

FRUIT AND VEGETABLE CONSUMPTION PATTERNS AND MENTAL WELL-BEING AMONG UNDERGRADUATE STUDENTS OF ABIA STATE UNIVERSITY, NIGERIA

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Abstract

This study investigated fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University, Nigeria. Three research questions and one hypothesis guided the study. The study adopted a descriptive cross-sectional research design and was conducted at Abia State University, Nigeria. The population comprised undergraduate students of the university, and a sample size of 146 respondents was selected using a multi-stage sampling technique involving simple random and convenience sampling methods. Data were collected using a self-structured questionnaire, titled: Fruit and Vegetable Consumption Patterns and Mental Well-Being Questionnaire (FVCPMWQ). The instrument was face validated by experts in the Department of Human Nutrition and Dietetics, Micheal Opkara University of Agriculture, Umudike. The reliability was established through pre-testing and the use of standardized measurement scales. Data were collected through interviewer-administered questionnaires. Data were analyzed using frequencies, percentages, means, standard deviations, and Chi-square statistics with the aid of IBM Statistical Package for Social Sciences (SPSS). The decision rule was based on a significance level of 0.05, whereby a p-value less than or equal to 0.05 was considered statistically significant, while a p-value greater than 0.05 was considered not statistically significant. The findings revealed a low prevalence of daily fruit and vegetable consumption among the students. The study further revealed that most respondents consumed fruits and vegetables only occasionally and in inadequate portions. The findings also showed no significant association between mental well-being and fruit consumption, as well as between mental well-being and vegetable consumption. However, a significant association was found between mental well-being and combined fruit and vegetable consumption. Consequently, the null hypothesis was accepted for fruit consumption and vegetable consumption but rejected for combined fruit and vegetable consumption. The study recommended among others that the university management should intensify nutrition education programmes and promote regular consumption of fruits and vegetables among students. The study contributed to knowledge by establishing that combined fruit and vegetable consumption was significantly associated with better mental well-being among undergraduate students, whereas the consumption of fruits or vegetables alone was not significantly associated with mental well-being.

Keywords: Fruit consumption, vegetable consumption, mental well-being, dietary patterns

Introduction

Concerns regarding inadequate fruit and vegetable consumption among university students have continued to attract considerable attention among nutritionists, public health practitioners, and behavioural scientists because dietary habits established during young adulthood have significant implications for both physical and mental health. Fruits and vegetables constitute essential components of a healthy diet due to their rich content of vitamins, minerals, dietary fibre, antioxidants, and other bioactive compounds necessary

for optimal physiological and psychological functioning. However, evidence suggests that many university students fail to consume fruits and vegetables in recommended quantities. Alkazemi and Salmean (2021) reported that fruit and vegetable consumption among university students remains below recommended levels due to barriers such as affordability, accessibility, and personal food preferences. Similarly, Eze, Ibe, Onyeke, Ezenwugo and Nwankwo (2017) observed inadequate fruit and vegetable consumption among Nigerian university students and attributed this trend partly to insufficient nutritional knowledge and poor dietary practices. According to El Ansari, Stock and Mikolajczyk (2012), changing lifestyles, academic commitments, and unhealthy eating habits further contribute to low fruit and vegetable consumption among university students.

Mental well-being has become an important public health concern because it influences emotional stability, psychological functioning, social relationships, productivity, and overall quality of life. Mental well-being enables individuals to cope effectively with daily challenges, maintain positive interpersonal relationships, and function optimally in different aspects of life. Among university students, mental well-being is particularly important because higher education environments often expose students to numerous academic, social, financial, and personal challenges. Apau, Appiah and Zotor (2022) emphasized that mental well-being reflects a positive psychological state characterized by life satisfaction, emotional balance, and the ability to manage everyday stressors. Nevertheless, university students are increasingly confronted with mental health challenges capable of affecting academic performance and general well-being. Adewuya, Ola, Aloba and Mapayi (2006) reported a notable prevalence of depressive symptoms among Nigerian university students, while Dabana, Abubakar and Adamu (2018) identified psychological distress as a growing concern among undergraduates. Similarly, Bresolin, Dalmolin, Vasconcellos, Barlem, Andolhe and Magnago (2020) observed substantial levels of depressive symptoms among undergraduate students, highlighting the need to identify factors that may promote positive mental well-being.

