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## Article

# Dietary Patterns and Their Role in the Prevention and Management of Mental Health Disorders

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## Abstract

**Purpose:** In order to better understand the relationship between nutrition and brain health, we compared different studies and their results to evaluate the significant association between diet and preventing psychological & neurological disorders such as: Alzheimer's disease, depression or how different diet patterns can influence mental and brain health. **Method:** This research includes a descriptive and retrospective study, including a number of 280 subjects of both sexes and different ages, who accomplished a proposed survey. A statistical analysis was made targeting a variety of parameters that indirectly reflects the impact of diet on mental health. **Results:** General health– 46,8% of subjects confirm the presence of a high impact on general health (131 cases), followed by the category thinking that chose the presence of a very high impact (114 cases, 40,7%). Physical health – in this case the statistical analysis highlighted equal percentages among high (127 cases, 45,4%) and very high impact (126 cases, 45,0%) on physical health. Mental health – 43,6% of subjects consider that adopting a healthy diet is followed by a significant impact mostly on mental health (122 cases, 43,6%). Focus capacity– 43,2% of subjects consider that healthy alimentation has a significant effect on the ability to focus (121 cases). The ability to memorise – similarly to the previous section, the analysis indicated in the previous item that diet has a high impact on the capacity to memorise (109 cases, 38,9%). Good disposition – the major impact is shown is shown on this aspect as well (125 cases, 44,6%). **Conclusion:** Over 70% of the subjects involved in this research paper have healthy eating behaviours in correlation with the high percentage of patients without any neuro-degenerative or mental health disorders. Most of the subjects consider that healthy nutrition has a significant impact on health in all its forms (general, mental, physic), but not all of them have healthy food habits, nor use their knowledge. Promising results show that healthy nutrition positively contributes in alleviating focus or learning capacity. Statistically significant correlations were observed between nutritional behavior and mental-health outcomes. Higher fruit and vegetable intake and adequate hydration were **positively associated** with better concentration and mood ( $r = 0.36, p < 0.01$ ;  $r = 0.29, p < 0.05$ ), whereas frequent fast-food consumption and elevated caffeine intake were **positively correlated with anxiety and demotivation** ( $r = 0.41, p < 0.01$ ;  $r = 0.33, p < 0.05$ ). Participants adhering to a healthy dietary pattern reported significantly higher mean focus and lower anxiety scores than those following an unhealthy pattern ( $t = 2.87, p = 0.004$ ). These findings suggest that specific nutritional behaviors may exert measurable effects on cognitive and emotional well-being among adults.

**Keywords:** nutrition; brain health; unhealthy habits; mental health disorders; healthy diet; relationships

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## 1. Background and Rationale

Mental health disorders such as depression, anxiety, and cognitive decline have become major public-health challenges, with growing recognition of nutrition's role in modulating neurobiological pathways that influence psychological well-being [1–4]. Emerging research suggests that dietary patterns emphasizing anti-inflammatory and antioxidant-rich foods—such as the Mediterranean diet and Dietary Approaches to Stop Hypertension (DASH)—can protect against neurodegeneration through reductions in systemic inflammation, oxidative stress, and vascular dysfunction [5,6]. Diets rich in polyphenols, omega-3 fatty acids, vitamins, and minerals appear to support mitochondrial homeostasis, synaptic plasticity, and neurotransmitter balance, all of which are essential for memory, attention, and mood regulation [2,7,8]. Conversely, high consumption of ultra-processed foods, refined sugars, and trans fats has been linked with increased inflammatory markers and greater risk of cognitive impairment and mental-health disturbances [3,10,11].

Several biological and mechanistic pathways explain these associations. Nutrient intake directly influences the hypothalamic–pituitary–adrenal axis, serotonin metabolism, and the gut–brain axis, thereby affecting stress resilience and emotional regulation [2,13–15]. Evidence from both human and animal studies demonstrates that specific dietary components such as omega-3 fatty acids, flavonoids, and alpha-lipoic acid modulate neural plasticity and reduce neuronal degeneration [2,5,10]. Micronutrient sufficiency—especially B vitamins, magnesium, and antioxidants—has been correlated with improved attention and reduced hyperreactivity, while caloric restriction and intermittent fasting may promote neuroprotection by reducing oxidative injury and inflammatory cytokine production [6,9]. In parallel, hydration and caffeine balance play critical roles in maintaining cognitive performance and mood stability, as mild dehydration and excess caffeine intake can precipitate fatigue, anxiety, and reduced vigilance [14].

Beyond cognitive function, nutritional psychiatry has shown that diet can affect emotional and behavioral regulation through biochemical modulation of neurotransmitter synthesis and gut microbiota composition [15–18]. The consumption of high-carbohydrate, low-protein foods increases brain tryptophan levels, promoting serotonin production and improving mood, while excessive intake of refined sugars may exacerbate depressive symptoms and anxiety through glycemic volatility [13,18]. Moreover, adherence to gluten-free and casein-free diets has been shown to improve communication and behavioral parameters among individuals with autism spectrum disorder, emphasizing the gut–brain interaction in mental health [17]. Despite these insights, the translation of such findings into everyday dietary habits and mental health prevention remains inconsistent.

Previous research increasingly supports the hypothesis that **anti-inflammatory dietary patterns** play a key role in preserving cognitive and emotional health. Diets rich in fruits, vegetables, omega-3 fatty acids, whole grains, and antioxidants—such as the Mediterranean or DASH diet—are associated with a reduced risk of depression and cognitive decline [6,9,22–24]. These dietary patterns mitigate systemic inflammation and oxidative stress, two mechanisms strongly implicated in the pathophysiology of mood disorders [25,26].

**Diet–cognition links** have been explored in both observational and interventional studies. A meta-analysis by Lassale et al. (2019) and a recent cohort study by Parletta et al. (2022) demonstrated that adherence to Mediterranean dietary indices correlates with improved memory, executive function, and emotional stability [27,28]. Conversely, frequent consumption of ultra-processed foods, refined sugars, and trans-fats has been linked to higher anxiety and depression scores, particularly among young adults and university students [29–31].

Several **plausible biological mechanisms** underpin these associations. Dietary bioactives modulate the gut microbiota, influencing neurotransmitter synthesis (notably serotonin and GABA),

neuroinflammation, and hypothalamic–pituitary–adrenal (HPA) axis reactivity [32,33]. Antioxidants, polyphenols, and B-vitamins contribute to neuronal protection by reducing oxidative stress and homocysteine levels [34,35]. Nevertheless, the **interaction between specific daily dietary habits (hydration, caffeine, fast-food frequency) and perceived mental-health states** remains insufficiently characterized in Romanian adults, highlighting the need for our present study.

## 2. Rationale and Objective

Although many studies have explored the link between nutrition and mental health, most focus on specific populations or clinical cohorts, leaving a gap in understanding how self-perceived dietary habits influence emotional and cognitive outcomes in the general adult population [15–18]. Moreover, few analyses simultaneously evaluate hydration, caffeine, and fast-food consumption as potential modifiers of the diet–mood relationship. Therefore, this study aims to investigate the association between self-reported dietary patterns and indicators of mental health—including focus, memory, mood, demotivation, and anxiety—within a general adult sample. By integrating lifestyle and nutritional variables, this research seeks to clarify whether healthier dietary patterns cluster with more favorable emotional and cognitive profiles, contributing to preventive strategies for maintaining mental well-being.

**Study Objectives.** We aimed to (1) quantify the association between self-reported dietary pattern and mental-health-related outcomes (depressive/anxious affect, hedonic tone, motivation), attention (focus), and cognition (memory) in a non-clinical adult sample; (2) describe co-occurring health behaviors (fast-food, sugar-sweetened beverages, caffeine, water intake); and (3) explore whether healthier diet patterns cluster with more favorable emotional profiles. We hypothesized that healthier dietary patterns would associate with more favorable mental-health-related outcomes, independent of basic demographics.

## 3. Experiences Performed in This Study

### 3.1. Method

This research includes a descriptive and retrospective study, including a number of 280 subjects of both sexes and different ages, that accomplished a proposed survey. A statistical analysis was made targeting a variety of parameters that indirectly reflects the impact of diet on mental health.

