

Research

Drivers of food choice, meal pattern, and lifestyle habits among undergraduate students in Lead City University, Ibadan, Oyo State, Nigeria

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Background and objective: Food choice is a complex human behavior, which is influenced by many interdependent factors. University students are exposed to unhealthy eating habits and poor dietary intake. This could be attributable to the independent food choices made. This study assessed the drivers of food choice, patterns, and lifestyle habits of undergraduate students at Lead City University Ibadan, Nigeria.

Method: The study adopted a cross-sectional design and a multistage random sampling technique to select 200 respondents. Data on socio-demographic characteristics, eating habits, and dietary practices were obtained using a self-administered questionnaire.

Results: The mean age of the students was 21 ± 2 years, 46% of the students ate three meals daily, 36% skipped breakfast daily and 17% consumed alcohol. The main drivers of food choice among the students were sensory appeal in which taste (79%), pleasant texture (54%), and nice smell (54%) of food were considered very important. Concerning health and natural food content, the respondents considered good feeling (74%), weight control (48%), no additives (46%), low-fat content (42%), and low-calorie content (35%) as very important associated factors. Good value for money (53%), not expensive (42%), and easy availability (49%) were very important economic factors for driving food choices among respondents.

Conclusion: Sensory appeal, health and natural food content, and price and purchase convenience were major drivers of food choice among respondents. It is recommended that regular nutrition education programs by the institution with emphasis on healthy dietary practices should be provided for the students.

INTRODUCTION

Food which includes a combination of micro and macronutrients is a necessity of life. Food choice is a complex human behavior that is influenced by a lot of interdependent elements ranging from biological mechanisms and hereditary susceptibility to social and cultural factors (Hauser, Jonas, and Riemann 2011). The organoleptic features of food such as taste, smell, texture, and appearance can play a significant role in food choice. The presence of such characteristics influences the drivers of food consumption. The way a person perceives these characteristics is the final path that will lead to intake of food intake (Lupi et al. 2015).

Diet quality changes occur during the transition from adolescence to young adulthood which results in young adults often not meeting the recommended dietary guide-

lines (Winpenny et al. 2018). The diet of most US university students was found to be lacking in vegetables, fruits as well as dairy foods but high in sodium, sugar, and fat (Brunt and Rhee 2008). They also have limited food selection, high consumption of fast foods, and frequency of snacking as well as constant meal skipping thereby leading to weight loss.

In young adults, the influences on food choice vary from sensory perception to their socioeconomic status and personality. Oftentimes, financial constraints and lack of adequate knowledge of healthy food selections could influence the eating habits and dietary intake of young adults (Deliens et al. 2014). College students are often faced with academic responsibilities such as tests, fieldwork, assignments, term papers, etc. which might lead to stress, and modifications in their eating lifestyles. Likewise, students eating behavior may be influenced by campus activities like

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recreational, religious, and student society activities as well as exams and changes in accommodation (Deliens et al. 2014; Kremmyda et al. 2008; Jessop, Herberts, and Solomon 2005). For instance, students may choose to purchase food during lecture breaks at the university cafeteria where food choices are limited (Lee and Loke 2005).

A lot of students are not aware of the nutritional values of food. Some of them avoid specific foods as a result of personal dislike, peer group influence, social and cultural pressure, religion, etc. A study in Malaysia found that lack of information on nutritional requirements was the major issue encountered by students (Gan et al. 2011). In a Greek study, most of the students lacked adequate funds or diverted their feeding allowance to other activities, which led to skipping meals (Papadakos et al. 2007). Very little research has been done on drivers of food choice among university students in Nigeria, and none at Lead City University. Therefore, we explored meal patterns, dietary intake of undergraduate students and evaluated the factors that often predisposed them to unhealthy dietary lifestyles.

METHODOLOGY

STUDY DESIGN AND SETTING

This is a descriptive cross-sectional study conducted among undergraduate students at Lead City University, Ibadan, Oyo State, Nigeria. Lead City University is a private university located in the toll-gate area of Ibadan, Oyo State. Ibadan is the capital and largest city in Oyo state. It is located in South-Western Nigeria. It is reputed to be the largest indigenous city in Africa, south of the Sahara and is the center of administration of the old Western Region (Adefisan, Bayo, and Ropo 2015).

ETHICAL APPROVAL

This study was conducted based on the ethical standards for human participation (Fletcher 2015). Approval was obtained from Lead City University. Respondents who agreed to participate in the study signed a consent form before the commencement of this research work.

