

Comparative Analysis of Vegetarianism & Healthy Diet On Mental Health & Personality Traits

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ABSTRACT

Over the past few decades, Indians' preferences for food have shifted towards a Western diet, which includes frozen foods that are already prepared to eat and packaged foods. This way of life, which includes unhealthy eating, can bring on stress and anxiety. In a number of studies, the levels of stress, anxiety, and depression experienced by vegetarians and non-vegetarians, along with healthy and unhealthy diet consumers, have been shown to be distinct from one another. The purpose of this study was to assess the role of vegetarianism and healthy dietary habits on depression, anxiety, stress, and personality. 50 vegetarians and 50 non-vegetarians participated in the study, out of which 21 healthy diet consumers and 23 unhealthy diet consumers were screened out. The DASS and NEO-FFI scales were used to assess the sample, along with eating habits questions framed by the researcher. A significant difference was found between healthy and unhealthy diet consumers with respect to depression and conscientiousness. However, no significant difference was found between vegetarians and non-vegetarians with respect to depression, anxiety, stress, or personality.

Keywords: Vegetarianism, depression, anxiety, stress, personality.

1. Introduction

Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community. According to the WHO Guidelines (2020) for a Healthy Diet for Adults, A healthy diet includes fruit, vegetables, legumes (e.g., lentils and beans), nuts, and whole grains (e.g., unprocessed maize, millet, oats, wheat, and brown rice). At least 400 g (i.e., five portions) of fruit and vegetables per day, excluding potatoes, sweet potatoes, cassava, and other starchy roots. Less than 10% of total energy intake comes from free sugars, which is equivalent to 50 g (or about 12 level teaspoons) for a person of healthy body weight consuming about 2000 calories per day, but ideally less than 5% of total energy intake for additional health benefits. Free sugars are all sugars added to foods or drinks by the manufacturer, cook, or consumer, as well as sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates. Less than 30% of total energy intake comes from fats. Unsaturated fats (found in fish, avocado, and nuts, and in sunflower, soybean, canola, and olive oils) are preferable to saturated fats (found in fatty meat, butter, palm, and coconut oil, cream, cheese, ghee, and lard) and trans-fats of all kinds, including both industrially produced trans-fats (found in baked and fried

foods and pre-packaged snacks and foods, such as frozen pizza, pies, cookies, biscuits, wafers, and cooking oils and spreads) and ruminant trans-fats (found in meat and dairy foods from ruminant animals, such as cows, sheep, goats, and camels). It is suggested that the intake of saturated fats be reduced to less than 10% of total energy intake and trans-fats to less than 1% of total energy intake. In general, industrially produced trans-fats are not part of a healthy diet and should be avoided. Less than 5 g of salt (equivalent to about one teaspoon) per day. Salt should be iodized. Diet is a term used to describe a pattern of food consumption that satisfies requirements related to weight or health. A healthy diet can be defined as a pattern of food intake that has beneficial effects on health or at least no harmful effects (Stevenson, in press).

According to Deckers (2009), vegetarianism is the practice of avoiding all meat products, including red meat, poultry, seafood, and the flesh of any other animal. It may also involve avoiding animal byproducts. Vegetarians can be broadly classified into the following categories: Dairy products like milk and cheese are consumed by lacto-vegetarians in addition to the typical plant-based foods. (cereals, dals, fruits, and vegetables). In addition to all of the foods mentioned for lacto-vegetarians, ovo-lacto-vegetarians also consume eggs. Ovo-vegetarians consume eggs and all plant-based foods, but they avoid

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Received: 30 June, 2023

Available online: 20 September, 2023

milk and dairy-derived products. Fruitarians only consume plant materials that can be obtained without causing the plant's demise. Vegans only eat plant-based foods, such as grains, nuts, and fruits. All animal products, including milk, are avoided by them.

Non-vegetarian/Omnivorous are those who consume some meat (red meat, poultry, at least once a month), as well as those who consume more meat and fish overall than once per week. A significant source of beneficial proteins, vitamins like A, B1, B12, niacin, iron, zinc, and other micronutrients is found in meat. (Pattar et al., 2023). A *healthy diet* is one that provides enough micronutrients and fluids to meet the body's physiological needs while also consuming enough macronutrients in the right amounts to support energetic and physiologic needs without overeating (Stark, 2013). *Unhealthy Diet*: The developed world is seeing an increase in the consumption of packaged foods that are high in sugar and fat content but low in healthy micronutrients like antioxidants. Overeating of fatty, greasy foods, dairy products, sweet foods, strongly flavoured foods, and overly pungent foods are all examples of unhealthy diets. Consumption of toxic foods, such as contaminated and unhygienic foods, is also included.

