

Food Literacy and Dietary Behaviour among Day Students of Senior High Schools in Winneba, Central Region of Ghana

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Abstract This study investigated the extent to which food literacy competencies of day students in senior high school relates with their dietary behavior in Winneba. The study employed a descriptive survey design where the quantitative approach was followed. Using the purposive and stratified random sampling strategies, a sample size of 404 day students was selected for the study. A structured questionnaire was used for data collection which was analyzed using both descriptive (frequency, percentage, mean, standard deviation) and inferential (t-test, ANOVA, Pearson Moment Correlation) statistics. The study revealed that generally, even though day students had good food literacy skills, they exhibited different competencies in the food literacy constructs, it was discovered that food capacity (eat or intake) was dominant, followed by food selecting skills and preparation and food planning and management. The study further established that generally there was a moderate and statistically significant positive relationship ($r=0.660$, $p<0.05$, 2-tailed) between food literacy and students' dietary behavior. Besides, it was found that the students exhibited inappropriate dietary behavior as greater proportion skipped meals notably breakfast, practiced excessive snacking, low consumption of fruits and vegetables with very few eating three square meals daily. Additionally, it was found that whereas age and form/class/level of students influenced their food literacy levels, gender and type of school attended did not influence their food literacy. Based on these results, it was recommended that school authorities should liaise with the Effutu Municipal Health Directorate to design and implement programmes to conscientize students on the need to be food literate and also to develop and practice effective dietary practices for optimum dietary behavior.

Keywords: food literacy, dietary behavior, day senior high school students

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1. Introduction

Globally, there is consensus that the wealth of every nation is contingent on the health of its citizens. Indeed, extant literature demonstrates that good and quality food consumption has a positive sway in realizing good health and the maintenance and prevention of chronic diseases. The [1] and [2] corroborated these assertions when they argued that apart from providing our bodies with energy and the requisite nutrients for metabolic and physiological well-being of an individual, food also holds the essential nutrients for the sustenance of our body function and the general growth and development of an individual. It could be deduced from these perspectives that the benefit of good food consumption to an individual and the nation at large cannot be over-emphasized. Therefore, consuming nutrient rich foods should be the priority of every individual.

Despite the dangers associated with poor dietary behavior such as the occurrence of overweight and obesity

type 2 diabetes, cardiovascular and liver diseases, etc., there is indication that these diseases are prevalent worldwide. The World Health Organization (WHO) [3] in 2013 reported that 2.7 million people die due to low fruit and vegetable consumption while 2.6 million people die as a result of their being overweight or obese. According to [4], Non Communicable Diseases emanating from poor dietary behavior contributed 37% of all-cause mortality in South Africa. In Ghana, even though statistics on these variables are grossly unavailable, a recent study by [5] put adolescents' overweight and obesity prevalence between 4% and 7%. The available evidence suggests that inappropriate dietary behaviour is a major cause of mortality and morbidity, and therefore, an affront to individual's general wellbeing.

Researchers have inquired into the causes of the poor and inappropriate dietary behavior among adolescents. In their study, [6,7] established that even though adolescents and young adults are generally concerned about their health and nutrition, the general lack of adequate food literacy and lack of proper nutritional knowledge is the

results of their unacceptable food choices and dietary behaviours. A study by [8] expounded that food-literacy relates to the collection of inter-related context, which is dependent upon knowledge, skills and behaviors. This scholar considers food literacy as the collective power or strength that gives a person the knowledge to identify, plan and decide what to eat over a period of time with the behavior change that could be at individual, household or at community level. [8] concluded that food literacy has a role in nutritional status, food security and body weight and chronic diseases. Logically, effective or apposite food literacy is contingent on keen intellectual competence on nutrition, deliberate practice of healthy dietary activities so as to realise good wellbeing of an individual.

In his study, [9] conceptualized food literacy as an individual's ability to knowing, wanting, doing, sensing and caring by being practical, critical and conscious at personal level in relation to food and meals together with others in daily life. Also, [10] lent credence to this claim when they explained that food literacy is the aggregate of inter-related knowledge, skills and behaviors essential to plan, manage, select, prepare and eat foods to meet needs and determine food intake. To this end, [11] also substantiated food literacy when she observed that food literacy relates to a set of skills and attributes of an individual which is crucial in preparation of a healthy, tasty and affordable meal for themselves with the resources that are around them while [12] concluding that food literacy is the interrelationship concerning food and its importance on human lives and the ability to be critical in person's attitude on how food is brought to the final product and navigate the story of food item. Juxtaposing these explanations, it could be inferred that the authors recognized food literacy to predate beyond nutrition knowledge; it also encompasses the zeal and the motivation of an individual to apply nutrition information to food choices. However, these assertions recognize that apposite food literacy is the driver and pillar for healthy growth and general wellbeing of a person, and that an individual's healthy growth and development would be a mirage if sustainable and good food literacy is not guaranteed.

