Article

Assessment of Eating Habits of Adolescents According to Body Mass Index in Primary Health Care Centers in Iraq/Thi-Qar

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Abstract: The study examines eating habits among adolescents in Al-Nasr sector, Dhi Qar, Iraq, emphasizing the critical role of adolescence in shaping long-term nutritional behaviors. Despite global efforts, limited research addresses dietary habits in this region. The study aims to assess eating patterns based on body mass index (BMI) and explore their association with demographic factors such as age, gender, education level, weight, and height. A sample of 120 adolescents with nutritional health concerns was selected from various healthcare centers using predefined criteria. Results revealed that 53.3% of participants were males, 81.6% aged 17-19 years, and 93.3% had secondary education. Nearly half (45%) had normal BMI, while 50.8% displayed moderate dietary habits. Findings suggest limited nutritional awareness, with over half of male and one-third of female adolescents lacking essential dietary knowledge. The study underscores the need for targeted nutritional education to prevent diet-related health issues and promote healthier eating behaviors among adolescents.

Keywords: Assessment, Adolescents, Eating habits, Primary health care centers

1. Introduction

Many important changes occur in a person's physical, mental, and social development throughout adolescence. Lifestyle and dietary habits form throughout this time as well, and these choices may have far-reaching effects on a person's health. An important part of a healthy lifestyle for teenagers' development is maintaining a balanced diet (Błaszczyk-Bębenek et al., 2019). Błaszczyk-Bębenek et al. (2019) are among the writers who point out that young people lack understanding about healthy lifestyle choices, especially when it comes to what they consume. According to Wang and Lobstein (2006), teenagers often make poor dietary choices, such as skipping breakfast or eating too many processed foods and sugary drinks. Gustavson et al. (2017) found that adolescents also tend to follow an unhealthy, imbalanced diet.

Adolescence is the transitional period between childhood and maturity. According to Mansur et al. (2015), teenagers comprise around 20% of the global population and are defined by the World Health Organization (WHO) as ranging in age from 10 to 19 years. Developing countries are home to 1.2 billion teenagers, or between 25% and 50% of the global population (Motlomelo & Molapi, 1999). According to Al-Jayyousi and Tukan (2005), the first year of a person's life is the most formative, although adolescence follows closely after. Hormones and the environment influence significant changes in the body, mind, and social interactions during this period (Al-Jayyousi & Tukan, 2005). Adolescence is characterized by reaching 25% of adult height and 50% of adult weight (Adesina et al.,

2012). At the same time as females have a surge in adipose tissue and boys in muscular mass, sexual maturation begins (WHO, 2000). The natural process of physical development and maturation increases the requirement for macro- and micronutrients, such as iron, calcium, folic acid, and vitamins A, B12, and C. Adolescents have increased dietary needs as a result (WHO, 2000). The energy needs of puberty and an unhealthy diet have played a significant role in the epidemic of teenage obesity.

Health and dietary issues in childhood and adolescence both contribute to the current state of adolescents' weight. Prior research affecting teenagers has identified numerous health issues, including substance misuse, sexual behavior, and unhealthy eating patterns (WHO, 1997). Unfortunately, evaluation of weight status is not as important in adolescents as it is in children; thus, many of these people go undiagnosed due to insufficiencies in the amount and quality of food they consume (Elias et al., 2007). While most research on teenage obesity has been on undernourishment, there are certain teens who struggle with excess calories (Leenstra et al., 20005).

Undernutrition, manifesting as stunting and wasting, negatively impacts adolescents' capacity to study and work at their full potential. Adesina et al. (2012) found that this puts future children at risk of having unhealthy development, impacts their sexual maturity, and raises the likelihood of negative obstetric outcomes for women. Cardiovascular disease, diabetes, arthritis, and some malignancies are among the many illnesses for which obesity increases the risk (Adesina et al., 2012). Because teenagers have a heightened interest in their physical appearance, low self-esteem, and a negative self-image, obesity is a major concern for this age group.

Body Mass Index (BMI) is a common tool for assessing children's and teenagers' weight status in relation to established norms. Keys et al. (2007) defined the body mass index (BMI) as the product of the square of one's height and one's weight in kilograms. Due to its ability to differentiate between underweight, overweight, and at-risk youth according to age and sex, body mass index (BMI) has become the gold standard for evaluating children's and teenagers' weight (Adesina et al., 2012).