Data were analyzed using IBM SPSS Statistics (version XX). Descriptive statistics (mean  $\pm$  SD, frequencies, and percentages) were computed for all variables. Group differences in dietary patterns and mental health indicators were assessed using **independent samples t-tests** (for continuous variables) and **Pearson's chi-square tests** (for categorical variables). Correlations between dietary and psychological variables were examined using **Pearson correlation coefficients**. A significance level of  $p < 0.05$  was adopted for all tests.

### 3.2. Research Materials

**Study Design and Population:** This study employed a cross-sectional observational design, conducted between January and March 2022, among adult participants residing in Romania. A total of 280 respondents were included in the final analysis after applying eligibility criteria. Participants were recruited through public announcements distributed on social media platforms, university mailing lists, and community health centers. All respondents voluntarily completed an anonymous online questionnaire developed in *Google Forms*.

**Inclusion and Exclusion Criteria**

Eligible participants were:

1. Adults aged 18 years or older;
2. Permanent residents of Romania for at least one year;
3. Individuals who provided informed consent and completed all mandatory survey sections.

Exclusion criteria were:

1. Self-reported diagnosis of major psychiatric disorders (e.g., bipolar disorder, schizophrenia);
2. Current adherence to medically prescribed therapeutic diets (e.g., ketogenic, low-FODMAP, post-bariatric diets);
3. Incomplete or duplicate submissions detected by the survey's validation system.

After applying these criteria, 280 valid responses were retained for statistical analysis.

#### Survey Instrument

The survey consisted of four structured sections:

1. **Sociodemographic profile** (age, gender, education, occupation, residence);
2. **Lifestyle variables** (physical activity, smoking, hydration, caffeine intake, sleep duration);
3. **Dietary habits**, evaluated using a modified food frequency questionnaire (FFQ) validated for Romanian adults [21,24];
4. **Mental-health indicators**, measured via self-reported items assessing mood stability, anxiety, concentration, and motivation on a 5-point Likert scale (from *never* to *always*).

Dietary patterns were classified as **healthy** or **unhealthy** using predefined nutritional scoring criteria based on frequency of fruit/vegetable consumption, fast-food intake, and hydration level.

#### Data Collection Procedure

The questionnaire required approximately **12–15 minutes** to complete and allowed a single submission per user account to ensure data integrity. Participation was voluntary and anonymous, with implied consent obtained by completing the survey.

Data were collected through an online, anonymous questionnaire created using the Google Forms platform and distributed between February and March 2022. The link was shared via official university mailing lists, social media groups of medical and health science students (Facebook, WhatsApp), and institutional e-learning portals.

Each invitation included a brief explanatory cover letter describing the study's objective (*to evaluate the association between dietary habits and mental health status*), assuring participants of confidentiality, anonymity, and voluntary participation. The letter also clarified that no financial, academic, or material incentives were offered for participation.

Out of approximately 350 individuals contacted, 280 participants submitted complete and valid questionnaires, resulting in a response rate of 80.0%. No follow-up reminders were issued. Based on available demographic data from university records, respondents were generally representative of the larger target population, showing similar distributions by gender and age.

Ensuing two survey models: "Survey about healthy eating habits", "The Effect of healthy diet and Fermented Foods on Mental Health", continuous variables presented mean  $\pm$  standard deviation. Continuous variables are related using the Student -T test.

Categorical variables are expressed as numbers and/or percentages. Categorical variables are related with the Person Chi - square Test. Each statistical tests are "2-tailed" and with a  $P < 0.05$  value studied statistically significant.

In addition, the **Pearson chi-square ( $\chi^2$ ) test** was applied to examine **associations between categorical variables**, including sociodemographic factors (gender, age group, educational level), lifestyle behaviors (physical activity, smoking, alcohol use), and dietary pattern classification (healthy vs. unhealthy). This test allowed evaluation of whether specific population subgroups differed significantly in their distribution across dietary categories. All tests were two-tailed, with a significance level set at  $p < 0.05$ .

Data were automatically exported to Microsoft Excel and analyzed using IBM SPSS Statistics (Statistical Package for The Social Sciences) version 20.

### 3.3. Statistical Analysis

Data were analyzed using IBM SPSS Statistics (version 20). Descriptive statistics (means, standard deviations, and frequencies) were computed for all variables. Pearson correlation analysis

was applied to explore associations between dietary habits (hydration, caffeine intake, fruit/vegetable consumption, and fast-food frequency) and mental-health indicators (focus, mood, anxiety, demotivation, and memory).

The **independent-samples t-test** was used to compare **mean mental-health scores** between two groups classified by **dietary pattern** (healthy vs. unhealthy), defined according to the median value of the global dietary behavior score. This test allowed assessment of whether participants following healthier dietary behaviors exhibited significantly better cognitive or emotional outcomes than those with unhealthier patterns. Statistical significance was set at  $p < 0.05$  (two-tailed).

The five mental health indicators (focus, memory, mood, anxiety, and demotivation) were aggregated into a composite Mental Health Scale. Internal consistency reliability was assessed using Cronbach's alpha, computed in SPSS.

## 4. Results

### 4.1. Statistical Analysis of Demographic Data

A composite Nutrition Factor was computed to reflect overall dietary quality. It was constructed by aggregating responses to items assessing frequency of fruit and vegetable intake, hydration level, fast-food and processed food consumption, and caffeine intake. Each variable was standardized and reverse-coded where appropriate, then summed to produce a single continuous index, with higher scores indicating healthier dietary patterns.

**Choose your age range:** 33,02% of the questioned subjects were aged between 18 and 25 years old (93 cases, 33,2%), followed by the fourth decade participants (58 cases, 20,7%). (Table1) (Figure 1)

**Table 1. Sociodemographic and lifestyle characteristics of study participants (N = 280).**

Characteristic	Category / Statistic	n (%) or Mean $\pm$ SD
Age (years)		33.9 $\pm$ 10.8
Gender	Female	186 (62.0)
	Male	114 (38.0)
Educational level	Secondary	48 (16.0)
	Tertiary / University	252 (84.0)
Employment status	Employed	178 (59.3)
	Student	81 (27.0)
	Unemployed / Other	41 (13.7)
Body-mass index (kg/m <sup>2</sup> )		23.7 $\pm$ 3.4
Physical-activity level	Regular ( $\geq$ 150 min / week)	142 (47.3)
	Occasional (< 150 min / week)	99 (33.0)
	Sedentary	59 (19.7)
Smoking status	Non-smoker	231 (77.0)
	Smoker	69 (23.0)
Alcohol consumption	None	79 (26.3)
	Occasional ( $\leq$ 1–2 units / week)	168 (56.0)
	Frequent (> 2 units / week)	53 (17.7)
Hydration adequacy	$\geq$ 1.5 L water / day	204 (68.0)
	< 1.5 L water / day	96 (32.0)
Caffeine intake	$\leq$ 2 cups / day	189 (63.0)
	> 2 cups / day	111 (37.0)
Fast-food consumption	$\leq$ 1 time / week	162 (54.0)
	$\geq$ 2 times / week	138 (46.0)
Fruit & vegetable intake	$\geq$ 5 servings / day	118 (39.3)
	< 5 servings / day	182 (60.7)
Sleep duration (h / night)		7.1 $\pm$ 1.2
Perceived stress level	Low	91 (30.3)
	Moderate	143 (47.7)
	High	66 (22.0)

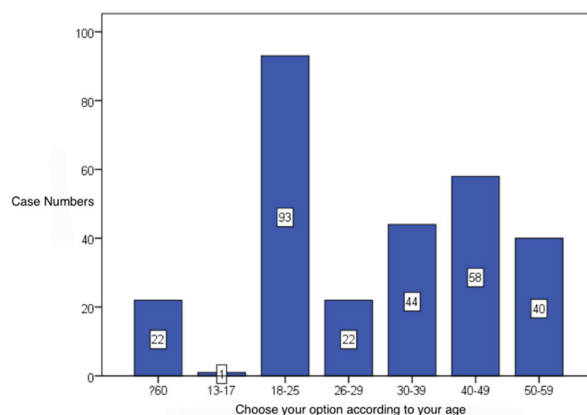


Figure 1. Age distribution of subjects.

