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[Oana Codruta Bacean Miloicov](#)^{*}, Georgiana Patricia Sitaru , Gabriel Cristian Vacaru , [Ciprian Ioan Borca](#) , Mihaela Cristina Simbrac , [Roxana Folescu](#) , Aljafari Rakan Adnan Mohammad Mohammad

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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. There has been a distinctive link between daily caffeine consumption which is associated with an unhealthy diet and unhealthy diet behaviours. 24,6% of subjects with an unhealthy diet and 4,9% of those with relative healthy diet agree daily consumption of soda drinks. Negative feelings, with a significant emotional impact were reported in most of the cases or in superior proportions in subjects with an unhealthy diet (prevailing or intermittent), proving that unhealthy habits might have an important effect on mental health, while exacerbating mental health disorders.

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

1. Introduction

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 or neurological disorders, the link between behaviour and mental health status and dietary patterns as well as the effects of healthy foods, on brain function and wellbeing.

1.1. Nutrition Impact on Brain Health

The high amounts of vitamins, minerals and antioxidants found in high quality food products nourish and protect the brain from oxidative stress and metabolites derived from oxygen consumption reactions from the rest of the body [1].

After ingesting food, secretion of peptides or hormones such as GLP1 (glucagon-like peptide 1) and insulin reach the hypothalamus and hippocampus to activate transduction ways involved in synaptic activation, contributing to memory and learning [2]. Physical activity and diet can influence mitochondrial energy production while the produced ATP might trigger the neurotrophic brain derived factor and insulin growth factor 1 (IGF1) which keeps synaptic plasticity, neuronal excitability and cognitive function [2]. A study that analysed an elderly population found out that consuming more than 58% calories derived from carbohydrates doubles the risk of light mental failure and dementia [3]. Excessive calories may increase cell dysfunction and reduce synaptic plasticity [2]. Many “antioxidant diets” are becoming more and more popular for their beneficial effects on the neuronal function, for instance forest fruits have a high antioxidant property [2].

Micronutrients intake such as vitamins or minerals has been correlated with a better emotion control and less aggressivity among children with ADHD, while a recent meta-analysis claims that a diet rich in refined sugars and saturated fats can increase the risk of hyperreactivity and ADHD compared with a protective effect of diet rich in vegetables and fruits [4].

1.2. Dementia and Alzheimer Disease

Interest has been shown in analysing Mediterranean diet and diet approaches that stop hypertension (DASH) as model diets that have potential strategies of dementia prevention thanks to their anti-inflammatory and cardioprotective influence [5].

Alpha lipoic acid found in meat, especially in heart and vegetables: potatoes, spinach and broccoli, represents a coenzyme that maintains energetic mitochondrial homeostasis, decreases cognitive degradation in small patient groups with Alzheimer disease while improving memory in mammals with Alzheimer [2]. Trans artificial fats could damage brain and can be found in margarine, sweet glazes, snacks and cakes being associated with Alzheimer disease and memory illness [3].

Caloric restriction may have a neuroprotective effect through mitochondrial function enhancement leading to an increase in energy production and suppressing reactive oxygen species production

Caloric restriction has anti-inflammatory effects by blocking interleukins (IL6, IL1 β , IL4, IL2) and necrosis factors synthesis [6].

2. Diet and Cognition

Epidemiological studies show that the risk of developing Alzheimer disease is not present in subjects having a regular less caloric intake. In a recent case control study based on population, reports show that a high caloric intake is linked with a double risk of having a slight cognitive decline [7].

The Finnish study of geriatric intervention for preventing cognitive disorders and disabilities (FINGER) managed to slow down some cognition decline signs and symptoms by combining physical activity, diet and cognitive training with specific intake of fats, proteins, carbohydrates and small sugar quantities [8].

Fasting

Neuroprotective properties of diet can be linked with an increased concentration of ketonic bodies and biochemical changes that occur in the body as a result of glycolysis inhibition [6]. A 48hours fasting proved an increase of parasympathetic system and a decrease of the frontal cerebral recess activity and improved prefrontal cortex cognitive functions such as metal flexibility [9]. A mice study that took part in an intermittent fasting regimen indicated a decrease in hippocampus neuronal degeneration [7].

3. Diet as a Treatment

Animal studies showed evidence of Western dietary model impact on Alzheimer Disease markers and cerebral insulin signalling [10]. It is well known that the development of dementia is linked with inflammatory risk factors such as: metabolic syndromes, obesity, insulin resistance, type 2 diabetes and hypertension [11]. A meta-analysis of multiple studies highlighted a longitudinal relationship between obesity and depression, observing that depression predisposes to obesity with 55% and vice versa [11].

