



EFFECT OF DIETARY HABIT ON PHYSICAL AND PSYCHOLOGICAL HEALTH OF THE STUDENTS OF UNIVERSITY

A PROJECT REPORT

BY

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment
of B.Sc. in Nutrition and Food Engineering

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APPROVAL

This Project titled “**Effect of Dietary Habit on Physical and Psychological Health of the Students of University**”, submitted by *Jannatul Maa * to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents.

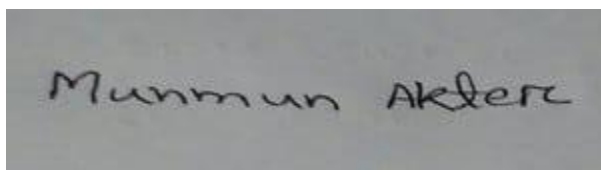
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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Munmun Akter, Lecturer, Department of Nutrition and Food Engineering, Daffodil International University**. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

Supervised by:

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Munmun Akter

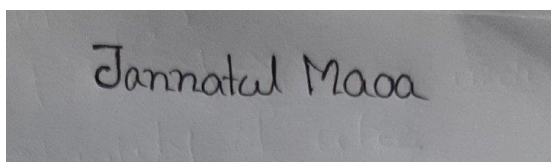
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ABSTRACT

Dietary habits significantly influence both the physical and psychological health of university students. Relationship between dietary habits and the physical and psychological health of university students is a critical area of research. This thesis aims to investigate how dietary choices impact both physical well-being and psychological aspects, including stress and anxiety levels. According to the findings of the study, a total 409 students from different public and private university students (age 15 to ≥ 30) were surveyed. Participants completed a cross-sectional design to investigate the relationship between dietary habits and physical and psychological health outcomes among university students. Analysis of the student dietary habit 14.4% are under weight, 47.4% are ideal weight, 15.2% are overweight, 19.1% are obese I and 3.9% are obese II. It was observed from findings that about 3.7% students that they never consumed breakfast, 11.7% indicated that they rarely ate, 24.4% consumed sometimes, 32.5% having breakfast most of the time and 27.6% consistently ate breakfast every day. More than three-quarters of the responds (87.5%) had dinner regularly and around 12.5% of the participants had irregular dinner habits. 66% of the respondents consumed little to no dairy products on a regular basis. In contrast, 34% reported consuming 1, 2 and 3 or more portion of dairy products daily. 62.3% of the respondents had minimal or no fruit consumption on a regular basis while more than half of the respondents (37.7%) consuming less than 1 portion of fruit per day. Nearly one-quarter (23%) of the respondents had low or no vegetable intake and 77% had consumed 1, 2 and 3 or more portion per day. The majority of respondents (90.5%) consumed at least one portion of fish, eggs, or meat daily, with 45.2% consuming two or more portions. A small percentage (9.3%) reported consuming less than one portion per day. 50.1% of students consumed less than one portion of pulses or legumes daily, more than half (61.6%) reported consumed less than 1 portion of fried foods while (29.3%) consumed 1 portion of fried food daily and 11.2% consumed two, three or more portion. (73.1%), reported no consumption of sugary or soda drinks. In contrast, (26.9%) indicated that they consumed at least 1 portion of sugary or soda drinks. (91.4%), reported not smoking or consuming alcohol regularly. In contrast, only (8.6%) indicated that they engaged in smoking or alcohol consumption. (50.9%) reported consuming less than 1 portion per day, while (33.2%) consumed 1, 2 and 3 or more portions daily. 63.1% of the respondents, had minimal or no fast food consumption, (39.9%) consumed 1, 2 and 3 or more portions daily. (54.0%), reported that they did not add extra salt to their meals (35.5%) indicated that they occasionally added extra salt (10.5%) always added extra salt to their foods. The research highlights the significant role of dietary habits in influencing the physical and psychological well-being of university students.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

There is a strong correlation between an individual's lifestyle and mental and physical well-being. They frequently have an impact on each other. According to recent studies on psychophysiology, some mental health issues and emotional stress situations might lead to physical illnesses. Poor eating habits are a significant public health concern among young adults transitioning into university life. Stress and lack of time can hinder healthy behaviours like eating and substance abuse, which can persist in older adulthood. Rapid changes in physical growth and psychological development make these young adults nutritionally vulnerable, leading to unhealthy eating habits. They often make their own food choices based on the cost and availability of fast food, lacking knowledge about healthy food choices. This leads to frequent snacking and higher fast food consumption. As emerging adults transitioning into independence, students often face challenges in maintaining healthy eating patterns amidst the demands of academic life (Laska, 2015).

A balanced diet is essential for maintaining optimal physical health among university students. Poor dietary habits, characterized by excessive intake of processed foods high in sugar and fat, have been linked to an increased risk of obesity and chronic diseases such as type 2 diabetes and cardiovascular diseases. Furthermore, inadequate nutrition can compromise immune function, leaving students vulnerable to infections and illnesses, ultimately affecting their academic performance and overall quality of life (Pelletier, 2015).

The relationship between dietary habits and psychological health is multifaceted. Nutrient-rich diets, abundant in fruits, vegetables, whole grains, and lean proteins, have been associated with lower levels of depression and anxiety among university students (Jacka, 2010). Conversely, diets high in refined sugars and processed foods have been linked to increased symptoms of depression and anxiety, possibly due to their detrimental effects on neurotransmitter function and inflammation (Lopresti, 2013).

Furthermore, disordered eating behaviours, such as restrictive dieting and binge eating, are prevalent among university students and can have detrimental effects on psychological well-being, leading to an increased risk of eating disorders and negative body image (Perez, 2012).

1.2 Background of the study:

The effect of dietary habits on the physical and psychological health of university students has been a topic of interest for researchers. A study conducted by (Kruger J., 2015) found that dietary habits of university students were associated with their physical and psychological health. The study found that students who consumed a diet rich in fruits, vegetables, and whole grains had better physical and psychological health than those who consumed a diet high in processed foods and sugars. Additionally, students who ate a diet

heavy in processed foods and sugars were more likely to develop chronic conditions like obesity type 2 diabetes and cardiovascular disease according to the study.

Another study conducted by (Kruger, 2016) found that dietary habits of university students were associated with their psychological health. The study found that students who consumed a diet rich in fruits, vegetables, and whole grains had better mental health than those who consumed a diet high in processed foods and sugars. The study also found that students who consumed a diet high in processed foods and sugars had a higher risk of developing mental health disorders such as depression and anxiety.

1.3 Rational of the study:

The research can identify the impact of dietary habits on the physical and psychological health of university students is crucial for promoting overall well-being during a pivotal period of development and long-term health outcomes. Poor dietary habits can lead to various health issues such as obesity, cardiovascular diseases, and mental health disorders like anxiety and depression, all of which can hinder students' ability to excel academically. Conversely, promoting healthy eating habits can enhance cognitive function, improve mood stability, and boost energy levels, and overall quality of life.

1.4 Research Objectives:

1.4.1 General Objective:

To investigate the association between dietary habits, including food choices and eating behaviours, and their impact on physical health outcomes (such as BMI, nutritional status and psychological well-being (including mood, stress levels, and mental health) of university students.

1.4.2 Specific Objectives:

- To examine the physical health status of students about their dietary choices.
- To explore the psychological well-being of students and its correlation with their dietary habits.
- To suggest recommendations for promoting healthier dietary behaviours among the student population.

CHAPTER 2

LITERATURE REVIEW

Dietary habits profoundly influence the physical and psychological well-being of university students, shaping their overall health outcomes (Laska, 2015). “Effect of dietary habit on physical and Psychological health of the students of university” the study included demographic information, anthropometric measures, lifestyle factors like alcohol consumption and physical activity, and eating habits such as meal regularity, food purchasing behaviour, results indicated stable BMI levels over the years, an increase in obesity classification, and an increase in alcohol consumption. The study also highlighted changes in eating habits like reduced snacking between meals and increased purchase of high-fat products. Emotional well-being assessments showed minimal depression symptoms, mild anxiety disorder, and consistent perceived stress levels over the four years. The study utilized validated instruments like the Beck Depression Inventory, generalized anxiety disorder scale, and Perceived Stress Scale for evaluation.

Nutritional Status and Physical Health:

Several studies (El Ansari, 2012), (Holm-Denoma, 2008) have highlighted the link between poor dietary habits and physical health outcomes such as obesity, cardiovascular diseases, and nutrient deficiencies among university students.

