Oral Communication, DC = Digital Communication, IC = Interactive Communication, SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, M = Mean, σ = Standard Deviation.

According to the respondents, written material on communication was accessible and clear (M = 3.73, σ = 1.08), with brochures and leaflets aiding retention (M = 3.85, σ = 0.99). Oral channels were rated higher, with 50.1% strongly agreeing that face-to-face delivery was engaging (M = 4.19, σ = 1.02). The respondents

mostly used online platforms to access updates (M = 4.02, σ = 1.00). Interactive communication emerged as the strongest, with nearly half (47.8 percent) strongly agreeing that active participation improved knowledge retention (M = 4.17, σ = 0.98).

8.3.3. Nutrition Communication Sources

As presented in Table 9, nutrition information sources varied in reliability and influence.

Table 9. Nutrition communication sources.

NO.	Summary of Nutrition Communication Sources								
	NCS	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	M	σ
1	Lecturers	My lecturers provide clear and reliable information on nutrition.	2.6	4.7	20.9	40.1	31.8	3.94	0.97
		I often rely on my lecturers for guidance on healthy eating habits.	8.3	20.2	31.8	27.9	11.9	3.15	1.13
		The nutrition information I receive from lecturers influences my dietary choices.	5.9	9.0	27.6	37.7	19.6	3.56	1.08
2	Media	I regularly access nutrition information through media platforms such as TV, radio, or online blogs.	4.4	11.4	30.7	33.3	20.2	3.53	1.07
		Media content greatly influences my understanding of nutrition.	6.5	11.9	27.9	34.4	19.4	3.49	1.13
		Media are my preferred source of nutrition communication content.	7.8	18.9	32.0	27.4	14.0	3.21	1.14
3	Peers	I frequently discuss nutrition-related topics with my peers.	4.7	5.4	20.9	39.8	29.2	3.83	1.05
		I consider my peers to be a reliable source of nutrition communication.	4.7	16.3	33.1	27.1	18.9	3.40	1.11
		Peer conversations help shape my daily food choices.	5.2	15.0	28.9	29.5	21.4	3.47	1.14
4	Family Members	My family's eating habits influence how I view nutrition.	5.7	14.0	23.5	33.6	23.3	3.55	1.16
		I consider my family's opinions when making decisions about my diet.	9.0	17.6	28.4	28.2	16.8	3.26	1.19
		My family members regularly share nutrition advice with me.	8.3	16.0	32.6	25.6	17.6	3.28	1.17

Key: NCS = Nutrition Communication Sources, SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, M = Mean, σ = Standard Deviation.

Lecturers were rated as the most reliable (M = 3.94, σ = 0.97), although reliance on them for everyday dietary decisions was weaker (M = 3.15, σ = 1.13). Media sources were accessible (M = 3.53, σ = 1.07) but less preferred (M = 3.21, σ = 1.14).

Moreover, family habits shaped perceptions (M = 3.55, σ = 1.16), but their advice was less considered in decision-making (M = 3.26, σ = 1.19). About 38.3% of the respondents agreed that they mostly discussed nutrition topics with friends (M = 3.83, σ = 1.05), although the reliability was rated as moderate (M = 3.40, σ = 1.11).

8.3.4. Nutrition Communication Strategies

The findings in Table 10 show varying effectiveness across advocacy, social mobilization, behavior change communication, and capacity building.

Table 10. Nutrition communication strategies.

