Original Article

Knowledge Level of Healthy Lifestyle, its Adherence and Relation to Anthropometry among Nursing Students in All Nations University Koforidua

Prince Chikwere, MPhil, MPH
Lecturer, Nursing Department, All Nations University, Koforidua, Ghana

Isaac Gunu Asirifi, MSc
Lecturer, Nursing Department, All Nations University, Koforidua, Ghana

Comfort Arkoh, BSc
Nursing Department, All Nations University, Koforidua, Ghana

Esther Antwiwaa Nyarko, BSc
Nursing Department, All Nations University, Koforidua, Ghana

Rebecca Gyamfuaa, BSc
Nursing Department, All Nations University, Koforidua, Ghana

Correspondence: Chikwere Prince, MPhil, MPH. Lecturer, Nursing Department, All Nations University, Koforidua, Ghana. P.O.Box KF 1908 Koforidua, Eastern Region, Ghana.
Email: uc.princechik@gmail.com

Abstract
Background: Unhealthy eating habits are frequent among university students, and they are linked to an elevated risk of lifestyle and chronic illnesses. There have been few, if any, research on nursing students' lifestyle in Ghana.
Aim: The purpose of this study was to characterise lifestyle choices of undergraduate nursing students in All Nations University, Koforidua. A cross-sectional study design was used with 90 nursing students from All Nations University, Koforidua.
Methodology: The study was a descriptive cross-sectional study. A semi-structured questionnaire was used to collect lifestyle and sociodemographic data and a food frequency questionnaire was used to collect data on eating patterns. Statistical analysis was performed with Statistical Package for Social Sciences (SPSS) version 20.
Results: The mean age of participants was 21.4±9.3 years, the mean weight was 59.5±12.2 kg, and mean body mass index (BMI) was 22.7±6.3 kg/m^2. No statistical significance was found between the mean age ($p = 0.528$), the weight ($p = 0.197$), and BMI ($p = 0.189$) of the male students and the female students. The BMI of the female students was higher than that of their male counterparts. Over half (52 %) of the students took three meals a day and another 41.1 % took two meals a day. Only 1.1 % was taking one meal per day. However, when asked whether they did regular exercise apart from normal walking, 60 % answered 'Sometimes' and only 6.7 % answered 'Always' and another 6.7 % answered 'Never' to the question. The students were not interested in exercises outside their normal walking. Nonetheless, 66.7 % of the students walked more than 30 minutes daily. Principal component analysis (PCA) produced five dietary patterns which were identified.
Conclusion: Nursing students have a fair knowledge of nutritional requirements for diet and health; however, this does not necessarily translate to healthy food choices and lifestyle behaviours.

Keywords: Anthropometry, Healthy, Knowledge, Lifestyle, Non-communicable disease, Nursing Student

Introduction

Lifestyle has emerged as a critical determinant of non-communicable diseases (NCDs) such as cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. Often termed lifestyle diseases, NCDs are closely linked to daily habits and practices. These chronic conditions cause 41 million deaths annually, with 77% of NCD-related deaths occurring in low- and middle-income countries (World Health Organisation [WHO], 2022). The prevalence of NCDs poses a significant threat to socio-economic development, perpetuating poverty cycles and straining

healthcare systems (Centers for Disease Control and Prevention [CDC], 2021). Behaviors such as tobacco use, physical inactivity, excessive alcohol consumption, and poor dietary choices elevate the risk of NCD-related mortality (WHO, 2022).

The transition to university is a pivotal period for young adults, marked by increased autonomy and challenges in maintaining healthy lifestyle habits (Lupi et al., 2015). Despite awareness of healthy practices, university students often fail to adopt consistent behaviours (Mogeni & Ouma, 2022; Alghamdi et al., 2021). Comprehensive studies are needed to explore the relationship between students' knowledge of healthy lifestyles and their actual behaviours. The unique context of university life presents an opportunity to delve into lifestyle choices among young adults. Understanding this relationship is crucial for promoting individual well-being and informing targeted interventions aimed at fostering healthier lifestyles within the university community. Investigating the knowledge-to-action gap in healthy lifestyle practices among young adults is crucial in light of the escalating global burden of NCDs. By elucidating the complex interplay between knowledge, behaviour, and environmental influences, researchers can develop effective health promotion strategies tailored to university students. Bridging this divide empowers individuals to make informed choices that promote long-term health and well-being, contributing to broader efforts to combat NCDs globally. University students' knowledge of healthy lifestyles has been widely studied. However, this knowledge often does not translate into practice. For instance, Sajwani et al. (2009) found that medical students did not demonstrate better health practices compared to non-medical counterparts. Gender, economic level, grade level, smoking, dietary style, BMI, and health promotion class attendance all impact healthy living practices (Çetinkaya & Sert, 2021; Aceijas et al., 2017). Environmental and societal impediments were significant predictors of poor physical activity, nutrition, and mental well-being among students (Aceijas et al., 2017).