Eating and Behaviour

The global burden of mental illnesses, both in terms of disability and financial costs competes with all kinds of neoplasm, combined. Furthermore, unipolar depression represents the first cause of disability in high & medium -income countries [12]. High consumption of processed glucides might increase the risk of anxiety and depression through rapid frequent glucose spikes [13].

There are proofs that light dehydration can affect mood and cognitive performance by inducing a negative influence on memory and vigilance, escalation of anxiety, tension and fatigue [14]. It has been also shown in recent studies that N-acetyl cysteine represents a potential therapeutic option for drug abuse, gambling, schizophrenia, depression and bipolar disorder as people consume certain foods as a response to positive and negative emotions [15,16].

4. Nutrition and Mental Health

4.1. Autism

Studies show that ASD (autistic syndrome disorder) patients that stick to a diet without gluten and casein (GFCF- Gluten free Casein free) significantly decreased intestinal permeability compared to healthy individuals (32). GFCF indicated improvements in behaviours and psychological, also in vocal communication and non-vocal, dis and attention, aggressive episodes, motor skills, affection, rituals and routine, learning responses, sleep, empathy and anxiety [17].

4.2. Nutritional Psychiatry

Animal research indicated that the link between appetitive and affective symptoms comes from the neurochemical effects of eating high-carbohydrate and low protein foods, reacts through insulin increasing levels of tryptophane in the brain, facilitating the production of serotonin [18].

5. Experiments Performed in This Study

5.1. 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.

5.2. Research Materials

Ensuing two survey models: "Survey about healthy eating habits", "The Effect of healthy diet and Fermented Foods on Mental Health", continuous variables presented mean ± 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. Also, statistical analyses including odds ratio (OR) were performed in IBM SPSS Statistics (Statistical Package for The Social Sciences) version 20.

5.3. Results

Statistical Analysis of Demographic Data

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. Statistical analysis of demographic data.

		Case number	Percentage (%)
Age	≥60	22	7.9%
	13-17	1	0.4%
	18-25	93	33.2%
	26-29	22	7.9%
	30-39	44	15.7%
	40-49	58	20.7%
	50-59	40	14.3%
Gender	Female	225	80.4%
	Male	55	19.6%

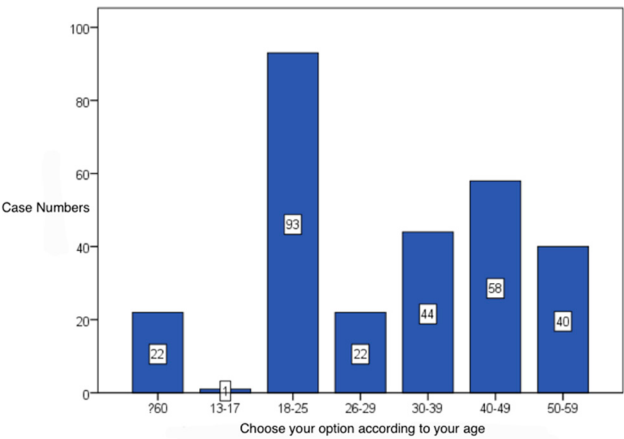


Figure 1. Age distribution of subjects.

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

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%). (Table 2) (Figure 2)

Table 2. Stake of eating habits answers .

		Case number	Percentage (%)
Eating habits	Very unhealthy	7	2.5%
	Very healthy	11	3.9%
	Relative unhealthy	57	20.4%
	Relative healthy	205	73.2%
Mental health issues	Yes	74	26.4%
	No	206	73.6%
Neuro-degenerative disorders	Yes	4	1.4%
	No	276	98.6%

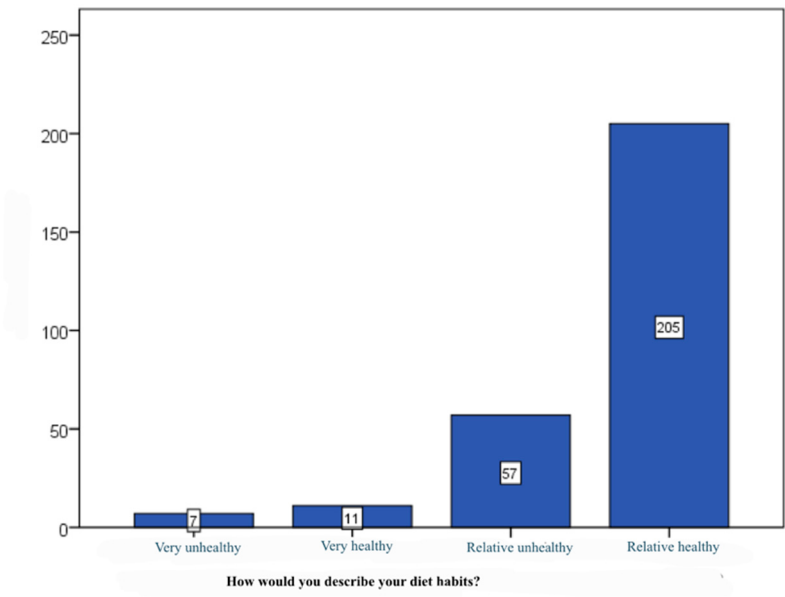


Figure 2. Eating habits stake.