No.	Summary of Nutrition Communication Strategies								
	NCS	Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	M	σ
1	Advocacy	Nutrition advocacy efforts in my institution have influenced policy or administrative decisions.	7.0	12.4	34.1	32.0	14.5	3.35	1.09
		I am aware of ongoing advocacy initiatives aimed at promoting better nutritional practices.	4.4	11.9	27.4	38.5	17.8	3.53	1.05
		Nutrition advocacy messages are clearly communicated and easy to understand.	3.1	8.5	26.6	41.3	20.4	3.67	0.99
2	Social mobilization	Community engagement activities have increased awareness of healthy dietary practices.	3.4	5.2	21.4	39.0	31.0	3.89	1.01
		Social mobilization efforts effectively involve students in nutrition-related initiatives.	3.1	9.3	29.2	36.4	22.0	3.65	1.02
		My institution uses community events to promote nutrition education.	9.0	15.0	26.4	30.2	19.4	3.36	1.21
3	Behavior change communication	I have changed some of my dietary practices due to behavior change and communication efforts.	3.1	9.6	19.9	39.0	28.4	3.80	1.05
		Behavior change communication materials are regularly updated and accessible.	4.9	9.3	30.5	35.9	19.4	3.56	1.06
		The communication I receive includes practical tips for improving my nutrition.	2.6	6.5	23.5	40.1	27.4	3.84	0.99
4	Capacity building	I have received adequate training on how to interpret and use nutritional information.	2.1	6.5	22.2	35.4	33.9	3.93	1.00
		My institution offers workshops or seminars that strengthen nutrition-related skills.	12.1	19.9	23.8	27.9	16.3	3.16	1.26
		There is sufficient technical support for students to participate in nutrition programs.	10.3	13.4	29.2	28.7	18.3	3.31	1.21

Key: NCS = Nutrition Communication Strategies, SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, M = Mean, σ = Standard Deviation.

Advocacy scored moderately, with only 31.5% strongly agreeing that such initiatives influenced institutional policies (M = 3.35, σ = 1.09). Social mobilization showed better performance, with engagement activities raising awareness (M = 3.89, σ = 1.01). Behavior change communication was effective, with many respondents acknowledging positive dietary changes (M = 3.80, σ = 1.05). Capacity building received the highest training adequacy ratings (M = 3.93, σ = 1.00), though workshops and technical support scored lower.

8.4. Individual Factors

Table 11 depicts the respondents' nutrition communication outcomes as influenced by knowledge, well-being, motivation, and time management.

Table 11. Individual factors.

No.	Summary of Individual Factors								
	Individual Factor	Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	M	σ
1	Level of Knowledge	I understand the nutritional requirements for maintaining a healthy lifestyle.	2.8	3.4	11.9	35.9	46.0	4.19	0.97
		I am aware of the nutritional value of the foods I regularly consume.	1.3	4.7	15.2	34.4	44.4	4.16	0.94
		I know how to read and interpret food labels accurately.	2.1	5.4	17.6	36.4	38.5	4.04	0.98
2	Mental Wellbeing	Stress and anxiety negatively affect my ability to maintain healthy eating habits.	2.6	8.5	20.4	31.8	36.7	3.92	1.07
		My emotional well-being influences my food choices.	3.9	5.9	18.6	36.7	34.9	3.93	1.06
		I often resort to unhealthy eating when I feel overwhelmed or low.	7.5	14.7	20.9	28.9	27.9	3.55	1.25
3	Motivation	I am motivated to eat healthily even when unhealthy options are available.	7.8	9.3	26.1	32.6	24.3	3.57	1.18
		I set personal goals related to healthy eating.	4.9	8.3	23.3	35.7	27.9	3.74	1.10
		I make conscious efforts to follow a nutritious diet.	3.6	5.4	25.8	37.2	27.9	3.80	1.02
4	Time Management	I often lack the time to prepare healthy meals.	12.9	20.9	22.0	25.1	19.1	3.17	1.31
		My busy schedule prevents me from planning nutritious meals.	12.9	16.3	24.3	28.2	18.3	3.23	1.28
		I prioritize quick meals over healthy ones due to time constraints.	12.9	18.1	18.3	28.4	22.2	3.29	1.34

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, M = Mean, σ = Standard Deviation.