Impact of Skipping Meals: Research (Fulkerson, 2004), (Larson, 2009) indicates that skipping meals, particularly breakfast, is prevalent among university students and can have detrimental effects on physical health. Skipping meals may lead to inadequate nutrient intake, compromised energy levels, and impaired metabolism.

Mood and Mental Well-being: Dietary habits have been linked to mood and mental well-being among university students. A study by (Jacka, 2010) found that a diet rich in fruits, vegetables, whole grains, and fish was associated with a lower risk of depression among young adults.

Stress and Coping Mechanisms: Dietary habits may influence stress levels and coping mechanisms among university students. Research (Peltzer, 2015) suggests that stress may lead to maladaptive eating behaviours, such as emotional eating or binge eating, which can exacerbate stress levels and contribute to poor mental health outcomes. Research indicates a notable impact of dietary behaviours on physical health outcomes among university students, with studies revealing a concerning trend of weight gain during the transition to university life (Vadeboncoeur, 2015).

Moreover, disparities in obesity prevalence between two-year and four-year university students underscore the importance of understanding dietary patterns in higher education settings (Laska, 2015), (Pelletier, 2015) emphasized the significance of promoting healthy eating behaviours to mitigate the risk of chronic diseases such as cardiovascular disorders, which are influenced by dietary choices. Inadequate nutrition not only compromises physical health but also affects immune function, leaving students vulnerable to infections and illnesses that can impact their academic performance (Jacka, 2010) In terms of

psychological health outcomes, dietary habits have been closely linked to symptoms of depression and anxiety among university students (Jacka, 2010),(Lopresti,2013). Adherence to a nutrient-rich diet, characterized by the consumption of fruits, vegetables, and whole grains, has been associated with lower levels of depression, highlighting the importance of dietary quality in mental well-being (Jacka, 2010).Conversely, diets high in refined sugars and processed foods have been linked to increased symptoms of depression and anxiety, suggesting a complex interplay between dietary habits and psychological health(Lopresti,2013).Furthermore, disordered eating behaviours prevalent among university students, such as restrictive dieting and binge eating, pose additional risks to psychological well-being and body image (Perez, 2012).The stressors of university life, compounded by poor dietary habits, can exacerbate mental health issues, necessitating interventions to promote healthier eating behaviours and support psychological resilience (Perez, 2012).

CHAPTER 3

METHODOLOGY

3.1 Research Design

This study employs a cross-sectional design to investigate the relationship between dietary habits and physical and psychological health outcomes among university students.

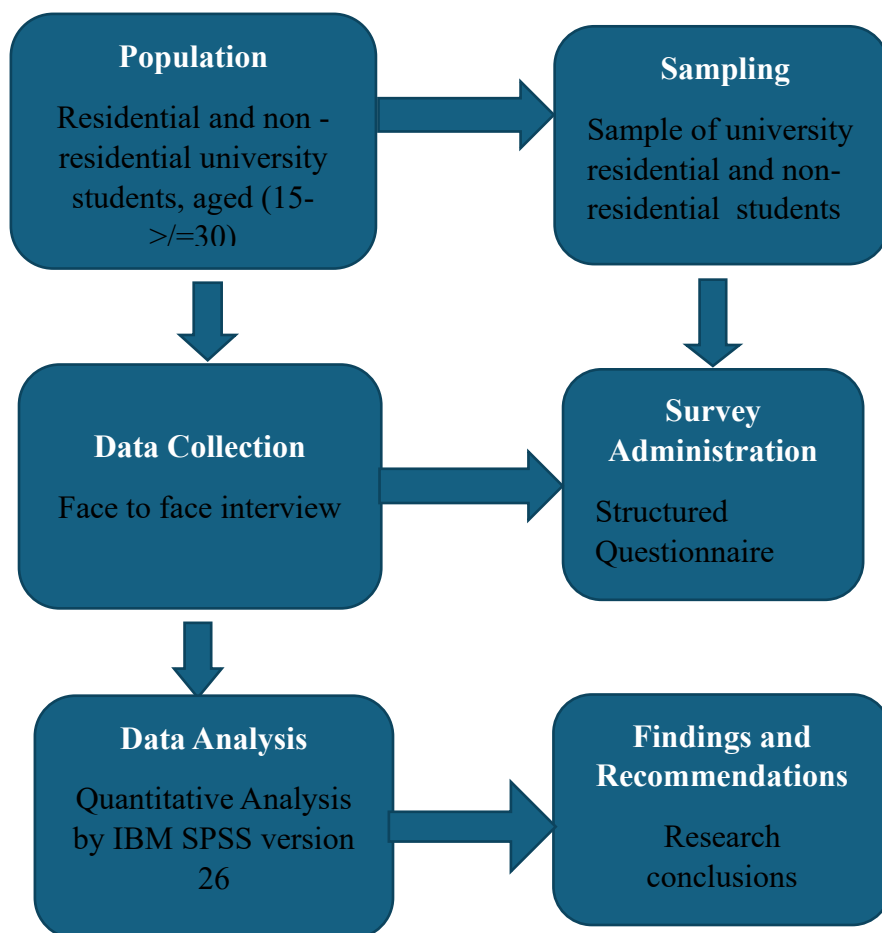


Figure 01: Study Design

3.2 Sampling technique and Participant Characteristics

It is a cross sectional study consists of multiple university students recruited from multiple departments or faculties across the campus. Inclusion criteria include full-time enrolment status and willingness to participate in the study. Different university students aged 15years to older will be eligible to participate in the study.

Sampling Method: Convenience sampling was utilized to recruit participants for this study.

Sample Size: A total of 409 university students participated in the study.

Age Range: participants ranged in age from 15 to >= 30 years old, reflecting the typical age range of university students.

Gender: The sample comprised 163 male and 246 female participants, representing both genders in the study population.

Academic Year: The study included university students from different academic years, ranging from freshers to seniors. This ensures a broad representation of students at different stages of their academic journey, allowing for a comprehensive understanding of the impact of dietary habits on their physical and psychological health throughout their university experience

3.3 Sample Size Calculation:

To determine the total number of sample size. The following equation was utilized for this purpose:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where, n=sample size

Z=statistic for a level of confidence

P=Expected prevalence or proportion

(if the expected prevalence is 20%, then p=0.2), and

d=Precision (if the precision is 5%, then d=0.05).

Though it's a cross sectional study. So, we considered Z statistics as 1.96 for 95% confidence level and the precision as 5%. So, we considered expected prevalence as p= 50%, then Sample size was:

$$n = \frac{(1.96)^2 * 0.5 * (1-0.5)}{(0.05)^2}$$

$$= 384$$

I took some additional data to remove the risk and got a total number of 409 data.

3.4 Data Collection Instruments:

I used a self-administered questionnaire on eating habits which was adopted from previous published studies. To gather data for this study, an offline survey was conducted with a sample of 409 participants. The questionnaire consisted of three parts. The first part included questions on socio demographic data; such as university name, department, age, socio economic level, gender, height are measured by ruler and measuring tape, and weight are measured by MI weight machine, education level, marital status, living place, were also included in this part. The second part includes questions on dietary factors (healthy and unhealthy practice), such as frequency of meals, type of meal, vegetables and fruits consumption, daily dairy product intake, consumption of fast food, etc. The third part included questions on psychological factors that influenced dietary habits of respondents such as rate of quality life, satisfied with health, enjoy life, satisfied with sleep, personal relationship, capacity for work, ability to perform daily life activities were also included in this part.

3.5 Data Collection Procedure:

Study Setting: Participants are informed about the study objectives and procedures through recruitment person to person. Participants complete the dietary assessment tool and self-report measures of physical and psychological health in-person, depending on the study setting.

Study Period: I have visited various universities and collected the data between March 2024- June 2024 with the help of my friends.

Study Site: I have collected 253 data from Daffodil International University (DIU), Ashulia, Savar, Dhaka. 46 data from University of Dhaka (DU), Shahbag, Dhaka. 20 data from Bangladesh University Of Engineering Technology (BUET), Palashi area, Dhaka. 20 data from Bangladesh University Of Professionals (BUP), Mirpur Cantonment, Dhaka. 45 data from Jahangirnagar University (JU), Savar, Dhaka and 25 data from others university.