Convinced that good food literacy is indispensable and a panacea for growing chronic nutritional related diseases and the general perpetuity of life especially amongst adolescents, several efforts have been made both internationally and nationally to promote food literacy. Indeed, studies on food literacy have gained grounds in recent years due to the conviction that it impacts dietary behaviors and healthy lifestyle among adolescents. Empirical research findings exist to endorse the claim that food literacy impacts dietary consumption [13,10]. For instance, [13] discovered a positive association between food literacy and dietary consumption. It could be construed that the fight against the escalating rate of dietary related diseases would be defeated or expected to shrink when people especially adolescents exhibit poor and inappropriate food literacy. In their observation, [7] concluded that adolescents' food literacy play a crucial role in shaping their dietary intake. Similarly, other studies like those of [14,15] support the findings of earlier studies that food literacy impact dietary consumption of adolescent students. The results of these studies suggest

that good food literacy enhances good dietary consumption whilst poor food literacy stifles adolescent students' dietary consumption. Nevertheless, [16] have gathered empirical proof that being food literate does not predict good food choices. These results are not only inconclusive but also there is no empirical evidence to support this claim or otherwise in Winneba. This dearth in research necessitated this study.

The dimensionality of food literacy has been in the state of constant flux as scholars and researchers have debated on its true components. For instance, whereas [10] unveiled eleven (11) components of food literacy which have been reduced into four main constructs namely: Planning and managing, selecting, food preparation and eating, [17] categorized food literacy under three main constructs namely: food and nutrition knowledge, food skills and capacity. Nonetheless, this study associates and resonates itself with the dimensions proposed by these scholars [10,17] grouped under three main components. These include food planning and management, food skills and preparation and food capacity/eat. These elements were considered in this study because they relate well to the Ghanaian context, and the results would have implications for improved dietary behaviour.

As defined by [10], food planning and management refers to one's ability to prioritize money and time for food, plan food intake so that food can be regularly accessed through some source irrespective of changes in circumstances or environment. Food skills and preparation delineate an individual's ability to access food through multiple sources and how the advantages of these food sources. It also refers to the ability to judge the quality of food. Additionally, it also explains an individual's ability to apply basic principles of safe food hygiene and handling. According to [17], food capacity/eat as the ability of an individual to understand and realize that food has an impact on the personal wellbeing. It is premised on the positive attitude towards cooking and healthy eating and finally, demonstrates self-awareness of the need to personally balance food intake. Even though [10,17] identified components of food literacy, they contended that food planning and management, food skills and preparation and food capacity/eat are disguisable components rather than types because individuals could have varying degrees of all three. Therefore, adolescents' food literacy level is the net sum of these components.

It is, therefore, crucial that practitioners persistently track food literacy especially among adolescent due to its benefits, and tracking could be to determine its nature, relationship with food consumption and the factors that impact it. Experts believe that improving food literacy among adolescents would make them be careful with their food selection, preparation and consumption and ultimately make them be better equipped on their dietary intake, while improving their diet-related health outcomes [18]. Other authors claim that practitioners need to rely less on formal rules in realizing enhanced food literacy to attain desirable dietary practices since many students are not actually able to put the theory they learn in the classroom into practice [19]. To buttress the above claim, [19] established that despite having significant food knowledge, many adolescents find it difficult to follow healthy eating prescriptions and often consume food that

they think is unhealthful. The above views allude that experts are not decisive on strategies for enhancing adolescents' food literacy. Therefore, attempt to promote food literacy among may employ varying strategies based on personal principles.

Researchers investigations on the level of adolescents' food and nutrition literacies have produced inconsistent results. For instance, [20] investigated the nutrition literacy status of adolescent students in Kampala District, Uganda and revealed low and average levels of nutrition and food literacy constructs. In the study conducted by [21] on understanding food literacy from perceptions of young Canadian adults, it was established that young Canadian adults lack the necessary food literacy required to make healthful food choices. The results further disclosed that significant bottlenecks exist relative to acquiring and utilizing food literacy, which appear to influence food choices, health and well-being. The conclusions drawn from these studies indicated that some degree of food literacy is essential for desirable and healthy food choices. However, there is no empirical evidence existing in the Effutu Municipality to support this conclusion. Accordingly, studies are required to ascertain the level of food literacy and the nexus thereof with dietary behavior in the Effutu Municipality.

Besides food literacy, scholars have noticed that adolescents' dietary habit is critical and may have significant consequences since these habits are carried into adulthood and are challenging to change [22]. However, empirical research findings exist to validate the fact that the dietary habit of adolescents is a perturbing issue where [23] for instance observed that diets consumed by adolescents usually are snacks, others are usually high in fat and sugars and are mostly low in unrefined carbohydrates, dairy foods, fruits and vegetables. Consistent with this observation, [24] have indicated that dietary habits amongst adolescents especially in developing countries includes diets that are starchy staples with few or no animal products and high in fats and sugars often inadequate compared to national guidelines.

On meal skipping, particularly breakfast, adjudged to be the most important meal of the day [25,26], disclosed that 47.7% and 25.2% of adolescent students skipped breakfast and lunch. This concern is supported by [27] who discovered that 52% of the students skipped breakfast. Similarly, [28] disclosed that sixty-one percent (61%) of adolescent students skipped meals during the day. Meals sometimes skipped included breakfast (59%), lunch (34%) and supper (10%). In Ghana, [29] in their study of adolescents' knowledge of diet-related chronic diseases and dietary practices discovered that, 41.8% of the adolescents' involved in the study skipped breakfast. Studies on the number of meals eaten by adolescents have caught the attention of nutritionist and other researchers. In a study of adolescent food habits in Koforidua, Ghana, [30] discovered 53% of adolescents eating three times a day.