The level of knowledge of dietary requirements was high among the respondents (M = 4.19, σ = 0.97). Mental and emotional well-being also played a role, with stress linked to poor habits (M = 3.92, σ = 1.07). Motivation was moderate, as many reported goal-setting to improve diet (M = 3.74, σ = 1.10). Time management was the greatest barrier, with respondents citing limited time for meal preparation (M = 3.17, σ = 1.31).

8.5. Dietary Practices

Table 12 shows that meal regularity was moderate among the respondents, with a few consistently consuming three meals daily (M = 3.34, σ = 1.22). The respondents reported that they diversified their diet and included various food groups (M = 3.69, σ = 1.15). The most preferred drink was water compared to other types of fluids, which were mostly sugary (M = 3.73, σ = 1.12). Snacking behaviors, however, were mixed. While nutritious snacks were sometimes chosen (M = 3.46, σ = 1.20), regulation of frequency was weak, and emotional influences persisted.

Table 12. Dietary practices.

No.	Summary of Dietary Practices								
	Dietary Practices	Statements	Poor (%)	Fair (%)	Average (%)	Good (%)	Very Good (%)	M	σ
1	Meal Regularity	Frequency of consuming three main meals per day.	10.1	12.4	31.3	25.1	21.2	3.34	1.22
		Consistency in avoiding skipped meals during academic days.	11.6	18.1	29.7	23.3	17.3	3.17	1.24
		Adherence to fixed meal times throughout the day.	14.0	22.7	25.8	24.5	12.9	2.99	1.25
2	Dietary Diversity	Inclusion of multiple food groups (carbohydrates, proteins, fruits, vegetables) in meals.	4.1	12.1	24.0	29.7	30.0	3.69	1.15
		Balance between the consumption of plant-based and animal-based foods.	6.5	14.5	26.9	28.9	23.3	3.48	1.18
		Variety of food types and colors is consumed daily.	6.7	18.1	24.0	32.0	19.1	3.38	1.18
3	Hydration Habits	Average daily water intake meets hydration guidelines.	4.1	10.6	23.3	31.8	30.2	3.73	1.12
		Preference for water over sugar-sweetened beverages.	8.0	12.4	24.0	30.2	25.3	3.52	1.22
		Regular fluid intake throughout the day, regardless of thirst.	6.5	9.3	27.4	28.7	28.2	3.63	1.17
4	Snacking Behavior	Tendency to choose nutritious snacks over processed or high-sugar options.	7.8	13.2	28.2	26.9	24.0	3.46	1.20

Continued

	Regulation of snacking frequency between meals.	7.5	20.2	27.4	27.1	17.8	3.28	1.19
	Influence of emotional or situational factors on snacking habits.	8.0	14.7	26.1	27.1	24.0	3.44	1.23

Key: M = Mean; σ = Standard Deviation.

8.6. Relationship between Nutrition Communication Variables and Dietary Practices

There was a relationship between nutrition communication variables and the dietary practices of the respondents. Table 13 shows the correlation coefficient to assess the direction and strength of the relationship.

Table 13. Correlation matrix between nutrition communication and dietary practices.

No.	Summary of the Correlation Matrix between Nutrition Communication and Dietary Practices							
	Variables	r	Dietary Practices	Nutrition communication strategies	Nutrition communicatio n Content	Nutrition Communication Channels	Nutrition communicati on Sources	Individual Factors
1	Dietary Practices	Pearson Correlation	1					
		Sig. (2-tailed)						
2	Nutrition communication strategies	Pearson Correlation	0.691**	1				
		Sig. (2-tailed)	0.001					
3	Nutrition communication content	Pearson Correlation	0.517**	0.611**	1			
		Sig. (2-tailed)	0.001	0.001				
4	Nutrition Communication Channels	Pearson Correlation	0.493**	0.638**	0.668**	1		
		Sig. (2-tailed)	0.001	0.001	0.001			
5	Nutrition communication Sources	Pearson Correlation	0.591**	0.681**	0.545**	0.574**	1	
		Sig. (2-tailed)	0.001	0.001	0.001	0.001		
6	Individual factors	Pearson Correlation	0.542**	0.656**	0.489**	0.568**	0.585**	1
		Sig. (2-tailed)	0.001	0.001	0.001	0.001	0.001	

Key: M = Mean; σ = Standard Deviation.