SAMPLING TECHNIQUE AND SAMPLE SIZE DETERMINATION

A multistage sampling technique was used to select respondents for this study. Of the five faculties in Lead City University at the time of this study, two faculties (the Faculty of Social Sciences and the Faculty of Medical and Applied Sciences) were purposively selected being the two largest faculties in the school. In Stage 2, of the ten departments at the time of data collection, four departments were randomly selected from these two faculties through the balloting technique. From each department, students were selected to participate in the study using the simple random technique. Based on the student population from each department, a total of 217 students filled the questionnaires, out of which 15 questionnaires had incomplete information

and 2 were poorly filled out, leaving 200 valid responses that were analyzed for this study.

DATA COLLECTION AND ANALYSIS

The research instrument used for data collection was self-administered questionnaires. A food choices questionnaire adopted from Fotopolous et al. (2009) was used to collect information on the drivers of food choices. Information on socio-demographic characteristics, dietary practices, and eating habits was also obtained using the self-administered questionnaire. The questions on dietary practices and eating habits included the number of meals per day, source of usual meals, meal time, meal skipping pattern, smoking, and alcohol consumption habits.

Following the verification of the students' identities through the use of their student identity cards, the questionnaire was distributed to selected students at the respective faculties. The questionnaire was then collected back at the point of administration as soon as the students had finished filling it out.

Data were analyzed using SPSS statistical package version 24 for descriptive (such as frequencies and percentages) and inferential statistics (T-test). The level of significance was set at $p < 0.05$.

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

[Table 1](#) illustrates the socio-demographic characteristics of respondents. The majority (67%) were females. Most were between the ages of 19-21 years (36%) and 22-24 years (25%). The vast majority (96%) of the respondents were single.

MEAL PATTERN

The meal pattern of the students is presented in [Table 2](#). Almost half (46%) of the students ate three meals daily. A majority (71%) consumed both self-prepared and purchased meals.

MEAL SKIPPING PATTERN OF RESPONDENTS

As shown in [Table 3](#) more than half (53%) of the respondents sometimes skipped breakfast, while 36% skipped breakfast every day. 31% skipped lunch every day while 21% stated that they had never skipped lunch. Almost half (44%) indicated that they sometimes skipped afternoon snacks 41% specified that they skipped dinner every day. When it comes to the lifestyle habits of the respondents, 97% did not smoke tobacco and 83% did not consume alcohol.

DRIVERS OF FOOD CHOICE AMONG RESPONDENTS

[Table 4](#) presents the drivers of food choice among respondents. The taste of food (79%), the pleasant texture of food (54%), and the nice smell of food (54%) were very important sensory appeal drivers to the respondents. The health and

Table 1. Socio-demographic characteristics of respondents (n = 200)

Socio-demographic characteristics	Frequency	Percentage
Sex		
Male	67	34
Female	133	67
Age (years)		
16 - 18	42	21
19 - 21	71	36
22 - 24	49	25
25 - 27	25	13
Above 27	13	7
Mean 21.4 ± 1.9		
Marital status		
Single	192	96
Married	8	4
Estimated Monthly Allowance (N)		
Less than 5,000	34	17
5,000 - 10,000	35	18
10,001 - 20,000	68	34
20,001 - 50,000	43	22
Undisclosed	20	10
Residence		
Hostel	4	22
Off-campus	123	62
Home	33	17

natural content important to the respondents include good feeling (74%), weight control (48%), no additives (46%), low in fat (42%), and low in calories (35%). The result further showed that respondents considered good value for money (53%), inexpensive characteristics (42%), and availability (49%) as very important economic factors. Concerning preparation convenience, easy cooking (36%), not time-consuming (34%), and easy to prepare (32%) were very important factors. Although, 29% stated that easy cooking, not time-consuming (27%), and easy to prepare (25%) were moderately important factors.

Based on familiarity, 50% preferred familiar foods, and 38% would select foods habitually. 44% of the respondents regarded food eaten in childhood as an unimportant factor in making a food choice. Some of the respondents considered foods that help cope with stress (43%) and help with relaxation (51%) to be very important considerations for food choices. Food packed in an environmentally sustainable manner was considered very important by 69% of the respondents.

FOOD CHOICES OF RESPONDENTS BY SEX

A summary of food choices by sex is shown in [Table 5](#). The mean sensory appeal score, mean price and purchase convenience score and mean ethical concern scores of females (10±1.89, 10±2.02, and 4±0.87 respectively) were significantly higher than that of males (10±2.66, 9±2.72, and

4±1.02 respectively) ($p < 0.05$). Although, the mean health and natural content score, mean preparation convenience score, mean familiarity score, and mean mood score of females (16±3.41, 9±2.82 and 8±2.50, and 7±1.19 respectively) were higher than that of males (15±3.80, 8±2.62, 8±2.72, 6±2.17), there was no statistical significance ($p > 0.05$).

