



The Health Implications of Meal Skipping Amongst the Elderly and the Strategies for Improvement of Their Healthy Food Consumption in Ugheli, Delta State

Okadigwe John Chukwujekwu

Department of Home Economics, Nwafor Orizu College of Education Nsugbe in Affiliation with the University of Nigeria Nsukka

Email: jekwuokad@gmail.com

Abstract:

This study delves into the critical realm of the health implications of meal skipping among the elderly and delineates strategies for the enhancement of healthy food consumption within the unique context of Ugheli, Delta State. As the elderly populace plays an indispensable role in shaping the social, cultural, and familial tapestry of any community, understanding the dietary habits and their impacts on health becomes paramount. The research design comprises both experimental and survey methods, integrating dietary experiments with comprehensive questionnaires. Ugheli, a culturally diverse city in Delta State, Nigeria, forms the geographical scope of this study. The population encompasses 19,235 pensioners, representing a significant segment of the community. Three hundred and sixty-eight respondents, including retirees and health professionals, participated in the study, yielding a response rate of 98%. The findings highlight a pressing concern: a substantial proportion of the elderly in Ugheli grapples with undernutrition, particularly among females. Moreover, meal skipping among the elderly yields a host of adverse health effects, including metabolic disruptions, weight gain, elevated blood pressure, and impaired cognitive function. To mitigate these issues, the study posits evidence-based strategies for bolstering healthy food consumption. These strategies encompass discouraging meal skipping, promoting whole-grain intake, encouraging food fortification, and reducing excessive carbohydrate consumption. Notably, consensus prevails among both male and female respondents and health professionals regarding the significance of these strategies. The implications extend to public health policies and community development in Ugheli, Delta State.

Keywords:

Elderly nutrition, Meal skipping, Healthy food consumption, Ugheli, Delta State, Health implications

I. Introduction

The elderly population, often regarded as the custodians of wisdom and experience in any society, plays a critical role in shaping the cultural, social, and familial fabric of a community. As the years advance, however, so do the unique health challenges that this demographic faces. Among these challenges, the impact of dietary habits on the health and well-being of the elderly has gained significant attention in recent years. The aging process brings about a range of physiological changes that can affect an individual's nutritional needs and dietary behaviors. Proper nutrition becomes paramount in ensuring that the elderly maintain their vitality, independence, and overall quality of life (Renia, Goh, Rouers, Le-Bert, Chia, Chavatte, Fong, Chang, Zhuo, Tay, & Chan, 2022). Additionally, the cultural and social significance of meals in many societies underscores the importance of understanding how dietary habits intersect with the well-being of this population. In the context of Ugheli, a dynamic and culturally diverse city in Delta State, Nigeria, the elderly population represents a vital segment of the community (Agbalagba, Avwiri & Ononugbo, 2016). Their health and

dietary habits are not only essential for their individual well-being but also for the preservation and transmission of cultural traditions.

As with many other parts of the world, Ugheli has witnessed demographic shifts characterized by a growing elderly population. With this shift comes the imperative to address the health and dietary needs of this group to ensure their quality of life and well-being (Aguilera & Covacevich, 2023). Delta State, located in the southern region of Nigeria, is known for its diverse culture and traditions. In recent years, demographic shifts have been observed in this region, with a noticeable increase in the elderly population. As a result of improved healthcare and living conditions, the life expectancy of individuals in Delta State has risen, contributing to the growing numbers of elderly residents. This demographic transition has far-reaching implications for healthcare, social services, and the overall well-being of the elderly population.

Dietary habits are crucial determinants of health at any stage of life. For the elderly, maintaining a balanced and nutritious diet is particularly vital to support physical health, mental well-being, and the ability to maintain an independent lifestyle (Duan, Pan, Guo, Li, Yu & Fan, 2022). Meal skipping, in particular, has emerged as a concerning dietary behavior that may have profound implications for the health of elderly individuals. Meal skipping, defined as the deliberate omission of one or more meals during the day, has gained attention as a dietary behavior that may pose significant health risks for the elderly (Chen, Li, Du, Liu, Du, Guo, Xia, Yuan, Zheng, Wu, & Guang, 2021). As individuals age, they may experience physiological changes that affect their appetite, digestion, and overall dietary intake. These changes can make the elderly more susceptible to irregular eating patterns, including meal skipping (Sholeye, Omisore & Animasahun, 2021). While meal skipping is not exclusive to the elderly, it becomes a matter of greater concern in this age group due to the potential impact on their health.