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)

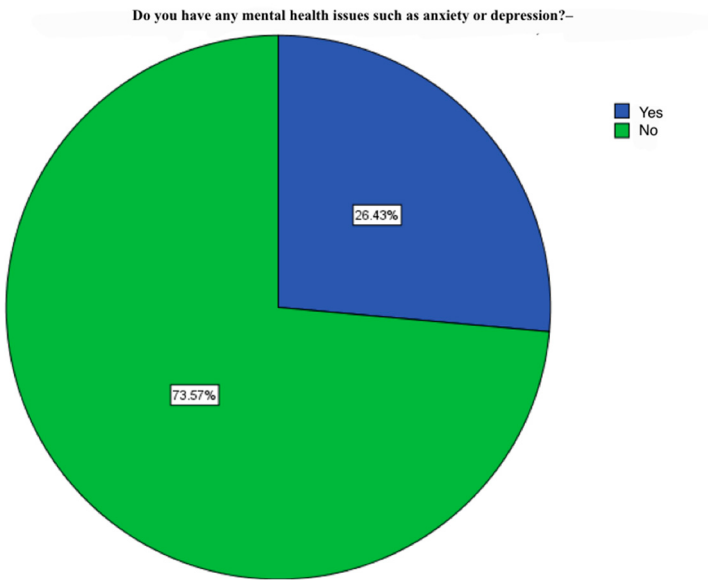


Figure 3. Stake of subjects with mental health issues.

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)

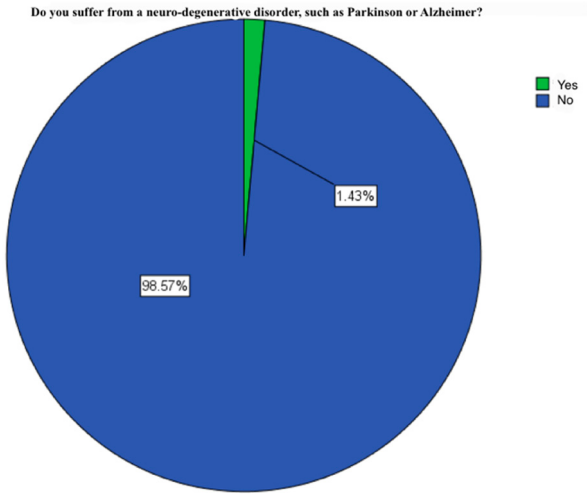


Figure 4. Stake of subjects with neuro-degenerative disorders.

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)

Table 3. Impact of a healthy diet on health.

		Case numbers	Percentage (%)
General	Has a very high impact	114	40.7%
	Has a high impact	131	46.8%
	Has a low impact	8	2.9%
	Does not have an impact	18	6.4%
	I do not know	9	3.2%
Physical	Has a very high impact	127	45.4%
	Has a high impact	126	45.0%
	Has a low impact	3	1.1%
	Does not have an impact	16	5.7%
	I do not know	8	2.9%
Mental	Has a very high impact	81	28.9%
	Has a high impact	122	43.6%
	Has a low impact	21	7.5%
	Does not have an impact	15	5.4%
	I do not know	41	14.6%

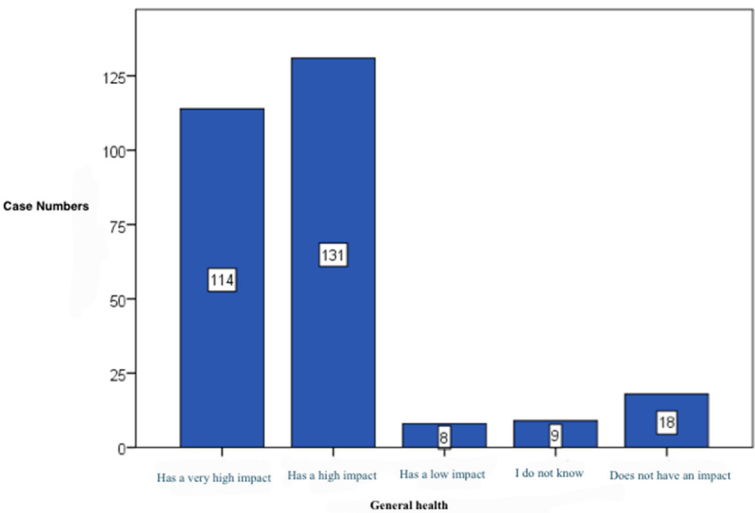


Figure 5. Healthy diet impact on general health.