(Tremellen, 2018) An unhealthy diet that is high in processed foods and sugar has been linked to an increased risk of depression and other mental health issues, whereas a healthy diet that is rich in nutrients has been found to have a positive impact on mental health. A poor diet (e.g., increased consumption of Western processed foods) is also associated with an increased likelihood or risk of depression (Jacka, Pasco, et al., 2010). Although stress and depression can lead to unhealthy eating habits, recent longitudinal studies indicate that reverse causality is a less likely explanation for long-term associations (Le Port, Gueguen, et al., 2012). According to some studies, people who eat a vegan or vegetarian diet may be at greater risk of developing anxiety disorders. This could be due to a deficit of nutrients found in animal products, such as vitamin B12 and omega-3 fatty acids. According to a recent German study, 8.5% of vegetarians and vegans and 5.3% of omnivores tested positive for possible cases of depression and anxiety, respectively (Pasalakis G, Richardson C, Nöhre, et al., 2020). In a study by Beezhold et al. (2014), a sample of adult vegans (n = 283), vegetarians (n = 109), and omnivores (n = 228) were surveyed to investigate factors that potentially impact mood. It was found that lower levels of stress in females were associated with a vegan diet and lower daily consumption of sweets.

According to the research, agreeableness and openness are FFM factors that are positively related to the tendency to consume fruits and vegetables but negatively related to meat consumption. Goldberg and Strycker 2002; Keller and Siegrist 2015; Pfeiler and Egloff 2018a; Forestell, Spaeth, and Kane 2012). Pfeiler and Egloff (2018a, Study 2)

hypothesize that those who avoid meat may be more conscientious, though their findings are inconsistent (see Pfeiler & Egloff, 2018b, Study 1). It has been proposed that the altruism and sympathy that characterize agreeable people may lead them to avoid eating animal products (Keller and Siegrist 2015).

Personality is the distinctive and typically enduring ways of thinking, feeling, and acting that define a person's reactions to situations in life. It refers to unique and relatively stable qualities that characterize an individual's behaviour across different situations over a period of time. Goldberg identified several consistencies, which he referred to as the 'Big Five Factors. On a scale from emotional stability to emotional instability, or neuroticism, this personality trait is measured. High neuroticism scores are frequently associated with persistent worry. They tend to be more anxious and fearful, overanalyzing their issues and exaggerating their importance. They might focus on a situation's drawbacks rather than its advantages. A person with neuroticism may find it more difficult to manage everyday stressors. *Extraversion* is outgoing, socially assured behaviour. *Openness to experience means an individual is willing to try new things.* Higher levels of openness make people more receptive to unconventional ideas and viewpoints, including those that contradict their preconceived notions. They enjoy engaging in artistic and cultural activities, going to theatres, museums, and art galleries, listening to music, and exploring new places. They are more receptive to strange cultures and traditions. Peers and coworkers frequently find *agreeable people* to be more likeable because they are more trusting of others, more altruistic, and more willing to assist those in need. They frequently perform well as team members due to their ability to collaborate with others. People who are agreeable dislike conflict, disagreements, and other confrontational situations. *Conscientious* people are more conscious of their actions and the results of their behaviour than unconscientious people are. They take responsibility for others and generally take care to complete the tasks given to them. People who are conscientious enjoy keeping their surroundings neat and organized.

Forestell et al. conducted a study in 2012 and found that vegetarians are significantly more open to new experiences and seek variety than omnivores. In comparison to omnivores, Pfeiler and Egloff (2018) discovered evidence for vegetarians being significantly more open, higher in trust (no significance after controlling for socio-demographic variables), and lower in conscientiousness. In Forestell and Nezlek's (2018) study, vegetarians appeared to be significantly more open than semi-vegetarians and omnivores, with semi-vegetarians falling in the middle. Tan et al. (2021) also looked at openness and found that vegans and vegetarians scored significantly higher than omnivores.