In a similar study, [31] in their study of nutrition knowledge, meal patterns and nutritional status of energy drink users in a Ghanaian University, found that majority of the respondents (72%) ate three times a day with a few eating four times daily. These scholars [31] discovered in

their study that 87% of the respondents ate three times or more in a day. Again, [32,33] discovered in their study that 83% and 84% of the respondents ate three times a day respectively. According to [34], eating three meals a day provide the body with essential energy and nutrients and help keep one focused and less irritable. Scholars like [35] believed that spreading meals evenly throughout the day helped with efficient digestion and absorption and maintain stable blood sugar levels. Frequent skipping of meals has been reported to be associated with poorer nutritional status and the risk of cardiovascular disease, diabetes and some cancers. Even though available literature has discussed at length the dietary habits of adolescents elsewhere, it appears not much has been done in Winneba. This dearth in knowledge needs to be dealt with because in the face of calls to promote healthy dietary practices among adolescents studies are needed in specific settings to uncover the true dietary habits of adolescents with regards to their level of food literacy. Nevertheless, researchers have theorized a significant positive correlation between food literacy component (cooking skills, food skills, nutrition knowledge, health consciousness and healthy eating) and adolescents' dietary behaviour [36,37,15]. Presumably, adolescents' level of food literacy is a critical determinant of dietary behaviour. Thus, healthful dietary consumption could be increased indirectly by applying and promoting food literacy.

Researchers have explored the effect of demographic variables of students and how they impact on their food literacy. Consequently, studies have unveiled that gender, age, class level, and type of school attended are variables that have caught the attention of previous researchers in determining their impact on food literacy. In their study [36] discovered that food literacy was influenced significantly by gender, age, and level of education. For instance, these authors disclosed in their study that females were more food literate than their male counterpart. Also, it was revealed that food literacy increases with increasing age. Likewise it was disclosed that food literacy increases with an increase in education level of an individual. Departing from the findings of [36], [38], revealed no association between age and other demographic characteristics and their nutrition and food literacies. Based on these conflicting, results, this study investigated the effect of age, sex, class level, type of school attended by adolescents on their food literacy.

As revealed that good food literacy enables adolescents to make healthful dietary practices which invariably lead to improved dietary behaviour. Available evidence suggests that Ghana is grappling with adolescents' food literacy challenges, thus, 52.2% being stunted and 46.2% being underweight [39,40,41]. Consequently, researchers [36,42] lamented that there is a decline of food and nutrition literacy and dietary behaviour especially amongst adolescents' throughout the globe. These scholars adduced the reason for this trend as poor dietary behaviour as a results of poor food literacy. Therefore, it is pertinent that the level of food literacy among adolescents and the extent to which it boosts their dietary behaviour are continuously researched. This study had the focus of ascertaining the nexus between food literacy and dietary behavior among Day Senior High School students in Winneba.

The following research questions guided the study:

1. What is the level of food literacy amongst Day Senior High School students in Winneba?
2. What are the dietary behaviours of Day Senior High School students in Winneba?
3. What is the relationship between food literacy and dietary behaviour amongst Day Senior High School students in Winneba?

The study also tested these hypotheses:

- H₀₁: There is no statistically significant difference in the food literacy of male and female day Senior High School students in Winneba.
- H₀₂: Age will not statistically significantly affect Day Senior High School students' food literacy levels in Winneba.
- H₀₃: Class/Level will not statistically significantly affect food literacy levels among day Senior High School students' in Winneba.
- H₀₄: Type of school attended by day Senior High School students will not statistically significantly affect food literacy levels in Winneba.

It is anticipated that the results of the study would inform stakeholders such as Ministry of Education and the Ghana Education Service through the Winneba Municipal Education Directorate about the state of food literacy among adolescents, and the degree to which such practices influence adolescents' dietary behaviour. This awareness would make these stakeholders to determine and design effective strategies that could be used in enhancing appropriate food literacies amongst students for desirable dietary outcomes. It is the hope of the researcher that the findings of the study will benefit the students in their dietary behaviour through improved dietary practices and food literacy.

2. Methodology

A descriptive survey design by utilizing the quantitative approach was employed in the conduct of the study. This design focuses on and describes a phenomenon [43]. The rationale for the selection of the descriptive survey design was grounded in the conviction that it allows researchers to collect data regarding the opinion of participants on a particular topic, and it is used to investigate the existence of relationship between variables [44]. Similarly, the quantitative approach was considered based on the reason that involves statistical analysis and relies on numerical evidence to examine relationships between variables [45], thereby justifies the purpose of the study. The target population for this study comprised all day students from one public and two private Senior High Schools in Winneba because this category of students prepare their food unlike the boarders who are fed with prepared menu. Additionally, the findings would have implications for practice and necessary remediation implemented so as to engender good dietary behavior among day students. The two private schools accounted for 445 day students (215 & 230) respectively while a total of 604 day students constituted those from the public school. Collectively, 1049 day students in public and private Senior High Schools composed the population of the study. In all, a sample size of 415 day Senior High School students

representing 39% of the target population were sampled through the multi-stage sampling technique where stratified and simple random sampling techniques based on their proportion to the target population. As proposed by [46], at least 10% to 30% of the target population is deemed representative in surveys being representative in quantitative studies.