DISCUSSION

Late adolescence is a phase of life characterized by rapid growth and development leading to increased total nutrient need, as well as a transition from parent-led food consumption to self-led food consumption. Dietary intake among this group is therefore usually sub-optimal (Aslam and Durani 2018). Hence, this study aimed at identifying the drivers of food choice, meal patterns, and lifestyle habits among undergraduate students at Lead City University Ibadan, Nigeria.

Students displayed similar patterns to those reported in previous studies showing that adolescents preferred self-prepared meals (Dohle, Rall, and Siegrist 2014; Banna et al. 2020) and consumed mostly two meals per day, mainly skipping breakfast (Wennberg et al. 2014; Díaz-Torrente and Quintiliano-Scarpelli 2020; Shiyam et al. 2021). Breakfast consumption is an indicator of a healthy lifestyle (Díaz-Torrente and Quintiliano-Scarpelli 2020); however, studies have shown that it is the most skipped meal among young

Table 2. Meal pattern of the respondents

Variables	Frequency	Percentage
Meals per day		
Once	10	5
Twice	76	38
Thrice	91	46
More than thrice	23	12
Source of usual meal		
Self-prepared only	30	15
Purchased only	29	15
Self-prepared and purchased	141	71
Meal time		
Breakfast (am)		
7:00 – 8:00	27	14
8:00 – 10:00	89	45
10:00 – 11:30	84	42
Lunch (pm)		
12:00 – 1:00	11	6
1:00 – 2:00	66	33
3:00 – 4:00	98	49
4:00 – 6:00	25	13
Dinner		
7:00 – 8:00	41	21
8:00 – 9:00	68	34
9:00 – 10:00	66	33
10:00 – 11:30	25	13

Table 3. Meal skipping pattern of respondents

Meal skipping pattern	Everyday	Sometimes	Never
	Freq.(%)	Freq.(%)	Freq.(%)
Breakfast	72 (36)	106 (53)	22 (11)
Morning snack	55 (28)	98 (49)	47 (24)
Lunch	62 (31)	96 (48)	42 (21)
Afternoon snack	48 (24)	88 (44)	64 (32)
Dinner	81 (41)	53 (27)	66 (33)
Evening snack	46 (23)	85 (43)	69 (35)

people (Pearson, Biddle, and Gorely 2009). Regular breakfast consumption is associated with increased cognitive and physical performance and less body fat (Herrero and Fillat 2006; Burns et al. 2018). On the other hand, skipping breakfast is a predisposing factor for overweight and obesity, headaches, depression, and some metabolic diseases such as diabetes (Ardehshirlarijani et al. 2019; Zhu et al. 2019; Mansouri et al. 2018; Shiyam et al. 2021; Mansouri et al. 2021). Skipping breakfast is also associated with a reduction in daily diet quality (Zeballos and Todd 2020)

Breakfast skipping is not the only culprit for health challenges, however. Skipping a meal affects total daily energy intake and affects general food consumption, thereby re-

ducing the Healthy Eating Index (HEI) (Zeballos and Todd 2020). Next common after breakfast skipping is lunch skipping. A reduction in tonic alertness in children is associated with skipping lunch (Müller et al. 2013). Similarly, among college-aged students, skipping lunch is associated with a reduction in cognitive abilities (Datta et al. 2020). This present study revealed that over three-quarters of respondents skipped lunch. Many times, dinner is skipped in a bid to lose weight and Zeballos and Todd (2020) found that this did not really affect diet quality. However, it also has no effect on weight reduction; in fact, it has been found to be a significant predictor of overweight and obesity (Pot, Hardy, and Stephen 2015; Yamamoto et al. 2021). Contrary