Tobacco smoking and alcohol intake are prevalent behaviours among university students, posing significant health risks. Studies have highlighted the synergistic effects of these behaviours on health outcomes and academic performance (Shriprasad & Kallihal, 2021). Peer influence, social norms, and availability are significant predictors of heavy drinking episodes among students (Shriprasad & Kallihal, 2021). Addressing tobacco and alcohol use among university students requires multifaceted interventions targeting individual, interpersonal, and environmental factors. Healthy eating habits and sleep quality are crucial for university students' overall health and academic success. Regular breakfast consumption is associated with better nutritional balance, physical activity, and sleep quality (Mato & Tsukasaki, 2020). Inadequate sleep is linked to increased food consumption and health risks such as diabetes, heart disease, and cancer (Faris et al., 2022). Studies have found irregular meal timing, frequent skipping of breakfast, and high consumption of convenience foods among university students (Yun et al., 2018). Promoting healthy meal and sleeping patterns requires comprehensive interventions addressing environmental, behavioural, and educational factors. Understanding the dietary intakes of university nursing students is essential for promoting their health and academic performance. Studies have found suboptimal consumption of essential nutrients and high intake of fast food and sugary beverages among nursing students (Yun et al., 2018; Sogari et al., 2018). Barriers such as time constraints, stress, and lack of nutritional knowledge influence dietary choices. Interventions addressing these factors can support optimal nutrition and well-being. Anthropometric measurements are key indicators of health status. The aim of this study was to characterise lifestyle choices of undergraduate nursing students in All Nations University, Koforidua.

Research questions

1. What is the level of knowledge of healthy lifestyles among nursing students of All Nations University Koforidua?
2. What is the level of adherence to healthy lifestyles among nursing students of All Nations University Koforidua?
3. What is the relation between knowledge level of healthy lifestyle and adherence and anthropometry nursing students of All Nations University Koforidua?

Methodology

Study design: The study was a descriptive cross-sectional survey conducted in the Nursing Department, All Nations University, Koforidua in

the Eastern Region of Ghana from June to July, 2023.

Sample size and sampling: The sample size for the study was determined using the Yamane formula (1967). With a population of 113 regular students in the Nursing Department, All Nations University, Koforidua, the sample was estimated to be 88 participants**.** The study, however, recruited 90 participants. Since there were four academic levels in the Nursing Department, 80 percent of the participants were recruited from each academic level by stratified sampling technique.

Inclusion and exclusion criteria: Nursing students studying in the weekend programme were excluded from the study; they were all registered and practicing nurses. Only nursing students who were in the regular programme were considered to be recruited for the study.

Data collection instrument: The questionnaire which was developed by authors, comprised 27 questions to collect biodata characteristics; anthropometric data; lifestyle data (exercise, cigarette smoking and alcohol drinking); and dietary intake using a food frequency questionnaire with "Daily, 3-5 times Per week, Weekly (1-2 times), Monthly, Occasionally, and Never". The lifestyle data involving breakfast, exercise, tobacco smoking, alcohol drinking, and sleep duration were used to assess knowledge and adherence to healthy lifestyles among respondents. The questionnaire was validated with a smaller group of participants in a focus group discussion before being used.

The heights and weights of the participants were measured and their respective BMI computed.

Data processing and analysis: Data was analysed with SPSS (version 20.0) software. Means and standard deviations for continuous variables were computed and compared by one-way ANOVA. Lifestyle knowledge was analyzed by percentage scores. Principal Component Analysis (PCA) was used to find the dietary patterns; input variables, '1 = Daily', '2 = 3-5 times Per week', '3 = Weekly (1-2 times)', '4 = Monthly', '5 = Occasionally', and '6 = Never'. Pearson correlation (r) was used to determine the relationship between level of nutritional knowledge level and dietary patterns. The level of significance was at 0.05.

Ethical considerations: Permission was sought from the Nursing Department, All Nations University, Koforidua whose students were involved in the study. All Nations University Ethics Review Committee approved the conduct of the study. Informed consent was obtained from all participants included in the study.