3.6: Statistical Analysis:

Socio demographic information are descriptive statistics these analysed by IBM SPSS version 26. On the other hand, correlation between dietary information and physical and psychological health are calculated by using inferential statistics which are also analysed by using same software.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Result

4.1.1: Sociodemographic Information

For my study purpose I have collected some variables of sociodemographic information like university name, department, age, gender, marital status, economic status, religion, living place and sedentary lifestyle (>6 hours sitting per day) of the population. The sociodemographic information is presented below through a table

Table 01: Sociodemographic Information of the Sample:

Variables	Frequency	Percentage (%)
University Name		
Daffodil International University (DIU)	253	61.9
University of Dhaka (DU)	46	11.2
Bangladesh University of Engineering Technology (BUET)	20	4.9
Bangladesh University of Professionals (BUP)	20	4.9
Jahangirnagar University (JU)	45	11.0
Others	25	6.1
Name of the Departments		
Health Science	219	53.5
Engineering and Technology	89	21.8
Business Administration	63	15.4
Arts	38	9.3
Age		
15-19	38	9.3
20-24	358	87.5
25-30	11	2.7
>=30	2	0.5
Gender		
Male	163	39.9
Female	246	60.1

Marital Status		
Married	21	5.1
Unmarried	388	94.9
Economic Status		
Low	49	5.1
Medium	12.0	94.9
High	15	3.7
Religion		
Muslim	360	88
Hindu	45	11
Christianity	4	1
Living Place		
Rural	306	74.8
Urban	103	25.2
Sedentary Lifestyle (>6 hours sitting per day)		
Yes	317	77.5
No	92	22.5

Here the gender is male 39.9% and female is 60.1%. A significant majority, 94.9%, are unmarried, with only 5.1% being married. We collect data from some university like Daffodil International University (DIU), University of Dhaka (DU), Bangladesh University of Engineering Technology (BUET), Bangladesh University of Professionals (BUP), Jahangirnagar University (JU) and others. Sample of Daffodil International University (DIU) is 253, University of Dhaka (DU) is 46, Bangladesh University of Engineering Technology (BUET) is 20, Bangladesh University of Professionals (BUP) is 20, %, Jahangirnagar University (JU) is 45 and others university is 25. A majority of the individuals, 61.9%, are from Daffodil International University (DIU), followed by 11.2% from the University of Dhaka (DU). Smaller percentages are from Bangladesh University of Engineering Technology (BUET) and Bangladesh University of Professionals (BUP), each constituting 4.9%. Jahangirnagar University (JU) represents 11.0%, while other universities make up 6.1% of the sample. In terms of departmental affiliation, 53.5% of the individuals are from Health Science. Those from Engineering and Technology account for 21.8%, while Business Administration and Arts represent 15.4% and 9.3%, respectively. The age distribution shows that the vast majority, 87.5%, are between 20 and 24 years old. The 15-19 age group comprises 9.3%, while 2.7% are aged 25-30. A very small fraction, 0.5%, are 30 years or older. The economic status of the population indicates that 84.4% are

from a medium economic background, 12.0% from a low economic background, and 3.7% from a high economic background. Most individuals, 88.0%, follow Islam, while 11.0% are Hindu, and 1.0% adhere to Christianity. Urban residents dominate the sample, accounting for 74.8%, with rural residents making up 25.2%. A large proportion of the individuals, 77.5%, have a sedentary lifestyle, defined as sitting for more than six hours per day, while 22.5% do not.

4.1.2: Nutritional Status

Table 02: Nutritional Status According to BMI

Nutritional Status	Frequency	Percentage
Under Weight	59	14.4
Ideal weight	194	47.4
Overweight	62	15.2
Obese I	78	19.1
Obese II	16	3.9
Total	409	100.0

Table 2 presents the nutritional status according to BMI. According to the table and chart distribution of the participants based on their Body Mass Index (BMI) categories is presented in Table 2. Out of the total 409 university students assessed, the majority (47.4%) fell within the "Ideal Weight" category, indicating a balanced nutritional status. However, a significant portion of the sample exhibited weight-related concerns. Approximately 14.4% of the participants were classified as "Underweight," which might suggest potential nutritional deficiencies or other health issues. On the other hand, 15.2% of the students were categorized as "Overweight," and a notable 19.1% were in the "Obese I" category. Furthermore, a smaller yet concerning 3.9% of the sample were classified as "Obese II," reflecting severe obesity levels that may require immediate health interventions.

For better understanding, the information is presented below through a pie chart.

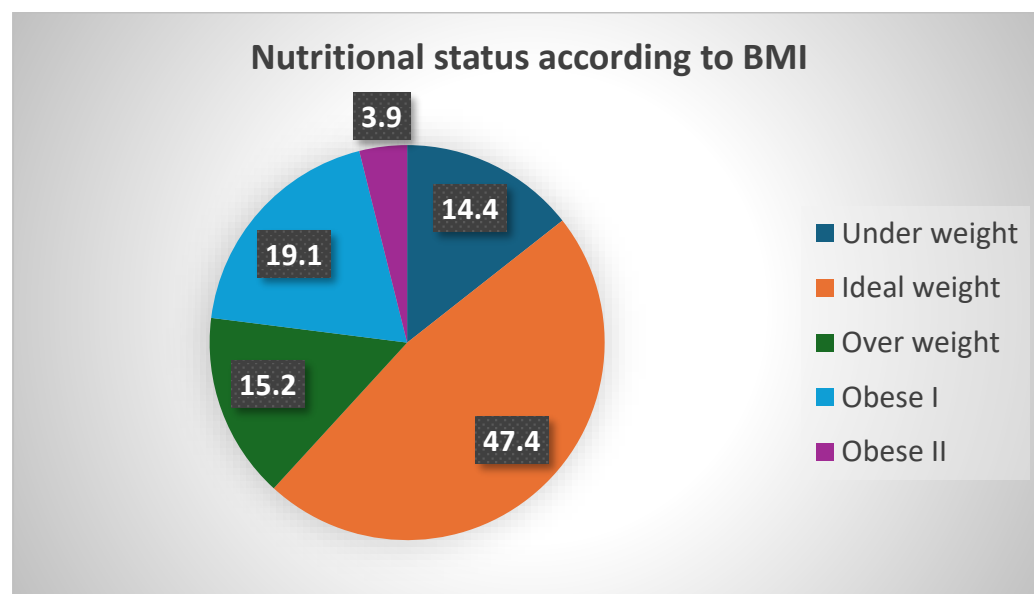


Figure 02: Nutritional Status of the Sample according to BMI

4.1.3: Nutritional Status

Table 03: Anthropometric Measurements of the Sample:

	Height(m)	Weight(kg)
Mean	1.6227	59.47
Std. Deviation	.08392	12.536
Minimum	1.35	32
Maximum	1.85	120

The total number of valid participants in my sample is 409. There were no missing values for either height or weight, which indicates that the data set is complete for these two variables. The average height of the participants is 1.6227 meters (standard deviation is 0.08392 meters) and the average weight of the participants is 59.47 kilograms. (standard deviation is 12.536 kilograms). The shortest participant is 1.35 meters tall, while the tallest is 1.85 meter the lightest participant weighs 32 kg, and the heaviest weighs 120

4.1.4: Healthy Dietary Habits

Table 04: Information on Healthy Dietary Habits

Variables	Frequency	Percentage (%)
Taking breakfast		
Never	15	3.7
Very rare	48	11.7
Sometimes	100	24.4
Most of the time	133	32,5
Always	113	27.6
Taking dinner		
Very rare	25	3.7
Sometimes	36	8.8
Most of the times	113	27.6
Always	245	59.9
Taking home-cooked meal		
Never	34	8.3
Very rare	66	16.1
Sometimes	63	15.4
Most of the times	154	37.7
Always	92	22.5
Portions of dairy products consumed		
(1 portion=1glass) (>=1)		
No consumption	83	20.3
<1 portion	187	45.7
1 portion	108	26.4
2 portions	27	6.4
>=3portions	4	1.0

Portions of fruits consumed (1 portion=1piece)		
(>=2)		
No Consumption	69	16.9
<1 portion	186	45.5
1portion	110	26.9
2 portions	28	6.8
>/=3 portions	16	3.9
Portions of vegetables consumed		
(1 portion=1cup) (>=4)		
No consumption	15	3.7
<1portion	179	19.3
1 portion	182	44.5
2 portions	99	24.2
>/=3 portions	34	8.3
Portions of whole foods consumed		
(1 portion=1cup) (>=1)		
No Consumption	24	5.9
<1 portion	79	19.3
1portion	143	35.0
2 portions	110	26.9
>/=3 portions	53	13.0
Portions of fish/eggs/meat consumed		
(1 portion=1medium piece) (>=3)		
No Consumption	5	1.2
<1 portion	33	8.1
1portion	186	45.5
2 portions	142	34.7
>/=3 portions	43	10.5

Portions of pulse/ legumes consumed		
(1 portion=1 cup) (>=1)		
No Consumption	56	13.7
<1 portion	149	36.4
1portion	145	35.5
2 portions	46	11.2
>=3 portions	13	3.2

"sometimes," while 16.1% stated "very rarely" and 8.3% reported "never" eating home-cooked meals. In terms of dairy consumption, 45.7% of the participants reported consuming less than one portion per day. A further 26.4% consumed exactly one portion per day, while 20.3% reported no dairy consumption at all. The consumption of two or more portions of dairy products was less common, with only 6.4% consuming two portions, and 1% consuming three or more portions daily. Fruit intake was relatively low, with 45.5% of participants consuming less than one portion of fruit per day and 16.9% reporting no fruit consumption. About 26.9% consumed one portion of fruit daily, while 6.8% consumed two portions, and only 3.9% consumed three or more portions.