Recent developments in nutritional science and mental health research have increasingly highlighted the role of dietary behaviour in supporting psychological well-being. Diet is now recognized as one of the modifiable lifestyle factors capable of influencing mental health outcomes. Alminger and O'Donnell (2020) explained that nutrition plays a critical role in brain development, cognitive functioning, emotional regulation, and psychological health. Likewise, Aucoin, LaChance, Naidoo, Remy, Shekdar, Sayar and Cooley (2021) reported that healthy dietary patterns were associated with reduced symptoms of anxiety and improved mental health outcomes. Davison and Kaplan (2016) further observed that adequate nutrient intake was positively associated with better psychiatric functioning and overall mental health. These findings suggest that dietary choices may significantly influence psychological functioning and mental well-being.

Importantly, among the various dietary components associated with mental health, fruits and vegetables have received considerable attention because they provide essential nutrients involved in neurological functioning and emotional regulation. Fruits and vegetables contain vitamins, minerals, antioxidants, phytochemicals, and dietary fibre that contribute to neurotransmitter synthesis, reduction of oxidative stress, and regulation of inflammatory processes associated with mental health outcomes. Barros and Nunes (2020) emphasized the importance of vitamin C and antioxidants in maintaining brain health and supporting cognitive and emotional functioning. Brookie, Best and Conner (2018) found

that consumption of raw fruits and vegetables was associated with better mental health outcomes than consumption of processed fruits and vegetables. Similarly, Blanchflower, Oswald and Stewart-Brown (2013) reported that psychological well-being was positively associated with fruit and vegetable consumption. These findings support the growing recognition of fruits and vegetables as important dietary components for promoting mental well-being.

Hence, the relationship between fruit and vegetable consumption and mental well-being has increasingly attracted the interest of researchers across different regions of the world. Adejumo, Akinyemi and Eze (2019) reported a positive association between fruit and vegetable intake and mental health among Nigerian university students. In a related study, Akinyemi, Adejumo and Eze (2020) observed that healthier dietary patterns were associated with better mental well-being among undergraduate students. Eze, Akinyemi and Adejumo (2018) also emphasized the importance of diet in promoting both mental and physical health among Nigerian students. Furthermore, Aune, Giovannucci, Boffetta, Fadnes, Keum, Norat and Tonstad (2017) reported that increased fruit and vegetable intake contributed positively to health outcomes and reduced the risk of several chronic diseases. Collectively, these studies suggest that fruit and vegetable consumption may play a significant role in supporting mental well-being and overall health.

Notwithstanding increasing awareness of the benefits of fruit and vegetable consumption, inadequate intake remains a persistent concern among university students globally. This pattern of suboptimal dietary behaviour has been widely attributed to a combination of socioeconomic, environmental, and behavioural factors, including limited financial resources, poor food choices, academic workload, time constraints, and the easy availability and preference for processed foods (Smolin & Grosvenor, 2020; Sherrell, 2021). These constraints collectively contribute to unhealthy dietary practices among undergraduates, thereby reducing their likelihood of meeting recommended dietary intake levels for fruits and vegetables. Consequently, many students are unable to obtain sufficient essential nutrients required for optimal physiological functioning, cognitive performance, and psychological stability. In addition to dietary challenges, mental health concerns among university students have become an increasing public health issue. Evidence from previous studies indicates a rising prevalence of depression, psychological distress, and emotional instability among undergraduate populations across different regions (Randall et al., 2016; Rotenstein et al., 2016; Tessema et al., 2019). These mental health problems have been linked to academic pressure, transition to independent living, financial stress, and inadequate coping mechanisms. Such psychological challenges not only affect students' academic performance but also their overall quality of life and social functioning. In this regard, there is growing interest in identifying modifiable lifestyle factors, such as dietary behaviour, that may contribute to improved mental well-being.