Dietary practices were significant and positively correlated with the nutrition communication variables. The strongest association was observed with nutrition communication strategies (r = 0.691, p = 0.001), suggesting that when communication strategies are well-developed and effectively implemented, respondents have a higher chance of adopting healthy dietary behaviors.

Nutrition communication sources had a moderate correlation with dietary practices (r = 0.591, p = 0.001), emphasizing the importance of credible and accessible information providers. Similarly, individual factors such as motivation, knowledge, and personal beliefs were moderately associated with dietary practices (r = 0.542, p = 0.001).

The relationships with nutrition communication content (r = 0.517, p = 0.001) and communication channels (r = 0.493, p = 0.001) were also positive and statistically significant, though slightly weaker than strategies and sources. This implies that both the quality of information and the medium through which it is delivered influence dietary behaviors, albeit to a lesser extent than strategies and trusted sources.

8.7. Predictors of Dietary Practices among the Respondents

Table 14 presents the regression model, which yielded an R value of 0.715, indicating a significant positive relationship between the set of predictors and dietary practices. The R-squared collectively explains 51.1% of the variance in dietary practices, while the adjusted R^2 of 0.505 confirms the robustness of the model after accounting for the number of variables.

The F-statistic (F = 79.524, p = 0.001) indicates that the overall model is statistically significant, confirming that the independent and moderating variables had an effect on the outcome of interest. This suggests that more than half of the variation in dietary behaviors among respondents can be attributed to these predictors. Table 14 presents a detailed summary of the regression model.

Table 14. Predictors of dietary practices among the respondents.

No.	Model Summary of Predictors of Dietary Practices among the Respondents									
	Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.715a	0.511	0.505	0.59656	0.511	79.524	5	380	0.001	0.715a

a Predictors: (Constant), Nutrition Communication Content, Channel, Source, Strategy, and Individual Factors.

8.8. Hypothesis Testing

To further assess the specific contributions of the independent variables, a series of hypotheses was tested, with results summarized in Table 15.

The findings reveal that nutrition communication strategies had the strongest and most significant positive effect on dietary practices, leading to the rejection of H_{04}. Similarly, nutrition communication sources and nutrition communication

content were also significant predictors, resulting in the rejection of H_{03} and H_{01}, respectively.

Table 15. Hypothesis testing.

No.	Summary of Hypothesis Testing	
	Hypothesis	Outcome
1	H_{01}: Nutrition communication content does not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.	Reject H_0: There is a statistically significant positive effect of nutrition communication content on the dependent variable.
2	H_{02}: Nutrition communication channels do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.	Fail to reject H_0: Nutrition communication channel has no significant effect on the dependent variable.
3	H_{03}: Nutrition communication sources do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.	Reject H_0: Nutrition communication source has a statistically significant positive effect.
4	H_{04}: Nutrition communication strategies do not significantly influence the dietary practices of medical students at Kenyan public tertiary institutions.	Reject H_0: Nutrition communication strategies have the strongest and most significant positive effect.
5	H_{05}: Individual factors have no moderating effect on the relationship between nutrition communication and dietary practices of medical students at Kenyan public tertiary institutions.	Reject H_0: (borderline) Individual factors have a statistically significant positive effect, but it is weak and just at the threshold.

Conversely, nutrition communication channels were found not to have a statistically significant effect, leading to a failure to reject H_{02}. Individual factors such as beliefs, knowledge, and motivation had a weak effect on dietary practices. Thus, H_{05} was rejected at the threshold of significance. These results collectively indicate that while multiple dimensions of nutrition communication influence dietary practices, strategies and sources emerge as the most powerful predictors.