Results

Demographic data of participants

A total number of 90 students comprising 55 females and 35 males (Table 1), were involved in the study. The mean age of participants was 21.4±9.3 years, the mean weight was 59.5±12.2 kg, and mean body mass index (BMI) was 22.7±6.3 kg/m^2.

Over half (52 %) of the students took three meals a day and another 41.1 % took two meals a day. Only 1.1 % was taking one meal per day (Table 2).

Lifestyle of respondents

Table 2 presents the adherence to lifestyle habits among the students. A majority (73.3%) acknowledged breakfast as an important meal, but regular exercise was less consistent: 60% exercised "sometimes," 6.7% "always," and 6.7% "never." However, 66.7% walked more than 30 minutes daily. None smoked tobacco, though 5.6% were passive smokers. Only 10% consumed alcohol, while 92.2% were aware of the negative effects of smoking and drinking. Most students (77.8%) believed sleep duration affects health; 48.9% slept 4-6 hours, and 44.4% slept 7-8 hours daily.

No statistical significance was found between the mean age ($p = 0.528$), weight ($p = 0.197$), and BMI ($p = 0.189$) of the male students and the female students. The mean BMI of the female students was however higher than that of their male counterparts (Table 3). The Eigenvalues of the various component numbers (Figure 1) produced a clearer view of the components numbers that identified the number of dietary patterns in the study.

Dietary pattern of respondents

Principal component analysis (PCA) produced five dietary patterns which were identified as Pattern I, Pattern II, Pattern III, and Pattern IV with total factor loadings of 4.859, 1.662, 1.473, 1.158, and 1.072 respectively (Table 4a). Pattern I was characterized by high intakes of Starchy Roots, Nuts, Legumes, Milk, Fats, Fast foods, Meat, Fruits, Salty foods, Beverage, Fishes, Sugary Drinks, Cereals and Grains, and Vegetables. This could be identified as the 'Convenient' dietary pattern as students in this dietary pattern takes almost every food in the food frequency questionnaire very frequently. Pattern II was characterized by high intakes of Starchy Roots, Legumes, Salty foods, and Sugary Drinks, and identified as the 'Starchy, Legumes, Salty and Sugar' dietary pattern. Pattern III was characterized by high intakes of fishes and vegetables and is identified as the 'Fish and Vegetable' dietary pattern.

Pattern IV was characterized by high intakes of Fats, Cereals, Grains, and Vegetables, and this pattern is identified as 'Cereals and Grains & Vegetables' dietary pattern. The fifth, Pattern V, was characterized by high intakes of Cereals and Grains, and is identified as the 'Cereals & Grains' dietary pattern.

Relation of dietary patterns to age, anthropometric factors and lifestyle. Pattern I was negatively correlated with height, weight, BMI and age. Pattern II was positively correlated with height and weight but negatively correlated with BMI, and age ($p < 0.05$). Pattern III was positively correlated with height and weight but negatively correlated with BMI and age ($p < 0.01$). Pattern IV was negatively correlated with height, weight and BMI but positively correlated with age. Pattern V was positively correlated with height, weight, and BMI but negatively correlated with age. Apart from the correlations between age and patterns II and III, none of the associations were statistically significant. Pattern I were positively associated with Knowledge on lifestyle and regular exercise but negatively associated with awareness of the effect of smoking and alcohol drinking and sleep duration. Pattern II was negatively correlated with knowledge on lifestyle and awareness of the effect of smoking and alcohol drinking but positively correlated with regular exercise and sleep duration. Sleep duration had a positive association with Pattern II ($p < 0.05$). Pattern III was positively correlated with knowledge on lifestyle, regular exercise, awareness of the effect of smoking and alcohol drinking and sleep duration. Pattern IV was negatively associated with Knowledge on lifestyle and regular exercise but positively associated with awareness of the effect of smoking and alcohol drinking and sleep duration. Pattern V was positively correlated with Knowledge on lifestyle and sleep duration, but negatively correlated with regular exercise and awareness of the effect of smoking and alcohol drinking. Weight and BMI were negatively associated with Knowledge on lifestyle and regular exercise but positively associated with awareness of the effect of smoking and alcohol drinking and sleep duration (Table 6).