Similarly, vegetable consumption was also modest, with 44.5% consuming one portion of vegetables daily, and 19.3% consuming less than one portion. A notable 24.2% of participants consumed two portions, while 8.3% consumed three or more portions of vegetables. Only 3.7% reported no vegetable consumption. In terms of whole foods, 35% of the participants consumed one portion of whole foods daily, while 26.9% consumed two portions. About 13% consumed three or more portions, while 19.3% reported consuming less than one portion, and 5.9% indicated no whole food consumption. The findings reveal that the majority of students (45.5%) consume 1 portion of fish, eggs, or meat daily. This is followed by 34.7% of students who consume 2 portions. A smaller percentage, 10.5%, consume 3 or more portions daily. Notably, 8.1% of students consume less than 1 portion, while only 1.2% reported no consumption at all. The intake of pulses and legumes was slightly higher than fruits and vegetables, with 36.4% consuming less than one portion daily and 35.5% consuming one portion. About 11.2% consumed two portions, and 3.2% consumed three or more portions, while 13.7% reported no consumption of pulses or legumes.

This data provides a clear indication that while most participants tend to consume dinner regularly and a significant portion consumes breakfast frequently, the intake of dairy products, fruits, and vegetables remains relatively low. Additionally, the reliance on home-cooked meals is moderately strong but not universal, suggesting potential areas for improvement in dietary habits, particularly in promoting more consistent consumption of healthy, nutrient-rich foods like fruits, vegetables, and dairy products.

4.1.5: Unhealthy habit

Table 05: Information on Unhealthy habit

Variables	Frequency	Percentage (%)
Portions of fried food consumed(1 portion=1piece) (>=1)		
No consumption	43	10.5
<1 portion	209	51.1
1 portion	120	29.3
2 portions	28	6.8
>=3 portions	9	2.2
Consumption of minimum 1portion sugary/soda drinks (1 portion=200cc glass)		
No	299	73.1
Yes	110	26.9
Smoking or taking alcohol		
No	374	91.4
Yes	35	8.6
Portions of sugar/sweet snacks consumed (1 portion=5g/1 piece) (>=2)		
No consumption	65	15.9
<1 portion	208	50.9
1portion	95	23.2
2 portions	38	9.3
>=3 portions	3	0.7

Potion of fast food consume (1 potion=1 piece) (>=1)		
No consumption	71	17.4
<1 portion	187	45.7
1 portion	111	21.1
2 portions	32	7.8
>=3 portions	8	2.0
Extra salt added in food		
No added	221	54.0
Occasionally added	145	35.5
Always added	43	10.5

The study assessed the dietary habits and consumption patterns of fried foods, sugary drinks, sweet snacks, fast food, smoking/alcohol intake, and the use of extra salt among the sample population. The following key findings were observed:

The majority of participants (51.1%) reported consuming less than one portion of fried food (where 1 portion equals one piece). Approximately 29.3% consumed one portion, while 10.5% reported no consumption at all. Only a small percentage (6.8%) consumed two portions, and an even smaller group (2.2%) consumed three or more portions. A large proportion of participants (73.1%) did not consume sugary or soda drinks (with one portion being a 200cc glass), while 26.9% reported consuming at least one portion. A significant majority of the population (91.4%) did not engage in smoking or alcohol consumption, with only 8.6% of participants reporting such behaviour. Regarding sweet snacks (where one portion is equivalent to 5 grams or one piece), 50.9% of participants consumed less than one portion. A further 23.2% consumed one portion, while 15.9% reported no consumption. Around 9.3% consumed two portions, and only 0.7% consumed three or more portions. In terms of fast food intake, 45.7% consumed less than one portion (where 1 portion equals one piece). Additionally, 17.4% reported no consumption, 21.1% consumed one portion, 7.8% consumed two portions, and only 2.0% consumed three or more portions. More than half of the participants (54.0%) reported not adding extra salt to their meals. However, 35.5% added extra salt occasionally, and 10.5% always added extra salt to their food.

These findings provide insight into the dietary behaviours of the population, highlighting tendencies towards low consumption of unhealthy foods, moderate consumption of fast foods and sugary drinks, and minimal engagement in smoking or alcohol use.

4.1.6: Physical and Psychological Health

Table 06: Statistical Information of Physical and Psychological Health

	Total Score of Healthy Dietary Habit	Total Score of Unhealthy Dietary Habit	Total Score of Psychological Health	Total Score of Physical Health
Mean	28.55	10.90	18.33	21.82
Median	29.00	11.00	18.00	22.00
Mode	26 ^a	10	18	19
Std. Deviation	4.381	2.360	5.035	5.547
Minimum	16	6	6	7
Maximum	44	19	30	35

In this section, the data on healthy dietary habits, unhealthy dietary habits, psychological health, and physical health are presented for a sample of 409 university students. The descriptive statistics for each variable offer insights into the central tendencies, dispersion, and distributional characteristics. For better understanding I use some graph charts are Bellow.

Healthy Dietary Habit:

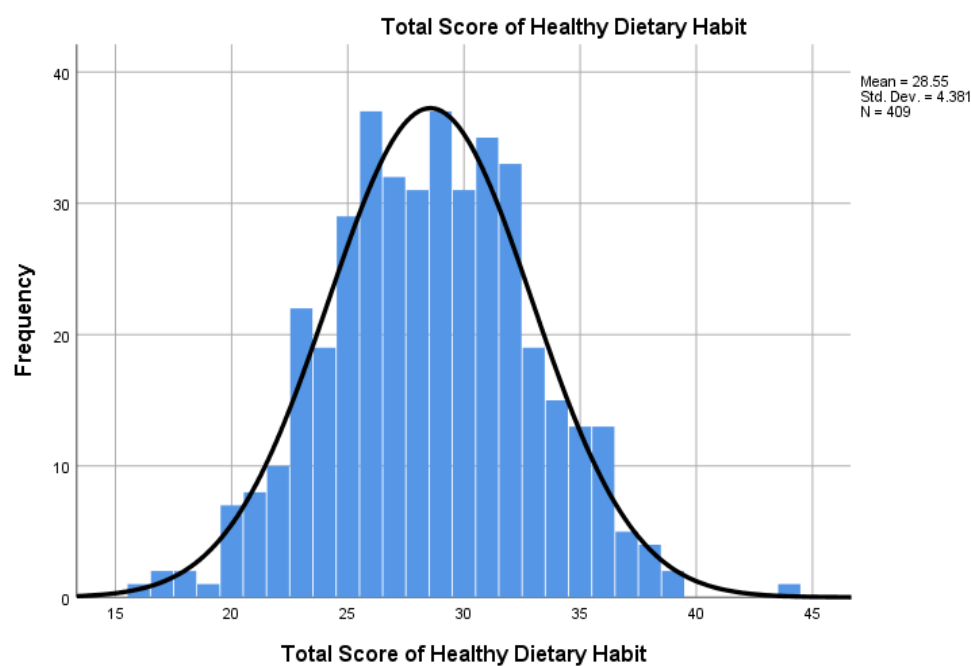


Figure 03: Total Score of Healthy Dietary Habit

The mean score for healthy dietary habits is 28.55, with a median of 29.00 and a mode of 26. It indicates that, on average, participants exhibit a moderately healthy dietary pattern, with the most common score being slightly lower than the mean and median.

The standard deviation is 4.381, suggesting moderate variability in healthy dietary habits across the sample. Skewness is 0.023, which is near zero, implying the data distribution is relatively symmetrical. Kurtosis is -0.062, indicating a slightly flatter distribution than a normal distribution. The minimum score is 16, while the maximum score is 44, showing a wide range of dietary behaviours.