Khalid, Williams, et al. (2016) found no significant association between eating fruit and vegetables and moods in a systematic review of 20 studies looking at the connection between diet and depression in adolescents, but depression was associated with 'unhealthy' eating behaviours such as frequent takeaways or eating away from home (Faith, Matz, & Jorge, 2002; Quirk et al., 2013) and skipping meals or breakfast (Lee et al., 2017).

Jacka et al. (2011) studied 3040 Australian adolescents aged 11–18 years who were selected and assessed for the quality of their diet and mental health using the Pediatric Quality of Life Inventory (PedsQL). Higher PedsQL scores at follow-up were predicted by higher healthy diet scores at baseline, but lower PedsQL scores at follow-up were predicted by higher unhealthy diet scores at baseline. Over the course of the study, improvements in diet quality were mirrored by improvements in mental health, whereas declines in diet quality were linked to worsening psychological functioning.

Khanna, Chattu, et al. (2019) conducted a systematic review of around 1000 pertinent articles published between January 1978 and December 2017, chosen using electronic databases. Numerous healthy foods, including fish, olive oil, nuts, dairy products, legumes, vegetables, and fruits, are found to be inversely related to the risk of depression in this context and may even help with symptoms. Contrarily, longitudinal studies have shown that Western dietary patterns, such as consuming sweetened beverages, fried foods, processed meats, and baked goods, are linked to a higher risk of depression.

A study by Choi and Choi (2020) on 393 college students was conducted to study the impact of stress on eating behaviours. College students in Korea were given self-report questionnaires, and the 10-item Perceived Stress Scale (PSS-10) was used to measure perceived stress. The findings revealed that students who felt under a lot of stress consumed more ready-made meals ($p < 0.001$) and other unhealthy eating habits.

2. Relevance of the Present Study

On reviewing the literature, it was discovered that not many studies are available with respect to the Indian context that tap into these variables. Moreover, while searching for a relevant scale for the Indian population that assesses its dietary preferences and eating habits, the researcher was not able to find any scale. This further indicates the gaps present in the scientific research on eating habits.

Therefore, this study was conducted to fill in the gaps in the literature where dietary preference is not only dependent on personality but also plays a crucial role in determining the choices people make with respect to their dietary intake. So, the purpose of the present study was to assess the impact of vegetarianism and a healthy diet on the

mental health and personality traits of individuals aged 18–25. The objectives of the study are:

1. To assess depression, anxiety, and stress levels among vegetarian and non-vegetarian individuals.
2. To understand depression, anxiety, and stress levels among individuals taking a healthy diet and those who are not.
3. To assess the impact of vegetarianism and non-vegetarianism on personality traits.
4. To evaluate the impact of a healthy and unhealthy diet on personality traits.

The following hypotheses were proposed based on the above objectives:

H_{01} : There is no significant difference between depression, anxiety, and stress levels among vegetarian and non-vegetarian individuals.

H_{02} : There is no significant difference between depression, anxiety, and stress levels among individuals taking a healthy diet and those who are not.

H_{03} : There is no significant difference between vegetarians and non-vegetarians on various personality traits.

H_{04} : There is no significant difference in various personality traits among individuals taking a healthy diet and those who are not.

3. Method

Design

A descriptive design and cross-sectional method were used to measure the difference. Descriptive research helps in accurately and systematically describing a situation, population, or phenomenon. It can answer where, what, how, and when questions, but not why questions.

Participants

Data was collected from the subjects using purposive sampling, which is a non-probability sampling method. The study was done on 100 participants from Delhi-NCR consisting of equal numbers of vegetarians and non-vegetarians belonging to the age group of 18 to 25, which comprised 71% females and 29% males.

Tools Used

In order to compare vegetarians and non-vegetarians on the dimensions of depression, stress, anxiety, and personality, there were two research tools that were employed. The Depression, Anxiety, and Stress Scale—21 Items (DASS-21) is a set of three self-report scales formed to assess the emotional states of depression, anxiety, and stress. The three DASS-21 scales contain seven items each, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-

deprecation, lack of interest or involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxiety. The stress scale is sensitive to levels of chronic nonspecific arousal. DASS-21 has good internal consistency and reliability (Cronbach's alpha ranged between 0.74 and 0.93) in both clinical and non-clinical samples. The DASS has adequate convergent and discriminant validity (CFI = .93).