Emerging evidence in nutritional psychiatry suggests that fruit and vegetable consumption may play a protective role in mental health outcomes. Studies have shown that higher intake of fruits and vegetables is associated with reduced perceived stress, lower depressive symptoms, and improved psychological well-being (Rooney et al., 2013; Radavelli-Bagatini et al., 2021). These benefits are believed to be linked to the presence of essential micronutrients, antioxidants, dietary fibre, and bioactive compounds that support neurochemical balance and brain function. For instance, certain naturally occurring compounds in fruits, such as serotonin precursors, have been suggested to influence mood regulation and emotional stability (Sitaramayya & Subramanian, 1985). Furthermore, adequate intake of fruits and vegetables has been associated with reduced inflammation

and oxidative stress, both of which are implicated in mental health disorders. Despite these established benefits, evidence indicates that many university students fail to meet the recommended daily intake of fruits and vegetables, thereby missing potential protective effects on mental health. The situation is further compounded by poor nutritional awareness and inadequate health-promoting behaviours among young adults transitioning into independent living. Although global literature has increasingly recognized the link between diet and mental well-being, findings remain inconsistent, and the direction of association is not always clear, particularly when examining individual food groups versus combined dietary patterns.

More importantly, there is a notable scarcity of empirical studies focusing specifically on fruit and vegetable consumption patterns and mental well-being among Nigerian university students. Available research has largely focused on general dietary habits or mental health prevalence without adequately exploring the interaction between specific dietary components and psychological outcomes. In particular, limited information exists regarding the prevalence of fruit and vegetable consumption, the quantity or portions consumed daily, and how these dietary patterns relate to mental well-being among undergraduate students of Abia State University, Nigeria. This gap is significant because cultural, economic, and environmental factors unique to the Nigerian university setting may influence both dietary behaviour and mental health outcomes differently from other populations. Furthermore, existing literature has not sufficiently examined whether combined fruit and vegetable intake has a stronger association with mental well-being compared to individual consumption of either food group alone. This limitation restricts the development of targeted nutrition-based interventions that could be used to improve both dietary behaviour and psychological health among students. Therefore, there is a need for continued investigation into the role of fruit and vegetable consumption patterns in promoting mental well-being among undergraduate students, particularly within the Nigerian university context.

Based on researcher's observations and empirical studies within the university environment and evidence from previous empirical studies, fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University have not received sufficient scholarly attention in the integrated manner addressed in the present study. Consequently, this study examined fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University, Nigeria, with a view to determining the prevalence of fruit and vegetable consumption, assessing the portions consumed, and examining the association between fruit and vegetable consumption patterns and mental well-being.

Statement of the Problem

Fruit and vegetable consumption and mental well-being are critical components of students' overall health and academic functioning. Adequate intake of fruits and vegetables supplies essential nutrients that support physical health, cognitive performance, emotional stability, and psychological functioning. In an ideal situation, undergraduate students should maintain healthy dietary practices that include regular consumption of fruits and vegetables in recommended amounts, thereby promoting positive mental well-being and enhancing their ability to cope with academic and social demands. In reality, many university students consume fruits and vegetables in quantities below recommended levels. Factors such as poor dietary habits, financial limitations, busy academic schedules, inadequate nutrition awareness, and the increased availability of processed foods have

contributed to unhealthy eating patterns among students. At the same time, undergraduate students increasingly experience stress, anxiety, emotional difficulties, and other mental health challenges associated with academic pressures, social adjustment, and personal responsibilities. These challenges can negatively affect academic performance, relationships, and overall quality of life.

Although existing evidence suggests that healthy dietary practices, including adequate fruit and vegetable consumption, may support better mental well-being, there is limited institution-specific information regarding this relationship among undergraduate students in Nigerian universities. Particularly, there is insufficient empirical evidence on the prevalence of fruit and vegetable consumption, the portions consumed, and the association between consumption patterns and mental well-being among undergraduate students of Abia State University. The problem of this study, therefore, is the insufficient empirical evidence on fruit and vegetable consumption patterns and their association with mental well-being among undergraduate students of Abia State University, Nigeria. Specifically, there is inadequate information on the prevalence of fruit and vegetable consumption, the portions consumed, and the extent to which consumption patterns are related to students' mental well-being. This study was therefore undertaken to examine fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University, Nigeria.