Structured questionnaire on Food Literacy (FL) was adapted from [47] and Food Frequency Questionnaire (FFQ) were the main instruments used for data collection. The choice of this data collection instrument is influenced by factors such as the nature of the problem and availability of time and money [48] plus the fact that it is probably the single most common research tool that is relatively well understood and has the advantages of simplicity, versatility and low cost [49]. Besides, the quantitative approach adopted for the study required the collection of quantifiable data that will help to determine the relationship between food literacy of students' and their dietary behaviour. The questionnaire was made up of three sections. Section One gathered demographic information of the respondents such as gender, age, class/level, and type of school attended. Section Two contained items on the food literacy of adolescents'. The questionnaire asked the adolescents to rate their food literacy practices measured on a 5-point Likert-type scale such that 1=Never, 2=Seldom, 3=Sometimes, 4=Usually, and 5=Always. Section Three which collected data on the food frequency required adolescents to circle only one option to reflect their perception their dietary behavior.

In checking for reliability of the instrument, a pre-test was conducted with the day students of Potsin T. I. Alhamadiya Senior High School in the Gomoa East District which share similar characteristics as those students in Winneba. In this approach, the questionnaire was administered to participants in the pilot study once and the coefficient of the inter-item correlations was computed using Cronbach alpha to determine the reliability. The Cronbach alpha coefficients for food literacy component were 0.78 for food planning and management, 0.77 for food selection skills and preparation, 0.76 for food capacity (eat or intake) as well as 0.79 for the overall food literacy. The dietary behavior construct yielded Cronbach alpha coefficient of 0.81. [43] argue that Cronbach alpha coefficient should be at least 0.70 to be indicative of internal consistency. Based on this view, it could be observed that the questionnaire was reliable. Face and content validation was also checked as the instrument was given to Faculty members and a Professor in Food and Nutrition. Suggestions relating to grammatical errors, typographical mistakes, and ambiguities and the expert advice were all incorporated in reshaping the instrument.

Responses from the questionnaires were coded and entered into the Version 22 of the Statistical Product for Service Solutions (SPSS). Descriptive statistics such as frequency and percentages were used to analyse the demographic data while mean and standard deviation and inferential statistical tools such as Pearson Moment Correlation, independent samples t-test and one-way between groups analysis of variance (ANOVA) were used to answer the research questions and the hypotheses set. Finally, in this study, ethical issues such as anonymity, confidentiality, and informed consent were all ensured.

3. Results and Discussions

Out of a total of four hundred and fifteen (415) questionnaires administered, four hundred and four (404) were involved in the analysis representing a response rate of 97%. This response rate was attained because some respondents did not fill-in their questionnaires whilst other questionnaires contained a lot of missing information. However, this response rate was deemed appropriate based on the recommendation of [50] that a response rate of 70% is enough in a survey. The demographic characteristics of the respondents are presented in Table 1.

As indicated in Table 1, more female students (n=243, 60.1%) than male students (n=161, 39.9%) were involved in the study. The information further reveal that more of the students were in SHS 1 (n=185, 45.8%), than those in SHS 3 (n=111, 27.5%), while the rest were those in SHS 2 (n=108, 26.7%). Concerning their ages, the findings show that more than half of the students who participated in the study were 16-19 years (n=312, 77.2%) than those who fell between 12-15 years (n=52, 12.9%), as well as those who were 19 years and above (n=40, 9.9%). The distribution of the students based on the type of school attended revealed that those from the public school (n=203, 50.2%) were more than those from the private schools (n=201, 49.8%). The demographic distributions of the students were crucial to the study because they disclosed that data were collected from students with diverse backgrounds, thereby making the data rich and devoid of bias. Besides, the demographic factors like students' sex, level, age and type of school attended assisted in determining the extent to which these factors influenced the food literacy and dietary behaviour of the students so as to provide answers to the study's hypotheses.

3.1. What is the Level of Food Literacy amongst Day Senior High School Students in Winneba?

This research question investigated the level of food literacy among day students in Senior High Schools in Winneba. In this study, the variable food literacy composed of three main constructs namely: literacy in food planning and management, food selection skills and preparation as well as food capacity (eat or intake). In determining the level of food literacy among students, mean and standard deviation were calculated to determine the level of literacy such as that mean <2.50 indicated low literacy, 2.50 ≥ mean < 3.50 indicated average literacy, and mean ≥ 3.50 indicated good literacy. The general level of food literacy is shown in Table 2.

Table 1. Demographic Information of Students

Variables	Categories	Frequency	Percent
Sex	Male	161	39.9
	Female	243	60.1
	Total	404	100.0
Level	SHS 1	185	45.8
	SHS 2	108	26.7
	SHS 3	111	27.5
	Total	404	100.0
	12-15	52	12.9
Age	16-19	312	77.2
	Above 19	40	9.9
	Total	404	100.0
Type of School	Public	203	50.2
	Private	201	49.8
	Total	404	100.0

Source: Fieldwork Data, 2019.