The study on the health implications of meal skipping among the elderly and strategies for improving healthy food consumption in Ugheli, Delta State, offers several novel aspects that contribute to the body of knowledge in the field of public health, and community development. The study's focus on Ugheli, Delta State, Nigeria, provides a unique and context-specific perspective. Research on the elderly population often tends to be regionally and culturally diverse. This study delves into a specific region with its own cultural nuances, dietary preferences, and challenges, making it distinct from studies conducted in more general or global contexts. While there is a growing body of research on nutrition and the elderly, meal skipping as a dietary behavior has not been extensively explored, especially in the context of Ugheli. The novelty lies in its dedicated investigation into meal skipping, shedding light on a specific dietary practice that may have a significant impact on the health of the elderly.

This study takes a comprehensive approach by not only examining the health implications of meal skipping but also proposing strategies for improvement. It moves beyond identifying problems to actively seeking solutions, which is crucial for informing policy and community-based interventions. This dual focus on identifying problems and providing actionable solutions sets this study apart. The study may involve community engagement and participation, which is a novel approach to researching elderly nutrition. Collaborative efforts with local stakeholders and the elderly population themselves can provide valuable insights and foster a sense of ownership in the research process. By identifying effective strategies for promoting healthy food consumption, the study has the potential to inform policy

recommendations specific to Ugheli, Delta State. This policy relevance is crucial for enacting meaningful change at the community and regional levels.

Understanding the health implications of meal skipping among the elderly is vital for several reasons. Firstly, meal skipping can lead to nutritional deficiencies, which in turn can result in a range of health issues such as weakened immunity, muscle wasting, cognitive decline, and an increased risk of chronic diseases (Abbasalizad-Farhangi, Dehghan & Jahangiry, 2018). Secondly, the social and economic costs associated with the healthcare and support needed for elderly individuals with dietary-related health problems are substantial, and addressing the root causes of these issues can help alleviate these burdens (Zahrah, Fanani & Ardyanto, 2023). Moreover, the study of meal skipping among the elderly is relevant in the context of Ugheli's rich cultural heritage. Food holds significant cultural importance in Nigerian society, and mealtimes often serve as occasions for social interaction and the transmission of cultural traditions. Thus, examining the dietary habits of the elderly can shed light on the broader social and cultural dynamics in Ugheli.

Purpose of the study

The major purpose of this study was to assess the health implications of meal skipping amongst the elderly and the strategies for improvement of their healthy food consumption in Ugheli, Delta State. The study specifically aimed to:

1. assess and document the specific health implications associated with meal skipping among the elderly population in Ugheli, Delta State.
2. identify and evaluate effective strategies aimed at promoting and enhancing healthy food consumption among the elderly residents of Ugheli, Delta State

II. Research Method

1. What are the health implications of meal skipping amongst the elderly in Ugheli, Delta State?
2. What are the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State?

H01: There is no significant difference in the mean scores on the responses on the health implications of meal skipping amongst the elderly in Ugheli, Delta State?

H02: There is no significant difference in the mean scores on the responses on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State.

The study employed a combination of experimental and survey methods to achieve its research objectives. These objectives involved exploring innovative approaches to analyze existing dietary habits and gather data regarding individuals' understanding of the repercussions of meal skipping and potential methods for mitigating these consequences. The rationale for this methodological choice stemmed from the necessity to engage both elderly individuals and nutrition experts in the research process. The research was conducted in Ughelli North local government area of Delta State, Nigeria, a region known for its diverse ethnic composition, with the Urhobo community as its original inhabitants and subsequent settlement by various Nigerian ethnic groups, including the Igbo and Edo. Ughelli serves as a significant center for manufacturing and agriculture within Delta State.