Table 4. Drivers of food choice among respondents

Food Choice Domain	Not important at all n (%)	A little important n (%)	Moderately important n (%)	Very important n (%)
Sensory appeal				
Tastes good	15 (8)	9 (5)	18 (9)	158 (79)
Smells nice	11 (6)	24 (12)	58 (29)	107 (54)
Has pleasant texture	14 (7)	29 (15)	49 (25)	108 (54)
Health and natural content				
Makes me feel good	12 (6)	14 (7)	27 (14)	147 (74)
Contains no additives	29 (15)	45 (23)	35 (18)	91 (46)
Low in fat	21 (11)	54 (27)	42 (21)	83 (42)
Low in calories	29 (15)	47 (24)	55 (28)	69 (35)
Help in weight control	26 (13)	42 (21)	36 (18)	96 (48)
Price and purchase convenience				
Has good value for the money	26 (13)	25 (13)	43 (22)	106 (53)
Not expensive	23 (12)	37 (19)	56 (28)	84 (42)
Easily available	24 (12)	32 (16)	46 (23)	98 (49)
Preparation Convenience				
Easy to prepare	35 (18)	52 (26)	49 (25)	64 (32)
Easy cooking	27 (14)	44 (22)	58 (29)	71 (36)
Not time-consuming	32 (16)	47 (23)	53 (27)	68 (34)
Familiarity				
Familiar	22 (11)	39 (20)	40 (20)	99 (50)
Habit	34 (17)	32 (16)	58 (29)	76 (38)
Ate during childhood	88 (44)	40 (20)	39 (20)	33 (14)
Mood				
Help cope with stress	29 (15)	49 (25)	36 (18)	86 (43)
Help relaxation	21 (11)	27 (14)	50 (25)	102 (51)
Ethical concern				
Packed in an environmentally friendly way	17 (8.5)	11 (6)	34 (17)	138 (69)

Table 5. Summary of food choices by sex

Domain	Male Mean± S.D	Female Mean± S.D	T- test	p- value
Sensory appeal	10±2.66	10±1.89	1.949	.001*
Health and natural content	15±3.80	16±3.41	1.256	.285
Price and purchase convenience	9±2.72	10±2.02	2.572	.000*
Preparation convenience	8±2.62	8±2.82{Kelder, 1994 #747;Neumark-Sztainer, 1999 #745}{Kelder, 1994 #747;Neumark-Sztainer, 1999 #745}	0.496	.435
Familiarity	8±2.72	8±2.50	0.816	.206
Mood	6±2.17	6±1.19	1.060	.056
Ethical concern	3±1.02	4±0.87	2.128	.047*

* Significant at p<0.05

to the research findings earlier mentioned, Yamamoto et al. (2021) stated that compared to breakfast, skipping dinner has a more significant impact on weight gain. The weight gain was associated with possible excess energy intake due to the upregulation of appetite after skipping dinner (Yamamoto et al. 2021)

Substance use is common among university students (A. B. Makanjuola, Daramola, and Obembe 2007; Atwoli et al. 2011; Osman et al. 2016) and can negatively impact the users' health, educational and professional lifestyle, as well as their families (Babalola, Ogunwale, and Akinhanmi 2013; A. Makanjuola, Abiodun, and Sajo 2014; Ohale et al. 2017; Mekonen et al. 2017; Ayalew, Tafere, and Asmare 2018). Tobacco and alcohol are usually the most commonly consumed (Heydari et al. 2015; Osman et al. 2016) and serve as a gateway to other substances (Babalola, Ogunwale, and Akinhanmi 2013; A. Makanjuola, Abiodun, and Sajo 2014). We recorded a low consumption of tobacco in our sample (3%) while alcohol intake was 17%. A study by Heydari et al. (2015) found a 13% prevalence of the consumption of alcohol among studied participants but tobacco use compared to this study was higher. Among students in tertiary universities in Imo State, Nigeria, tobacco was the most consumed among substance in both lifetime (50.3%) and current (48%) use (Ohale et al. 2017). Similarly, among undergraduate students in the Niger Delta region of Nigeria, alcohol was the most consumed (60.8%) (Donald 2017) and in Port Harcourt, 25.9% were alcohol consumers, and 55.3% were tobacco consumers (Okechukwu et al. 2021). Among Kenyan first-year university students, current use of alcohol and tobacco was 22% and 7% respectively (Musyoka et al. 2020). The low consumption recorded in this study is most likely a result of the fact that substance use is not the primary outcome of this study; therefore, details of substance use were not probed for.