Table 2: Descriptive Statistics on the Level of Food Literacy

Food Literacy Variables	Item	Response						Level of Literacy
		A (%)	U (%)	ST (%)	S (%)	N (%)	M (SD)	
Food Planning and Management	1	120 (29.7)	54 (13.4)	187 (46.3)	27 (6.7)	16 (4.0)	3.58 (1.10)	Good
	2	74 (18.3)	89 (22.0)	188 (46.5)	23 (5.7)	30 (7.4)	3.38 (1.08)	
	3	83 (20.5)	74 (18.3)	147 (36.4)	61 (15.1)	39 (9.7)	3.25 (1.22)	
	4	150 (37.1)	87 (21.5)	132 (32.7)	16 (4.0)	19 (4.7)	3.82 (1.12)	
	5	167 (41.3)	98 (24.3)	118 (29.2)	11 (2.7)	10 (2.5)	3.99 (1.02)	
SSM (SSSD)							3.61 (1.11)	
Food Selecting Skills and Preparation	6	98 (24.3)	84 (20.8)	163 (40.3)	23 (5.7)	36 (8.9)	3.46 (1.18)	
	7	122 (30.2)	78 (19.3)	154 (38.1)	28 (6.9)	22 (5.4)	3.62 (1.14)	
	8	135 (33.4)	79 (19.6)	120 (29.7)	46 (11.4)	24 (5.9)	3.63 (1.22)	
	9	199 (49.3)	59 (14.6)	95 (23.5)	13 (3.2)	38 (9.4)	3.91 (1.30)	
	10	165 (40.8)	103 (25.5)	114 (28.2)	11 (2.7)	11 (2.7)	3.99 (1.02)	
SSM (SSSD)							3.72 (1.17)	
Food Capacity (eat or intake)	11	178 (44.1)	92 (22.8)	87 (21.5)	28 (6.9)	19 (4.7)	3.95 (1.16)	
	12	214 (53.0)	78 (19.3)	93 (23.0)	9 (2.2)	10 (2.5)	4.18 (1.02)	
	13	222 (55.0)	51 (12.6)	84 (20.8)	27 (6.7)	20 (5.0)	4.06 (1.21)	
	14	126 (31.2)	118 (29.2)	120 (29.7)	19 (4.7)	21 (5.2)	3.76 (1.10)	
	15	99 (24.5)	79 (19.6)	150 (37.1)	46 (11.4)	30 (7.4)	3.42 (1.19)	
SSM (SSSD)							3.87 (1.13)	
Overall Food Literacy							3.73 (1.14)	Good

Source: Field Data, 2019

Key: A = Always, U = Usually, ST=Sometimes, S=Seldom, N=Never (%) = Percentage, M = Mean, SD = Std. Deviation, SSM = Sub-scale Mean, SSSD = Sub-scale Std. Deviation.

The data in Table 2 reveal that Day Senior High School students had good competencies in all food literacy components outlined in this study. However, using the sub scale means, it could be observed that students ranked highest on the food capacity (eat or intake) ($M=3.87$, $SD=1.13$) followed by food selection skills and preparation ($M=3.72$, $SD=1.17$), and food planning and management ($M=3.61$, $SD=1.11$), with the overall yielding ($M=3.73$, $SD=1.14$). Based on the 5-point Likert scale used where the mean score is 3.0, it could be said that the Day Senior High School students competencies in food literacy components were all above average which is an indication of good food literacy. Nonetheless, food capacity (eat or intake) was dominant among the students while the food planning and management was least practiced. This finding contradicts that of [21] where it was revealed that students lacked the necessary food literacy skills. However, the finding resonates with that of [20] study which disclosed average levels of food literacy constructs.

3.2. What are the Dietary Behaviours of Day Senior High School Students in Winneba?

This research question sought the views of the respondents on their dietary behavior as day students. The statements that solicited the views of the respondents aimed to discover the number of square meals they take, whether they skipped meals, snacking as well as the consumption of fruits and vegetables. Table 3 presents the views of respondents on the nature of their dietary behavior.

In determining the views of the respondents on the number of square meals they take in a day, the data in

Table 3 revealed that a larger portion of them eat two meals daily ($n=216$, 53.5%) than those who eat three square meals daily ($n=110$, 27.2%), more than thrice daily ($n=53$, 13.1%), and once ($n=25$, 6.2%) whereas the proportion of those who do not take breakfast daily ($n=221$, 54.7%) outstripped that of those who took breakfast daily ($n=183$, 45.3%). The data also disclose that a larger proportion of the students indicated skipping breakfast ($n=141$, 34.9%) than those who skipped snack ($n=110$, 27.2%) whilst some of the participants skipped lunch ($n=112$, 27.7%) as compared to those who skipped supper ($n=41$, 10.1%).

It could be observed from the data in Table 3 that more than half of the respondents snack during the day ($n=228$, 56.4%) than those who do not snack during the day ($n=176$, 43.6%) whilst some of the respondents snack once ($n=164$, 40.6%) as compared with those who snack twice ($n=107$, 26.5%), more than thrice ($n=107$, 26.5%) and those who snack thrice ($n=26$, 6.4%) respectively. Besides, the data has show that the proportion of students who do not eat fruits daily ($n=272$, 67.3%) was larger than those who indicated eating fruits daily ($n=132$, 32.7%). The dietary behavior and practices as shown in Table 3 have revealed that the students exhibited inappropriate dietary practices as majority skipped meals notably breakfast, practiced excessive snacking, low consumption of fruits and vegetables with very few eating three square meals daily. These findings resonate with those of previous studies [31,25,27] which demonstrated poor dietary practices where majority skipped meals notably breakfast, exhibited excessive snacking, low consumption of fruits and vegetables with very few eating three square meals daily.