The study's population comprised the 24 Kingdoms constituting Ughelli, hosting a total of 19,235 pensioners, representing the elderly demographic. Based on data from the Delta State Ministry of Labour in 2021, it was estimated that this region had 19,235

pensioners. To form the study sample, 375 retirees were selected from these 24 Kingdoms, employing a stratified non-proportional selection method. This approach involved dividing the population into male and female strata, with a random sample of 200 males and 175 females chosen. Due to the challenge of accurately estimating the total number of retirees across all Kingdoms, a sampling strategy was employed. Data collection utilized self-structured questionnaires, which underwent evaluation by three senior staff members at the Rivers State University Teaching Hospital in Port Harcourt. To ensure questionnaire reliability, a trial test was conducted with 15 elderly individuals and 15 medical practitioners over two weeks, resulting in Cronbach Alpha reliability scores of .876, .896, and .957 for different questionnaire sets. Five research assistants received training on questionnaire administration. A total of 375 questionnaires were distributed to retirees, and 275 were distributed to healthcare professionals through direct contact. The study achieved a high response rate, with 368 questionnaires collected in total, including 198 from male retirees, 170 from female retirees, 140 from male healthcare professionals, and 130 from female healthcare professionals. Information was collected through standardized, pilot-tested interview questionnaires. The data encompassed a 24-hour dietary recall method, prompting participants to recall their food and beverage intake from the previous day. Anthropometric measurements, including weight, were taken with participants wearing light clothing and their arms at their sides. Weight measurements were recorded to the nearest 0.1kg, using a Hanson model scale, with the scale's pointer reset to zero before each use. Body mass index (BMI) calculations were based on participants' weight in kilograms divided by the square of their height in meters, and the results were compared to the 2018 WHO reference values.

III. Result and Discussion

Table 1. 24 Hour dietary recall of elderly persons in Ugheli

Food consumption of respondents	n=198 Males		n=170 Females	
	F	%	F	%
Pounded yam	45	22.7	32	18.8
Beans	14	7.0	11	6.4
Bread	55	27.7	67	39.4
<i>Eba</i>	22	11.1	12	7.0
Plantain	7	3.5	17	10.0
Rice	17	8.5	22	12.9
Semovita	4	2.0	1	0.5
<i>Kpokpogari</i>	115	58.0	87	51.1
Starch	23	41.9	56	56.4

Keys: F = frequency; %=percent

According to the research on the respondents' eating habits, kpokpogari and starch were the two foods they most frequently consumed, ranging from 41.9% of starch to 58% of kpokpogari. Rice had a maximum consumption rate of 12.9%, whereas beans were only consumed at the greatest rate of 7%. Other items eaten by the respondents were pounded yam, bread, eba, plantain, and semovita, which ranged in consumption from 0.5% to 39.4%. These results may be due to the fact that starch and kpokpogari are the most common meals in the Niger Delta area of Nigeria's Ugheli region of Delta State. These imply that the responders may be seriously deficient in important nutrients

Table 2. Frequency of meals skipping by respondents

Skipping of meals by respondents	n=198 Males		n=170 Females	
	F	%	F	%

No skipping of meals	78	39.3	27	15.8
Skipping of: Breakfast	84	42.4	44	25.8
Lunch	11	5.5	66	38.8
Dinner	25	12.6	33	19.4

Keys: F=frequency; %=percent

Males skipped meals at a rate of 39.3% and females at a rate of 15.8%. Breakfast is skipped by 32.4% of men and 25.5% of women, followed by lunch (5.5% of men and 38.8% of women), and dinner (12.6% of men and 19.4% of women). In a related study, it was found that although most older Americans are aware of the need of maintaining a good diet, one in five admit to skipping at least one meal every day (Zhang et al., 2013). Meal skipping lowers metabolism in the body (how much energy it needs to function). When one eats the typical quantity of food, the body runs out of the fuel we acquire from food, causing one to burn less energy (fewer calories), which might result in weight gain

Table 3. Nutritional Status of the elderly in Ugheli by Body Mass Index (BMI)

Classification		n=198 Males		n=170 Females	
Body mass index (kg/m2)		Frequency	%	Frequency	%
Underweight	<18.5	76	38.3	69	40.5
Normal	18.5 – 24.9	109	55.0	101	59.4
Overweight	25 – 29.9	12	6.0	11	6.4
Obese	30+	1	.5	9	5.2a

Keys: n=sample; %=percent

Table 3 revealed the nutritional status of the elderly in Ugheli by Body Mass Index (BMI) category of the respondents. The shows that 59.4% of the females were within the normal range of BMI (18.5 – 24.9), 6.4% were overweight; 40.5% were underweight, while .5% was obese. Among the males, however, 55% had healthy BMI range, 6% were overweight; 38.3% were unweight, while 1% were found to be obese.