9. Discussion, Conclusion, and Recommendations

9.1. Socio-Economic and Demographic Factors of the Respondents

The findings show that most respondents were young (17 - 26 years), female, single, and residing off campus. This profile is consistent with studies in low- and

middle-income contexts, where women are overrepresented in health-related courses and limited campus accommodation forces many students to live outside institutions [52] [53].

Economically, the majority reported monthly family incomes of Kshs. 0 - 5000, reflecting financial vulnerability. The findings align with [54], who noted that food insecurity and stress among low-income students posed a significant challenge to their dietary practices. In contrast, students in private universities reported higher incomes and stronger family support [55]. These disparities highlight how socio-economic context influences dietary behaviors [56] [57].

9.1.1. Respondents' Measure of Body Mass Index (BMI)

Most of the respondents had a normal body mass index falling within the normal weight range (18.5 - 24.9), reflecting a generally WHO healthy body weight [58]. Comparable findings were reported by [52]. However, [59] noted increasing overweight and obesity in urban students, suggesting risks associated with sedentary lifestyles and poor diets.

9.1.2. Nutritional Preferences among the Respondents

Although a minority reported vegetarianism, halal diets, or avoidance of pork, most respondents did not have a structured meal plan nor a specific dietary restriction. These patterns echo findings by [60] [61], where financial constraints and convenience strongly shaped food choices. In contrast, studies in higher-income urban contexts report increasing adherence to structured diets influenced by social media and health trends [62].

9.1.3. Respondents' Level of Knowledge of Nutrition Content

The respondents had a high level of knowledge of nutrition content. Similar to [63], the respondents mentioned concepts such as disease prevention, weight management, and healthy snack options as important topics. On the other hand, they had low levels of knowledge on portion control, food label literacy, and the contribution of cultural and local dietary tips, findings similar to studies by [64] [65]. This gap between awareness and application suggests the need for experiential and context-based nutrition education.

9.2. Nutrition Communication Variables

9.2.1. Respondents' Perception on Nutrition Communication Content

The majority of the respondents were of the view that nutrition communication content was clear, accurate, and accessible, which was similar to findings by [66] [67]. They indicated that trust was higher when the content was evidence-based and backed by health authorities. [68] noted that accurate messaging, visual conciseness, and clarity were effective in aiding comprehension of the content. The integration of local food practices was moderately influenced by cultural relevance among the respondents, as noted by [69]. Feedback mechanisms were perceived as weak, consistent with [70], highlighting a gap in participatory approaches.

9.2.2. Respondents' Perception on Nutrition Communication Sources

The most credible sources of nutrition information were the Lecturers, though students rarely sought personal dietary advice from them. This distinction between trust and application mirrors [71]. Misinformation disseminated through media platforms discouraged respondents from seeking nutrition information from media sources, a finding consistent with those of [72]. Although peer-shared information remained a concern, the respondents influenced each other's dietary attitudes, consistent with [73]. Family influence was foundational but diminished as students gained autonomy, similar to findings by [74].

9.2.3. Respondents' Perception on Nutrition Communication Strategies

Social mobilization strategies, especially engagement activities, raised awareness of nutrition communication. The majority of the respondents indicated that capacity building had the highest training adequacy. Advocacy initiatives influenced institutional policies. Studies that echoed similar findings were [75]-[77].

9.2.4. Individual Factors and Dietary Practices

The respondents had a high level of knowledge of dietary requirements, although they experienced barriers such as time management, which limited their meal preparation. In addition, stress caused by mental and emotional imbalance led to poor eating habits. Overall, they were motivated to intentionally improve their dietary intake. Barriers to healthy eating were identified by [78]-[81].