Table 3. Descriptive Statistics on the Nature of Students' Dietary Behaviour

Statements	Responses	Frequency	Percent
1. How many square meals do you eat in a day?	One	25	6.2
	Two	216	53.5
	Three	110	27.2
	More than Three	53	13.1
	Total	404	100.0
2. Do you eat breakfast everyday	Yes	183	45.3
	No	221	54.7
	Total	404	100.0
3. Based on the three square meals per day, which meals do you mostly skip in a day	Breakfast	141	34.9
	Snack	110	27.2
	Lunch	112	27.7
	Supper	41	10.1
	Total	404	100.0
4. Do you snack during the day	Yes	228	56.4
	No	176	43.6
	Total	404	100.0
	Once	164	40.6
	Twice	107	26.5
5. If Yes, how many times do you snack in a day	Thrice	26	6.4
	More than three	107	26.5
	Total	404	100.0
	Yes	132	32.7
6. Do you eat fruits everyday	No	272	67.3
	Total	404	100.0

Table 4. Pearson Correlation Matrix for Food Literacy and Dietary Behavior

Variables	Mean	Std. Dev.	1	2	3	4	5
1. Food Planning and Management	3.61	0.67	1				
2. Food Selection Skills and Preparation	3.72	0.74	0.415* (0.00)	1			
3. Food Capacity and Intake	3.87	0.76	0.377* (0.00)	0.612*	1		
4. Overall Food Literacy	3.73	0.58	0.723* (0.00)	0.848* (0.00)	0.838* (0.00)	1	
5. Dietary Behavior	1.98	0.33	0.150* (0.03)	0.582* (0.00)	0.504* (0.00)	0.660* (0.00)	1

N=404 *Correlation is significant at $p < 0.05$ (2-tailed) NB: p-values are in brackets
Source: Field Data, 2019.

3.3. What is the Relationship between Food Literacy and Dietary Behaviour among Day Senior High School students in Winneba?

This research question investigated the relationship between food literacy factors and students' dietary behaviour in public and private Senior High Schools in Winneba. The food literacy construct in this study included food planning and management, food selection skills and preparation and food capacity and intake as well as the overall with the dependent variable being dietary behaviour. The Pearson correlation was used to analyze the data, and the correlation coefficients were interpreted in line with [51] suggestion which indicated that coefficients less than 0.50 represent a weak relationship, coefficients greater than 0.50 but less than 0.80 represent a moderate relationship, and coefficients greater than 0.80 represent a strong relationship. The results of the analysis were presented in Table 4.

The findings in Table 4 reveal that all the food literacy indicators outlined in the study was positively and significantly related with students' dietary behaviour. Indeed, the result show that there was a moderate but statistically significant relationship between food literacy and students' dietary behaviour ($r=0.660$, $p < 0.05$, 2-tailed). Therefore, being food literate engenders good dietary behaviour while poor food literacy is a threat to healthful dietary practices and behaviour. It was also established that there was a moderate but statistically significant relationship between food capacity and intake and students' dietary behaviour ($r=0.504$, $p < 0.05$, 2-tailed). Also, the study disclosed that there was a moderate and statistically significant positive relationship between food

selection skills and preparation and students' dietary behaviour ($r=0.582$, $p < 0.05$, 2-tailed). Finally, the relationship between food planning and management and students' dietary behaviour was found to be weak and statistically significant relationship ($r=0.150$, $p < 0.05$, 2-tailed). These results imply that the food literacy factors contained in this study were crucial in enhancing the dietary behaviour of the students. In essence, an improvement in the level of these factors is probable to boost and lead to healthful dietary practices and behavior of the students. Conversely, a reduction in the level and quality of these factors is likely to lead to a poor dietary behavior which is an affront fight against the increasing levels of Non Communicable Diseases and a drop in the quality of lifestyle among adolescent students. This finding corroborates previous studies [7,13,15,36,37] where food literacy correlated with dietary behavior. The finding, however, departs from [19] studies which established that despite having significant food knowledge, many adolescents find it difficult to follow healthy eating prescriptions and often consume food that they think is unhealthy, thus, good food literacy do not translate into good dietary behavior.

3.4. Test of the Study' Hypotheses

Hypothesis 1

H_{01} : There is no statistically significant difference in the food literacy of male and female students in Day Senior High Schools in Winneba.

This hypothesis sought to test if the food literacy levels of the students could be contingent on their gender. In testing this hypothesis, the independent samples t-test was carried out, and the results are presented in Table 5.

Table 5. T-test Results for Male and Female Students on their Food Literacy

Variables	Sex	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Food Planning and Management	Male	3.54	0.73	-1.516	402	0.130
	Female	3.65	0.63			
Food Selection Skills and Preparation	Male	3.65	0.84	-1.658	402	0.098
	Female	3.77	0.66			
Food Capacity and Intake	Male	3.88	0.83	0.156	402	0.876
	Female	3.87	0.70			
Overall Food Literacy	Male	3.69	0.64	-1.214	402	0.226
	Female	3.76	0.54			

Source: Field Data, 2019.