Making food choices goes beyond filling the stomach and nourishing the body but involves complex decisions (Marsola et al. 2020). It is usually dependent on a wide range of factors including price, rewards, lifestyle, health status, family, dietary component, safety and freshness, convenience, seasonally fresh local foods, and sensory appeal. (Vilaro et al. 2018; Boatemaa, Badasu, and de-Graft Aikins 2018; Marsola et al. 2020; Moraes et al. 2020; Zhang and Jakku 2020; Guiné et al. 2021; Powell et al. 2022). This study revealed that sensory appeal especially taste, health and natural content especially good feeling, price and purchase convenience, especially value for the price, preparation convenience, familiarity with food, mood, and ethical concerns were all very important drivers of food choice

among respondents. Gender, sensory appeal, price and purchase convenience, and ethical concerns were statistically significant, with scores higher among females. This is similar to findings by Vilaro et al. 2018; Marsola et al. 2020; Guiné et al. 2021. Contrariwise, Boek et al. (2012) found drivers were significantly higher among males especially cost, taste, and food quality. Health and natural content were not statistically significant as a driver for both gender groups, similar to Vilaro et al. 2018. The sensory appeal was the leading driver of food choice among study participants, especially females. Previous studies (Carrillo et al. 2011; Marsola et al. 2020) documented similar results. Next after sensory appeal was convenience and price, similar to Boatemaa, Badasu, and de-Graft Aikins 2018.

This study has a number of limitations. First, the involvement of only two faculties in the university, as well as the small sample size can affect the generalizability of the results of this study for the whole university community. Secondly, there is the possibility of bias due to self-reported responses and the purposive selection of two faculties.

CONCLUSIONS AND RECOMMENDATION

The findings of this study are relevant for health promotion and behavior change interventions among this group of university student respondents. The health and natural content of food was not a significant driver of food choice among respondents, which is likely an indicator of poor knowledge, attitude, and practice of nutrition among respondents. This, therefore, opens up the opportunity for nutrition education as the nutritional quality of food and attitude towards its product cannot be overemphasized. Breakfast was the meal least consumed among respondents; therefore, it is recommended that cafeterias focus on breakfast preparations that can be set up within the school premises in locations easily accessible to students, facilitating breakfast consumption on the go on the way to their lectures.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