Keeping oneself healthy is an essential and dynamic part of everyone's daily routine. Circumstances, ideas, culture, and the social and physical environment all have a role. According to Barnes and Schoenborn (2012), each individual's state of health is a product of their unique combination of mental, physical, and spiritual components. The capacity to manage and withstand stress is a key indicator of overall health and fitness. Puberty, with its rapid acceleration of development and changes in body composition, elevates nutritional requirements throughout adolescence (Benazeera, 2014). Due to significant changes, increased energy and nutrient needs, and other factors, adolescents' eating patterns and nutrient consumption may impact their nutritional health (Dwyer, 2017). When it comes to being healthy and warding off illness, proper nutrition is key. By establishing and maintaining good eating habits from a young age, lifestyle illnesses can reduce morbidity and mortality (Vann & Finkle et al., 2011).

Health and nutritional issues in infancy and adolescence both contribute to the development of unhealthy eating habits and obesity in adolescents (WHO, 2000). Particularly noteworthy are the formative years of infancy and adolescence, when significant changes occur in both the physical and psychological aspects of a person's identity (Adesina et al., 2012). Adolescents' distinct patterns of behavior have the potential to disrupt nutritional status and lead to energy imbalance (Akseer et al., 2017).

In order for teenagers to develop healthy eating habits, it is crucial that they get the necessary information about food safety and how to make appropriate food choices (Prasanna et al., 2023). In order to create nutrition interventions that are specific to people and help them eat healthier, we need a deeper understanding of the factors that influence eating habits. Tomar and Reeves (2009) have identified practice, inclination, self-efficacy, change obstacles, and the definitions of "healthy" and "unhealthy" food and diet as factors

that influence eating habits. A healthy diet may help ward against a number of long-term health problems, such as type 2 diabetes, binge eating, heart problems, and several cancers. French et al. (2001) recommend starting good eating habits during infancy and continuing them throughout adolescence to reduce the risk of chronic illnesses associated with poor nutrition.

All the aforementioned points indicate that teenagers lack knowledge about healthy food and how to assess their body mass index. It is the duty of the healthcare provider to educate the teen about healthy eating options, food safety, and how to make informed food choices. The majority of research on eating habits has focused on adults. Adolescents are underrepresented in the literature. Some have hypothesized that poor eating habits start at a young age. Controversy persists about the effect on metabolic disorders, overweight, or obesity in children and teenagers (Pinho et al., 2014). Research on teenage eating habits is scarce, despite the well-documented significance of developing good eating habits at a young age (Matthys et al., 2003). The purpose of this research is to learn how teenagers' eating habits relate to their BMI and other lifestyle factors (Tavares et al., 2014).

Because they are more impressionable and parents are more likely to let their kids consume cariogenic foods, these changes are more noticeable in younger generations. These youths may be at increased risk for developing chronic illnesses and experiencing a decline in quality of life as a result of this (Bica et al., 2014). Keeping one's health is an essential part of everyone's day-to-day life. A person's mentality, cultural background, and the social and physical settings in which they find themselves all have a role. An individual's health is the sum of their mental, physical, and spiritual well-being (Barnes & Schoenborn, 2012).

Being able to handle and fight off stress is one indicator of health or well-being. Due to the changes in body composition and the rapid acceleration of development that accompany puberty, adolescents have greater nutritional demands (Shamron & Rafleson, 2002). The substantial changes, increasing energy and dietary needs, and other factors may influence adolescents' eating patterns, nutrient consumption, and overall nutritional status. Proper diet is essential for maintaining health and warding off illness (Nicklas et al., 2002).

According to the World Health Organization (2002), a combination of health and nutritional concerns from early infancy and adolescence impact teens' eating patterns and weight status. Changes in one's physical and mental characteristics, as well as one's social circle, take place during the formative years of childhood and adolescence. Energy imbalances and nutritional difficulties may result from adolescents' unique behavioral patterns (Kulkarni et al., 2015).

Teens should be encouraged to eat healthy, and having enough information on food choices and safety may help. Factors influence people's food choices (Jabade & Roy, 2019). We need a better grasp of behavior to develop individualized nutrition treatments that promote healthy eating. Therefore, it is important to consider things like habit, tendency, self-efficacy, change barriers, and the definitions of a "healthy" and "unhealthy" diet and food (Tomar & Reeves, 2009). A balanced diet helps avoid several chronic illnesses, including binge eating disorder, heart irregularities, stroke, certain forms of cancer, and type 2 diabetes. Researchers have shown that preventing nutrition-related chronic illnesses begins with establishing and maintaining healthy eating habits from infancy and into adolescence. The aforementioned statistics show that young people are not well-informed when it comes to healthy eating and BMI calculations. Health care providers should encourage teens to make healthy food choices and educate them about food safety (French et al., 2001).