The NEO-FFI was formulated by Costa and McCrae and is based on the personality's five-factor model. It is a 60-item version of the NEO-PI-R that provides a brief, comprehensive measure of five domains of personality. It includes five 12-item scales that assess each domain. NEO-FFI is a self-administered instrument and can be used with individuals who are 17 years of age or older. There is no time limit; most respondents require 10–15 minutes. It is not intended to diagnose mental health. The test-retest reliability for 3 months for the five factors is as follows: N = 0.79, E = 0.79, O = 0.80, A = 0.75, and C = 0.83. Studies by McCrae and Costa (1992) showed the correlation of five scales in short form and long form ranged from 0.77 to 0.92. Also, the internal consistency of sub-scales has been estimated at 0.68 to 0.86.

4. Procedure

Research questions were formulated according to the dietary preferences of the Indian population. A Google Form was created that consisted of five sections that included a consent form, demographic details, questions related to eating habits, and the two scales used. A pilot study was conducted on five participants at first, and after considering their valuable feedback, three more questions were added. After including the new questions, the form was circulated using snowball sampling, and data was gathered from 100 participants. After which, the responses of vegetarians and non-vegetarians were separated into two groups using Microsoft Excel, and the raw scores were calculated. After calculating the scores, the data was exported to Jamovi 2.3.21, and an independent sample student's t test was performed for the two groups to compare the differences between their depression, anxiety, stress, and the five traits of personality.

Table 1: M, SD, obtained t value and p-value of vegetarians and non-vegetarians on depression, anxiety and stress.

	Vegetarians			Non-Vegetarians			df	T	p
	N	M	SD	N	M	SD			
Depression	50	11.0	10.4	50	11.1	11.4	98.0	-0.0365	0.971
Anxiety	50	9.88	8.91	50	11.6	9.01	98.0	-0.960	0.339
Stress	50	10.4	8.94	50	11.1	8.74	98.0	-0.373	0.710

Note: * p < .05.

Table 2: M, SD, obtained t value and p-value of individuals taking a healthy diet and unhealthy diet on depression, anxiety and stress

	Healthy diet			Unhealthy diet					
	N	M	SD	N	M	SD	df	t	p
Depression	21	7.24	8.91	23	16.9	15.5	42.0	-2.50*	0.016
Anxiety	21	8.00	8.39	23	14.3	12.1	42.0	-1.98	0.054
Stress	21	9.24	8.14	23	13.7	12.1	42.0	-1.44	0.158

Note: * p < .05.

Table 3: M, SD, t value and p-value of vegetarians and non-vegetarians on five personality traits

Personality domains	Vegetarians			Non-Vegetarians			df	t-value	p
	N	Mean	SD	N	Mean	SD			
Neuroticism	50	25.6	5.98	50	25.1	8.15	98.0	0.32	0.748
Extraversion	50	26.8	5.51	50	27.4	6.31	98.0	-0.540	0.590
Openness to experience	50	25.4	4.10	50	26.5	5.84	98.0	-1.05	0.296
Agreeableness	50	27.6	5.07	50	26.5	5.04	98.0	1.11	0.271
Conscientiousness	50	29.5	5.71	50	29.3	7.67	98.0	0.103	0.918

Note: * p < .05.

Table 4: Mean, standard deviation, obtained t value and p-value of individuals taking a healthy diet and unhealthy diet on five personality traits.

Personality domains	Healthy Diet			Unhealthy diet			df	t-value	p
	N	Mean	SD	N	Mean	SD			
Neuroticism	21	23.1	7.47	23	27.0	8.59	42.0	-1.60	0.117
Extraversion	21	26.8	5.74	23	26.1	6.50	42.0	0.340	0.735
Openness to experience	21	26.5	4.27	23	26.0	4.72	42.0	0.318	0.752
Agreeableness	21	26.8	4.59	23	26.5	4.93	42.0	0.167	0.868
Conscientiousness	21	31.2	7.51	23	26.3	6.23	42.0	2.38*	0.022

Note: * p < .05.

5. Discussion

The aim of the present study was to assess the impact of vegetarianism and a healthy diet on mental health and personality traits.

Based on the aim, four objectives were formulated, and student t-tests were used to get insights into the same.