Unhealthy Dietary Habits:

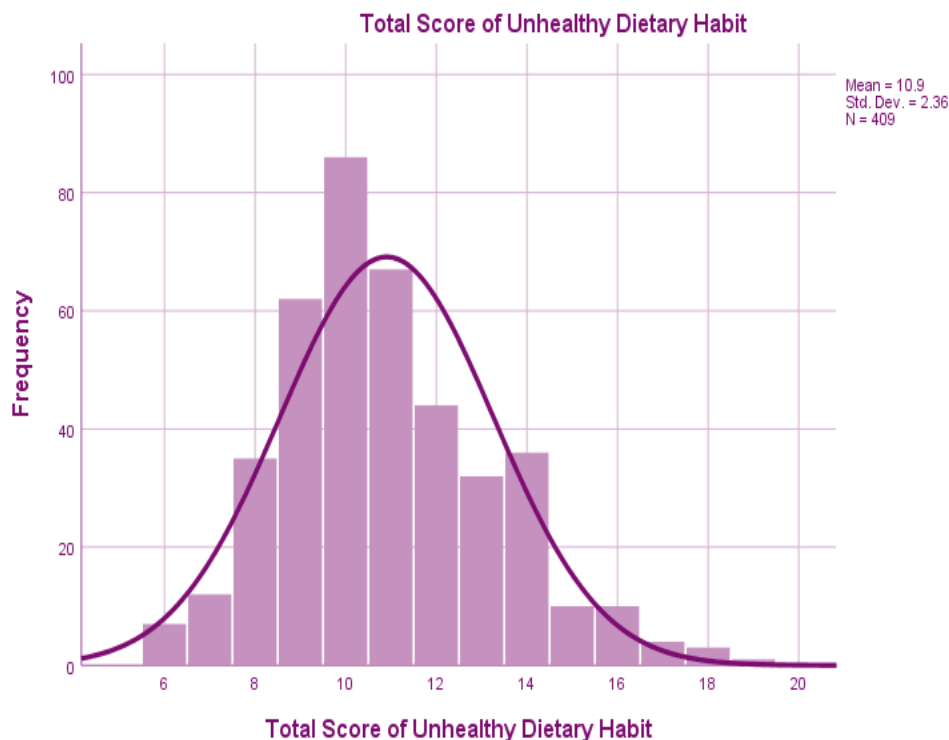


Figure 04: Total Score of Unhealthy Dietary Habit

The mean score for unhealthy dietary habits is 10.90, with a median of 11.00 and a mode of 10. These values suggest that unhealthy dietary habits are less prevalent compared to healthy ones but still present among the sample.

The standard deviation of 2.360 indicates less variation in unhealthy dietary habits compared to healthy habits. The skewness is 0.571, suggesting a positive skew; more participants report lower scores of unhealthy habits, with fewer participants having higher scores. Kurtosis is 0.276, indicating the data distribution has slightly heavier tails than a normal distribution. The range of unhealthy dietary habit scores spans from 6 to 19.3.

Psychological Health:

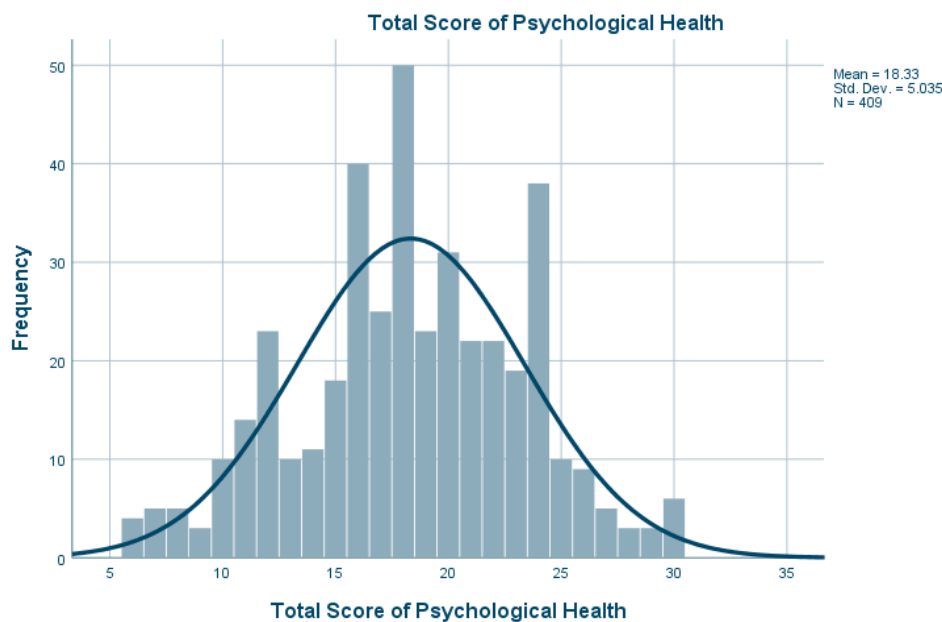


Figure 05: Total Score of Physical Health

The mean score for psychological health is 18.33, with a median of 18.00 and a mode of 18. These close values suggest that most participants report average psychological health. The standard deviation is 5.035, indicating moderate variability in psychological health scores. Skewness is -0.131, suggesting a slight negative skew, meaning a few participants report higher psychological health scores. Kurtosis is -0.296, which suggests a slightly flatter distribution compared to normal. Scores for psychological health range from 6 to 30, reflecting a diverse set of psychological health outcomes among the participants.

4. Physical Health:

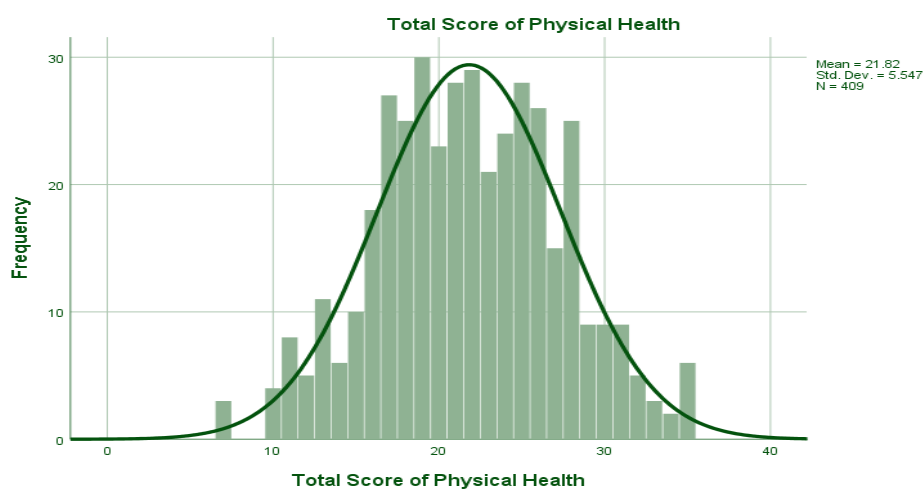


Figure 06: Total Score of Psychological Health

The mean score for physical health is 21.82, with a median of 22.00 and a mode of 19. This implies that the participants, on average, have moderate levels of physical health. The standard deviation is 5.547, indicating a greater spread in physical health scores compared to psychological health scores. The skewness is -0.010, indicating that the distribution is almost perfectly symmetrical. Kurtosis is -0.278, reflecting a distribution slightly flatter than normal. The range of physical health scores is from 7 to 35, showing variability in how participants perceive their physical health.

Over all the results show that the university students in the sample tend to have relatively healthy dietary habits, with fewer unhealthy dietary habits. Both psychological and physical health scores are average, but there is noticeable variability in these measures across the sample. Healthy dietary habits are fairly consistent among participants, while unhealthy dietary habits have a positively skewed distribution, suggesting that most students avoid significant unhealthy eating patterns. Psychological and physical health scores are relatively balanced and normally distributed across the sample.

4.1.7 Relationship between Dietary habits and Physical and Psychological Health

Table:07 Correlations between Dietary habits and Physical and Psychological Health

	Total Score of Healthy Dietary Habit	Total Score of Unhealthy Dietary Habit
Total Score of Psychological Health	0.093	0.082
Total Score of Physical Health	0.101*	0.054

Correlation is significant at the 0.05 level (2-tailed).

Correlation Coefficient: $r = 0.101$

Significance Level: $p < 0.05$

There is a moderate positive correlation between healthy dietary habits and physical health scores. This finding suggests that individuals who engage in healthier eating patterns are more likely to report better physical health. The significance of this correlation indicates that promoting healthy dietary habits could be beneficial for improving physical health outcomes.