2. Materials and Methods

RESEARCH DESIGN: Cross-sectional study design.

STUDY POPULATION AND SETTING: Research data came from primary health care centers in Al-Nasr sector, Dhi Qar Governorate, Iraq. The study population consisted of teenage women and men who visited the nutrition unit and who suffered from health problems such as obesity and others in all centers affiliated with the Al-Nasr sector during the period from February to October 2024.

SAMPLING DESIGN: The study sample included adolescents coming to the nutrition unit and other departments and suffering from nutritional health problems in all health care centers in Al-Nasr sector, Dhi Qar / Iraq. There were inclusion criteria for selecting a sample that included both genders, all educational levels, and consent to participate in the study.

SAMPLE SIZE: This means 120 or more measurements/surveys are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value. This means, in this case, there is a 95% chance that the real value is within ±4.90% of the measured/surveyed value.

DATA COLLECTION METHODS AND TOOLS: The study instrument is a questionnaire composed of 2 parts:

Part one: Part one: demographic data ; This part consists of 6 item :Age , Gender, Weight, Height, BMI, Monthly income.

Part two: Eating habits/ How often do you eat these foods Scale; This part consists of 1 domen item. this domain contains have 26 questions

DATA COLLECTION: Data is collected by the researcher, and the researcher explains the study and the purpose of the sample and obtains the consent of the sample to participate in the study and then uses the self-management method to collect data from the sample. Data will be collected by the researcher through a face-to-face interview with the help of the nursing staff.

Ethical consideration: The researcher explains the study and the objectives to the sample and ask them to participate in the study. After take the sample agreement, the investigator collect the data through use of interview method.

Validity of the Questionnaire : To Validity is concerned with the extent to which an instrument corresponds. The content validity of instrument was established through a panel of (4) experts from different specialties. The results of the review of the questionnaire by the experts revealed that all of the experts agree that items of the study instrument are clear and adequate for the measurement of the phenomenon.

DATA ANALYSIS: Data Analysis: The descriptive purposes of the study were determined through the frequency distribution. The association of two proportions was evaluated byChi-square tests. The predictors of eating habits of adolescents according to body mass index through the univariate analyses. The significant level was considered asP-value of less than 0.05. All calculations were performed by Statistical Package for Social Sciences (SPSS, version 22).

3. Results

Table 1. Distribution of demographic characteristics

Variables		Frequency	Percent
Sex	Male	64	53.3
	Female	56	46.7
	Total	120	100.0
Age	13-14	5	4.2
	15-16	17	14.2
	17-19	98	81.6
	Total	120	100
Education	Secondary school	112	93.3
	Ungraduated	8	6.7
	Total	120	100.0
BMI	Underweight	32	26.7
	Normal weight	54	45.0
	Overweight	18	15.0
	Obese	16	13.3
	Total	120	100.0
Income	More than expenses	24	20.0
	Equal to expenses	59	49.2
	Less than expenses	37	30.8
	Total	120	100.0

53.3% of sample are males, 81.6% at age 17-19 years, 93.3% of them have secondary education, 45% had normal weight status and 49.2% had equal to expenses income.
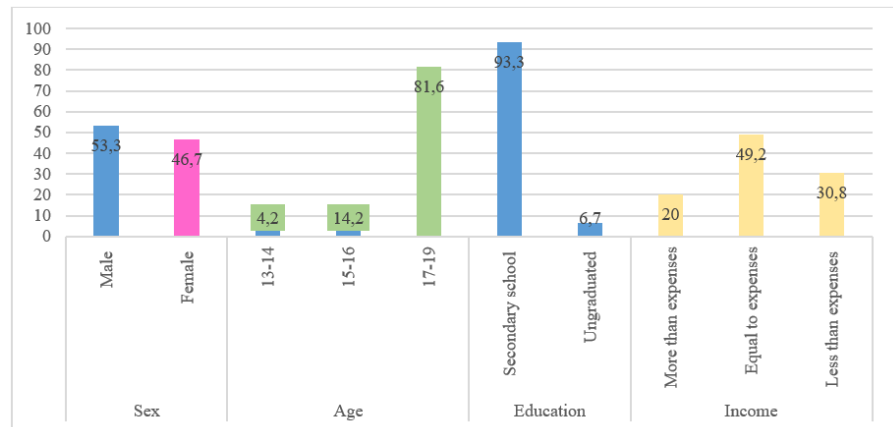