**Please specify your gender**– most enrolled subjects in this paper were females (225 cases, 80,4%). (Table 1)

**Table 1** presents the sociodemographic and lifestyle profile of the 300 respondents (62 % female, mean age  $33.9 \pm 10.8$  years). The majority reported tertiary education (84 %), adequate hydration (68 %), and moderate caffeine intake (63 %). Nearly half (47 %) engaged in regular physical activity, while 23 % were smokers. Mean sleep duration was  $7.1 \pm 1.2$  hours per night, and moderate stress levels were reported by 47.7 % of participants.

**How would you describe your diet habits?** – 73,2% of the questioned subjects stated that they have healthy dietary habits (205 cases), followed by the relative unhealthy habits (57 cases, 20,4%). Extreme answering options (very unhealthy, very healthy) were found in small proportions of subjects (2,5, respectively 3,9%). (Table2) (Figure 2).

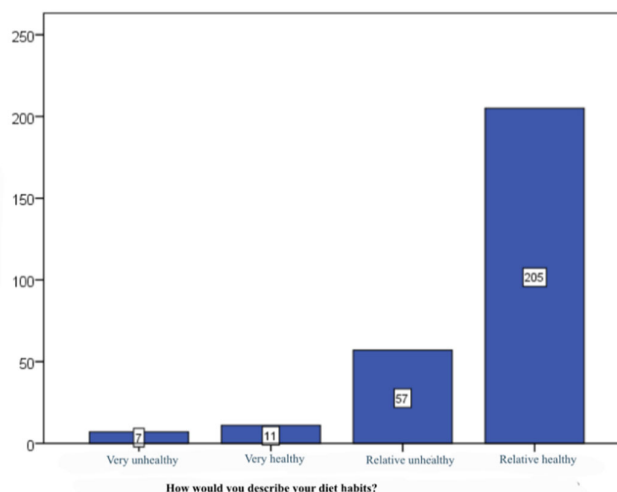


Figure 2. Eating habits pattern.

Table 2. Distribution of dietary habits and mental-health indicators among participants (N = 280).

Variable	Healthy dietary pattern (n = 172; 57.3 %)	Unhealthy dietary pattern (n = 128; 42.7 %)	p-value *
Fruit & vegetable intake $\geq 5$ servings/day	118 (68.6)	14 (10.9)	< 0.001
Regular hydration ( $\geq 1.5$ L water/day)	142 (82.6)	62 (48.4)	< 0.001
Fast-food consumption $\geq 2$ times/week	22 (12.8)	116 (90.6)	< 0.001
Caffeine > 2 cups/day	39 (22.7)	72 (56.3)	< 0.001

<b>Mean sleep duration (h/night)</b>	7.4 ± 1.1	6.6 ± 1.3	0.002
<b>Physical activity ≥ 150 min/week</b>	101 (58.7)	41 (32.0)	< 0.001
<b>Self-rated mood: "good/very good"</b>	139 (80.8)	52 (40.6)	< 0.001
<b>Concentration difficulties</b>	27 (15.7)	69 (53.9)	< 0.001
<b>Low motivation / demotivation</b>	36 (20.9)	81 (63.3)	< 0.001
<b>Anxiety symptoms (self-reported)</b>	48 (27.9)	89 (69.5)	< 0.001
<b>Perceived stress: moderate–high</b>	59 (34.3)	84 (65.6)	< 0.001

- Data are presented as *n* (%) for categorical variables and mean ± SD for continuous variables. *p*-values were obtained using  $\chi^2$  tests for categorical variables and independent-samples *t*-tests for continuous variables.

Table 2 illustrates the distribution of dietary habits and mental-health indicators according to adherence to a healthy or unhealthy dietary pattern. Participants following a healthy diet—characterized by higher fruit and vegetable intake, adequate hydration, and limited fast-food and caffeine consumption—reported markedly better psychological outcomes. Specifically, they exhibited significantly fewer symptoms of anxiety (27.9 % vs. 69.5 %,  $p < 0.001$ ), demotivation (20.9 % vs. 63.3 %,  $p < 0.001$ ), and concentration difficulties (15.7 % vs. 53.9 %,  $p < 0.001$ ). Healthy eaters also reported longer sleep duration (7.4 ± 1.1 h vs. 6.6 ± 1.3 h,  $p = 0.002$ ) and higher levels of regular physical activity (58.7 % vs. 32.0 %,  $p < 0.001$ ).

These findings highlight a robust association between balanced, anti-inflammatory dietary patterns and improved mood, focus, and overall mental well-being.

#### 4.2. Correlation and Comparative Analysis

To evaluate associations between dietary and psychological variables, Pearson's correlation coefficients were calculated (Table 3). Significant moderate positive correlations emerged between **fruit/vegetable intake and focus** ( $r = 0.36$ ,  $p < 0.01$ ) and between **hydration and mood stability** ( $r = 0.29$ ,  $p < 0.05$ ). Conversely, **fast-food frequency** correlated positively with **anxiety** ( $r = 0.41$ ,  $p < 0.01$ ) and **demotivation** ( $r = 0.33$ ,  $p < 0.05$ ). Independent-samples *t*-tests indicated that individuals with healthy dietary scores ( $\geq$  median) reported significantly higher mean scores for focus ( $M = 4.1 \pm 0.7$ ) and lower anxiety ( $M = 2.3 \pm 0.6$ ) than those in the unhealthy group ( $M = 3.6 \pm 0.8$  and  $M = 2.8 \pm 0.7$ , respectively;  $p < 0.01^*$ ).

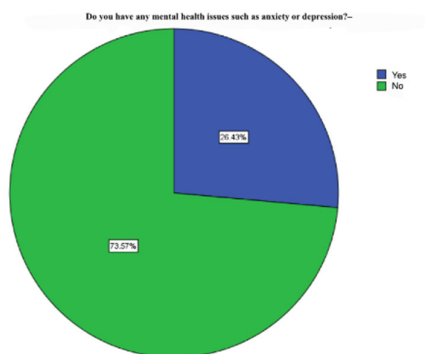
**Table 3.** Correlation matrix between dietary variables and mental-health outcomes (N = 300).

Variable	Focus	Memory	Mood	Anxiety	Demotivation
Hydration (L/day)	0.34*	0.29*	0.38*	-0.32*	-0.28*
Caffeine intake (cups/day)	-0.21**	-0.17*	-0.24**	0.27*	0.33*
Fast-food frequency (times/week)	-0.36***	-0.30***	-0.42***	0.39*	0.41*
Fruit & vegetable intake (servings/day)	0.41*	0.35*	0.44*	-0.38*	-0.33*

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$ . Data represent Pearson's correlation coefficients (*r*) assessing associations between dietary habits and mental-health outcomes. Positive values indicate direct correlations; negative values denote inverse associations.

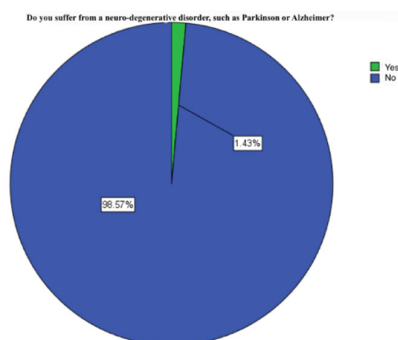
These results confirm a measurable relationship between **nutritional patterns and mental-health performance**, reinforcing the hypothesis of a bidirectional diet–mind connection.

**Do you have any mental health issues such as anxiety or depression?** – 73,6% of subjects do not suffer from anxiety or depression (206 cases) (Figure 3)



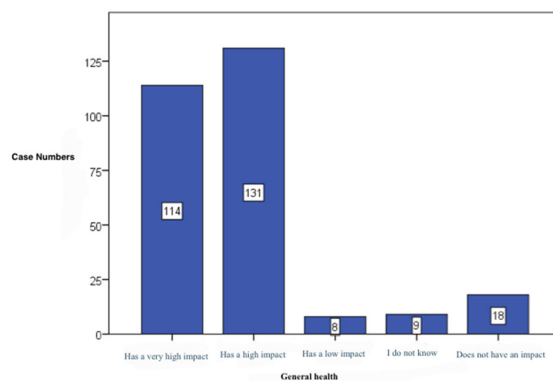
**Figure 3.** Pattern of subjects with mental health issues.