Correlation Coefficient: $r = 0.093$

Significance Level: $p = 0.062$

The correlation between healthy dietary habits and psychological health is weak and approaches significance ($p = 0.062$). While this suggests a potential relationship. This indicates that further research may be needed to explore the nuances of how dietary habits may influence psychological well-being.

Correlation Coefficient: $r = 0.082$

Significance Level: $p = 0.099$

The correlation between unhealthy dietary habits and psychological health is also weak and not statistically significant ($p = 0.099$). This suggests that there is no strong evidence to

support a relationship between unhealthy eating patterns and psychological health in this sample. However, it may warrant further investigation to understand any potential associations.

Correlation Coefficient: $r = 0.109$

Significance Level: $p < 0.05$

A significant positive correlation exists between healthy dietary habits and unhealthy dietary habits. This indicates that individuals who report engaging in healthy dietary practices may also exhibit some degree of unhealthy eating behaviours. This finding could suggest a complex relationship between dietary habits, where individuals may not strictly adhere to one category of dietary practice.

Correlation Coefficient: $r = 0.054$

Significance Level: $p = 0.275$

The correlation between unhealthy dietary habits and physical health is weak and not statistically significant. This suggests that unhealthy eating patterns do not have a strong association with physical health outcomes in this sample.

Finally, we can say that the correlation analysis highlights significant relationships between psychological health and physical health, as well as between healthy dietary habits and physical health. While some correlations involving dietary habits and psychological health show potential, they require further exploration to establish clearer connections.

4.1.8: Dietary Diversity Score (IDDS) Category

Table 08: Individuals Dietary Diversity Score (IDDS) Category:

Variables	Frequency	Percent
Lowest dietary diversity (≤ 3 food groups)	31	7.6
Medium dietary diversity (4 and 5 food groups)	112	27.4
High dietary diversity (≥ 6 food groups)	266	65.0
Total	409	100.0

The table presents the frequency and percentage distribution of university students ($N = 409$) based on their dietary diversity, categorized into three groups: low, medium, and high dietary diversity. A small percentage of the sample (7.6%) falls into the category of low dietary diversity, meaning these students consume three or fewer food groups regularly. This suggests that a minority of students may not be meeting the dietary variety necessary to support adequate nutritional intake, potentially putting them at risk for nutrient deficiencies and poor health outcomes. A quarter of the students (27.4%) belong to the medium dietary diversity group, consuming between four and five food groups. These students have a relatively balanced intake, which is generally sufficient to meet their basic nutritional needs. This group may still benefit from an increased variety in their diet, but they are likely maintaining a more consistent level of health than those with low diversity. The majority of the sample (65.0%) reports high dietary diversity, consuming six or more food groups. This indicates that most students are achieving a varied diet that likely meets or exceeds recommended dietary guidelines. A diet that includes a broad range of food

groups tends to be more nutrient-dense and beneficial for both physical and psychological health. This data indicates that a significant portion of the student population (65%) is consuming a highly diverse diet, which is associated with better health outcomes. However, nearly 35% of the students fall into either the low or medium dietary diversity categories, suggesting that more than a third of students may benefit from interventions or education programs aimed at improving their dietary diversity. This distribution is crucial in understanding the overall nutritional status of the student population and can be used to guide health promotion strategies within the university. The emphasis should be placed on encouraging those with lower dietary diversity to incorporate a wider variety of food groups into their diet to improve their overall health. For better understanding, the information is presented below through a pie chart.

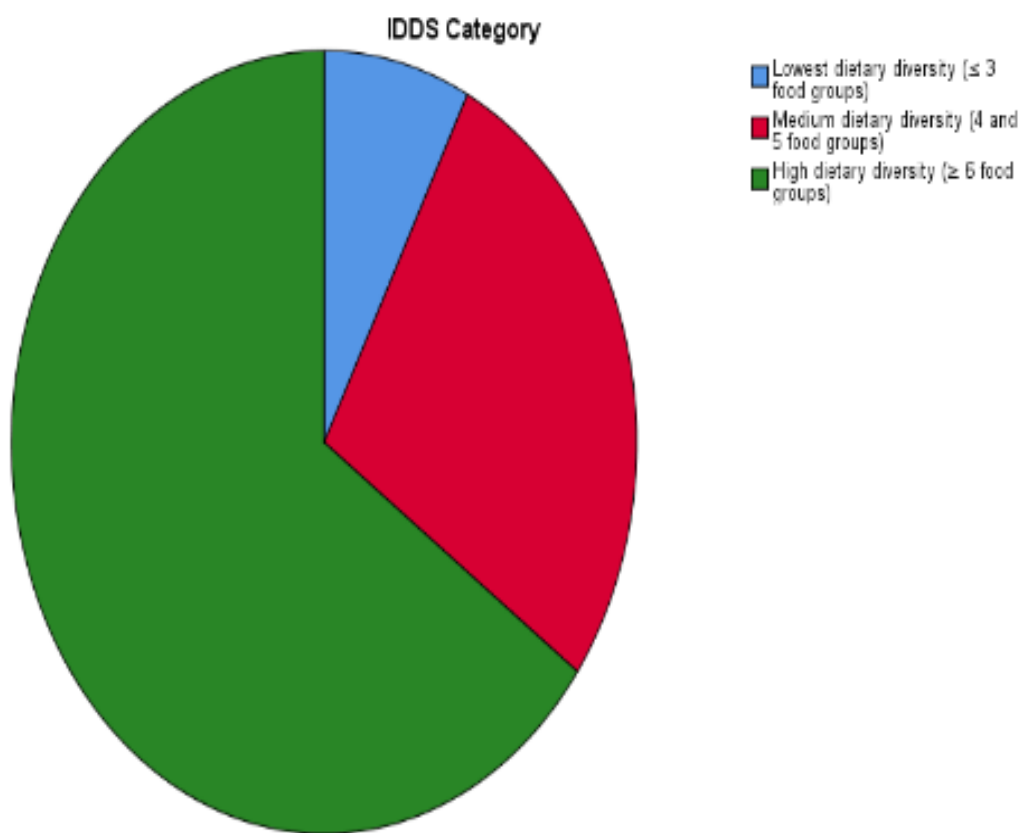


Figure 07: Individuals Dietary Diversity Score (IDDS) Category

4.1.9: Comparing Physical and Psychological Score for Different Individuals Dietary Diversity Score (IDDS) Category

Table 09: ANOVA Test

					95% Confidence Interval for Mean		Significance Level
		N	Mean	Std. Deviation	Lower Bound	Upper Bound	
Total Score of Physical Health	Lowest dietary diversity (≤ 3 food groups)	31	19.48	4.725	17.75	21.22	<.01
	Medium dietary diversity (4 and 5 food groups)	112	22.29	5.696	21.22	23.35	
	High dietary diversity (≥ 6 food groups)	266	21.90	5.525	21.24	22.57	
	Total	409	21.82	5.547	21.28	22.36	
Total Score of Psychological Health	Lowest dietary diversity (≤ 3 food groups)	31	15.81	5.089	13.94	17.67	
	Medium dietary diversity (4 and 5 food groups)	112	18.55	5.300	17.56	19.55	
	High dietary diversity (≥ 6 food groups)	266	18.53	4.851	17.94	19.12	
	Total	409	18.33	5.035	17.84	18.82	

Here we find out the result of the ANOVA test and get the significant result. I conducted an ANOVA test to determine. Whether physical and psychological health differs across different dietary diversity groups, and I found a significant result, where the significance level was <.01. Therefore, I can conclude that if the dietary diversity score varies, physical and psychological health will also differ. According to my results, those with low dietary diversity had physical and psychological health values of 19.48 and 15.81, medium dietary diversity was 22.29 and 18.55 and high dietary diversity is 21.90 and 18 respectively. Thus, for different dietary diversity groups, physical and psychological health varies, and we obtained a significant result through the ANOVA test, with the significance level being less than 0.01.