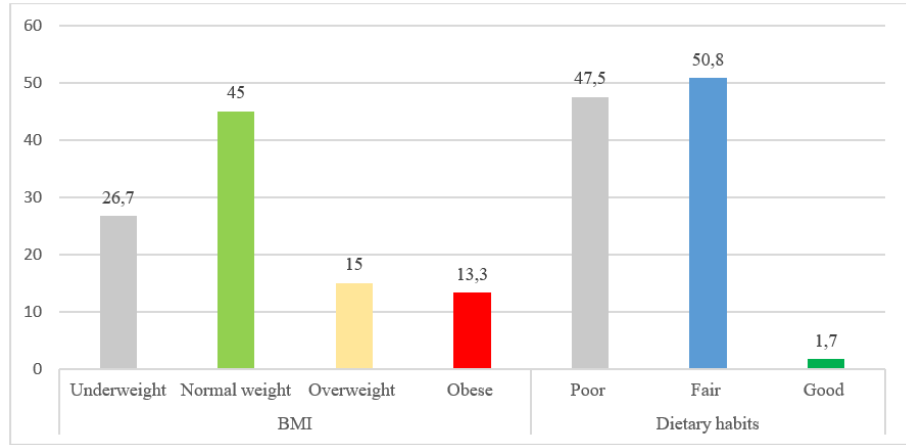Figure 1. Distribution of demographic characteristics

Figure 2. Distribution of BMI and dietary habits

Table 2. Distribution of dietary habits

Variables		Frequency	Percent
Dietary habits	Poor	57	47.5
	Fair	61	50.8
	Good	2	1.7
	Total	120	100.0

50.8% of sample had fair dietary habits.

Table 3. Table distribution of sample response to dietary habits items

Items	Response	Frequency	Percent
Breakfast cereal	Once / week	61	50.8
	2-4 / week	32	26.7
	5-6 / week	27	22.5
Fresh fruit	Once / week	58	48.3
	2-4 / week	31	25.8
	5-6 / week	31	25.8
Cooked green vegetables	Once / week	55	45.8
	2-4 / week	36	30.0
	5-6 / week	29	24.2
Cooked root vegetables	Once / week	44	36.7
	2-4 / week	43	35.8
	5-6 / week	33	27.5
Raw vegetables or salad	Once / week	27	22.5
	2-4 / week	63	52.5
	5-6 / week	30	25.0
Chips	Once / week	67	55.8
	2-4 / week	33	27.5
	5-6 / week	20	16.7
Potatoes, pasta, rice	Once / week	47	39.2
	2-4 / week	45	37.5

Items	Response	Frequency	Percent
	5-6 / week	28	23.3
Meat	Once / week	62	51.7
	2-4 / week	34	28.3
	5-6 / week	24	20.0
Meat product	Once / week	27	22.5
	2-4 / week	60	50.0
	5-6 / week	33	27.5
Poultry	Once / week	85	70.8
	2-4 / week	24	20.0
	5-6 / week	11	9.2
White fish	Once / week	68	56.7
	2-4 / week	36	30.0
	5-6 / week	16	13.3
Oil rich fish	Once / week	94	78.3
	2-4 / week	16	13.3
	5-6 / week	10	8.3

Table 4. Cont. table

Items	Response	Frequency	Percent
Cheese	Once / week	57	47.5
	2-4 / week	43	35.8
	5-6 / week	20	16.7
A great deal of the time	Once / week	91	75.8
	2-4 / week	20	16.7
	5-6 / week	9	7.5
A lot of the time	Once / week	57	47.5
	2-4 / week	44	36.7
	5-6 / week	19	15.8
From time to time but not too often	Once / week	72	60.0
	2-4 / week	29	24.2
	5-6 / week	19	15.8
Only occasionally	Once / week	66	55.0
	2-4 / week	34	28.3
	5-6 / week	20	16.7
Beans or pulses	Once / week	31	25.8
	2-4 / week	65	54.2
	5-6 / week	24	20.0
Sweets, chocolates	Once / week	61	50.8
	2-4 / week	42	35.0
	5-6 / week	17	14.2
Ice cream	Once / week	33	27.5
	2-4 / week	58	48.3
	5-6 / week	29	24.2