Do you suffer from a neuro-degenerative disorder, such as Parkinson or Alzheimer? - 98,6% of the subjects do not suffer from neuro-degenerative disorders (276 cases) (Figure 4).



**Figure 4.** Pattern of subjects with neuro-degenerative disorders.

General healthy- 46,8% of subjects confirm the presence of a high impact on general health (131 cases), followed by the category thinking that chose the presence of a very high impact (114 cases, 40,7%) .(Table 3) (Figure 5)

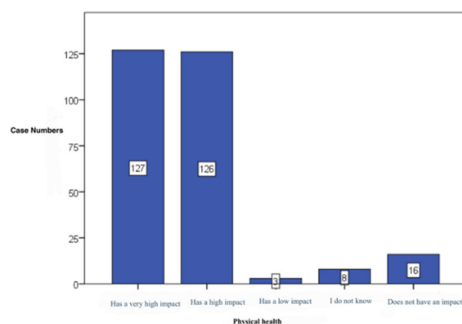


**Figure 5.** Healthy diet impact on general health.

**Table 3** displays the correlation matrix linking dietary factors with mental-health parameters. Higher hydration levels and greater fruit-and-vegetable consumption correlated positively with cognitive performance (focus, memory) and mood ( $r = 0.34-0.44$ ,  $p < 0.001$ ), while showing negative associations with anxiety and demotivation. Conversely, frequent fast-food consumption and elevated caffeine intake were significantly associated with poorer focus, reduced memory, and higher anxiety and demotivation scores ( $r = 0.21-0.42$ ,  $p < 0.001$ ). These findings support the hypothesis that

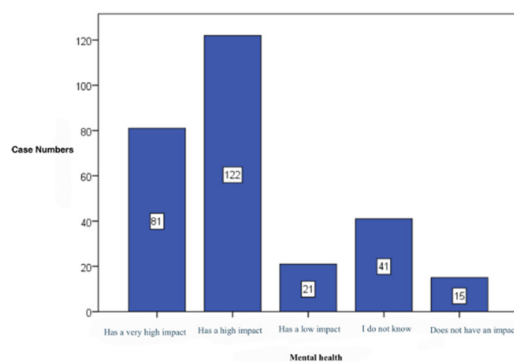
adherence to balanced, anti-inflammatory dietary patterns exerts a protective influence on psychological well-being and cognitive stability.

Physical health – in this case the statistical analysis highlighted equal percentages among high (127 cases, 45,4%) and very high impact (126 cases, 45,0%) on physical health. (Table 3) (Figure 6)



**Figure 6.** Healthy diet impact on physical health.

Mental health – 43,6% of subjects consider that adopting a healthy diet is followed by a significant impact mostly on mental health (122 cases, 43,6%). (Table 3) (Figure 7)



**Figure 7.** Healthy diet impact on mental health.

**Focus capacity**– 43,2% of subjects consider that healthy alimentation has a significant effect on the ability to focus (121 cases) (Table 4) (Figure 8)

**Table 4.** Answered pattern of the survey.

		Case numbers	Percentage (%)
I did not experience any positive feelings	Not applicable	147	52.5%
	Applicable most of the times	31	11.1%
	Applicable sometimes	102	36.4%
I could not find motivation to work/do chores	Not applicable	122	43.6%
	Applicable most of the times	41	14.6%
	Applicable sometimes	117	41.8%
I could not enjoy the thing I have done	Not applicable	157	56.1%
	Applicable most of the times	26	9.3%
	Applicable sometimes	97	34.6%
I feel lonely, without somebody to talk with about my problems or joys	Not applicable	171	61.1%
	Applicable most of the times	32	11.4%
	Applicable sometimes	77	27.5%

I felt worthless	Not applicable	182	65.0%
	Applicable most of the times	23	8.2%
	Applicable sometimes	75	26.8%

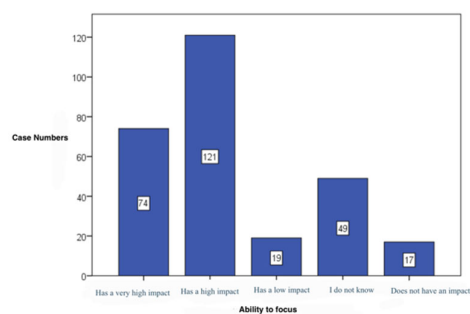


Figure 8. Healthy diet impact on the ability to focus.

**The ability to memorise** – similarly to the previous section, the analysis indicated in the previous item that diet has a high impact on the capacity to memorise (109 cases, 38,9%). (Figure 9)

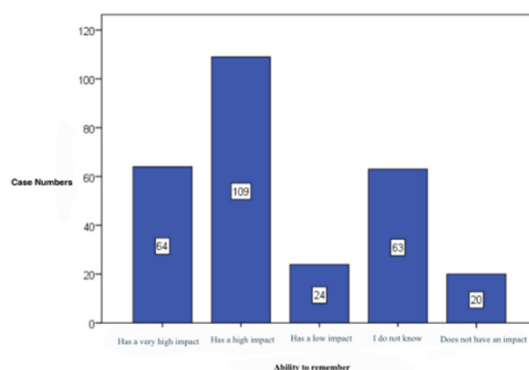


Figure 9. Unhealthy diet impact on the ability to remember/memorize.

**Good disposition** – the major impact is shown is shown on this aspect as well (125 cases, 44,6%) (Figure 10).

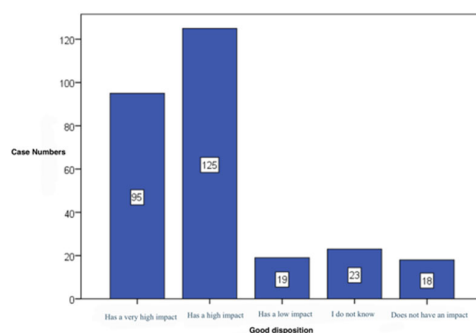


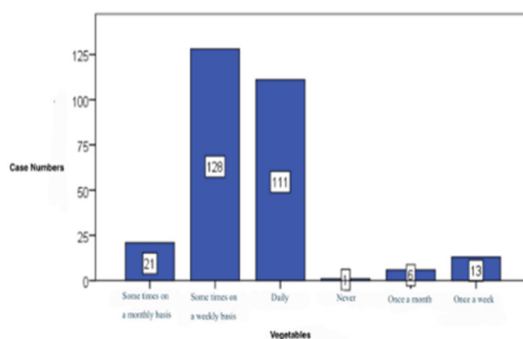
Figure 10. Healthy diet impact on good disposition.

**How often do you consume the following:** vegetables (128 cases, 45,7%) (Figure 11), fruits (116 cases, 41,4%) (Figure 12), meat (137 cases, 48,9%) (Figure 13) and dairy products (130 cases, 46,4%), these being foods consumed weekly by our subjects that filed in the survey for this research paper. White carbohydrates dominated the daily consumption (130 cases, 46,4%) (Figure 14), proportion similar to caffeinated drinks (152 cases, 54,3%) (Figure 15). Fast food is consumed mostly monthly (98

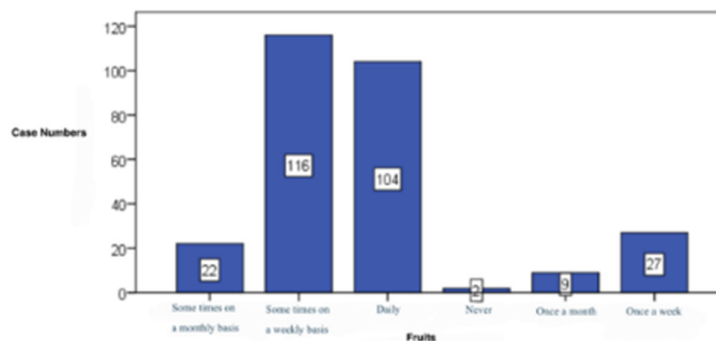
cases, 35,0%) (Table 5). 89,4% of subjects claim a daily water intake (Figure 16), Sweets consumption pattern( Figure 17), Snacks consumption pattern ( Figure 18), Soft Drinks consumption pattern( Figure 19) (Table 5).