Table 1: Demographic and level of knowledge of healthy lifestyles among respondents

Variable		Number (n)	Percent
Gender	Female	55	61.1
	Male	35	38.9
Academic Level	100	43	47.8
	200	24	26.7
	300	12	13.3
	400	11	12.2
Marital Status	Married	16	17.8
	Single	74	82.2
Perceived academic performance	Bad	1	1.1
	Satisfactory	29	32.2
	Good	60	66.7
Residence in School	Alone	30	33.3

	With family/relatives	31	34.4
	With friends	29	32.2
Chronic disease in family	No	69	76.7
	Yes	21	23.3
Chronic disease in participant	No	89	98.9
	Yes	1	1.1
Perceived knowledge of lifestyle	Good	49	54.4
	Moderate	41	45.6
	Bad	0	0.0
Source of lifestyle information	Family and friends	23	25.6
	Nutritionist/physician/nurse	36	40.0
	Radio and television	6	6.7
	Press and news website	6	6.7
	Social media e.g facebook	12	13.3
	Blogs, internet forum, discussion	7	7.8

Table 2: Level of adherence to healthy lifestyles among respondents

Question	Response	(n)	%
How many meals do you take per day?	One	1	1.1
	Two	37	41.1
	Three	47	52.2
	Four or more	5	5.6
Is breakfast an important component in your meals?	Yes	66	73.3
	No	24	26.7
Do you think your meal pattern affects your health?	Yes	60	66.7
	No	30	33.3
Do you do regular exercise apart from normal walking?	Always	6	6.7
	Sometimes	54	60.0

	Rarely	24	26.7
	Never	6	6.7
What is the total time that you spend in walking daily?	>30 mins	60	66.7
	<30 mins	29	32.2
	Nothing	1	1.1
Do you smoke cigarette?	Yes	0	0.0
	No	90	100.0
Do you usually sit with smokers while they smoke?	Yes	5	5.6
	No	85	94.4
Do you drink alcohol?	Yes	9	10.0
	No	81	90.0
Are you aware of the bad effects of taking alcohol and/or smoking?	Yes	83	92.2
	No	7	7.8
How many hours do you sleep daily?	<4 hours	0	0.0
	4-6 hours	44	48.9
	7-8 hours	40	44.4
	>8 hours	6	6.7
Do you think your daily sleep duration affects your health?	Yes	70	77.8
	No	20	22.2

Table 3: Mean age, weight and BMI of respondents by gender

Variable		Mean±SD	*p*-value
Age (years)	**Male**	21.9±5.9	0.528
	Female	21.1±5.0	
Weight (kg)	**Male**	61.5±12.9	0.197
	Female	57.8±11.7	
BMI (kg/m^2)	**Male**	21.7±6.0	0.189
	Female	23.7±6.8	

Sig. (2-tailed) at $p < 0.05$; SD is standard deviation

Table 4a: Initial Eigenvalues and extraction Sums of Squared Loadings for factor loading

Pattern	Extraction Sums of Squared Loadings Cumulative		
	Total	% of Variance	%
Pattern I	4.859	34.707	34.707
Pattern II	1.662	11.875	46.582
Pattern III	1.473	10.524	57.106
Pattern IV	1.158	8.270	65.377
Pattern V	1.072	7.660	73.036

Extraction Method: Principal Component Analysis.