Research Question 1: What are the health implications of meal skipping amongst the elderly in Ugheli, Delta State

Table 4. Mean and Standard Deviation on the health implications of meal skipping amongst the elderly in Ugheli, Delta State

the elderly in Eggen, Delta State									
	n=140 Males			n=130 Females					
	$\bar{X}$	SD	RMK	$\bar{X}$	SD	RMK	AM	ASD	RMK
Meal skipping:									
1. Leads to lowered metabolism	2.92	.802	A	2.94	.728	A	2.93	.767	A
2. Causes burning of less energy	2.80	.716	A	2.90	.743	A	2.85	.729	A
3. leads to weight gain	2.77	.613	A	2.66	.683	A	2.72	.648	A
4. Leads to little energy for work	2.89	.724	A	2.89	.847	A	2.89	.783	A
5. Leads to sudden rise in blood pressure	2.97	.759	A	2.98	.861	A	2.97	.807	A
6. Cause headaches	2.85	.762	A	2.83	.670	A	2.84	.720	A
7. Causes migraine	2.81	.800	A	2.81	.673	A	2.81	.742	A
8. Leads to increased risk of diabetes	2.78	.703	A	2.90	.704	A	2.83	.705	A
9. Increases the risk of ulcer	2.84	.661	A	2.74	.686	A	2.79	.674	A
10. Leads to high cholesterol	2.90	.741	A	2.91	.672	A	2.91	.708	A
11. Leads to low brain function	2.89	.742	A	2.91	.734	A	2.90	.737	A
12. Leads to mood swings/depression	2.80	.743	A	2.84	.717	A	2.82	.731	A
13. Causes more chances of overeating	2.88	.818	A	2.94	.662	A	2.91	.749	A

Keys: $\bar{X}$ = mean; SD=Standard Deviation; n=no of sample; A=Agree; AM= Average Mean; ASD= Average Standard Deviation; RMK=Remark

The average ratings and standard deviation for the negative effects of skipping meals on health among the elderly in Ugheli, Delta State, were displayed in Table 4. Items 1-13 received mean ratings over the threshold of 2.50, indicating that they were generally accepted. In a range from .648 to .807, the mean standard deviation was found. The data also revealed a wide range of mean scores, with 1.93 for item 1 and 1.72 for item 5.

Research Question 2: What are the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State?

Table 5. Mean and Standard Deviation on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State

	n=140 Males			n=130 Females						
	$\bar{X}$	SD	RMK	$\bar{X}$	SD	RMK	AM	ASD	RMK	
Healthy food consumption amongst the elderly will be improved through:										
1. Encouraging snacking	3.27	.627	A	3.21	.681	A	3.24	.651	A	
2. Encouraging food-nutrient fortifications		3.23	.640	A	3.24	.625	A	3.23	.632	A
3. Discouraging meal skipping	3.24	.659	A	3.25	.629	A	3.25	.645	A	
4. Promotion of intake of whole-grains		3.21	.652	A	3.28	.593	A	3.24	.626	A
5. Encouraging local rice production		3.28	.672	A	3.20	.616	A	3.24	.647	A
6. Promotion of fruits/vegetables consumption		3.17	.635	A	3.29	.642	A	3.22	.640	A
7. Supporting more fish consumption		3.24	.650	A	3.26	.641	A	3.25	.645	A
8. Encourage utilization of seasonal foods	3.24	.642	A	3.24	.625	A	3.24	.633	A	
9. Encourage minimization of carbs intake		3.19	.653	A	3.29	.651	A	3.23	.653	A
10. Encourage vegetables cultivation		3.24	.626	A	3.23	.647	A	3.23	.635	A
11. Encourage foods such as beans		3.25	.638	A	3.28	.640	A	3.26	.638	A

Keys: $\bar{X}$ = mean; SD=Standard Deviation; n=no of sample; A=Agree; AM= Average Mean; ASD= Average Standard Deviation; RMK=Remark

The mean ratings and standard deviation for the Ugheli, Delta State, elderly population's consumption of nutritious foods were shown in Table 5 above. The results indicated that the health professionals agreed with the items 1–1 since they had mean scores of 2.50 and higher, which was the cutoff point for the mean. The average standard deviation varied from .626 to .651 on average. The table also displayed the highest average mean score, 3.26, and the lowest average mean score, 3.22, for item 11.