- Adefisan, E.A., A.S. Bayo, and O.I. Ropo. 2015. "Application of Geo-Spatial Technology in Identifying Areas Vulnerable to Flooding in Ibadan Metropolis." *J Environ Earth Sci* 5 (14): 153–66.
- Ardeshirlarijani, Edris, Nazli Namazi, Masoumeh Jabbari, Mina Zeinali, Hadis Gerami, Reza B. Jalili, Bagher Larijani, and Leila Azadbakht. 2019. "The Link between Breakfast Skipping and Overweight/Obesity in Children and Adolescents: A Meta-Analysis of Observational Studies." *Journal of Diabetes & Metabolic Disorders* 18 (2): 657–64. <https://doi.org/10.1007/s40200-019-00446-7>.
- Aslam, Iram, and Anisa M. Durrani. 2018. "A Cross Sectional Study on Food Preferences among Adolescents in Schools of Aligarh City." *Internat. J. Appl. Home Sci* 5 (4): 805–10.
- Atwoli, L., P.A. Mungla, M.N. Ndung'u, K.C. Kinoti, and E.M. Ogot. 2011. "Prevalence of Substance Use among College Students in Eldoret, Western Kenya." *BMC Psychiatry* 11: 34.
- Ayalew, Meseret, Mateb Tafere, and Yohannes Asmare. 2018. "Prevalence, Trends, and Consequences of Substance Use among University Students: Implication for Intervention." *International Quarterly of Community Health Education* 38 (3): 169–73. <https://doi.org/10.1177/0272684x17749570>.
- Babalola, Emmanuel, Adegboyega Ogunwale, and Akin Akinhanmi. 2013. "Pattern of Psychoactive Substance Use among University Students in South-Western Nigeria." *Journal of Behavioral Health* 2 (4): 334. <https://doi.org/10.5455/jbh.20130921013013>.
- Banna, Jinan, Rickelle Richards, Blake Jones, Alex Kojo Anderson, Marla Reicks, Mary Cluskey, Carolyn Gunther, et al. 2020. "Describing Independent Eating Occasions among Low-Income Adolescents." *International Journal of Environmental Research and Public Health* 17 (3): 981. <https://doi.org/10.3390/ijerp17030981>.
- Boatema, Sandra, Delali Margaret Badasu, and Ama de-Graft Aikins. 2018. "Food Beliefs and Practices in Urban Poor Communities in Accra: Implications for Health Interventions." *BMC Public Health* 18 (1): 434. <https://doi.org/10.1186/s12889-018-5336-6>.
- Boek, Stacey, Stephanie Bianco-Simeral, Kenny Chan, and Keiko Goto. 2012. "Gender and Race Are Significant Determinants of Students' Food Choices on a College Campus." *Journal of Nutrition Education and Behavior* 44 (4): 372–78. <https://doi.org/10.1016/j.jneb.2011.12.007>.
- Brunt, Ardith R., and Yeong S. Rhee. 2008. "Obesity and Lifestyle in U.S. College Students Related to Living Arrangements." *Appetite* 51 (3): 615–21. <https://doi.org/10.1016/j.appet.2008.04.019>.
- Burns, Ryan D., You Fu, Timothy A. Brusseau, Kristen Clements-Nolle, and Wei Yang. 2018. "Relationships among Physical Activity, Sleep Duration, Diet, and Academic Achievement in a Sample of Adolescents." *Preventive Medicine Reports* 12 (December): 71–74. <https://doi.org/10.1016/j.pmedr.2018.08.014>.
- Carrillo, E., P. Varela, A. Salvador, and S. Fiszman. 2011. "Main Factors Underlying Consumers' Food Choice: A First Step For The Understanding Of Attitudes Toward 'Healthy Eating.'" *Journal of Sensory Studies* 26 (2): 85–95. <https://doi.org/10.1111/j.1745-459x.2010.00325.x>.
- Datta, N., T. Bidopia, S. Datta, G. Mittal, F. Alphin, E.J. Marsh, G.J. Fitzsimons, T.J. Strauman, and N.L. Zucker. 2020. "Meal Skipping and Cognition along a Spectrum of Restrictive Eating." *Eating Behaviors* 39 (101431).
- Deliens, T., P. Clarys, I. Bourdeaudhuij, and B. Deforche. 2014. "Determinants of Eating Behavior in University Students: A Qualitative Study Using Focus Group Discussions." *BMC Public Health* 14 (53).
- Díaz-Torrente, Ximena, and Daiana Quintiliano-Scarpelli. 2020. "Dietary Patterns of Breakfast Consumption among Chilean University Students." *Nutrients* 12 (2): 552. <https://doi.org/10.3390/nu12020552>.
- Dohle, Simone, Sina Rall, and Michael Siegrist. 2014. "I Cooked It Myself: Preparing Food Increases Liking and Consumption." *Food Quality and Preference* 35 (April): 14–16. <https://doi.org/10.1016/j.foodqual.2013.11.001>.
- Donald, C.C. 2017. "Psychoactive Substance Use among Nigerian Students; Patterns and Sociodemographic Correlates." *American J. of Psychiatry And Neuro.*, 20(18): 22–25.
- Fletcher, J. 2015. "Ethical Approval for All Studies Involving Human Participants." *CMAJ* 187 (2): 91.
- Fotopoulos, C., A. Krystallis, M. Vassallo, and A. Pagiaslis. 2009. "Food Choice Questionnaire (FCQ) Revisited. Suggestions for the Development of an Enhanced General Food Motivation Model." *Appetite* 52 (1): 199–208.
- Gan, W.Y., N.M. Mohd, M.S. Zalilah, and A.S. Hazizi. 2011. "Differences in Eating Behaviors, Dietary Intake and Body Weight Status between Male and Female Malaysian University Students." *Mal J Nutr* 17 (2): 213–28.
- Guiné, Raquel P. F., Elena Bartkiene, Sofia G. Florença, Ilija Djekić, Maša Černelič Bizjak, Monica Tarcea, Marcela Leal, et al. 2021. "Environmental Issues as Drivers for Food Choice: Study from a Multinational Framework." *Sustainability* 13 (5): 2869. <https://doi.org/10.3390/su13052869>.
- Hauser, M., K. Jonas, and R. Riemann. 2011. "Measuring Salient Food Attitudes and Food-Related Values. An Elaborated, Conflicting and Interdependent System." *Appetite* 57 (2): 329–38.