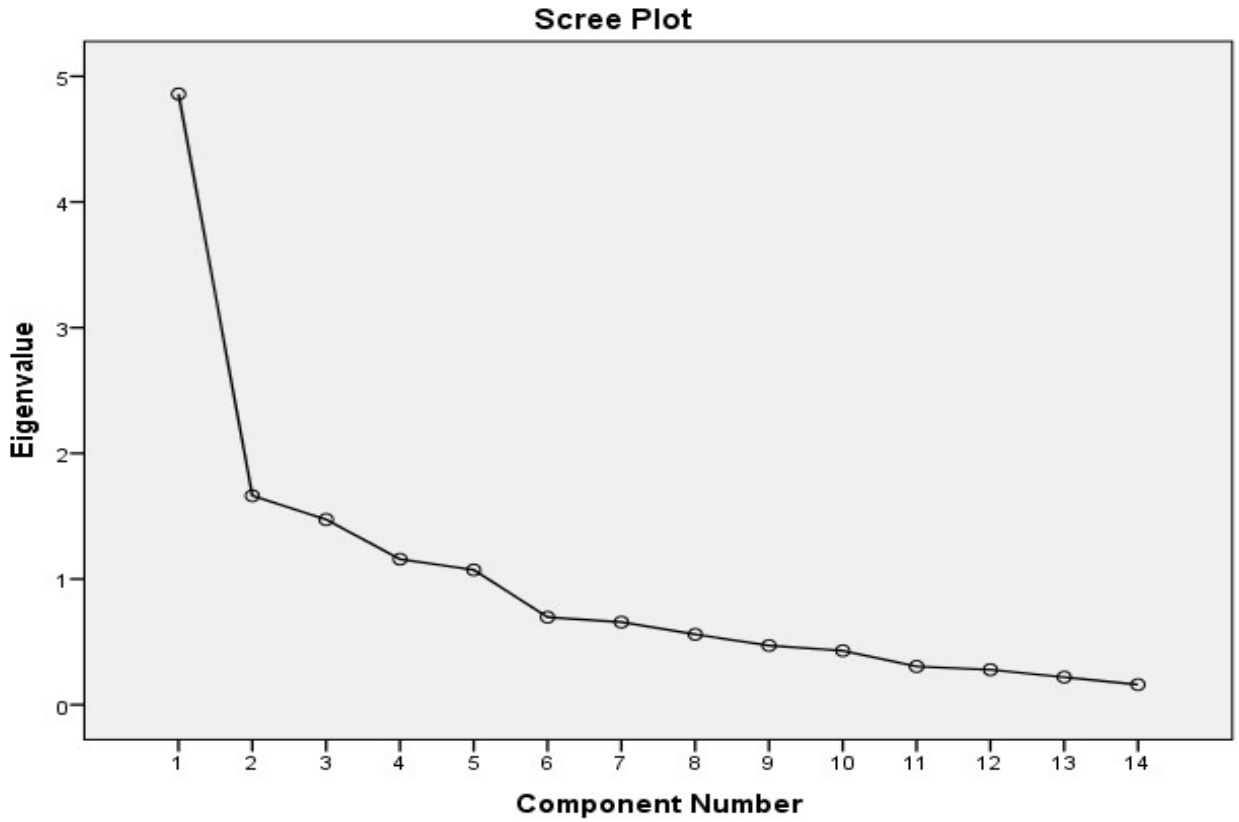

Figure 1: Scree plot for extraction of principal component factors

Table 4b: Component Matrix for dietary patterns

Foods	Patterns				
	Pattern I	**Pattern II**	**Pattern III**	**Pattern IV**	**Pattern V**
Starchy Roots	0.684	0.408			
Nuts	0.661			-0.532	
Legumes	0.656	0.356			
Milk	0.652	-0.460			
Fats	0.637		-0.334	0.453	
Fast foods	0.630	-0.477	-0.342		
Meat	0.606	-0.604			
Fruits	0.604				-0.435
Salty foods	0.591	0.486			
Beverage	0.590		-0.510	-0.309	
Fishes	0.535	-0.336	0.469	-0.321	
Sugary Drinks	0.561	0.348	-0.562		
Cereals and Grains				0.467	0.685
Vegetables	0.433		0.395	0.445	-0.446

Five (5) components extracted; correlation coefficients less than 0.3 were not considered.

Table 5: The relation between dietary patterns and anthropometry and age among nursing students.

Variable	Pattern I	Pattern II	Pattern III	Pattern IV	Pattern V
Height	-0.056	0.059	0.106	-0.74	0.075
Weight	-0.200	0.054	0.078	-0.109	0.091
BMI	-0.104	-0.019	-0.122	-0.59	0.012
Age	-0.062	-0.244*	-0.332**	0.152	-0.015

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Table 6: The relation between knowledge level of healthy lifestyle and adherence and anthropometry among nursing students.

	Pattern I	Pattern II	Pattern III	Pattern IV	Pattern V	Weight	BMI
Lifestyle knowledge	0.067	-0.015	0.053	-0.221	0.119	-0.059	-0.014
Regular exercise	0.154	0.195	0.221	-0.096	-0.052	-0.094	-0.004
Effect of Smoking and Alcohol	-0.062	-0.032	0.053	0.0355	-0.118	0.001	0.138
Sleep duration	-0.063	0.262*	0.046	0.211	0.060	0.151	0.104

*Correlation is significant at the 0.05 level (2-tailed)

Discussion

The study sample consisted of 90 students, with a predominance of females (61.1 %) over males (38.9 %). The participants' mean age was 21.4±9.3 years, indicating a youthful cohort typical of university settings. The mean weight was 59.5±12.2 kg, and the mean BMI was 22.7±6.3 kg/m², suggesting that, on average, the participants fell within the normal weight range according to standard BMI classifications.

These findings are similar to those of other studies (Ibrahim & Aldawsari, 2024; Belogianni et al., 2021). Statistical analysis revealed no significant differences between male and female students in terms of mean age ($p = 0.528$), weight ($p = 0.197$), and BMI ($p = 0.189$). These p-values suggest that any observed differences in these parameters between genders are likely due to random variation rather than true differences.