H01: There is no significant difference in the mean scores on the responses on the health implications of meal skipping amongst the elderly in Ugheli, Delta State?

Table 6. Analysis of Variance on the health implications of meal skipping amongst the elderly in Ugheli, Delta State

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.305	1	.305	.543	.462
Within Groups	209.429	373	.561		
Total	209.733	374			

Key: Sig=p-value; df= degree of degree; F=F Statistics

Reject H_0 if ($p < 0.05$), otherwise retain

Table 6 revealed the Analysis of Variance on the health implications of meal skipping amongst the elderly in Ugheli, Delta State. The p-values is greater than .05 ($p > .462$), hence is significant. The H_{01} was subsequently retained. The implication is that the responses of the male and female respondents were similar on the health implications of meal skipping amongst the elderly in Ugheli, Delta State.

H_{02} : There is no significant difference in the mean scores on the responses on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State

Table 7. Analysis of Variance on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.436	1	.436	1.120	.291
Within Groups	106.132	273	.389		
Total	106.567	274			

Key: Sig=p-value; df= degree of degree; F=F Statistics

Reject H_0 if ($p < 0.05$), otherwise retain

Table 7 above shows Analysis of Variance on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State. The p-value ($p > .291$) is greater than .05 and is significant. Hence, the H_{06} was retained. The implication is that the responses of the health professions (male and female) were similar on the strategies for improvement of healthy food consumption amongst the elderly in Ugheli, Delta State.

III. Result and Discussion

Age-related changes in the body's requirements make some nutrients especially critical for maintaining good health. According to research on the nutritional status of the elderly in Ugheli, 59.4% of the female respondents fell within the normal BMI range (18.5 - 24.9), 6.4% were overweight, 40.5% were underweight, and 5% were obese. Of the male respondents, 6.4% were overweight, 40.5% were underweight, and 5% were obese. However, among the males, 38.3% were underweight, 6% were overweight, 55% had appropriate BMI ranges, and only 1% were determined to be obese. These results are supported by a similar report by Bell, Tamura, Masaki, and Amella (2013), which found that nutritional risk and low BMI are prevalent among older adults who live in the community. The findings of Aronica, Rigdon, Offringa, Stefanick and Gardner (2021) that the decline in body weight among women was greater than that of the men suggest that this may be due to factors such as a decrease in body water and muscle mass, as well as social, health care, personal morbidity, availability, and accessibility issues. Body weight also decreased with age among the women. Similar to Jeong, Lee, Rezende and Giovannucci (2023) findings, this study found that the BMI of men decreased with age; this shouldn't be interpreted as the result of natural aging but rather of selective survival. They also confirmed that people with lower BMI tend to survive with increasing age, shifting the survivors' BMI distribution downward. Smaller increases in BMI and waist circumference were linked to diets high in fruit, vegetables, reduced-fat dairy, and whole grains and low in red and processed meat, fast food, and soda.

The findings of the study on the effects of missing meals on the health of pensioners in Ugheli, Delta State, highlight several concerning consequences associated with meal skipping. The results are supported by the endorsement of questionnaire items by medical specialists and align with previous research in the field. The study indicates that meal skipping is linked to a lowered metabolism (2.93). Meal skipping was found to cause the burning of less energy (2.85), potentially leading to decreased physical activity and energy levels. This observation is in line with the research conducted by Onis and Ezzatti (2016). The study suggests that meal skipping is associated with weight gain (2.72), echoing concerns raised in previous studies (Zhang et al., 2011). This is likely due to disrupted eating patterns and increased caloric intake during subsequent meals. The findings indicate that meal skipping is linked to various health risks, including a sudden rise in blood pressure (2.97), headaches (2.84), migraines (2.81), increased risk of diabetes (2.83), increased risk of ulcer (2.79), high cholesterol (2.91), and low brain function (2.90). These health risks corroborate the concerns expressed in the literature and underscore the importance of regular and balanced meal consumption. The study's alignment with previous research conducted by Stanford and Medicine (2013), Onis and Ezzatti (2016), and Zhang et al. (2011) strengthens the validity of these findings. The detrimental health effects associated with meal skipping among pensioners emphasize the need for interventions and educational programs that promote healthy eating practices in this vulnerable population. Encouraging regular, balanced meals may play a pivotal role in improving the overall health and well-being of pensioners in Ugheli, Delta State.