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)

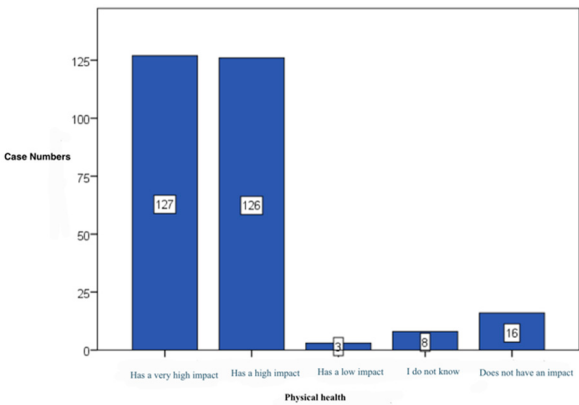


Figure 6. Healthy diet impact on physical health.

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)

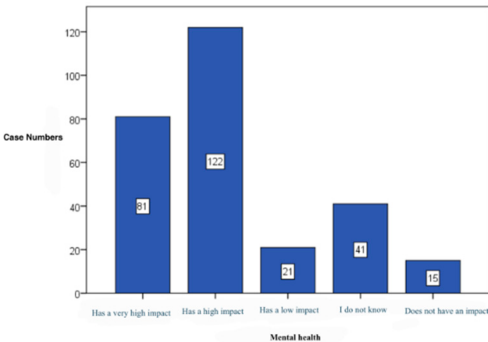


Figure 7. Healthy diet impact on mental health.

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)

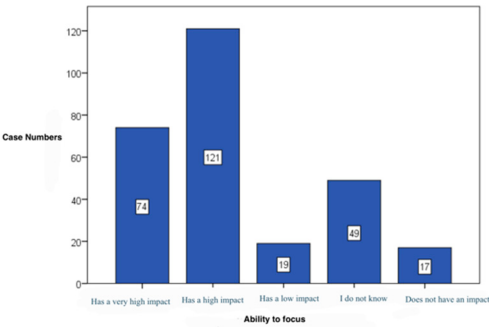


Figure 8. Healthy diet impact on the ability to focus.

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%). (Table 4) (Figure 9)

Table 4. Healthy diet impact on the ability to focus and memorise .

		Case numbers	Percentage (%)
Ability to focus	Has a very high impact	74	26.4%
	Has a high impact	121	43.2%
	Has a low impact	19	6.8%
	Does not have an impact	17	6.1%
	I do not know	49	17.5%
Ability to memorise	Has a very high impact	64	22.9%
	Has a high impact	109	38.9%
	Has a low impact	24	8.6%
	Does not have an impact	20	7.1%
	I do not know	63	22.5%
Good dysposition	Has a very high impact	95	33.9%
	Has a high impact	125	44.6%
	Has a low impact	19	6.8%
	Does not have an impact	18	6.4%
	I do not know	23	8.2%

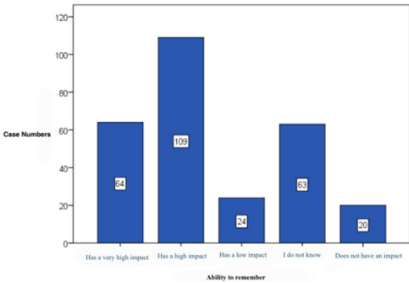


Figure 9. Unhealthy diet impact on the ability to remember/memorize.

Good disposition – the major impact is shown is shown on this aspect as well (125 cases, 44,6%) (Table 4) (Figure 10)

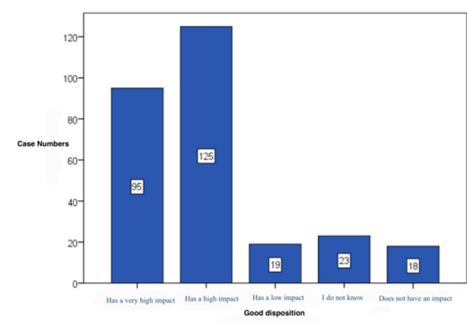


Figure 10. Healthy diet impact on good disposition.

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%) (Table 5), 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 stake(Figure 17), Snacks consumption stake (Figure 18), Soft Drinks consumption stake(Figure 19) (Table 5).