- Herrero, R., and J. Fillat. 2006. "A Study on Breakfast and School Performance in a Group of Adolescents." *Nutr. Hosp* 21: 346–52.
- Heydari, Seyed Taghi, Somayeh Izedi, Yaser Sarikhani, Navid Kalani, Ali Akbary, Abolfazl Miri, Mojtaba Mahmoodi, and Maryam Akbari. 2015. "The Prevalence of Substance Abuse and Associated Risk Factors Among University Students in the City of Jahrom, Southern Iran." *International Journal of High Risk Behaviors and Addiction* 4 (2). [https://doi.org/10.5812/ijhrba.4\(2\)2015.22381](https://doi.org/10.5812/ijhrba.4(2)2015.22381).
- Jessop, D.C., C. Herberts, and L. Solomon. 2005. "The Impact of Financial Circumstances on Student Health." *Br J Health Psychol* 10 (Pt 3): 421–39.
- Kremmyda, Lefkothea-Stella, Angeliki Papadaki, George Hondros, Maria Kapsokefalou, and Jane A. Scott. 2008. "Differentiating between the Effect of Rapid Dietary Acculturation and the Effect of Living Away from Home for the First Time, on the Diets of Greek Students Studying in Glasgow." *Appetite* 50 (2–3): 455–63. <https://doi.org/10.1016/j.appet.2007.09.014>.
- Lee, Regina L. T., and Alice J. T. Yuen Loke. 2005. "Health-Promoting Behaviors and Psychosocial Well-Being of University Students in Hong Kong." *Public Health Nursing* 22 (3): 209–20. <https://doi.org/10.1111/j.0737-1209.2005.220304.x>.
- Lupi, S., F. Bagordo, A. Stefanati, T. Grassi, L. Piccinni, M. Bergamini, and A.D. Donno. 2015. "Assessment of Lifestyle and Eating Habits among Undergraduate Students in Northern Italy." *Annali Dell'Istituto Superiore Di Sanita* 51: 154–61.
- Makanjuola, A, O Abiodun, and S Sajo. 2014. "Alcohol and Psychoactive Substance Use among Medical Students of the University of Ilorin, Nigeria." *European Scientific Journal* 10 (8): 69–83.
- Makanjuola, A.B., T.O. Daramola, and A.O. Obembe. 2007. "Psychoactive Substance Use among Medical Students in a Nigerian University." *World Psychiatry* 6 (2): 112–14.
- Mansouri, Masoume, Shirin Hasani-Ranjbar, Hamid Yaghubi, Jamal Rahmani, Yousef Moghadas Tabrizi, Abasali Keshtkar, Mehdi Varmaghani, Farshad Sharifi, and Omid Sadeghi. 2018. "Breakfast Consumption Pattern and Its Association with Overweight and Obesity among University Students: A Population-Based Study." *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity* 25 (2): 379–87. <http://doi.org/10.1007/s40519-018-0609-8>.
- Mansouri, Masoume, Farshad Sharifi, Azad Shokri, Mehdi Varmaghani, Hamid Yaghubi, Yousef Moghadas-Tabrizi, and Omid Sadeghi. 2021. "Breakfast Consumption Is Inversely Associated with Primary Headaches in University Students: The MEPHASOUS Study." *Complementary Therapies in Medicine* 57 (March): 102663. <https://doi.org/10.1016/j.ctim.2021.102663>.
- Marsola, Camila de Mello, Luís Miguel Cunha, Joana Pereira de Carvalho-Ferreira, and Diogo Thimoteo da Cunha. 2020. "Factors Underlying Food Choice Motives in a Brazilian Sample: The Association with Socioeconomic Factors and Risk Perceptions about Chronic Diseases." *Foods* 9 (8): 1114. <https://doi.org/10.3390/foods9081114>.
- Mekonen, Tesfa, Wubalem Fekadu, Tefera Chane Mekonnen, and Shimelash Bitew Workie. 2017. "Substance Use as a Strong Predictor of Poor Academic Achievement among University Students." *Psychiatry Journal* 2017: 1–9. <https://doi.org/10.1155/2017/7517450>.
- Moraes, J.M., C.H. Carvalho Moraes, A.A. Souza, and M. Santos Alvarenga. 2020. "Food Choice Motives among Two Disparate Socioeconomic Groups in Brazil." *Appetite* 155 (104790).
- Müller, K, L Libuda, N Gawehn, C Drossard, K Bolzenius, C Kunz, and M Kersting. 2013. "Effects of Lunch on Children's Short-Term Cognitive Functioning: A Randomized Crossover Study." *European Journal of Clinical Nutrition* 67 (2): 185–89. <https://doi.org/10.1038/ejcn.2012.209>.
- Musyoka, Catherine Mawia, Anne Mbwayo, Dennis Donovan, and Muthoni Mathai. 2020. "Alcohol and Substance Use among First-Year Students at the University of Nairobi, Kenya: Prevalence and Patterns." *PLOS One* 15 (8): e0238170. <https://doi.org/10.1371/journal.pone.0238170>.
- Ohale, Ikechi, Chukwuma C Okafor, Nwaigbo E, Kevin C Diwe, Anthony C Iwu, Uche R Oluoha, Chinyere M Aguocha, and Chukwuma B Duru. 2017. "Socio-Demographic Determinants of Psychoactive Substance Use among Students of Tertiary Institutions in Imo State, Nigeria." *Journal of Addiction Research & Therapy* 8 (5): 345. <https://doi.org/10.4172/2155-6105.1000345>.
- Okechukwu, C., S. A. Abolo, R. N. Ogo, and O. U. Okorie. 2021. "The Pattern of Psychoactive Substance Use among Undergraduates in the University of Port Harcourt, Rivers State, Nigeria." *International Neuropsychiatric Disease Journal* 15(3 (April): 11–19. <https://doi.org/10.9734/indi/2021/v15i330154>.
- Osman, Tarig, Cathrine Victor, Alaa Abdumoneim, Hala Mohammed, Fatima Abdalla, Asma Ahmed, Eiman Ali, and Wael Mohammed. 2016. "Epidemiology of Substance Use among University Students in Sudan." *Journal of Addiction* 2016: 1–8. <https://doi.org/10.1155/2016/2476164>.
- Papadacos, A., G. Hondros, A.J. Scott, and M. Kapsokefalou. 2007. "Eating Habits of University Students Living at, or Away from Home in Greece." *Appetite* 49 (16976).
- Pearson, Natalie, Stuart J.H. Biddle, and Trish Gorely. 2009. "Family Correlates of Breakfast Consumption among Children and Adolescents. A Systematic Review." *Appetite* 52 (1): 1–7. <https://doi.org/10.1016/j.appet.2008.08.006>.
- Pot, Gerda K., Rebecca Hardy, and Alison M. Stephen. 2015. "Irregularity of Energy Intake at Meals: Prospective Associations with the Metabolic Syndrome in Adults of the 1946 British Birth Cohort." *British Journal of Nutrition* 115 (2): 315–23. <https://doi.org/10.1017/s0007114515004407>.
- Powell, Patricia, Sheleigh Lawler, Jo Durham, and Katherine Cullerton. 2022. "The Rewards US University Students Associate with Campus Dining Halls and Food Choices." *Journal of American College Health* 16 (March): 1–11. <https://doi.org/10.1080/07448481.2022.2054279>.