Purpose of the Study

The study examined fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University, Nigeria. Specifically, the study sought to:

1. determine the prevalence of daily fruit consumption, vegetable consumption, and combined fruit and vegetable consumption among undergraduate students of Abia State University.
2. assess the daily portions of fruits, vegetables, and combined fruits and vegetables consumed among undergraduate students of Abia State University.
3. examine the association between mental well-being and the portions of fruits, vegetables, and combined fruits and vegetables consumed daily among undergraduate students of Abia State University.

Research Questions

The following research questions guided the study;

1. What is the prevalence of daily fruit consumption, vegetable consumption, and combined fruit and vegetable consumption among undergraduate students of Abia State University?
2. What are the daily portions of fruits, vegetables, and combined fruits and vegetables consumed among undergraduate students of Abia State University?
3. What association exists between mental well-being and the portions of fruits, vegetables, and combined fruits and vegetables consumed daily among undergraduate students of Abia State University?

Hypothesis

H₀₁: There is no significant association between mental well-being and the portions of fruits, vegetables, and combined fruits and vegetables consumed daily among undergraduate students of Abia State University.

Methods

This study adopted a descriptive cross-sectional research design to assess fruit and vegetable consumption patterns and mental well-being among undergraduate students of Abia State University (ABSU), Nigeria. The study was conducted at Abia State University, a public university located in Abia State, Nigeria. The population for the study comprised all undergraduate students of Abia State University. A sample size of 146 respondents was determined using Cochran's formula for sample size estimation. A multi-stage sampling technique was employed, involving simple random sampling for the selection of departments and convenience sampling for the selection of eligible students from the selected departments. Data were collected using a structured questionnaire titled Fruit and Vegetable Consumption Patterns and Mental Well-Being Questionnaire (FVCPMWQ). The instrument consisted of sections on socio-demographic characteristics, mental well-being, and fruit and vegetable consumption patterns. The questionnaire was validated by experts in the Department of Human Nutrition and Dietetics to ensure content validity. Reliability was established through pre-testing and the use of standardized instruments, including the WHO-Five Well-Being Index. Data were collected through interviewer-administered questionnaires after obtaining informed consent from the participants. The collected data were coded, entered, and analyzed using IBM Statistical Package for Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data, while the Chi-square test was used to determine the association between fruit and vegetable consumption patterns and mental well-being. The decision rule was based on a significance level of 0.05. For the Chi-square test, a p-value less than or equal to 0.05 indicated a statistically significant association, while a p-value greater than 0.05 indicated no statistically significant association. For descriptive statistics, the highest frequency and percentage were used in interpreting the findings.

Results

Table 4.1: Prevalence of Fruit and Vegetable Consumption among Undergraduate Students of Abia State University (N = 146)

Consumption Pattern	Frequency (F)	Percentage (%)
Fruit Consumption		
Consume fruits daily	52	35.6
Do not consume fruits daily	94	64.4
Total	146	100.0
Vegetable Consumption		
Consume vegetables daily	54	37.0
Do not consume vegetables daily	92	63.0
Total	146	100.0
Combined Fruit and Vegetable Consumption		
Consume both fruits and vegetables daily	26	17.8
Consume either fruits or vegetables daily	19	13.0
Do not consume either fruits or vegetables daily	101	69.2
Total	146	100.0

Data in Table 4.1 show the prevalence of fruit and vegetable consumption among undergraduate students of Abia State University. The findings revealed that 52 (35.6%) respondents consumed fruits daily, whereas 94 (64.4%) did not consume fruits daily. This

indicates that the majority of the students were not regular consumers of fruits. Similarly, 54 (37.0%) respondents reported consuming vegetables daily, while 92 (63.0%) did not consume vegetables daily. This suggests that regular vegetable consumption was also low among the respondents. With regard to combined fruit and vegetable consumption, only 26 (17.8%) respondents consumed both fruits and vegetables daily. Nineteen (13.0%) respondents consumed either fruits or vegetables daily, while the majority, 101 (69.2%), did not consume either fruits or vegetables daily. Generally, the results indicate a low prevalence of daily fruit and vegetable consumption among the students, as most respondents did not consume fruits and vegetables regularly.