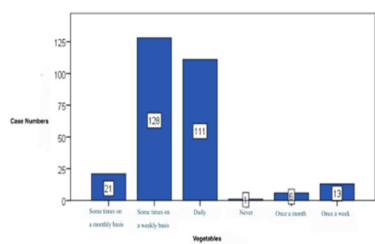


Figure 11. Vegetable consumption stake.

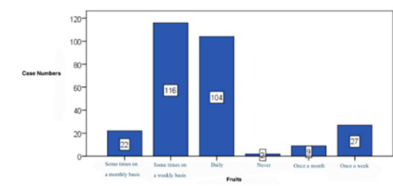


Figure 12. Fruits consumption stake.

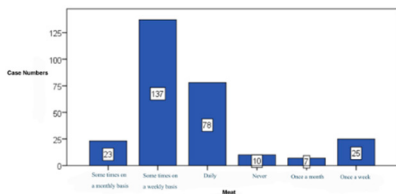


Figure 13. Meat consumption stake.

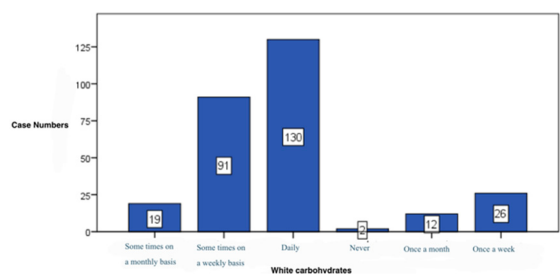


Figure 14. White carbohydrates consumption stake.

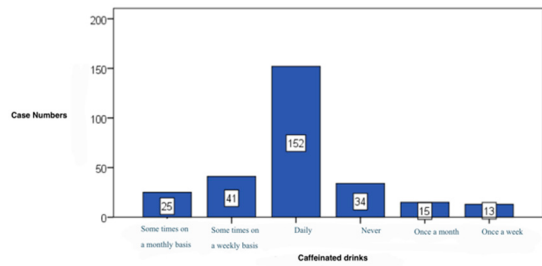


Figure 15. Caffeinated drinks consumption stake.

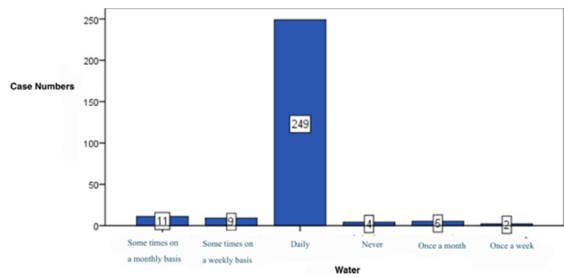


Figure 16. Water consumption stake.

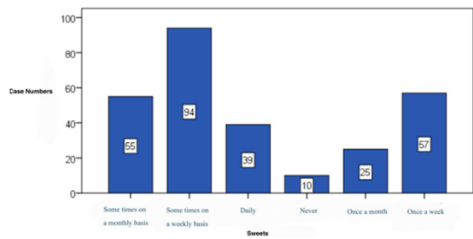


Figure 17. Sweets consumption stake.

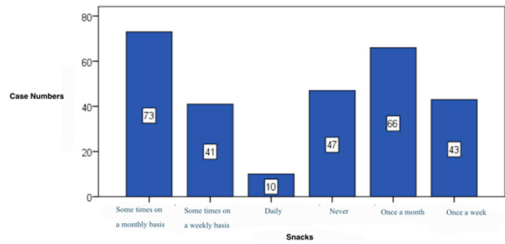


Figure 18. Snacks consumption stake.

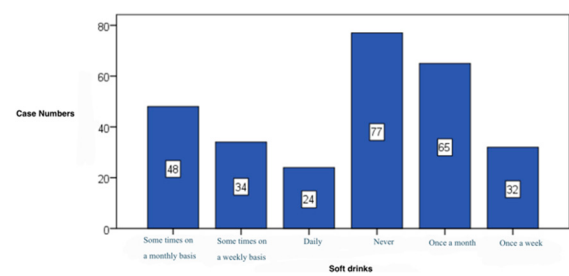


Figure 19. Soft Drinks consumption stake.

Table 5. Stake of consumption of certain foods in the statistical analysed lot.