The t-test results in Table 5 show that there was a statistically significant difference in the mean scores for male and female students in relation to their literacy in food selection skills and preparation [$t(402) = -1.658, p < 0.05$, 2-tailed]. However, the results indicate that there were no statistically significant difference in the mean scores for male and female students concerning their literacy in food planning and management [$t(402) = -1.516, p > 0.05$, 2-tailed] where the female students had better literacy ($M=3.65, SD=0.63$) than the male students ($M=3.54, SD=0.73$). Similarly, the results disclose that the mean scores for male ($M=3.88, SD=0.83$) and female ($M=3.87, SD=0.70$) students does not differ significantly on their literacy in food capacity (eat or intake) [$t(402) = 0.156, p > 0.05$, 2-tailed] which implied that the male students had better literacy in food capacity (eat or intake) than their female counterparts. The results on the overall food literacy of the students reveal that the mean score for male students ($M=3.69, SD=0.64$) and the mean score for the female students ($M=3.76, SD=0.54$) were not significantly different [$t(402) = -1.214, p > 0.05$, 2-tailed], thus implied that the female students generally had better food literacy than the male students. Based on these results, the study concluded that the gender of the students do not matter in determining their food literacy levels in Senior High Schools in Winneba. Hence, the null hypothesis that “There is no statistically significant difference in the food literacy levels of males and females day Senior High School students in Winneba” was supported while the alternative hypothesis was not supported. This finding authenticates that of [36] study where male and female students did not differ statistically significant with their food literacy. However, the finding from this study disagrees with that of [38] where gender was statistically significant with students’ food literacy levels.

Hypothesis 2

H_{02} : Class/level/form will not statistically significantly affect food literacy levels among day Senior High School students’ in Winneba.

This hypothesis sought to find out the extent to which level/class/form affect students’ food literacy. Class/level/form was categorized into three: SHS1, SHS2, and SHS3. The one-way between groups ANOVA was used to provide answers to the hypothesis, and the results are presented in Table 6.

It is observed from the ANOVA results in Table 6 that there were no statistically significant differences in the mean scores for the students’ literacy in relation to food planning and management [$F(2, 401) = 0.327, p > 0.05$], as well as food capacity (eat or intake) [$F(2, 401) = 1.933, p > 0.05$] due to their level/form. However, there were statistically significant differences in the mean scores for the students’ literacy in relation to food selection skills and preparation [$F(2, 401) = 7.294, p < 0.05$], as well as the overall food literacy of the students [$F(2, 401) = 6.321, p < 0.05$] due to level/form. Therefore, the study concluded that the food literacy levels of day Senior High students in Winneba were influenced by level/form of schooling. Hence, the null hypothesis that “Class/Level will not statistically significantly affect food literacy levels among day Senior High School students in Winneba” was not supported while the alternative hypothesis was supported. The finding of this study disagrees with that of [36] study where the level of students did not differ statistically significant with their food literacy. However, the finding from this study agrees with that of [38] where form/level of students was statistically significant with their food literacy levels.

Hypothesis 3

H_{03} : Age will not statistically significantly affect Day students’ in Senior High School food literacy levels in Winneba.

This hypothesis investigated the role of age in determining the food literacy levels of the students. In this study, the age groups of the students were identified as those within 12-15years, 16-19years and those above 19 years. The one-way between groups ANOVA was employed in testing this hypothesis and the results are shown in Table 7.

Table 6. ANOVA Results for Class/level/form of Students’ and Students’ Food Literacy

Food Literacy Scales	Level	Mean	Std. Dev.	Sum of Squares	df	Mean Square	F	Sig.
Food Planning and Management	SHS 1	3.62	0.79	.293	2	0.147	0.327	0.721
	SHS 2	3.62	0.57	179.852	401	0.449		
	SHS 3	3.56	0.53	180.146	403			
	Total	3.61	0.67					
Food Selection Skills and Preparation	SHS 1	3.58	0.75	7.694	2	3.847	7.294	0.001
	SHS 2	3.80	0.60	211.514	401	0.527		
	SHS 3	3.89	0.80	219.208	403			
	Total	3.72	0.74					
Food Capacity/eat/ Intake	SHS 1	3.80	0.79	2.203	2	1.101	1.933	0.146
	SHS 2	3.98	0.63	228.460	401	0.570		
	SHS 3	3.89	0.80	230.662	403			
	Total	3.87	0.76					
Overall Food Literacy	SHS 1	3.67	0.63	1.556	2	0.778	6.321	0.003
	SHS 2	3.80	0.44	134.404	401	0.335		
	SHS 3	3.78	0.60	135.960	403			
	Total	3.73	0.58					

Table 7. ANOVA Results for Age of Students' and Students' Food Literacy

Food Literacy Variables	Age Range	Mean	Std. Dev.	Sum of Squares	df	Mean Square	F	Sig.
Food Planning and Management	12-15	3.75	0.64	1.623	2	0.811	1.822	0.163
	16-19	3.57	0.67	178.523	401	0.445		
	Above 19	3.69	0.68	180.146	403			
	Total	3.61	0.67					
Food Selection Skills and Preparation	12-15	3.75	0.85	4.312	2	2.156	4.023	0.019
	16-19	3.68	0.73	214.897	401	0.536		
	Above 19	4.03	0.58	219.208	403			
	Total	3.72	0.74					
Food Capacity and Intake	12-15	3.72	0.80	3.984	2	1.992	3.524	0.030
	16-19	3.87	0.76	226.678	401	0.565		
	Above 19	4.14	0.59	230.662	403			
	Total	3.87	0.76					
Overall Food Literacy	12-15	3.74	0.63	2.083	2	1.042	3.120	0.045
	16-19	3.71	0.59	133.876	401	0.334		
	Above 19	3.95	0.42	135.960	403			
	Total	3.73	0.58					

Source: Field Data, 2019.