- Shiyam, V., N. Nishanthini, R. Niranjjan, and Lokeshmaran A. A. 2021. "Comparative Study on Dietary Pattern and Their Associated Factors among the Rural and Urban School Going Adolescents." *Annals of Community Health* 8 (4): 71–77.
- Vilaro, Melissa, Sarah Colby, Kristin Riggsbee, Wenjun Zhou, Carol Byrd-Bredbenner, Melissa Olfert, Tracey Barnett, Tanya Horacek, Morgan Sowers, and Anne Mathews. 2018. "Food Choice Priorities Change Over Time and Predict Dietary Intake at the End of the First Year of College Among Students in the U.S." *Nutrients* 10 (9): 1296. <https://doi.org/10.3390/nu10091296>.
- Wennberg, M., P.E. Gustafsson, P. Wennberg, and A. Hammarstrom. 2014. "Poor Breakfast Habits in Adolescence Predict the Metabolic Syndrome in Adulthood." *Public Health Nutr* 18: 122–29.
- Winpenny, E.M., E.M. Sluijs, M. White, K.I. Klepp, B. Wold, and N. Lien. 2018. "Changes in Diet through Adolescence and Early Adulthood: Longitudinal Trajectories and Association with Key Life Transitions." *International Journal of Behavioral Nutrition and Physical Activity* 15 (1): 1–9.
- Yamamoto, Ryohei, Ryohei Tomi, Maki Shinzawa, Ryuichi Yoshimura, Shingo Ozaki, Kaori Nakanishi, Seiko Ide, et al. 2021. "Associations of Skipping Breakfast, Lunch, and Dinner with Weight Gain and Overweight/Obesity in University Students: A Retrospective Cohort Study." *Nutrients* 13 (1): 271. <https://doi.org/10.3390/nu13010271>.
- Zeballos, Eliana, and Jessica E Todd. 2020. "The Effects of Skipping a Meal on Daily Energy Intake and Diet Quality." *Public Health Nutrition* 23 (18): 3346–55. <https://doi.org/10.1017/s1368980020000683>.
- Zhang, Airong, and Emma Jakku. 2020. "Australian Consumers' Preferences for Food Attributes: A Latent Profile Analysis." *Foods* 10 (1): 56. <https://doi.org/10.3390/foods10010056>.
- Zhu, Zhihong, Yufei Cui, Qiang Gong, Cong Huang, Feng Guo, Wang Li, Wenbo Zhang, Yanbo Chen, Xin Cheng, and Yongxiang Wang. 2019. "Frequency of Breakfast Consumption Is Inversely Associated with the Risk of Depressive Symptoms among Chinese University Students: A Cross-Sectional Study." *PLOS One* 14 (8): e0222014. <https://doi.org/10.1371/journal.pone.0222014>.