		Case numbers	Percentage (%)
Vegetables	Some times on a monthly basis	21	7.5%
	Some times on a weekly basis	128	45.7%
	Daily	111	39.6%
	Never	1	0.4%
	Once a month	6	2.1%
	Once a week	13	4.6%
Fruits	Some times on a monthly basis	22	7.9%
	Some times on a weekly basis	116	41.4%
	Daily	104	37.1%
	Never	2	0.7%
	Once a month	9	3.2%
	Once a week	27	9.6%
White carbohydrates	Some times on a monthly basis	19	6.8%
	Some times on a weekly basis	91	32.5%
	Daily	130	46.4%
	Never	2	0.7%
	Once a month	12	4.3%
	Once a week	26	9.3%
Meat	Some times on a monthly basis	23	8.2%
	Some times on a weekly basis	137	48.9%
	Daily	78	27.9%
	Never	10	3.6%
	Once a month	7	2.5%
	Once a week	25	8.9%
Fast-food	Some times on a monthly basis	59	21.1%
	Some times on a weekly basis	17	6.1%
	Daily	1	0.4%
	Never	61	21.8%
	Once a month	98	35.0%
	Once a week	44	15.7%
Sweets	Some times on a monthly basis	55	19.6%
	Some times on a weekly basis	94	33.6%
	Daily	39	13.9%
	Never	10	3.6%
	Once a month	25	8.9%
	Once a week	57	20.4%
Caffeinated drinks	Some times on a monthly basis	25	8.9%
	Some times on a weekly basis	41	14.6%

	Daily	152	54.3%
	Never	34	12.1%
	Once a month	15	5.4%
	Once a week	13	4.6%
Soft Drinks	Some times on a monthly basis	48	17.1%
	Some times on a weekly basis	34	12.1%
	Daily	24	8.6%
	Never	77	27.5%
	Once a month	65	23.2%
	Once a week	32	11.4%
Water	Some times on a monthly basis	11	3.9%
	Some times on a weekly basis	9	3.2%
	Daily	249	88.9%
	Never	4	1.4%
	Once a month	5	1.8%
	Once a week	2	0.7%

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 6
- I could not find the motivation to work/fulfil chores – 43,6% deny this affirmation, 41,8% occasionally agree (117 cases). (Figure 21) , Table 6
- I could not enjoy the things I have done – 56,1% of cases disagree (157 cases). (Figure 22), Table 6
- 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 6
- I felt that life has no sense – 75,0% of the subjects disagree (210 cases) (Figure 24), Table 6
- I felt worthless – 65,0% disagree with this affirmation (182 cases). (Figure 25), Table 7
- 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 7
- 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 7
- 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 7
- I felt almost close to panic – 60,7% of subjects disagree this (170 cases).(Figure 29) , Table 7
- I was put in situations where I felt terrified, I was panicked, - 67,9% of subjects disagree this (190 cases). (Figure 30), Table 7

Table 6. Answered stake of the survey.

		Case numbers	Percentage (%)
I did not experiment 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%
	Not applicable	157	56.1%

I could not enjoy the thing I have done	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%
I felt worthless	Applicable sometimes	77	27.5%
	Not applicable	182	65.0%
	Applicable most of the times	23	8.2%
	Applicable sometimes	75	26.8%

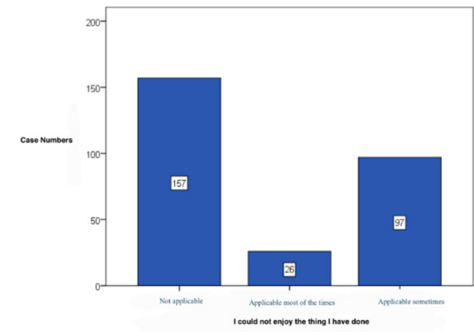


Figure 20. Positive feelings stake.

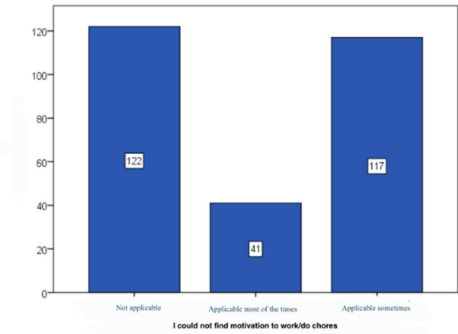


Figure 21. Demotivation stake.

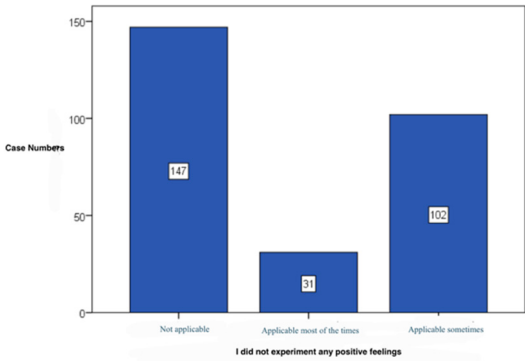


Figure 22. Lack of the ability to feel joy stake.