Crisps, savoury snacks	Once / week	79	65.8
	2-4 / week	28	23.3
	5-6 / week	13	10.8
Fruit juice	Once / week	70	58.3
	2-4 / week	29	24.2
	5-6 / week	21	17.5
Soft/fizzy drinks	Once / week	30	25.0
	2-4 / week	59	49.2
	5-6 / week	31	25.8
Cakes, scones, sweet pies or pastries	Once / week	66	55.0
	2-4 / week	29	24.2
	5-6 / week	25	20.8

Table 5. Cont. table

Items	Response	Frequency	Percent
Biscuits	Once / week	38	31.7
	2-4 / week	52	43.3
	5-6 / week	30	25.0
Fast food	Once / week	55	45.8
	2-4 / week	36	30.0
	5-6 / week	29	24.2

Table 6. Association between dietary habits and demographic characteristics of sample

Variables		Dietary habits			Total	Chi square
		Poor	Fair	Good		
Sex	Male	32	30	2	64	X^2=.353 P=.308
	Female	25	31	0	56	
	Total	57	61	2	120	
Age	13-14	1	4	0	5	X^2=2.85 P=.58
	15-16	10	7	0	17	
	17-19	46	50	2	98	
	Total	57	61	2	120	
Education	Secondary school	55	55	2	112	X^2=2.041 P=.360
	Ungraduated	2	6	0	8	
	Total	57	61	2	120	
BMI	Underweight	18	13	1	32	X^2=11.49 P=.074
	Normal weight	30	24	0	54	
	Overweight	4	13	1	18	
	Obese	5	11	0	16	
	Total	57	61	2	120	
Income	More than expenses	14	10	0	24	X^2=2.261 P=.688
	Equal to expenses	28	30	1	59	

	Less than expenses	15	21	1	37	
	Total	57	61	2	120	

There is no significant statistical association between dietary habits and demographic characteristics of sample.

4. Discussion

The findings of a Viennese research study, "Gender differences in nutritional behavior and weight status during early and late adolescence," in which 424 (62.63%) of the participants were female, contradict this finding (Askovic & Kirchengast, 2012). Nearly half of the participants in this research were female. We hypothesize that cultural norms around modesty and traditional practices may discourage women in Iraq from participating in the research.

In line with the current study, the majority of participants in the Nigerian study "Nutritional Status of Adolescent Girls in a Selected Secondary School of North-Eastern Part of Nigeria" (Uba et al., 2020) were 16 years old or older. Among the participants in this research, 98 (or 81.6% of the total) were teenagers. The majority of the subjects in the same research had normal weights of 116 (85.3%), which aligns with the present finding. Of the participants in this research, 54 (or 45.0%, according to Uba et al., 2020) were of a normal weight.

While 54 participants (14.9%) in the research "Food Knowledge, Habits, Practices, and Addiction Among Adolescents: A Cross-Sectional Investigation" from Damanhur City, Egypt, had completed secondary school, this finding does not align with the present study. (Hantira et al., 2023). In this research, 112 participants (93.3%) had completed at least some secondary school. We believe this disparity stems from the potential use of different sampling procedures or demographic data in the two studies, which could have influenced the interpretation of their respective results.

The Turkish study "The relationship between adolescents' nutrition literacy and food habits, and affecting factors" (Koca & Arkan, 2021) found that a large majority of the 306 participants (65.53% of the total) belonged to the medium income bracket, which is consistent with the present research. Of the total costs and revenue in the present study, 59 (or 49.2%) were equal.

The majority of participants in an Indian research study titled "Poor Dietary Habits: A Function of Online Food Delivery Fad among Medical and Dental College Students in India" had fair dietary habits, with 69.8% of the participants falling into this category (Srivastava et al., 2021), which aligns with the present study's findings. Of the participants in this research, 61 (or 50.8%) had adequate eating habits.

The German research study "Sex-Specific Dietary Patterns and Social Behavior in Low-Risk Individuals" (Hamburg City, 2023) found no statistically significant correlation between dietary habits and age (p-value = 0.536) (Engler et al., 2023), which is consistent with the present study. Dietary habits and age did not show a statistically significant link in this research (p = 0.580). This finding is in line with the previous one, which found no statistically significant correlation between food consumption and body mass index (Engler et al., 2023, p-value: 0.876). There was no statistically significant correlation between food consumption and body mass index (0.074) in this investigation.