The null hypothesis H_{01} states that “there is no significant difference between depression, anxiety, and stress levels among vegetarian and non-vegetarian individuals.” H_{01} is retained as in all three domains, the obtained t value for df 98 at the 0.05 significance level (-0.0365, -0.960, and -0.373) is less than the t-crit value (1.984). However, slight differences in the mean values of vegetarians and non-vegetarians for anxiety (9.88 and 11.6) and stress (10.4 and 11.1) are observed. And the same can be observed in Table 1. This signifies that vegetarians experience lower levels of anxiety and stress as compared to non-vegetarians, which includes lower levels of situational anxiety, skeletal muscle effects, autonomic arousal, and the subjective perception of anxious affect. They also face less difficulty relaxing, have lower nervous arousal, and are not easily agitated, irritable, over reactive, or impatient.

In a systematic review by Askari, Daneshzad, et al. (2020), the association between a vegetarian diet and depression, anxiety, and stress was studied. Findings from 13 publications (four cohort studies and nine cross-sectional studies) studying the association between a vegetarian diet and depression, anxiety, and stress were included. 10 studies revealed the absence of any relationship between the consumption of a vegetarian diet and depression. Further, the pooled effect size from four studies suggests that a vegetarian diet is not related to anxiety.

In another study by Rossa-Roccor et. al (2021) 339 university undergraduate students were selected to analyze the association between diet and mental health. No association was found between predominantly plant-based diet patterns and mental health and wellbeing. However, a significant positive association between the junk food component and depression (z-score $\beta = .21$, $p < .001$; adj. $R^2 = .39$) and anxiety was found (z-score $\beta = .14$; $p < .001$; adj. $R^2 = .32$).

The H_{02} , which states that “There is no significant difference between depression, anxiety, and stress levels among individuals taking a healthy diet and those who are not,” is rejected since a significant difference is observed in depression, where the obtained t-test value is (-2.50), which is greater than the t-critical value 2.021 at the 0.05 significance level with a df of 42. This implies that individuals on an unhealthy diet experience more dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia, and inertia. However, no significant difference between anxiety and stress among individuals on healthy and unhealthy diets is observed. Although large mean differences were observed in the three domains, The mean value of individuals taking a healthy diet was lower (7.24, 8.00, and 9.24) than the ones taking an unhealthy diet (16.9, 14.3, and 13.7) for depression, anxiety, and stress. This means that consumers of healthy diets experience less anxiety, depression, and stress.

A study by Jacka, Pasco, et al. (2010) was conducted on 1046 women to find the relationship between traditional and Western diets and anxiety. Responses to a food frequency questionnaire were converted into a diet quality score, and a factor analysis revealed dietary habits. Measurements of psychological symptoms were made using the 12-item General Health Questionnaire (GHQ-12), and evaluations of current depressive and anxiety disorders were made using a structured clinical interview. A “traditional” dietary pattern consisting of vegetables, fruit, meat, fish, and whole grains was linked to a lower risk of both major depression or dysthymia as well as anxiety disorders after adjusting for age, socioeconomic status, education, and health behaviours. A higher GHQ-12 score was linked to a “Western” diet high in processed or fried foods, refined grains, sugary goods, and beer.

H_{03} states that there is no significant difference between vegetarians and non-vegetarians in various personality traits. This hypothesis is retained as the obtained t values for all five domains are less than the t-crit value, which is 1.984 at a 0.05 level of significance and degrees of freedom of 98. However, slight differences in the mean values of vegetarians and non-vegetarians for neuroticism, extraversion, openness to experience, and agreeableness can be observed. The same can be observed in Table 3.

Consistent with these results, Forestell and Nezelek (2018) studied the association between vegetarianism, depression, and the five-factor model of personality among an American undergraduate sample. They found that vegetarians ($n = 276$) and semi-vegetarians ($n = 1191$) were more neurotic as compared to omnivores ($n = 4955$).

The findings for agreeableness with respect to vegetarianism and non vegetarianism are a bit contradictory. According to some researchers, eating meat negatively correlated with agreeableness (Keller & Siegrist, 2015; Pfeiler & Egloff, 2018b). Contrarily, Conner et al. (2017) discovered that agreeableness did not influence how much fruit or vegetables were consumed.

H_{04} , which states that “there is no significant difference in various personality traits among individuals taking a healthy diet and those who are not,” is rejected as a significant difference between the two groups is observed on the conscientiousness domain with the obtained t value of 2.38, where the t-critical value is 2.021 at a 0.05 level of significance and 42 degrees of freedom. This implies that individuals taking a healthy diet are more rational, prudent, practical, neat, and well-organized, adhere strictly to their ethical principles, are cautious and deliberate, and think carefully before acting. However, no significant difference is found in the other four domains of personality. Although mean differences were observed in the two groups for neuroticism, extraversion, openness to experience, and conscientiousness, as can be observed in Table 4.