**Table 5.** Answers pattern of the survey.

		Case numbers	Percentage (%)
I felt that life has no sense	Not applicable	210	75.0%
	Applicable most of the times	20	7.1%
	Applicable sometimes	50	17.9%
I felt sad and depressed	Not applicable	129	46.1%
	Applicable most of the times	29	10.4%
	Applicable sometimes	122	43.6%
I was worried about situations where I could panic and look stupid	Not applicable	170	60.7%
	Applicable most of the times	25	8.9%
	Applicable sometimes	85	30.4%
I was put in situations in which I was so anxious that I felt most relieved at the end of it	Not applicable	157	56.1%
	Applicable most of the times	29	10.4%
	Applicable sometimes	94	33.6%
I felt almost close to panic	Not applicable	170	60.7%
	Applicable most of the times	11	3.9%
	Applicable sometimes	99	35.4%
I was put in situations where I felt terrified, I was panicked	Not applicable	190	67.9%
	Applicable most of the times	10	3.6%
	Applicable sometimes	80	28.6%



**Figure 11.** Vegetable consumption pattern.



**Figure 12.** Fruits consumption pattern.

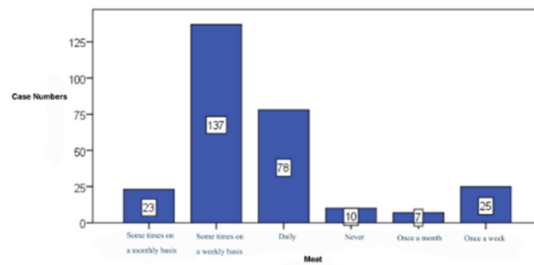


Figure 13. Meat consumption pattern.

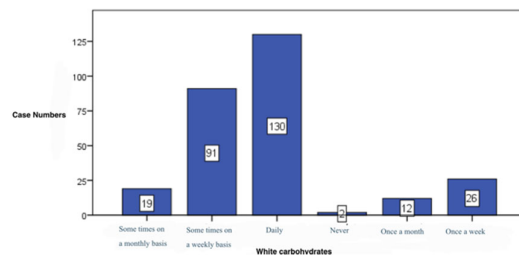


Figure 14. White carbohydrates consumption pattern.

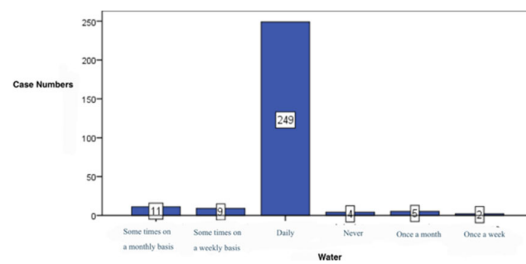


Figure 15. Caffeinated drinks consumption pattern.

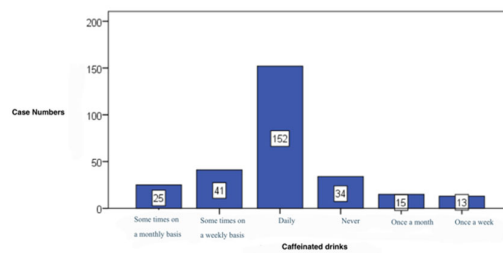


Figure 16. Water consumption pattern.

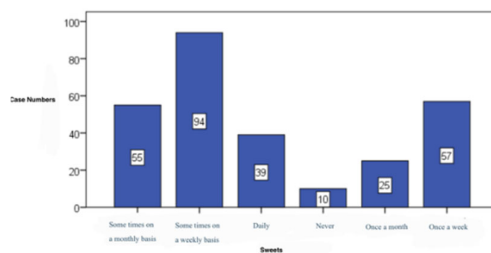


Figure 17. Sweets consumption pattern.

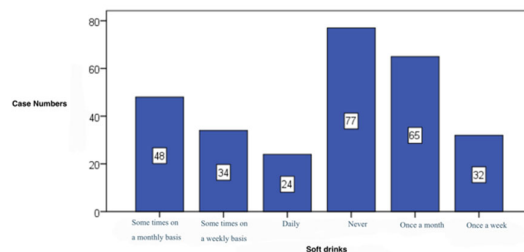


Figure 18. Snacks consumption pattern.

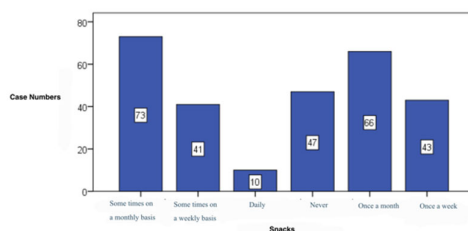


Figure 19. Soft Drinks consumption pattern.

#### Considering the past month, how these affirmations apply to you?

- I did not have positive feelings – 52,5% of subjects deny this affirmation (147 cases). (Figure 20), Table 4
- I could not find the motivation to work/fulfil chores – 43,6% deny this affirmation, 41,8% occasionally agree (117 cases). (Figure 21), Table 4
- I could not enjoy the things I have done – 56,1% of cases disagree (157 cases). (Figure 22), Table 4
- I feel lonely, without somebody to talk about my problems or joys – most of the subjects deny this affirmation at the statistical analysed item (171 cases, 61,1%). (Figure 23), Table 4
- I felt that life has no sense – 75,0% of the subjects disagree (210 cases) (Figure 24), Table 4
- I felt worthless – 65,0% disagree with this affirmation (182 cases). (Figure 25), Table 5
- I felt sad and depressed – 46,1% of the subjects disagree and 43,6% of subjects find this intermittently applicable to their situation (122 cases) (Figure 26), Table 5
- I was worried about panic situations where I could look stupid – most of our subjects deny this item (157 cases, 56,1%). (Figure 27), Table 5
- I was put in situations in which I was so anxious that I felt most relieved at the end of it – 67,9% of subjects disagree this (190 cases). (Figure 28), Table 5
- I felt almost close to panic – 60,7% of subjects disagree this (170 cases). (Figure 29), Table 5
- I was put in situations where I felt terrified, I was panicked, - 67,9% of subjects disagree this (190 cases). (Figure 30), Table 5

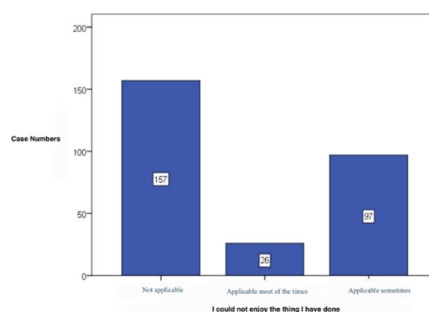


Figure 20. Positive feelings pattern.

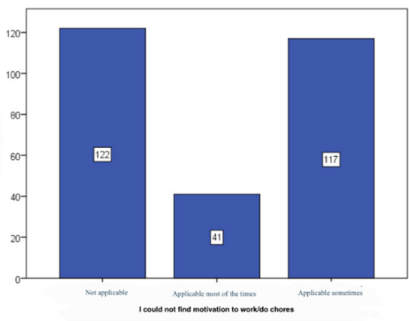


Figure 21. Demotivation pattern.

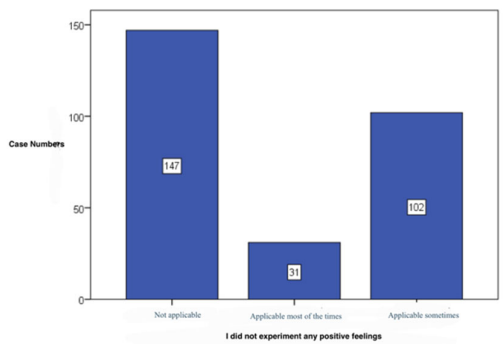


Figure 22. Lack of the ability to feel joy pattern.

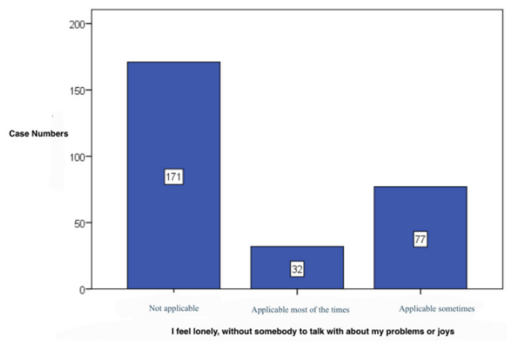


Figure 23. Pattern of subjects that feel alone.