Table 4.2: Daily Portions of Fruits, Vegetables and Combined Fruits and Vegetables Consumed by the Study Participants (N = 146)

Daily Portions Consumed	Frequency (F)	Percentage (%)
Daily Portions of Fruits Consumed		
Eat some days	79	54.1
1 portion	22	15.1
2 portions	16	11.0
Never eat	15	10.3
4 portions	5	3.4
5 or more portions	5	3.4
3 portions	4	2.7
Total	146	100.0
Daily Portions of Vegetables Consumed		
Eat some days	81	55.5
1 portion	36	24.7
Never eat	11	7.5
2 portions	7	4.8
4 portions	6	4.1
3 portions	3	2.1
5 or more portions	2	1.4
Total	146	100.0
Combined Fruits and Vegetables Consumption		
Do not consume fruits and vegetables daily	101	69.2
Consume both fruits and vegetables daily	26	17.8
Consume either fruits or vegetables daily	19	13.0
Total	146	100.0

Data in Table 4.2 show the daily portions of fruits, vegetables, and combined fruits and vegetables consumed by the study participants. Regarding fruit consumption, the majority of the respondents, 79 (54.1%), reported consuming fruits only on some days. Twenty-two (15.1%) respondents consumed one portion of fruits daily, while 16 (11.0%) consumed two portions daily. Fifteen (10.3%) respondents reported that they never consumed fruits. Only a few respondents consumed three portions, four portions, and five or more portions daily, accounting for 4 (2.7%), 5 (3.4%), and 5 (3.4%), respectively. With respect to vegetable consumption, more than half of the respondents, 81 (55.5%), consumed vegetables only on some days. Thirty-six (24.7%) respondents consumed one portion daily, while 7 (4.8%) consumed two portions daily. Eleven (7.5%) respondents reported never consuming vegetables. A relatively small proportion consumed three portions, four portions, and five or more portions daily, representing 3 (2.1%), 6 (4.1%),

and 2 (1.4%) respondents, respectively. Concerning combined fruit and vegetable consumption, the majority of the respondents, 101 (69.2%), did not consume fruits and vegetables daily. Only 19 (13.0%) respondents consumed either fruits or vegetables daily, while 26 (17.8%) consumed both fruits and vegetables daily. Overall, the findings indicate that the portions of fruits and vegetables consumed by the respondents were generally low, with most participants consuming these food groups only occasionally rather than on a daily basis.

Table 4.3: Association Between Mental Well-Being Scores and Fruit and Vegetable Consumption Patterns among Undergraduate Students (N = 146)

Daily Consumption Pattern	Poor Mental Well-Being n (%)	Good Mental Well-Being n (%)	Total	χ^2	p-value
Fruit Consumption					
Do not consume fruits daily	36 (38.3)	58 (61.7)	94	1.316	0.251
Consume fruits daily	15 (28.8)	37 (71.2)	52		
Total	51	95	146		
Vegetable Consumption					
Do not consume vegetables daily	34 (37.0)	58 (63.0)	92	0.449	0.590
Consume vegetables daily	17 (31.5)	37 (68.5)	54		
Total	51	95	146		
Combined Fruit and Vegetable Consumption					
Do not consume either fruits or vegetables daily	41 (40.6)	60 (59.4)	101	6.602	0.040*
Consume either fruits or vegetables daily	2 (10.5)	17 (89.5)	19		
Consume both fruits and vegetables daily	8 (30.8)	18 (69.2)	26		
Total	51	95	146		

Significant at $p < 0.05$; Cramer's $V = 0.213$.