The ANOVA results in Table 5 reveal that except the students' literacy in food planning and management where age did not account for a statistically significant difference [$F(2, 401) = 1.822, p > 0.05$], the study discovered statistically significant differences in the literacy levels of students in relation to food selection skills and preparation [$F(2, 401) = 4.023, p < 0.05$], food capacity (eat or intake) [$F(2, 401) = 3.524, p < 0.05$], as well as the overall food literacy of the students [$F(2, 401) = 3.120, p < 0.05$] due to age. Thus, the results suggested that age is a critical determinant of the students' food literacy in Senior High Schools in Winneba. Therefore, the null hypothesis that "Age will not statistically significantly affect day Senior High School students' food literacy levels in Winneba" was not supported while the alternative hypothesis was supported. The finding of this study agrees with that of [36] study where age of students statistically significantly predicts students' food literacy. However, the finding from this study is not in agreement with [38] where age of students was not statistically significant with their food literacy levels.

Hypothesis 4

H_{04} : Type of school attended by day Senior High School students' will not statistically significantly affect food literacy levels in Winneba.

This hypothesis sought to investigate if the food literacy of the students could be as a result of the type of school they attend (ie public/private). The independent samples t-test was used and the results are shown in Table 8.

The t-test results in Table 8 showed that there was no statistically significant difference in the mean scores for public ($M=3.64, SD=0.71$) and private ($M=3.57, SD=0.62$) students in relation to their competencies in food planning

and management [$t(402) = 1.101, p > 0.05, 2$ -tailed]. Similarly, the results disclosed that the mean scores for public ($M=3.67, SD=0.77$) and private ($M=3.78, SD=0.70$) students do not differ significantly on their literacy in food selection skills and preparation [$t(402) = -1.530, p > 0.05, 2$ -tailed] which implied that the private students were more literate in food selection skills and preparation than their public school counterparts. The findings further disclosed that there was a difference in the mean scores for public ($M=3.88, SD=0.75$) and private ($M=3.87, SD=0.76$) students regarding their literacy in food capacity (eat or intake) which was not statistically significant [$t(402) = 0.240, p > 0.05, 2$ -tailed]. The results on the overall food literacy of the students reveal that the mean score for public students ($M=3.73, SD=0.61$) and the mean score the private students ($M=3.74, SD=0.55$) were statistically not significantly different [$t(402) = -0.120, p < 0.05, 2$ -tailed]. This implies that the private school students were generally more food literate than the public school students. Based on these results, the study concluded that the type of school attended (public/private) of the students do not matter in determining their food literacy levels in Senior High Schools in Winneba. Hence, the null hypothesis that "type of school attended by day Senior High School students will not statistically significantly affect food literacy levels in Winneba" was accepted while the alternative hypothesis was rejected. The finding of this study is in agreement with that of [36] study where the type of school attended by students did not differ statistically significant with their food literacy. However, the finding from this study disagrees with that of [38] where type of school attended by the students was statistically significant with their food literacy levels.

Table 8. T-test Results for Public and Private Students on their Food Literacy

Food Literacy Scales	Type of School	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Food Planning and Management	Public	3.64	0.71	1.101	402	0.272
	Private	3.57	0.62			
Food Selection Skills and Preparation	Public	3.67	0.77	-1.530	402	0.127
	Private	3.78	0.70			
Food Capacity and Intake	Public	3.88	0.75	0.240	402	0.811
	Private	3.87	0.76			
Overall Food Literacy	Public	3.73	0.61	-0.120	402	0.905
	Private	3.74	0.55			

Source: Field Data, 2019.

4. Conclusions and Recommendations

The study gathered ample evidence to confirm that food literacy matters in boosting dietary behavior and practices. It is, therefore, expected that when appropriate competencies in food literacy is maintained by students, it would enhance and sustain healthful dietary behavior and practices. The results of the study have proven that the day students had good food literacy as they exhibited competencies in the food literacy components although much attention was directed at food capacity (eat or intake). This suggests that the students were conscious of the consequences of outcomes of not being food literate. It is, therefore, expected that the stakeholders of the schools would pay attention to the food literacy levels of students, and adopt necessary measures to enhance the food literacy levels of students at all times. The results presented showed a statistically significant relationship between food literacy and dietary behaviours of students as all the food literacy components (food selection skills and preparation, food planning and management and food capacity/eat/ intake) all had positive and significant correlation with dietary behaviour. Interesting to this study was the revelation that even though students had good food literacy, it did not translate into the practice of good dietary behavior as they were seen not to be eating three square meals daily, practiced excessive snacking and meal skipping with overwhelming number revealing not to be eating fruits daily. Accordingly, it is envisaged that school authorities would liaise with the municipal health directorate to design and implement programmes to conscientize students on the need to develop and practice effective dietary behavior. Besides, awareness should be created among the students to recognise the consequences of practicing undesirable dietary behaviour. This will make them apply result-driven food choices so as to achieve desired and optimum dietary behavior. Finally, the test of the hypotheses established that age and form/class/level of students influenced their food literacy levels while gender and type of school attended did not influence their food literacy which suggested that some of these personal factors of students were crucial in their food literacy. Therefore, in rolling out programmes to conscientize students on the need to develop and practice effective dietary behavior, there should be special considerations to age and form/class/level of students since these were critical in determining their food literacy levels.

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