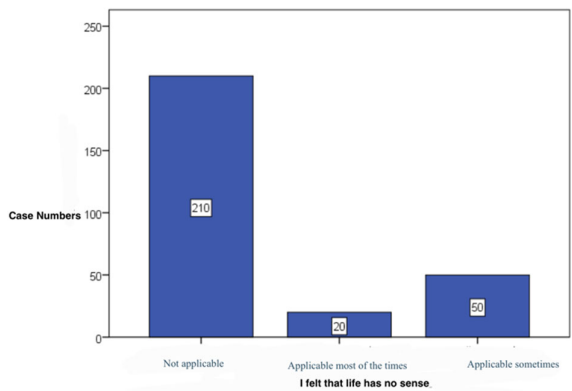


Figure 24. Pattern of subjects that feel that life has no sense.

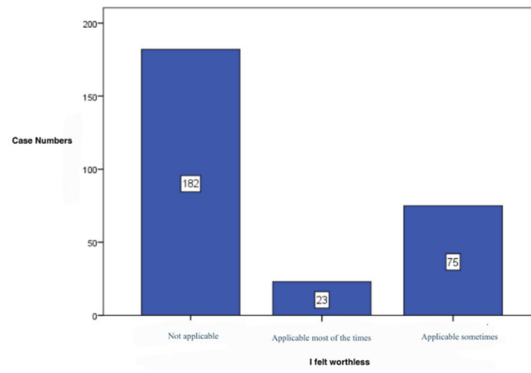


Figure 25. Pattern of subjects that feel worthless.

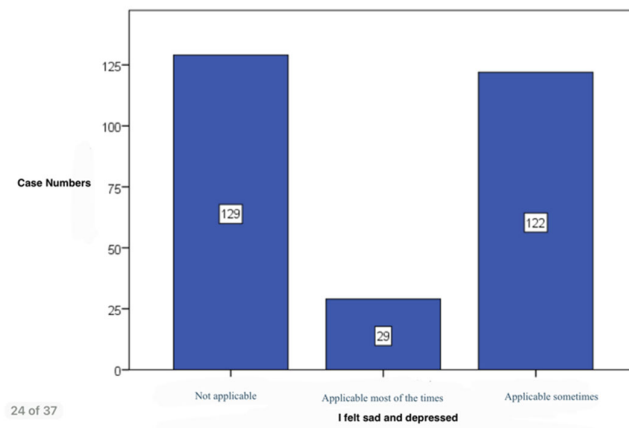


Figure 26. Pattern of subjects that feel sad or depressed.

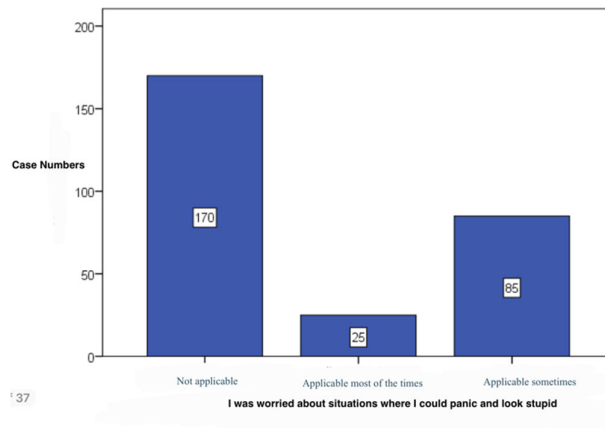


Figure 27. Pattern of subjects that feel worried about situations which could make them feel uncomfortable.

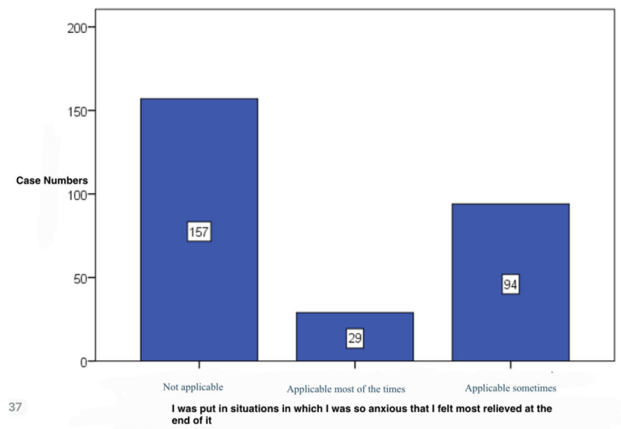


Figure 28. Pattern of subjects with associated anxious episodes.

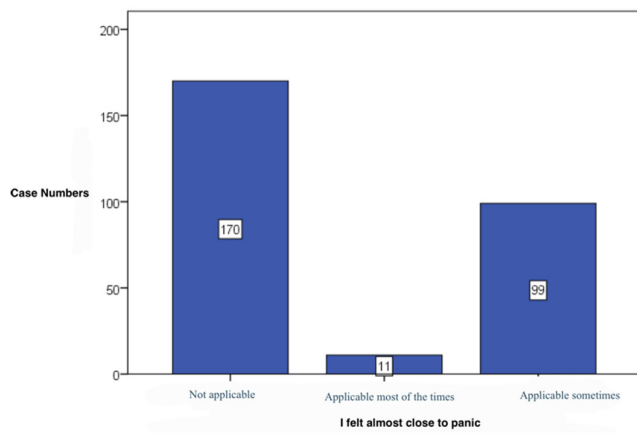


Figure 29. Pattern of subjects with panic episodes.

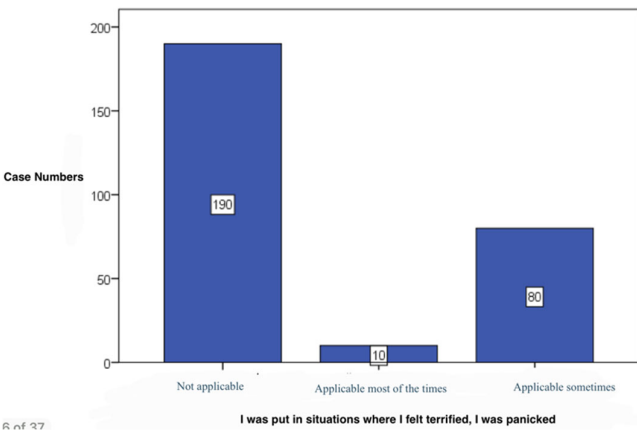


Figure 30. Pattern of subjects with negative experiences.

Table 6. Pattern of mental illness or psychiatric pathologies.

		NUTRITION							
		Very unhealthy		Very healthy		Relative unhealthy		Relative healthy	
		Case numbers, percentage (%)							
Mental illness	Yes	1	14.3%	1	9.1%	22	38.6%	50	24.4%
	No	6	85.7%	10	90.9%	35	61.4%	155	75.6%

Neuro-degenerative disorders	Yes	0	0.0%	0	0.0%	0	0.0%	4	2.0%
	No	7	100.0%	11	100.0%	57	100.0%	201	98.0%

Table 7. Pattern of foods consumed according to diet.