Data in Table 4.3 show the association between mental well-being and fruit and vegetable consumption patterns among the study participants. The result revealed that there was no statistically significant association between fruit consumption and mental well-being among the respondents ($\chi^2 = 1.316$, $p = 0.251$). Among respondents who consumed fruits daily, 37 (71.2%) had good mental well-being, while 15 (28.8%) had poor mental well-being. In comparison, among those who did not consume fruits daily, 58 (61.7%) had good mental well-being and 36 (38.3%) had poor mental well-being. Since the p-value was greater than 0.05, the observed difference was not statistically significant. Similarly, there was no statistically significant association between vegetable consumption and mental well-being ($\chi^2 = 0.449$, $p = 0.590$). Of the respondents who consumed vegetables daily, 37 (68.5%) had good mental well-being, while 17 (31.5%) had poor mental well-being. Among those who did not consume vegetables daily, 58 (63.0%) had good mental well-being and 34 (37.0%) had poor mental well-being. The p-value exceeded the 0.05 level of significance, indicating that vegetable consumption alone was not significantly associated with mental well-being. However, a statistically significant association was found between combined fruit and vegetable consumption and mental

well-being ($\chi^2 = 6.602$, $p = 0.040$). Among respondents who did not consume either fruits or vegetables daily, 41 (40.6%) had poor mental well-being and 60 (59.4%) had good mental well-being. Among those who consumed either fruits or vegetables daily, only 2 (10.5%) had poor mental well-being, while 17 (89.5%) had good mental well-being. Similarly, among respondents who consumed both fruits and vegetables daily, 8 (30.8%) had poor mental well-being and 18 (69.2%) had good mental well-being. The significant p-value indicates that combined fruit and vegetable consumption was significantly associated with mental well-being. The Cramer's V value of 0.213 further indicates a weak but meaningful association between the variables. In general, the findings suggest that while individual fruit or vegetable consumption was not significantly associated with mental well-being, the combined consumption of fruits and vegetables was significantly associated with better mental well-being among the respondents.

Ho1: There is no significant association between mental well-being and the portions of fruits, vegetables, and combined fruits and vegetables consumed daily among undergraduate students of Abia State University.

Table 4.4: Chi-square Analysis of the Association Between Mental Well-Being and Portions of Fruits, Vegetables, and Combined Fruits and Vegetables Consumed Daily Among Undergraduate Students of Abia State University (N = 146)

Variables	χ^2 -value	p-value	Decision	Remark
Mental well-being and daily fruit consumption	1.316	0.251	Accept Ho	Not Significant
Mental well-being and daily vegetable consumption	0.449	0.590	Accept Ho	Not Significant
Mental well-being and combined daily fruit and vegetable consumption	6.602	0.040	Reject Ho	Significant

Accept the null hypothesis (Ho) if the p-value is greater than 0.05; otherwise, reject the null hypothesis if the p-value is less than or equal to 0.05.

Data in Table 4.4 show the Chi-square analysis of the association between mental well-being and the portions of fruits, vegetables, and combined fruits and vegetables consumed daily among undergraduate students of Abia State University. The result revealed that there was no significant association between mental well-being and daily fruit consumption ($\chi^2 = 1.316$, $p = 0.251$). Similarly, there was no significant association between mental well-being and daily vegetable consumption ($\chi^2 = 0.449$, $p = 0.590$). Therefore, the null hypothesis was accepted for fruit and vegetable consumption. However, a significant association was found between mental well-being and combined daily fruit and vegetable consumption ($\chi^2 = 6.602$, $p = 0.040$). Since the p-value was less than 0.05, the null hypothesis was rejected for combined fruit and vegetable consumption. This implies that combined daily consumption of fruits and vegetables was significantly associated with mental well-being among undergraduate students of Abia State University.

Discussion

The findings of the study revealed that the prevalence of daily fruit consumption, daily vegetable consumption, and combined daily fruit and vegetable consumption among undergraduate students of Abia State University was low. The study showed that the majority of the students did not consume fruits daily, did not consume vegetables daily, and did not consume both fruits and vegetables daily. This indicates poor adherence to healthy dietary practices among the respondents. The findings are in consonance with the

study of Eze, Ibe, Onyeke, Ezenwugo and Nwankwo (2017), who posited that fruit and vegetable consumption among university students was generally inadequate, with many students failing to consume these food groups regularly. The findings are also consistent with the study of Alkazemi and Salmean (2021), who reported that a large proportion of university students consumed fruits and vegetables below recommended levels due to barriers such as affordability, accessibility, and personal food preferences. The similarity between these findings and the present study suggests that inadequate fruit and vegetable consumption remains a common dietary problem among undergraduate students.