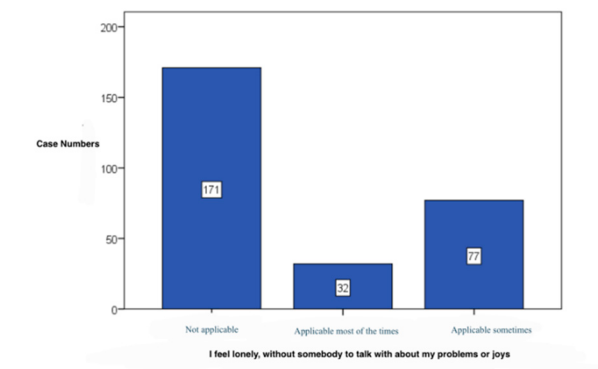


Figure 23. Stake of subjects that feel alone.

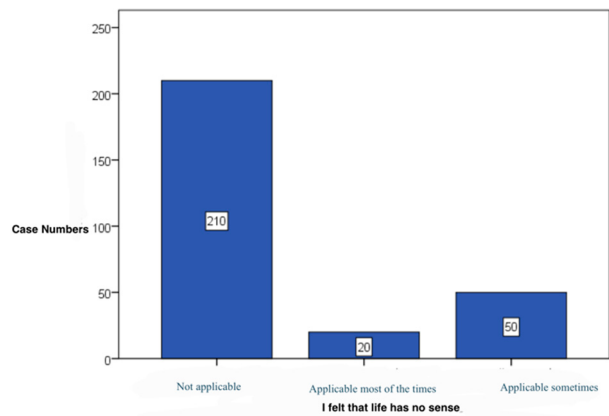


Figure 24. Stake of subjects that feel that life has no sense.

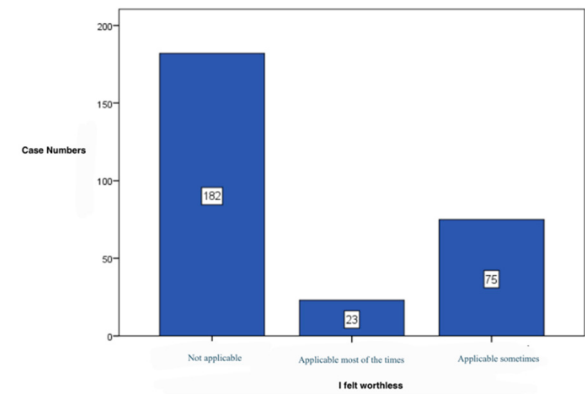


Figure 25. Stake of subjects that feel worthless.

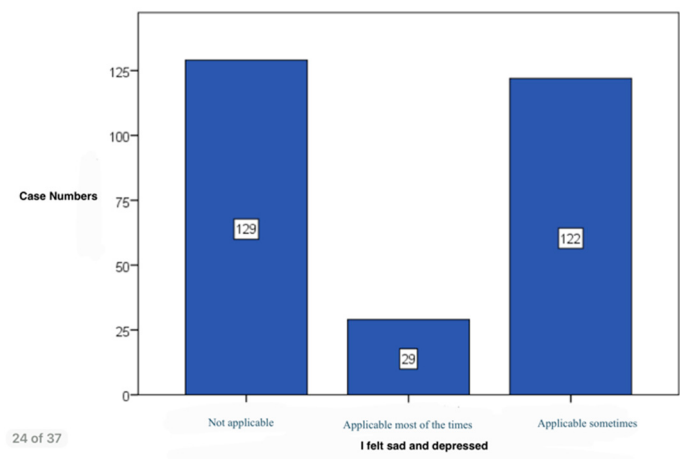


Figure 26. Stake of subjects that feel sad or depressed.

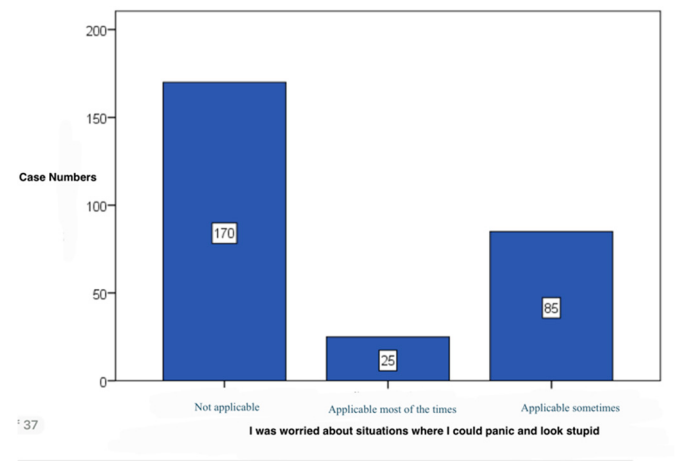


Figure 27. Stake of subjects that feel worried about situations which could make them feel uncomfortable.