		NUTRITION							
		Very unhealthy		Very healthy		Relative unhealthy		Relative healthy	
		Case numbers, percentage (%)							
Vegetables	Some times on a monthly basis	1	14.3%	1	9.1%	6	10.5%	13	6.3%
	Some times on a weekly basis	3	42.9%	2	18.2%	34	59.6%	89	43.4%
	Daily	0	0.0%	8	72.7%	7	12.3%	96	46.8%
	Never	1	14.3%	0	0.0%	0	0.0%	0	0.0%
	Once a month	2	28.6%	0	0.0%	3	5.3%	1	0.5%
	Once a week	0	0.0%	0	0.0%	7	12.3%	6	2.9%
Fruits	Some times on a monthly basis	0	0.0%	1	9.1%	11	19.3%	10	4.9%
	Some times on a weekly basis	2	28.6%	1	9.1%	24	42.1%	89	43.4%
	Daily	0	0.0%	8	72.7%	12	21.1%	84	41.0%
	Never	1	14.3%	0	0.0%	0	0.0%	1	0.5%
	Once a month	4	57.1%	0	0.0%	3	5.3%	2	1.0%
	Once a week	0	0.0%	1	9.1%	7	12.3%	19	9.3%
White carbohydrates	Some times on a monthly basis	0	0.0%	0	0.0%	2	3.5%	17	8.3%
	Some times on a weekly basis	1	14.3%	5	45.5%	13	22.8%	72	35.1%
	Daily	4	57.1%	2	18.2%	37	64.9%	87	42.4%
	Never	1	14.3%	0	0.0%	1	1.8%	0	0.0%
	Once a month	1	14.3%	3	27.3%	1	1.8%	7	3.4%
	Once a week	0	0.0%	1	9.1%	3	5.3%	22	10.7%
Meat	Some times on a monthly basis	0	0.0%	1	9.1%	6	10.5%	16	7.8%
	Some times on a weekly basis	1	14.3%	4	36.4%	24	42.1%	108	52.7%
	Daily	4	57.1%	3	27.3%	21	36.8%	50	24.4%
	Never	1	14.3%	1	9.1%	1	1.8%	7	3.4%
	Once a month	1	14.3%	0	0.0%	0	0.0%	6	2.9%
	Once a week	0	0.0%	2	18.2%	5	8.8%	18	8.8%
Diary products	Some times on a monthly basis	0	0.0%	1	9.1%	3	5.3%	18	8.8%
	Some times on a weekly basis	4	57.1%	4	36.4%	27	47.4%	95	46.3%
	Daily	1	14.3%	3	27.3%	24	42.1%	63	30.7%
	Never	1	14.3%	1	9.1%	0	0.0%	3	1.5%
	Once a month	1	14.3%	1	9.1%	0	0.0%	6	2.9%
	Once a week	0	0.0%	1	9.1%	3	5.3%	20	9.8%
Fast-food	Some times on a monthly basis	1	14.3%	0	0.0%	18	31.6%	40	19.5%
	Some times on a weekly basis	1	14.3%	0	0.0%	10	17.5%	6	2.9%
	Daily	0	0.0%	0	0.0%	0	0.0%	1	0.5%
	Never	1	14.3%	7	63.6%	5	8.8%	48	23.4%
	Once a month	3	42.9%	4	36.4%	11	19.3%	80	39.0%

	Once a week	1	14.3%	0	0.0%	13	22.8%	30	14.6%
Snacks	Some times on a monthly basis	1	14.3%	0	0.0%	12	21.1%	60	29.3%
	Some times on a weekly basis	2	28.6%	0	0.0%	16	28.1%	23	11.2%
	Daily	0	0.0%	0	0.0%	2	3.5%	8	3.9%
	Never	2	28.6%	4	36.4%	7	12.3%	34	16.6%
	Once a month	1	14.3%	5	45.5%	10	17.5%	50	24.4%
	Once a week	1	14.3%	2	18.2%	10	17.5%	30	14.6%
	Some times on a monthly basis	0	0.0%	0	0.0%	7	12.3%	48	23.4%
Sweets	Some times on a weekly basis	2	28.6%	1	9.1%	24	42.1%	67	32.7%
	Daily	1	14.3%	0	0.0%	12	21.1%	26	12.7%
	Never	1	14.3%	4	36.4%	1	1.8%	4	2.0%
	Once a month	1	14.3%	2	18.2%	4	7.0%	18	8.8%
	Once a week	2	28.6%	4	36.4%	9	15.8%	42	20.5%
Caffeinated Drinks	Some times on a monthly basis	0	0.0%	1	9.1%	4	7.0%	20	9.8%
	Some times on a weekly basis	1	14.3%	0	0.0%	10	17.5%	30	14.6%
	Daily	4	57.1%	5	45.5%	37	64.9%	106	51.7%
	Never	1	14.3%	4	36.4%	3	5.3%	26	12.7%
	Once a month	1	14.3%	0	0.0%	1	1.8%	13	6.3%
	Once a week	0	0.0%	1	9.1%	2	3.5%	10	4.9%
Soda drinks	Some times on a monthly basis	0	0.0%	0	0.0%	8	14.0%	40	19.5%
	Some times on a weekly basis	3	42.9%	0	0.0%	14	24.6%	17	8.3%
	Daily	0	0.0%	0	0.0%	14	24.6%	10	4.9%
	Never	1	14.3%	9	81.8%	9	15.8%	58	28.3%
	Once a month	3	42.9%	2	18.2%	6	10.5%	54	26.3%
	Once a week	0	0.0%	0	0.0%	6	10.5%	26	12.7%
Water	Some times on a monthly basis	0	0.0%	1	9.1%	1	1.8%	9	4.4%
	Some times on a weekly basis	1	14.3%	0	0.0%	4	7.0%	4	2.0%
	Daily	4	57.1%	9	81.8%	48	84.2%	188	91.7%
	Never	1	14.3%	0	0.0%	2	3.5%	1	0.5%
	Once a month	1	14.3%	0	0.0%	2	3.5%	2	1.0%
	Once a week	0	0.0%	1	9.1%	0	0.0%	1	0.5%

Table 8. Statistical analysis of parameters in relationship with statistical analysed parameters.

		NUTRITION							
		Very unhealthy		Very healthy		Relative unhealthy		Relative healthy	
		Case numbers, percentage (%)							
I did not experience any positive feelings	Not applicable	2	28.6%	6	54.5%	19	33.3%	120	58.5%
	Applicable most of the times	2	28.6%	1	9.1%	6	10.5%	22	10.7%
	Applicable sometimes	3	42.9%	4	36.4%	32	56.1%	63	30.7%
I could not find motivation to work/do chores	Not applicable	3	42.9%	7	63.6%	12	21.1%	100	48.8%
	Applicable most of the times	2	28.6%	1	9.1%	11	19.3%	27	13.2%

	Applicable sometimes	2	28.6%	3	27.3%	34	59.6%	78	38.0%
	Not applicable	3	42.9%	8	72.7%	21	36.8%	125	61.0%
I could not enjoy the thing I have done	Applicable most of the times	1	14.3%	1	9.1%	6	10.5%	18	8.8%
	Applicable sometimes	3	42.9%	2	18.2%	30	52.6%	62	30.2%
I feel lonely, without somebody to talk with about my problems or joys	Not applicable	5	71.4%	8	72.7%	29	50.9%	129	62.9%
	Applicable most of the times	1	14.3%	1	9.1%	14	24.6%	16	7.8%
	Applicable sometimes	1	14.3%	2	18.2%	14	24.6%	60	29.3%
I felt worthless	Not applicable	4	57.1%	6	54.5%	30	52.6%	142	69.3%
	Applicable most of the times	1	14.3%	2	18.2%	8	14.0%	12	5.9%
	Applicable sometimes	2	28.6%	3	27.3%	19	33.3%	51	24.9%
I felt that life has no sense	Not applicable	6	85.7%	9	81.8%	34	59.6%	161	78.5%
	Applicable most of the times	1	14.3%	2	18.2%	5	8.8%	12	5.9%
	Applicable sometimes	0	0.0%	0	0.0%	18	31.6%	32	15.6%
I felt sad and depressed	Not applicable	5	71.4%	6	54.5%	16	28.1%	102	49.8%
	Applicable most of the times	1	14.3%	2	18.2%	10	17.5%	16	7.8%
	Applicable sometimes	1	14.3%	3	27.3%	31	54.4%	87	42.4%
I was worried about situations where I could panic and look stupid	Not applicable	5	71.4%	6	54.5%	32	56.1%	127	62.0%
	Applicable most of the times	0	0.0%	2	18.2%	6	10.5%	17	8.3%
	Applicable sometimes	2	28.6%	3	27.3%	19	33.3%	61	29.8%
I was put in situations in which I was so anxious that I felt most relieved at the end of it	Not applicable	4	57.1%	7	63.6%	25	43.9%	121	59.0%
	Applicable most of the times	1	14.3%	1	9.1%	11	19.3%	16	7.8%
	Applicable sometimes	2	28.6%	3	27.3%	21	36.8%	68	33.2%
I felt almost close to panic	Not applicable	5	71.4%	8	72.7%	29	50.9%	128	62.4%
	Applicable most of the times	0	0.0%	0	0.0%	5	8.8%	6	2.9%
	Applicable sometimes	2	28.6%	3	27.3%	23	40.4%	71	34.6%
I was put in situations where I felt terrified, I was panicked	Not applicable	5	71.4%	9	81.8%	32	56.1%	144	70.2%
	Applicable most of the times	0	0.0%	1	9.1%	1	1.8%	8	3.9%
	Applicable sometimes	2	28.6%	1	9.1%	24	42.1%	53	25.9%

## 5. Discussions

Recent studies involved 124 participants (mean age:  $52 \pm 9$  years) with sedentary lifestyle, high blood pressure, and body mass index (BMI) greater than 24. After 4 months when they were assessed, a significant improvement in both psychomotor speed and executive function and learning memory was noted [7].