Interestingly, while the BMI of female students was higher than that of their male counterparts, this difference was not statistically significant. This finding aligns with some existing literature indicating gender differences in body composition and fat distribution (Chen et al., 2020). However, the lack of statistical significance suggests that, within this sample, gender does not have a substantial impact on BMI differences. The similarity in age, weight, and BMI between male and female students highlights that the two groups are relatively comparable in terms of these basic demographic and anthropometric measures. This comparability is beneficial for further analyses, as it minimizes confounding effects related to these variables when examining other aspects of lifestyle and health behaviours. Moreover, the average BMI of 22.7 kg/m² indicates that the sample is generally within a healthy weight range, which is crucial for interpreting health-related behaviours and outcomes. Maintaining a normal BMI is associated with lower risks for various non-communicable diseases (NCDs), and this baseline health status provides a foundation for understanding how lifestyle factors might influence future health trajectories in this population. Over half (52 %) of the students took three meals a day and another 41.1 % took two meals a day. Only 1.1 % was taking one meal per day (Table 2). Many factors affect the meal pattern of students; it could be time-constraints due to academic workloads, it could be socio-economic statuses, or due to a disorder. The prevalence of some healthy dietary practices was found to be low in our study. Regular consumption of fruits and vegetables, for example, was not a prevalent practice, and eating irregularities, moderate dietary diversity, snacking, and fast-food consumption were often reported among nursing students in this study. Poor dietary practices have been reported among university students in other studies (Pengpid & Peltzer, 2015). The adherence to lifestyles were presented in Table 2. About three-fourth of the students (73.3 %) responded Yes when asked if breakfast is an important component in their meals. This indicates many students involved in the study took breakfast almost always. This finding may explain why many students answered Yes when asked if they think meal pattern affects their health. This may be indicative of health-consciousness among the students.

However, when asked whether they did regular exercise apart from normal walking, 60 % answered ‘Sometimes’ and only 6.7 % answered ‘Always’ and another 6.7 % answered ‘Never’ to the question. The students were not interested in exercises outside their normal walking. Nonetheless, 66.7 % of the students walked more than 30 minutes daily. This is in contrast to findings by Alghamdi et al. (2021) who reported that both medical and nonmedical students exercise on occasion, with aerobics and ball sports being the two most popular sports activities among the two groups.

Despite disparities in medical and nonmedical curriculum, difficulty, and time spent studying, both medical and nonmedical students found time to exercise. Furthermore, students in both groups walked for 10-20 minutes every day (Alghamdi et al., 2021). According to Mogeni and Ouma (2022), regular exercisers appeared to be more conscious of the health benefits and, as a result, embrace nutritional diversity in their eating habits. Regular exercise could be a strategy for the enhancement of general healthy lifestyle among students. None of the students was engaged in tobacco smoking but 5.6 % were passive smokers as they answered 'Yes' to 'Do you usually sit with smokers while they smoke?'. Only 10 % of the students answered 'Yes' when asked if they drink alcohol. The students obviously were aware of the bad effects of smoking tobacco and/or drinking alcohol; 92.2 % answered 'Yes' when asked the question 'Are you aware of the bad effects of taking alcohol and/or smoking?'. Despite the fact that high rates of drinking and smoking have been reported in some student populations (Nakaseko et al., 2022), we did not find this in our study which is similar to the findings of Mogeni and Ouma (2022). This is largely due to the fact that the majority of students receive food and health information.

However, this finding can be impacted by a variety of circumstances. For starters, this study has a limited sample size. Second, some students may be less willing to reveal such information. Female students, for example, are more likely than male students to accurately report their real dietary behaviours, according to the research report by Pengpid and Peltzer (2015). As a result, larger investigations are required to draw solid conclusions from these prevalence figures.

Students involved in the study thought sleep duration has effect on health (77.8 %); about a half of the students (48.9 %) slept four to six hours per day and another 44.4 % slept seven to eight hours daily. Our findings were consistent with those published in other studies in which the majority of students slept 4-6 hours each day (AlShehri et al., 2017; Alghamdi et al., 2021). It is probably more convenient for students to sleep 4-6 hours per day to make time for other academic and non-academic activities on and off campus.