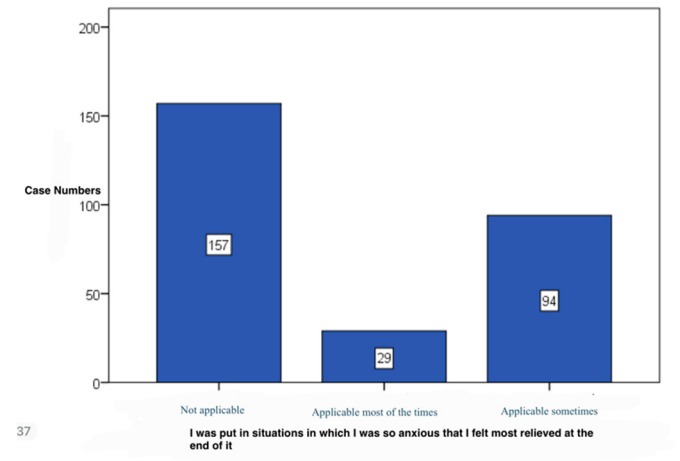


Figure 28. Stake of subjects with associated anxious episodes.

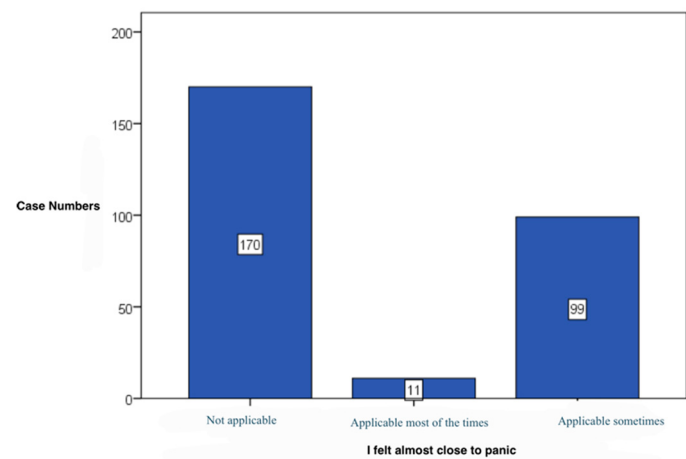


Figure 29. Stake of subjects with panic episodes.

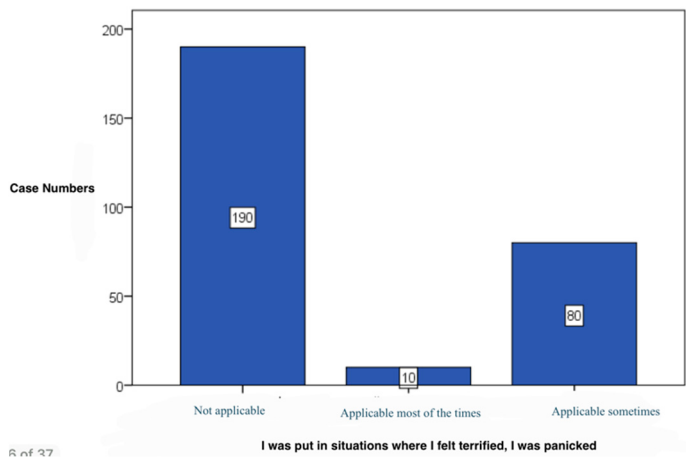


Figure 30. Stake of subjects with negative experiences.

Table 7. Answers stake 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%

6. Discussions

Recent studies involved 124 participants (mean age: 52 ± 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].

7. Conclusions

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 (Table 8). 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 (Table 8 and Table 9).

Table 8. Stake of mental illness or psychiatric pathologies in relationship with.

		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 9. Stake of foods consumed according to diet.

	NUTRITION
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		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%
Sweets	Some times on a monthly basis	0	0.0%	0	0.0%	7	12.3%	48	23.4%
	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%

Promising results show that healthy nutrition positively contributes in alleviating focus or learning capacity. There has been a distinctive link between daily caffeine consumption which is associated with an unhealthy diet and unhealthy diet behaviours. 24,6% of subjects with an unhealthy diet and 4,9% of those with relative healthy diet agree daily consumption of soda drinks(Table 9 and Table 10).

Table 10. 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 experiment 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%
I could not enjoy the thing I have done	Not applicable	3	42.9%	8	72.7%	21	36.8%	125	61.0%
	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%

Negative feelings, with a significant emotional impact were reported in most of the cases or in superior proportions in subjects with an unhealthy diet (prevailing or intermittent), proving that unhealthy habits might have an important effect on mental health, while exacerbating mental health disorders(Table 8, 9 and 10).

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