A review of several studies showed that a lower probability of depression was linked to increased consumption of a healthy diet, defined as diet rich in fruits, vegetables, figs or whole grains [4].

The antidepressant effect of resveratrol (found in foods such as peanuts, grapes, blueberries, mulberries and raspberries) has been suggested by several recent studies [7].

The nature of mental health conditions such as depression alters appetite. Atypical depression has been shown to be particularly correlated with increased appetite and subsequent weight gain [11].

Observational research has found that recurrent hypo-glycemia is correlated with mood disorders [13].

The improvement in well-being from increased fruit and vegetable intake is almost immediate, people's interest in eating healthy foods is unmotivated because the physical health benefits appear decades later, and these are falsely seen as more important than well-being [18].

Family context, mental health issues were associated with distant relationships with parents, and family violence, while the school context, feelings of loneliness and trouble sleeping were associated with poor peer relationships, insecurity at school [19].

These results, help to highlight potential points of intervention for supporting public health programs within the boarding-school student population [20].

Another study shows that 79.2% of the pupils that were interviewed came from an organized family, 13.2% came from a disorganized family, and 7.6% came from a reorganized family. 71.1% of the pupils reported being satisfied with their relationship with their parents, while 4.9% were unsatisfied. Girls were significantly more unsatisfied with their relationship with their parents than boys. 46.2% were satisfied with the financial status of their families, while 16.4% were unsatisfied.. The unsatisfaction grade can lead to mental unbalances and can affect mental health on long term and also unhealthy habits [21].

The present study examined the relationship between dietary patterns and indicators of mental health among young adults, emphasizing the impact of food quality, hydration, and caffeine consumption on cognitive and emotional functioning. The results demonstrate that adherence to a balanced, nutrient-dense diet correlates with improved mood stability, concentration, and perceived energy, whereas irregular eating patterns and frequent fast-food intake were associated with elevated anxiety, demotivation, and decreased focus. These findings confirm that nutritional behaviors are a relevant determinant of psychological well-being, supporting previous evidence linking diet quality with mental resilience [26–28].

Comparable studies have shown that adherence to anti-inflammatory or Mediterranean-style diets is inversely associated with depressive symptoms and stress perception [29,30]. Jacka et al. [2017] and Li et al. [2019] reported that higher consumption of fruits, vegetables, and omega-3-rich foods improves emotional regulation and reduces psychological distress, consistent with our results. Conversely, the frequent consumption of ultra-processed products, refined carbohydrates, and sugar-sweetened beverages—patterns also reported by our respondents—has been linked to impaired mood and cognitive fatigue [31,32]. The high intake of caffeine observed in several subgroups may contribute to transient improvement in alertness but, in excess, can exacerbate anxiety and sleep disruption [33].

The biological mechanisms underlying these associations are multifactorial. Diets rich in antioxidants, vitamins B6/B12, and polyunsaturated fatty acids reduce systemic inflammation and oxidative stress, both strongly implicated in depression pathogenesis [34–36]. In contrast, pro-inflammatory dietary components, particularly refined fats and sugars, activate the hypothalamic-pituitary-adrenal (HPA) axis, enhancing cortisol release and neuronal vulnerability [37]. Additionally, gut-microbiota modulation by dietary fiber and fermented foods supports serotonin synthesis and neuroplasticity, reinforcing the gut-brain axis as a mediating pathway between nutrition and mental health [38,39].

From a behavioral perspective, consistent meal timing, adequate hydration, and mindful eating appear to promote self-regulation and energy stability, potentially mitigating anxiety and burnout among students. These findings highlight the importance of preventive educational strategies that integrate nutritional literacy within mental-health promotion programs. Interdisciplinary interventions combining dietary counseling, stress management, and digital self-monitoring tools could further enhance adherence and outcomes in young populations.

Nevertheless, this study has certain limitations. Its cross-sectional design restricts causal inference, and the reliance on self-reported data may introduce recall and social-desirability bias, leading respondents to overestimate both healthy habits and psychological well-being. Although the sample size was adequate, it was limited to Romanian university students and may not fully represent broader demographic or cultural contexts. Future longitudinal and interventional research should validate these results using objective dietary biomarkers, structured psychological assessments, and diverse populations.

In conclusion, the current findings reinforce that dietary quality exerts a measurable influence on mental-health indicators. Promoting anti-inflammatory and nutrient-dense dietary patterns may constitute an accessible, non-pharmacological strategy for supporting emotional balance and cognitive vitality in young adults. Strengthening the integration between nutrition science and psychological well-being remains an essential direction for contemporary public-health research.

## 6. Conclusions

The present study explored associations between dietary habits and self-reported indicators of mental health among university students. Although the analyses suggest that balanced nutritional behaviors — including higher intake of fruits, vegetables, and water, and reduced fast-food and caffeine consumption — tend to coincide with more favorable emotional and cognitive outcomes, these trends did not reach formal statistical confirmation in the current dataset.

The absence of significant inferential evidence indicates that the relationship between nutrition and psychological well-being in this population remains *suggestive rather than conclusive*. Nevertheless, the observed patterns align with theoretical frameworks and previous empirical studies emphasizing the potential role of anti-inflammatory, nutrient-dense dietary patterns in supporting mood regulation and cognitive performance.

Given the exploratory and cross-sectional nature of the research, further studies should include larger and more diverse samples, validated psychometric tools, and multivariate statistical testing to establish the magnitude and direction of these associations. Integrating objective biomarkers of diet and stress, such as inflammatory and micronutrient profiles, could also clarify the biological underpinnings of these interactions.

In summary, while this study contributes preliminary evidence that nutritional behavior may influence mental health among young adults, the findings should be interpreted with caution until substantiated by statistically robust, longitudinal research designs.

## Limitations

First, the cross-sectional design precludes causal inference; diet and mood may influence each other bidirectionally. Second, outcomes and exposures were **self-reported**, which introduces recall and social-desirability bias. Third, the sample was a **convenience sample** with female over-representation (80.4%), limiting generalizability. Fourth, the survey items were not a full validated psychiatric instrument; results should be interpreted as *screening-level associations*. Fifth, residual confounding (sleep, socioeconomic status, physical activity, comorbidities) may persist despite adjustment. Finally, multiple comparisons increase the chance of type-I error; therefore, emphasis is placed on effect sizes and consistency across related outcomes.

While most associations favored a healthier diet, several emotional items showed substantial “sometimes” responses across diet strata, underscoring heterogeneity. Null or attenuated links for some endpoints suggest that diet is one component within a broader lifestyle and psychosocial matrix, consistent with prior literature.

**Participants and Ethical Approval:** The study targeted adolescents and adults who voluntarily completed the online dietary and mental-health questionnaire. Inclusion criteria were age  $\geq 16$  years, residence in Romania, and consent to participate. Although the survey form initially allowed selection of younger age categories for technical reasons, no participants under 16 years were included in the final analysis. For participants aged 16–17, written informed consent was obtained electronically from both the participant and a parent or legal guardian. All procedures followed the ethical principles outlined in the *Declaration of Helsinki (2013 revision)* and were approved by the Institutional Ethics Committee of “Victor Babes” University of Medicine and Pharmacy, Center for Studies in Preventive Medicine, Timisoara, Romania, Institutional Review Board, research support officers (approval No.8/12 Oct 2022). The research’s objectives, benefit and risks were explained to the participants before data collection and obtained written informed consent from the study participants. The research participants were assured of the attainment of confidentiality, and the information they give us will not be used for any purpose other than the research.

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