4.2 Discussion:

This review aimed to determine the effects of dietary habits on the physical and psychological health of individuals. A balanced diet and regular exercise are essential for maintaining good health, according to numerous controlled trials and case studies. Research indicates that being overweight or obese is associated with less physical activity, which in turn reduces life satisfaction and promotes poor mental health[(.Janssen I, 2004), (SteeleCA, 2004), (Thome, 2004)]. In all 163 men and 246 women took part in the study. At universities where the proportion of female students is significantly higher this distribution is typical. During the academic years, the transition to another environment is likely to change subjects' eating patterns (Tanton, Dodd, Woodfield, & Mabhala, 2015). Many factors were found to affect these behaviours: stress, economic status, dietary habits related to their family of origin, the cost of food, the knowledge about healthy food, the time of food preparation, culture, etc. In the case of medical students, these factors can even be multiplied: busy schedule, skipping lunches, early wakeups with no breakfasts, long practical sessions, etc., considering the lives of many students. The results of this research showed that roughly the students (47.4%) had a normal BMI without significant differences according to gender; 14.4% were underweight and 15.2% were overweight, 19.1 obese I and 3.9 obese II. At the same time, these results are the findings of a study conducted by Rahman, M.M, and Sultana, N.(2020) who showed that 61.8% of students had normal weight, 10.2% were underweight which is lower than my result, and 12.4% were overweight, Obese I and obese II were 12.4% and 3.0%. These result are similar to my result but not same because my data was more than that. The fact that 60.1% of the students are in the habit of eating breakfast every day. We consider it a negative indicator, because we know that the ideal is to eat breakfast every day to promote health and well-being. If comparing with other studies, the breakfast consumption data indicates that 60.1% of respondents in my study either skip breakfast or do so rarely (15% never, 11.7% very rare, and 24.4% sometimes). Comparatively, a study among Bangladeshi university students conduct by (Placeholder2) (2024) found a higher prevalence of skipping breakfast, with approximately 53.85% reporting they skip breakfast regularly.[(Logi Kristjánsson, 2010). On the other hand comparable research on the same population revealed that fewer than half of the students regularly ate breakfast. (Crovetto M, 2018), Rinat RG, 2012). Low body mass index, healthy eating, and physical exercise are all related. Students' academic success is influenced by their eating habits, which include three meals a day and a balanced diet. On the other hand, eating unhealthily more than seven times a week has a detrimental effect on their academic achievement (Kim SY, 2016). The main findings indicate that eating breakfast and cooking at home are protective factors against a lower quality of life across all dimensions. But adding salt eating fast food and consuming sugary snacks are risk factors for a poor quality of life. In the two domains that were expected for this age group the mean QOL scored well: psychological health (18.33 ± 5.035) and physical health (21.82 ± 5.547). Specifically, in the psychological health domain our study revealed that eating home-cooked meals was a protective factor against lower QOL. When students eat, they typically consume highly processed foods that are low in nutrients and high in energy. In terms of compliance with the recommendations of Chilean food guides we found a low

consumption rate of daily portions of dairy products (4.3 %) fruits (83.1 %) fish meat and eggs (98.8 %) and vegetables (96.3%). This is highly relevant because it enables us to direct nutritional interventions toward the promotion of a more natural home-made diet specially at lunch and dinner time (Watts AW, 2017). The principal results are that the habit of eating breakfast and consuming home-cooked meals are protective factors for a lower QOL in all its dimensions. However, consuming sweet snacks, fast food and adding salt are risk factors for a low QOL.

Regarding compliance with fish consumption (7.6%) fruits and vegetables (14.4%) and legumes (22.6 %) these results were better than those of the most recent national health survey 2018 (NHS) (Thome J, 2004) administered to participants aged 15 to 24. Conversely the results were worse when it came to dairy consumption (23%). Although (84.1%) of the students in our study consumed sweets (such as chocolate candies or cakes) on a daily basis this level of compliance is insufficient to completely adhere to a healthy diet. These findings do not significantly differ from those of a study carried out in Lebanon which found that between (42.60%) of participants regularly ate sweets (cake ice cream chocolate etc) (Salameh, 2014). Furthermore 82.6% of the students in our study reported eating fast food which is typically defined as pizza shawarma hamburgers or fries. Of these student half (47.56%) ate fast food at least once a week. The findings of Salameh and colleagues had greater rates indicating that 12.40% of students consumed fast food daily and that over half of participants (58.70%) consumed it less than twice a week. The findings of our study revealed that 91.4% of participants do not drink alcohol while 8.6% of students occasionally do. Comparing university students to people of the same age we can conclude that they consume less alcohol. We discovered that unhealthy eating practices were very common in our study including drinking sugary drinks (26.9%) and salting food before tasting it. This was another risk factor that was statistically significant for the social relationship domain of QOL. Furthermore, we previously demonstrated that a high prevalence of salt consumption was observed among our university students. The ENCA which indicates that (95.7 %) of Chileans aged 15 to 24 consume more than 5 grams of salt daily is in line with this. (Mahfouz, 2016) Nutrition.

Dietary habits are associated with many other diseases. Good diet helps fight diseases. Poor diet or meal skipping, especially breakfast, is closely associated with lesser self-confidence and even mood swings. Skipping lunch can cause diarrhoea while skipping breakfast can generate bloating (Ohlsson B, 2016). Food security status, added sugar and depression, anxiety are closely related (Wattick RA, 2018). There is a connection between adolescent depression and the quality of diet that depends on socio-economic status of every family. Poor diet increases the risk of adolescent depression [(Jacka FN, 2010), (Jacka FN K. P., 2010)]. Dairy products do not much affect mental health but are beneficial for physical health.

CHAPTER:05

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The dietary habits of university students significantly affect their physical and psychological health. Through extensive research and analysis, it is evident that poor dietary choices can lead to various health issues such as obesity, cardiovascular diseases, and mental health disorders like anxiety and depression. These health issues not only affect students' overall well-being but also hinder their quality of life. Many students exhibit poor eating patterns, such as skipping meals and consuming high-calorie, low-nutrient foods, which contribute to obesity and related health issues. These unhealthy diets are linked to increased stress, anxiety, and highlighting the need for nutritional education and healthier food options on campus. Furthermore, regular consumption of fruits and vegetables and adequate physical activity positively influence life satisfaction and overall well-being. Thus, universities should implement comprehensive health promotion programs to foster better dietary habits among students. Overall, addressing the role of dietary habits in the physical and psychological health of university students is crucial for creating a supportive and personal development. By prioritizing nutrition and wellness initiatives, universities can empower students to make healthier choices and thrive both academically and personally. The findings of this research contribute to a comprehensive understanding of the complex interplay between dietary habits, physical health, and psychological well-being among university students. Insights gleaned from this study can inform the development of targeted interventions and educational programs aimed at promoting healthier dietary behaviours and enhancing overall health and wellness in the student population.

5.2 Recommendations

The dietary habits of university students significantly impact their physical and psychological health. Common issues include irregular meal patterns leading to obesity and stress-related eating behaviours. Recommendations for improving dietary habits include:

Health Promotion Programs: Implement nutrition education and physical activity initiatives.

Regular Meal Plans: Encourage consistent meal times and healthy food choices.

Stress Management Workshops: Address the psychological factors affecting eating habits.

These strategies can help mitigate the negative effects of poor dietary habits on students' overall well-being.

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APPENDICES

Appendix 1: Synopsis

1. Title: Effect of Dietary Habit on Physical and Psychological Health of the Students of University

2. Introduction:

Background:

The dietary habits of university students significantly impact their physical and psychological well-being. As students transition to university life, they often encounter changes in their eating patterns, influenced by academic stress, social pressures, and newfound independence (El Ansari W. A., 2014). These factors contribute to shifts in dietary intake and lifestyle choices among university students, potentially influencing their risk of lifestyle-related disorders later in life (Vadeboncoeur C. T., 2015). Moreover, stress among university students has been linked to poor dietary choices, increased body mass index (BMI), smoking, and higher food intake (Papier, 2015). Psychological factors such as perceived stress, depression, boredom, and anxiety have been identified as contributors to overeating and emotional eating among university students (Ibrahim, 2013). Understanding the relationship between dietary habits and university students' physical and psychological health is of growing importance (Racette, 20008). Thus, this proposed study aims to investigate the intricate interplay between dietary habits and the overall well-being of students enrolled at the University. Recognizing the pivotal role that diet plays in shaping physical and psychological health, this research seeks to provide insights into how dietary choices impact students' lives (Almoosawi, 2016)

Rationale:

The research can identify the impact of dietary habits on the physical and psychological health of university students is crucial for promoting overall well-being during a pivotal period of development and long-term health outcomes.

Research Question or Hypothesis:

Research Question: How do dietary habits affect the physical and psychological health of university students?

Hypothesis: According to my research questionnaire the hypothesis are follows:

Null Hypothesis (H₀): There is no significant effect of dietary habits on the physical and psychological health of university students.

Alternative Hypothesis (H₁): Dietary habits have a significant effect on the physical and psychological health of university students.