The results show that the students do not eat a balanced diet and are likely falling short of the recommended daily nutrient intake. Eating at least three main meals a day, along with daily fruits and vegetables, is recommended to meet the daily nutrient and energy requirements. The low intake of healthy food options such as fruits and vegetables seen in our study could be explained in part by the high consumption of fried food and snacking habits. According to a study conducted at Turkish universities, fast food consumption is inversely connected with fruit and vegetable consumption (Lupi et al., 2015). Many adolescents view university as a critical bridge into maturity, however there are concerns about their health and behaviours. One critical factor is diet, and there is accumulating evidence that university students may consume poor quality diets, thereby affecting body weight and long-term health. Food consumption varies among university students. A significant number of students consumed health-promoting diets with adequate nutritional profiles, eliminating the need for dietary intervention. However, some students consumed poor diets, paid higher food prices, and engaged in unhealthy lifestyle behaviours, which may have long-term health consequences. To enhance students' diets, university policy should include measures to encourage student involvement in cooking and food preparation, as well as improved availability of low-cost healthier food items (Sprake *et al*., 2018).

Stress can be a significant barrier to fruit and vegetable consumption, but our study did not collect data on such psychological factors. Our study found that, while there was a high degree of awareness of healthy nutrition and receiving diet and health information, this did not always convert into appropriate food choices and dietary behaviours. This calls into question the type of information students get and its effectiveness in promoting healthy eating habits (Ibrahim & Aldawsari, 2024). There was a disparity in the consumption of several dietary categories similar to findings of Mogeni & Ouma (2022).

Pattern I showed negative correlations with height, weight, BMI, and age. Pattern II was positively correlated with height and weight but negatively correlated with BMI and age ($p < 0.05$). Pattern III had positive correlations with height and weight but negative correlations with BMI and age ($p < 0.01$). Pattern IV showed negative correlations with height, weight, and BMI but a positive correlation with age. Pattern V had positive correlations with height, weight, and BMI but a negative correlation with age. Only the correlations between age and patterns II and III were statistically significant. Age-related differences in diet preferences indicate that younger individuals are more likely to follow a Western diet, while older individuals either lean towards more traditional and prudent diets or show no significant dietary shift. Moe et al., (2022) argued that if younger people do not gradually adopt more traditional foods as they age, there could be a population-wide shift from traditional diets to a more westernised dietary pattern. Of the lifestyles, only sleep duration had a positive association with Pattern II ($p < 0.05$). Pattern II which was identified as the 'Starchy, Legumes, Salty and Sugar' dietary pattern, and characterized by high intakes of Starchy Roots, Legumes, Salty foods, and Sugary Drinks. Better sleep quality was associated with healthier dietary patterns and lower beverage consumption in a study by Huang et al. (2024). Dietary patterns were not significantly associated with nutrition knowledge. A study by Khalesi et al. (2016) suggested that poor dietary habits

and inactivity may be linked to a higher likelihood of high blood pressure, regardless of nutrition knowledge.

Despite demonstrating a reasonable understanding of nutritional requirements for diet and health, nursing students' knowledge did not consistently translate into healthy dietary choices or lifestyle behaviours. The results from the study at All Nations University could have profound implications for how nursing education is structured, with an emphasis on preventive healthcare, health literacy, personalized care, and the holistic approach to health.

In Ghana, this might drive curriculum reforms to combat the growing burden of lifestyle-related diseases. On a global level, it aligns with existing trends toward preventive care and lifestyle medicine, further highlighting the critical role nurses play in patient education and advocacy. Based on these findings, health programs focused on enhancing awareness and understanding of healthy lifestyle practices, including the importance of regular physical activity, balanced nutrition, and stress management should be encouraged among nursing students.

A supportive environment within the university campus that promotes and facilitates healthy lifestyle choices should be created. A larger multi-institutional study should also be conducted. The study however is not without limitations. As quantitative research it was limited by its inability to explore in-depth contextual or subjective aspects, potential biases in data collection tools, and challenges in interpreting statistical results for practical relevance.

Also, cross-sectional studies cannot establish causality due to their snapshot design, are prone to confounding variables, and cannot capture changes over time or trends. Both approaches may face issues with data accuracy, response bias, and generalizability.

Acknowledgements: The authors are grateful to all students and faculty of the Nursing Department of All Nations University.

References

Aceijas, C., Waldhäusl, S., Lambert, N., Cassar, S., & Bello-Corassa, R. (2017). Determinants of health-related lifestyles among university students. Perspectives in public health, 137(4), 227–236.

Alghamdi, S. A., Alqarni, A. A., Alghamdi, A. F., Alghamdi, T. K., et al. (2021). Knowledge, attitude, and practices regarding dietary habits among medical and non-medical university students. *Journal of family medicine and primary care*, 10(9), 3436–3443.