Results from a Nigerian study that looked at the "relationship between dietary habits and nutritional status among adolescents in the Abuja Municipal Area Council of Nigeria" (Otuneye et al., 2017) corroborate the current findings that there is no significant correlation between dietary habits and sex (p-value = 0.525). There was no statistically significant correlation (p = 0.308) between sex and eating habits in this research. Interestingly, previous research found a correlation between socioeconomic level and eating habits (Otuneye et al., 2017; p=0.001), which contradicts the findings of the present

investigation. The present research found no statistically significant correlation (p=0.688) between participants' income levels and their eating habits. We explain this by stating that income level often influences people's eating habits in Iraq. Those with more money tend to eat a wider variety of healthy foods, while those with less money may eat cheaper but less healthy options. This could be why our study didn't find a correlation between income and eating habits.

A Saudi Arabian study, "The Association between Dietary Patterns and Socio-Demographic and Lifestyle Characteristics: A Sample of Saudi Arabia" (Bawazeer et al., 2021), found a significant correlation between education and dietary habits, but the current study does not support this finding. The present research found no statistically significant link between education and eating habits (p-value = 0.360). We believe that the differences in the samples, cultures, and socioeconomic backgrounds between the two research studies could potentially explain this disparity.

Comparing the results of the present research with those of other studies conducted in other countries highlighted both consistency and inconsistency. Differences in demographics, methodology, and culture may explain these variations.

In contrast to Askovic and Kirchengast (2012) in Vienna, where females made up 62.63% of participants, the present research found that 46.7% of participants were female. Iraqi cultural traditions and norms, such as modesty and social constraints, may explain this variation by limiting female engagement. In contrast, 85.3% of participants were 16 and above in Uba et al. (2020) in Nigeria, suggesting that comparable patterns in age-related involvement exist across geographies. In the present research, however, 81.6% of participants were 17–19 years old.

Uba et al. (2020) found that 45.0% of the participants had a normal weight in terms of nutritional status, which aligns with their findings of 85.3% having a normal weight. It is possible that variations in dietary contexts or body mass index (BMI) categorization criteria account for the lower proportion seen in this research. Furthermore, in contrast to the results of Hantira et al. (2023) in Egypt, where only 14.9% of participants had secondary education, 93.3% of participants in the present research were in high school. Possible explanations for this disparity include different recruiting tactics or different demographics in the two groups under study.

Results regarding income indicated that 65.53 percent of the sample fell into the medium income bracket, which is in line with the results of Koca and Arkan (2021) in Turkey, where 49.2 percent of the sample reported an income equivalent to costs. In contrast to Otuneye et al. (2017) in Nigeria, where this link was substantial (p-value = 0.001), there is no significant relationship between eating habits and income (p-value = 0.688). Income may have less of an impact on eating habits in Iraq due to variables like food subsidies and culturally shared eating routines. Furthermore, this study found no correlation between education and food habits, unlike Bawazeer et al. (2021) in Saudi Arabia, where the correlation was statistically significant (p-value = 0.0001). This may be a result of variations in the influence of different educational systems on nutritional consciousness.

This study's 50.8% fair dietary habit rate is in line with that of Srivastava et al. (2021) in India, where 69.8% of the individuals also had fair dietary habits. Furthermore, the results align with earlier studies conducted in Germany (Engler et al., 2023) and Nigeria (Otuneye et al., 2017), which found no significant correlations between dietary habits and age (p-value = 0.580), sex (p-value = 0.308), and body mass index (p-value = 0.074). It seems that these factors may not significantly impact food patterns in various groups, based on these consistencies.

These results show that there are commonalities in people's eating habits throughout the world, but they also show that there are significant geographical variations. These differences underscore the necessity of customizing approaches to specific contexts to effectively address the nutritional and dietary challenges individuals encounter.

5. Conclusion

The majority of the studied teens exhibited very low consumption of healthful foods. Researchers find that 10% of young males consume in a manner that increases the risk of adverse health effects. Among the young people surveyed, almost 50% of males and 33% of females had poor knowledge of diets and nutrition. There was a statistically significant correlation between the quantity of information and the dietary intensities of both positive and negative health aspects among these youngsters, regardless of gender. Due to a lack of knowledge, young children may make unhealthy food choices, increasing their risk of obesity and related health issues in the future. Educating young people about the need for a balanced diet and the social disorders that might develop from unhealthy eating habits is crucial, as shown by the study's outliers.

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