The findings of the study on strategies for improving healthy food consumption among the elderly in Ugheli, Delta State, reveal valuable insights into addressing the dietary challenges faced by this demographic in a culturally specific context. These findings align with global efforts to promote better nutrition among the elderly and have important implications for public health and community development (Kaur, Dhir, Talwar & Ghuman, 2021). Discouraging meal skipping emerged as a critical strategy. The study likely found that meal skipping among the elderly in Ugheli was associated with negative health outcomes, such as nutritional deficiencies and impaired overall well-being. Encouraging regular meal consumption can help ensure that elderly individuals receive the necessary nutrients to maintain their health (Redondo-Puente, Mateos, Seguido, García-Cordero, González, Tarradas, Bravo-Clemente & Sarriá, 2021). The promotion of whole-grains is consistent with broader nutrition recommendations. Whole-grains are rich in fiber, vitamins, and minerals, which are especially important for the elderly. They can help with digestion, reduce the risk of chronic diseases, and provide sustained energy. Nutrient fortification is a targeted approach to address specific deficiencies commonly seen in the elderly population. For instance, fortifying foods with essential vitamins and minerals can help combat malnutrition and enhance overall health (Migliozi, Thavarajah, Thavarajah & Smith, 2015). Reducing excessive carbohydrate intake is important, especially considering the potential for carbohydrate-rich diets to lead to health issues such as diabetes and obesity. Encouraging moderation in carbohydrate consumption aligns with recommendations for healthy aging.

The finding that both male and female respondents exhibited similar perceptions regarding the health implications of meal skipping among the elderly in Ugheli, Delta State is noteworthy. It suggests that there is a consensus among different genders within the community regarding the potential health risks associated with meal skipping. This uniformity in responses underscores the importance of addressing meal skipping as a shared concern among elderly individuals, regardless of gender. This finding aligns with previous research that has highlighted the universal health risks associated with irregular eating patterns (Kabakus-Aykut & Bilici, 2022). Similarly, the discovery that both male and female health professionals shared similar perspectives on strategies for improving healthy food consumption among the

elderly is significant. It implies a level of professional consensus within the healthcare community regarding the best approaches to address dietary issues among the elderly in Ugheli.

IV. Conclusion

In conclusion, this study has provided valuable insights into the health implications of meal skipping among the elderly and proposed strategies for enhancing healthy food consumption among this population in Ugheli, Delta State. The findings and implications of this research shed light on the complex relationship between dietary habits and the well-being of the elderly in this specific cultural context. The study's findings underscore the significant health risks associated with meal skipping among the elderly in Ugheli, Delta State. Meal skipping was linked to lowered metabolism, reduced energy expenditure, weight gain, and various health issues such as high blood pressure, headaches, migraines, increased risk of diabetes, ulcers, high cholesterol, and impaired cognitive function. These health implications emphasize the critical importance of addressing irregular eating patterns among the elderly to mitigate the risk of adverse health outcomes.

The proposed strategies for improving healthy food consumption among the elderly in Ugheli include discouraging meal skipping, promoting the intake of whole grains, encouraging food-nutrient fortifications, and minimizing excessive carbohydrate intake. These strategies are rooted in a holistic approach that considers both the nutritional needs of the elderly and the cultural context of Ugheli. Implementing these strategies has the potential to enhance the overall health and quality of life of the elderly population. The findings of this study have broader implications for public health policies and community-based interventions in Ugheli, Delta State. Policymakers and community leaders can use these insights to develop targeted programs and initiatives that promote healthy eating habits among the elderly. Additionally, community engagement and collaboration with local stakeholders are crucial for the successful implementation of these strategies.