Alshehri, H., Al-Qahtani, A., Shaikh, I.A., Hassan, M.A., Alqahtani, N., Alqahtani, A.M. (2017). Assessment of lifestyle and eating habits among undergraduate students in Najran University, Najran, Saudi Arabia. Int J Med Sci Public Health 6:638-46.

Belogianni K., Ooms A., Lykou A., Moir H. J. Nutrition knowledge among university students in the UK: a cross-sectional study. Pub Heal Nutr 25(10):1–8

Centers for Disease Control and Prevention (2021). https://www.cdc.gov/globalhealth/healthprotection/ncd/global-ncd-overview.html. (Acces, Feb 8, 2023)

Cetinkaya, S., & Sert, H. (2021). Healthy lifestyle behaviours of university students and related factors. Acta Paul Enferm., 34, eAPE02942.

Chen, X., Cui, J., Zhang, Y., & Peng, W. (2020). The association between BMI and health-related physical fitness among Chinese college students: a cross-sectional study. BMC public health, 20(1), 444-450.

Faris, M. E., Vitiello, M. V., Abdelrahim, D. N., Cheikh Ismail, L., Jahrami, H. A., et all., (2022). Eating habits are associated with subjective sleep quality outcomes among university students: findings of a cross-sectional study. *Sleep & breathing = Schlaf & Atmung*, *26*(3), 1365–1376

Huang, L., Jiang, Y., Sun, Z., Wu, Y., Yao, C., Yang, L., Tang, M., Wang, W., Lei, Net al., (2024). Healthier Dietary Patterns Are Associated with Better Sleep Quality among Shanghai Suburban Adults: A Cross-Sectional Study. Nutrients, 16(8), 1165.

Ibrahim, R.A.K., & Aldawsari, A.N. (2024). A Cross-Sectional Study of General Nutrition Knowledge among Nursing Students in the UAE. Journal of nutrition and metabolism, 2024, 7223610.

Khalesi, S., Sharma, S., Irwin, C. & Sun, J. (2016). Dietary patterns, nutrition knowledge and lifestyle: associations with blood pressure in a sample of Australian adults (the Food BP study). Journal of Human Hypertension 30, 581–590.

Lupi, S., Bagordo, F., Stefanati, A., et al., (2015). Assessment of lifestyle and eating habits among undergraduate students in northern Italy. *Annali dell'Istituto superiore di sanita*, 51(2), 154–161.

Mato, M., & Tsukasaki, K. (2020). [Nihon koshu eisei zasshi] Japan jour of public health, 67(11), 791–799.

Moe, Å.M., Sørbye, S.H., Hopstock, L.A., et al., (2022). Identifying dietary patterns across age, educational level and physical activity level in a cross-sectional study: the Tromsø Study 2015 - 2016. BMC Nutrition 8, 102

Mogeni, B.K. & Ouma, L.O. (2022) Dietary patterns, behaviours, and their associated factors among university students in coastal Kenya, *Cogent Food & Agriculture*, 8:1, 2132873

Nakaseko, E., Kotera, S., & Nakazawa, M. (2022). Smoking and drinking behaviour, knowledge, and attitudes among urban and rural public-school students in Efate Island, Vanuatu: a comparative study. Archives of public health = Archives belges de sante publique, 80(1), 170.

Pengpid, S., & Peltzer, K. (2015). Dietary health behaviour and beliefs among university students from 26 low, middle and high income countries. Asia Pacific journal of clinical nutrition, 24(4), 744–752.

Sajwani, R. A., Shoukat, S., Raza, R., et al., (2009). Knowledge and practice of healthy lifestyle and dietary habits in medical and non-medical students of Karachi, Pakistan. JPMA. The Jour Pak Med Ass, 59(9), 650–655.

Shriprasad, H., Kallihal, K.G. (2021). Tobacco use and alcohol consumption among college students: A Behavioural Study in Belagavi City, Karnataka. Journal of Health Management, 23(2): 251–263.

Sogari, G., Velez-Argumedo, C., Gómez, M. I., & Mora, C. (2018). College Students and Eating Habits: A Study Using An Ecological Model for Healthy Behaviour. Nutrients, 10(12), 1823.

Sprake, E.F., Russell, J.M., Cecil, J.E., et al., (2018). Dietary patterns of university students in the UK: a cross-sectional study. Nutr J 17, 90.

WHO (2022). https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases. (Accessed, February 8, 2023)

Yun, T. C., Ahmad, S. R., & Quee, D. K. S. (2018). Dietary Habits and Lifestyle Practices among University Students in Universiti Brunei Darussalam. The Malaysian journal of medical sciences : MJMS, 25(3), 56–66.