3. Objectives:

General Objective: To investigate the correlation between dietary habits, including food choices and eating behaviours, and their impact on physical health outcomes (such as BMI, nutritional status and psychological well-being (including mood, stress levels, and mental health) of university students.

Specific Objectives:

- To examine the physical health status of students about their dietary choices.

- To explore the psychological well-being of students and its correlation with their dietary habits.
- To suggest recommendations for promoting healthier dietary behaviours among the student population

4. Methodology:

1.Research Design: We will conduct a cross-sectional study to gather at a specific point in time. A mixed-methods approach will be utilized, combining quantitative surveys and qualitative interviews.

2.Questionnaire: The questionnaire consisted of four parts. The first part includes questions on socio-demographic data, the second part includes questions on dietary factors, the third part includes questions on individual dietary diversity, four part includes on quality of life. The quality of life is included physical health, psychological health, social relationship and environment. The World Health Organization WHOQOL-BREF scale 14–15 is a short version of the WHOQOL-100 which measures 4 QOL domains. We take two QOL domains: physical and psychological. Which has a total of 63 questions. Various university students aged 19-27 will participate in this survey.

3.Sampling: We will randomly select a representative sample (400) of students from different departments and academic years in public and private university students at the age of 19-27 years.

4.Data Collection:

1.Develop a questionnaire covering dietary patterns, exercise routines, mental well-being height scale, weight in the machine for anthropometric measurement, and basic health indicators.

2.Use standardized psychological scales to assess stress, anxiety, and overall mental health.

5.Data Analysis:

Use statistical tools SPSS (Statistical Package for Social Science) to analyze the relationship between dietary habits, physical health, and psychological well-being.

5. Expected Outcomes:

The study would reveal connections between diet and psychological factors like stress levels, mood anxiety, and cognitive function among students. Identification of risk factors findings might highlight specific dietary habits that could potentially contribute to health risks. Recommendations for improvement based on the analysis would provide evidence-based recommendations for promoting healthier dietary choices among students

6. Socio-economic Impact:

Publishing a paper on the effects of dietary habits on university students' physical and psychological health can have significant socio-economic impacts. The socio-economic impact

of this project lies in its potential to improve student health, reduce healthcare costs, and enhance academic performance. Healthier students are likely to have better attendance and higher productivity, leading to improved educational outcomes and future economic contributions. Additionally, universities may see reduced financial strain on healthcare services and increased demand for healthier campus dining options. The findings could also influence

public health policies, fostering community well-being and lowering long-term healthcare costs associated with poor nutrition and related diseases.

7. Time Schedule of Activities:

Task	Activities by Months or Days (Starts to Ends)											
	1	2	3	4	5	6	7	8	9	10	11	12
Literature Research	↔											
Study protocol and questionnaire development		↔										
Ethical approval			↔									
Pretesting of study protocols, questionnaire				↔	↔							
Data and sample collection phase					↔	↔	↔	↔				
Data analysis and report writing									↔	↔	↔	
Report submission & plagiarism Checking											↔	↔

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Munmun Akter

Jannatul Maa

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Signature of the supervisor

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Signature of the student

Appendix 02: Questionnaire

Topic: Effect of dietary habits on the physical and psychological health of university students.

Respondent Name:

University:

Department:

Table 1: Sociodemographic Information

Questions	Response
1. Age (years)	
2. Gender	1. Male 2. Female
3. Socioeconomic level	1. Low 2. Medium 3. High
4. Marital Status	1. Married 2. Unmarried 3. Divorced 4. Widowed
5. Height (in feet and inches, e g 5 feet 2 inches)	
6. Weight (kg)	
7. Religion	1. Muslim 2. Hindu 3. Christian 4. Others
8. Living Place	1. Urban 2. Rural
9. Sedentary Lifestyle (>6 hours sitting per day)	1. Yes 2. No

Table 2: Dietary Factors

Healthy eating practice	
1. Do you have breakfast every day?	1. Never 2. Very rare 3. Sometimes 4. Most of the time 5. Always

2. Do you have dinner every day?	1. Never 2. Very rare 3. Sometimes 4. Most of the time 5. Always
3. Do you take home-cooked meals?	1. Never 2. Very rare 3. Sometimes 4. Most of the time 5. Always
4. How many dairy products do you consume per day (≥ 1)? (1 portion= 1 glass)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
5. How many portions of fruits do you consume per day (≥ 2)? (1 portion= 1 Piece)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day

6. How many portions of Vegetables do you consume per day (≥ 4)? (1 portion= 1 Cup)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
7. How many portions of whole foods do you consume per day (≥ 1)? (1 portion= 1 cup)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day

8. How many portions of fish/egg/meat do you consume per day (≥ 3)? (1 portion= 1 Medium Piece)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
9. How many servings of pulse/legume do you consume per day (≥ 1)? (1 portion= 1 cup)	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day

Unhealthy eating habits	
1. How many portions of fried foods do you consume per day (≥ 1)?	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
2. Do you consume sugary soda or juice per day? (1 portion: 200 cc glass)	1. Yes 2. No
3. Do you smoke/ take alcohol per day?	1. Yes 2. No

4. How many portions of sweet snacks do you consume per day (≥ 2)?	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
5. How many portions of fast foods do you consume per day (≥ 1)?	1. Do not consume 2. less than once a day 3. 1 portion per day 4. 2 portions per day 5. 3 or >3 portions per day
6. Do you add extra salt to food?	1. Do not add 2. Occasionally add 3. Always add

Table 4: Individual Dietary Diversity Questionnaire

Please tick the foods (meals and snacks) that **you ate yesterday** during the day and night, whether at home or outside the home. Start with the first food eaten in the morning.

Q. no.	Food Group	Examples	
1	Cereals	bread, noodles, biscuits, cookies or any other foods made from millet, sorghum, maize, rice, wheat + insert local foods e.g. ugali, porridge or pastes or other locally available grains	1. Yes 2. No
2	Vitamin-A-Rich Vegetables And Tubers	pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside + other locally available vitamin-A-rich vegetables	1. Yes 2. No
3	White Tubers And Roots	white potatoes, white yams, cassava, or foods made from roots.	1. Yes 2. No
4	Dark Green Leafy Vegetables	sweet pepper, dark green/leafy vegetables, including wild ones + locally available vitamin-A-rich leaves such as cassava leaves etc.	1. Yes 2. No
5	Other Vegetables	other vegetables, including wild vegetables	1. Yes 2. No
6	Vitamin A Rich Fruits	ripe mangoes, papayas + other locally available vitamin A rich fruits	1. Yes 2. No
7	Other Fruits	other fruits, including wild fruits	1. Yes 2. No

8	Organ Meat (Iron-Rich)	liver, kidney, heart or other organ meats or blood-based foods	1. Yes 2. No
9	Flesh Meats	beef, lamb, goat, rabbit, wild game, chicken, duck, or other birds	1. Yes 2. No

10	Eggs	chicken, duck, or other birds	1. Yes 2. No
11	Fish	fresh or dried fish or shellfish	1. Yes 2. No
12	Legumes, Nuts And Seeds	beans, peas, lentils, nuts, seeds	1. Yes 2. No
13	Milk and Milk Products	milk, cheese, yoghurt or other milk products	1. Yes 2. No
14	Oils and Fats	oil, fats or butter added to food or used for cooking	1. Yes 2. No
15	Sweets	sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies	1. Yes 2. No

16	Coffee/Tea	tea (black, green, herbal) or coffee	1. Yes 2. No
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B	Did you eat anything (meal or snack) outside of the home yesterday?	1. Yes 2. No

Table 5: Quality of Life

Physical Health						
No .	Question	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
1.	How satisfied are you with your health?	1	2	3	4	5
2.	How satisfied are you with the medical treatment to function in your daily life?	1	2	3	4	5
3.	How satisfied are you with your current energy levels for everyday life?	1	2	3	4	5

4.	How satisfied are you with your ability to get around?	1	2	3	4	5
5.	How satisfied are you with your sleep?	1	2	3	4	5
6.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
7.	How satisfied are you with your work capacity?	1	2	3	4	5

Psychological						
No.	Question	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
1.	How satisfied are you with the enjoyment you experience in life?	1	2	3	4	5
2.	How satisfied are you with the extent to which you feel your life is meaning?	1	2	3	4	5
3.	How satisfied are you with your ability to concentrate?	1	2	3	4	5

4.	How satisfied are you with your bodily appearance?	1	2	3	4	5
5.	How satisfied are you with yourself?	1	2	3	4	5
6.	How satisfied are you with the frequency of negative feelings such as a blue mood, despair, anxiety, or depression in your life?	1	2	3	4	5