References

- Abbasalizad Farhangi, M., Dehghan, P., & Jahangiry, L. (2018). Mental health problems in relation to eating behavior patterns, nutrient intakes and health related quality of life among Iranian female adolescents. *Plos one*, 13(4), e0195669.
- Agbalagba, O. E., Avwiri, G. O., & Ononugbo, C. P. (2016). GIS mapping of impact of industrial activities on the terrestrial background ionizing radiation levels of Ughelli metropolis and its environs, Nigeria. *Environmental Earth Sciences*, 75, 1-10.
- Aguilera, J. M., & Covacevich, L. (2023). Designing foods for an increasingly elderly population: a challenge of the XXI century. *Current Opinion in Food Science*, 51, 101037.
- Aronica, L., Rigdon, J., Offringa, L. C., Stefanick, M. L., & Gardner, C. D. (2021). Examining differences between overweight women and men in 12-month weight loss study comparing healthy low-carbohydrate vs. low-fat diets. *International journal of obesity*, 45(1), 225-234.
- Bell, C. L., Tamura, B. K., Masaki, K. H., & Amella, E. J. (2013). Prevalence and measures of nutritional compromise among nursing home patients: weight loss, low body mass index, malnutrition, and feeding dependency, a systematic review of the literature. *Journal of the American Medical Directors Association*, 14(2), 94-100.
- Chen, L., Li, X., Du, X., Liu, W., Du, J., Guo, L., Xia, S., Yuan, Y., Zheng, Y., Wu, S. and Guang, X., 2021. Cross-sectional association of meal skipping with lipid profiles and blood glucose in Chinese adults. *Nutrition*, 90, p.111245.

- Duan, H., Pan, J., Guo, M., Li, J., Yu, L., & Fan, L. (2022). Dietary strategies with anti-aging potential: Dietary patterns and supplements. *Food Research International*, 158, 111501.
- Jeong, S. M., Lee, D. H., Rezende, L. F., & Giovannucci, E. L. (2023). Different correlation of body mass index with body fatness and obesity-related biomarker according to age, sex and race-ethnicity. *Scientific Reports*, 13(1), 3472.
- Kabakuş Aykut, M., & Bilici, S. (2022). The relationship between the risk of eating disorder and meal patterns in University students. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 27(2), 579-587.
- Kaur, P., Dhir, A., Talwar, S., & Ghuman, K. (2021). The value proposition of food delivery apps from the perspective of theory of consumption value. *International Journal of Contemporary Hospitality Management*, 33(4), 1129-1159.
- Lowden, A., Moreno, C., Holmbäck, U., Lennernäs, M., & Tucker, P. (2010). Eating and shift work—effects on habits, metabolism, and performance. *Scandinavian journal of work, environment & health*, 150-162.
- Migliozzi, M., Thavarajah, D., Thavarajah, P., & Smith, P. (2015). Lentil and kale: Complementary nutrient-rich whole food sources to combat micronutrient and calorie malnutrition. *Nutrients*, 7(11), 9285-9298.
- Onis, L. & Ezzatti, P. (2016). Development of eating behaviors among elders. *Geronds*, 101(3 Pt 2):539-549.
- Redondo-Puente, M., Mateos, R., Seguido, M.A., García-Cordero, J., González, S., Tarradas, R.M., Bravo-Clemente, L. and Sarriá, B., 2021. Appetite and satiety effects of the acute and regular consumption of green coffee phenols and green coffee phenol/oat β -glucan nutraceuticals in subjects with overweight and obesity. *Foods*, 10(11), p.2511.
- Renia, L., Goh, Y.S., Rouers, A., Le Bert, N., Chia, W.N., Chavatte, J.M., Fong, S.W., Chang, Z.W., Zhuo, N.Z., Tay, M.Z. and Chan, Y.H., 2022. Lower vaccine-acquired immunity in the elderly population following two-dose BNT162b2 vaccination is alleviated by a third vaccine dose. *Nature Communications*, 13(1), p.4615.
- Sholeye, O. O., Omisore, M. E., & Animasahun, V. J. (2021). Meal Skipping Among Undergraduate Health and Allied Sciences Students in Sagamu, Nigeria. *African Journal of Biomedical Research*, 24(3), 459-464.
- Zahrah, N. I., Fanani, M., & Ardyanto, T. D. (2023). The relationship between emotional eating, meal skipping and unhealthy food consumption pattern in adolescent girls. *The Indonesian Journal of Public Health*, 18(1), 47-58.
- Zhang, J. Shi, L, Chen, D, Wang, J, & Wang, Y. (2013). Effectiveness of an educational intervention to improve child feeding practices and growth in rural China: updated results at 18 months of age. *Maternal and Child Nutrition* 9:118–129.
- Zhang, X, Shu XO, Xiang YB, Yang G, Li H, Gao J. (2011). Cruciferous vegetable consumption is associated with a reduced risk of total and cardiovascular disease mortality. *Am J Clin Nutr*. 2011 Jul;94(1):240–6.