9.3. Relationship between Nutrition Communication and Dietary Practices

There was a significant, moderately positive linear relationship between nutrition communication strategies and dietary intake, similar to findings by [8]. This indicated that well-developed and effectively implemented strategies had a higher chance of adopting healthy dietary behaviour among the respondents [7] [8] [82]. A positive linear correlation was observed between nutrition communication sources and dietary practices, showing the importance of accessing information from the providers [83] [84].

Moreover, the respondents' individual factors, such as personal beliefs, culture, and motivation, were significantly correlated with dietary practices [18]. Though significant, the nutrition communication channel and content had a weaker relationship with dietary practices [8] [84].

9.4. Predictors of Dietary Practices among the Respondents

Together, the variables, namely nutrition communication channels, sources, strategies, content, and individual factors, would explain more than half of the respondents' dietary practices. The results were reliable after correcting the number of variables in the model.

However, at the regression level, the nutrition communication channels was not a significant factor. A bivariate analysis on nutrition communication channels

appeared significant, while at the linear regression level, it was not significant. Adding other nutrition communication variables to the model may have introduced collinearity, where variables were highly correlated, masking the individual effect of the nutrition communication channel variable by distributing its predictive power across other variables that are also related to dietary practice. A study by [82] confirmed that advocacy and mobilization led to healthier dietary practices. [83] indicated that lecturers significantly influenced students' dietary practices through information dissemination and increased dietary activity, and [84] indicated that such information should be clear, relevant, and contextual.

9.5. Conclusion

The majority of the respondents were single female students who lived off campus and were from middle-income families. Although they generally had a normal BMI, they exhibited inconsistencies in meal planning and dietary intake. They had high levels of nutrition knowledge and were not restricted by religion or culture in their dietary practices. Sources of information, especially lecturers, influenced the respondents' dietary practices and behavior. Although digital and peer sources had an influence, their credibility was noted as a concern. Capacity-building efforts were effective in communicating nutrition information. Mental well-being and motivation supported healthier dietary practices, although these were constrained by stress. In conclusion, credible sources, strategies, and content influenced the respondents' dietary behaviors, while the channels were less impactful.

Regression analysis confirmed that strategies, credible sources, and content quality were the strongest predictors of healthy practices. Individual factors played a lesser but significant role. Channels were not significant predictors. Overall, hypotheses regarding the impact of content, strategies, sources, and individual factors were supported. Nutrition communication sources, strategies, content, and the moderating individual factors were significant predictors of dietary practices, thus supporting the hypotheses. The nutrition communication channel was not a significant predictor of dietary practices, and the hypothesis was not rejected.

9.6. Recommendations

1) Support students with affordable healthy meal options, food vouchers, and assistance programs targeting off-campus students.

2) Improve nutrition communication channels by strengthening institutional platforms alongside existing ones.

3) Enhance advocacy and social mobilization through student-led clubs, campaigns, and partnerships to ensure continuity.

4) Integrate mental health and time management training into nutrition programs, with personalized coaching, meal-prep resources, and stress management strategies.

9.7. Recommendations for Further Research

1) Effectiveness of nutrition communication channels in influencing dietary practices among tertiary students.

2) Impact of nutrition assistance programs in tertiary institutions.

3) The gap between nutrition awareness and practical application.

Nutrition communication and dietary practices of medical students at Kenyan private tertiary institutions.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Definition of Key Terms

- **Nutrition communication content:** Refers to culturally appropriate messages and specific information disseminated to educate, influence, or inform medical students on nutrition and healthy dietary practices.
- **Communication strategy:** Refers to planned approaches used to develop, design, publicize, and strengthen tailored nutrition messages with the goal of influencing healthy dietary behavior.
- **Individual factors:** Refers to the personal characteristics of final-year nutrition students at public tertiary institutions in Kenya. The characteristics include attitudes, beliefs, socioeconomic background, and living environment, which influence how nutrition students perceive and respond to nutrition communication, potentially moderating its impact on their dietary practices.