The findings of the study revealed that the daily portions of fruits, vegetables, and combined fruits and vegetables consumed by the undergraduate students were generally low. More than half of the respondents consumed fruits and vegetables only on some days, while only a small proportion consumed multiple portions daily. Furthermore, the majority of the respondents did not consume fruits and vegetables in quantities that could be considered adequate for maintaining optimal health. The findings are in consonance with the study of Adejumo, Akinyemi and Eze (2019), who posited that fruit and vegetable intake among Nigerian university students was generally below recommended dietary levels. Similarly, the findings agree with the study of El Ansari, Stock and Mikolajczyk (2012), who reported that university students often exhibit unhealthy dietary patterns characterized by low fruit and vegetable intake. The agreement between these studies and the present findings indicates that inadequate consumption of fruits and vegetables is a persistent nutritional concern among university students and may expose them to nutritional deficiencies and adverse health outcomes.

The findings of the study revealed that there was no statistically significant association between daily fruit consumption and mental well-being among undergraduate students of Abia State University. Similarly, no statistically significant association was found between daily vegetable consumption and mental well-being. However, a statistically significant association was observed between combined fruit and vegetable consumption and mental well-being. Students who consumed fruits and vegetables regularly demonstrated better mental well-being compared to those who did not consume these food groups regularly. The findings are in consonance with the study of Apau, Appiah and Zotor (2022), who posited that adequate consumption of fruits and vegetables contributes positively to mental well-being and psychological functioning. The findings also agree with the study of Akinyemi, Adejumo and Eze (2020), who reported that healthier dietary patterns, including regular consumption of fruits and vegetables, were associated with better mental well-being among undergraduate students. Furthermore, the findings support the report of Adejumo, Akinyemi and Eze (2019), who observed a positive relationship between fruit and vegetable intake and mental health among Nigerian university students. The significant association observed for combined fruit and vegetable consumption in the present study suggests that the cumulative effect of consuming both food groups may be more beneficial for mental well-being than consuming either food group alone.

Implications of the Study

The findings of this study imply that inadequate fruit and vegetable consumption remains a nutritional concern among undergraduate students of Abia State University. The low prevalence and inadequate portions consumed may expose students to poor nutritional outcomes and reduced overall well-being. The significant association between combined fruit and vegetable consumption and mental well-being further suggests that healthy

dietary practices may contribute positively to students' psychological health. Therefore, promoting regular consumption of fruits and vegetables may serve as an important strategy for improving both nutritional status and mental well-being among undergraduates.

Contribution to Knowledge

This study contributed to knowledge by providing empirical evidence on the prevalence and consumption patterns of fruits and vegetables among undergraduate students of Abia State University. The study further established that although individual fruit consumption and vegetable consumption were not significantly associated with mental well-being, combined fruit and vegetable consumption was significantly associated with better mental well-being. The findings therefore enrich existing literature on the relationship between dietary behaviour and mental well-being among university students and provide evidence that can inform nutrition and health promotion programmes within the university environment.

Conclusion

Based on the findings of the study, it was concluded that the prevalence of daily fruit and vegetable consumption among undergraduate students of Abia State University was low. The study also revealed that most students consumed inadequate portions of fruits and vegetables and did not meet recommended intake levels. Furthermore, no significant association was found between mental well-being and the consumption of fruits alone or vegetables alone. However, a significant association was found between combined fruit and vegetable consumption and mental well-being. It was therefore concluded that regular combined consumption of fruits and vegetables may contribute positively to the mental well-being of undergraduate students.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. The university management should organize regular nutrition education and awareness programmes to encourage students to consume fruits and vegetables more frequently.
2. Students should adopt healthier dietary practices by increasing their daily consumption of fruits and vegetables in order to promote better physical and mental well-being.
3. The university authorities should ensure that fruits and vegetables are readily available and affordable in campus cafeterias and food outlets.
4. Health educators and nutrition professionals should provide periodic dietary counselling and health promotion activities aimed at improving healthy eating habits among students.
5. Future studies should be conducted in other tertiary institutions and geographical locations to provide broader evidence on the relationship between fruit and vegetable consumption and mental well-being among undergraduate students.

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