In two studies among college students in Japan, researchers found such a relationship (Kikuchi, Masuda et al, 1999; Kikuchi, Watnabe, 2000). They investigated the Big Five personality dimensions in relation to health-consciousness and healthy habits such as not smoking, limiting alcohol consumption, eating regularly, and getting enough sleep, as well as receptivity to dietary advice. Participants who were high scorers on Conscientiousness had regular eating times, avoided salty foods, and were more receptive to advice to eat more yellow and green vegetables. An Internet survey among 583 college students found that higher Conscientiousness was positively associated with a number of health-promoting behaviors including consuming more fruits and vegetables (Raynor and Levine, 2009).

Consistent with these above results, it was found that individuals higher in conscientiousness are likely to make healthy choices as part of an overall tendency to adopt a healthy lifestyle, such as exercising regularly, avoiding risky behaviours, and eating fruit and vegetables (Raynor and Levine, 2009).

6. Limitations

The study was limited to researching depression, anxiety, stress, and personality domains with respect to vegetarianism and quality of dietary intake; other relevant variables could also have been considered, such as gender differences, empathy, happiness levels, etc. Due to the time constraints and limited availability of resources, the researcher was able to gather data from only 100 participants, and gathering data in an online mode made it quite challenging to analyze the authenticity of responses as a total of 97 questions were asked in the Google Form. The sample consisted of only adult participants, which is not representative of the entire population of vegetarians and non-vegetarians. The gender ratio was not maintained in the study as it was not considered a variable for analysis, but the predominant fraction of females could have influenced the data by measurement bias.

The researcher was unable to gather data on vegans as the vegan population is not very common in India. The sampling was non-probability, as it was based on the researcher's convenience and purpose. A longitudinal study would have yielded more insights by tapping into the dietary products consumed by every individual and the levels of stress, depression, and anxiety reported by them at alternate time intervals. The study relied only on empirical data and was thus limited in its methodology. Statistical analysis was constrained to t-tests and correlations. Additional statistical analysis may yield more information on mediating variables. Lastly, the social desirability factor, which is a type of response bias and is the survey respondents' propensity to provide answers that will be viewed favourably by others, might have also influenced the responses filled out by the participants.

7. Suggestions for future research

Along with collecting an equal amount of data for vegetarians and non-vegetarians, equal responses for males and females can also be taken into account to tap into gender differences as well. Incentives can be provided so that the participants are motivated to fill out the questionnaire genuinely, and a large number of participants can be gathered this way. Moreover, it is also suggested to gather the data physically, as this gives space for rapport formation. Along with adults, the dietary intake and preferences of adolescents can also be looked into, as adolescents are more vulnerable to falling into poor eating habits. Since a significant difference was observed between the healthy diet consumers and their counterparts in terms of depression levels, a follow-up study can be conducted to tap into the healthy practices of the former group that render them less prone to depression. Lastly, a larger sample can be taken into account that is representative of the entire population.

8. Implications

The study gives insights into how vegetarianism and healthy dietary habits are associated with the prevalence of depression, anxiety, stress, and the five domains of personality. The study's results can be used to build a knowledge base for future research and to develop dietary plans according to the needs of individuals. For instance, unhealthy diet consumers who reported higher depression could be suggested a healthier diet plan that includes less consumption of sugar-based drinks and junk food. Similarly, the study can also be used for further research into the effects of frozen or packaged foods on depression or anxiety. The study can be expanded to assess the impact of sattvic, rajasic and tamasic diet on mental health.

9. Conclusion

The dietary preferences of an individual and the quality of their diet determine their mental health and are also associated with their personalities. The Indian subcontinent has long recognised the value of fresh fruits and vegetables as well as the natural living philosophy, dietetic righteousness, abstinence from meat, and other non-vegetarian foods. People have, however, evolved their own food preferences over time in accordance with society, culture, exposure to various food items, availability of food, and farming methods. Results revealed no significant difference between the two groups with respect to depression, anxiety, stress, or personality.

However, when healthy and unhealthy diet consumers were screened out from the sample, a significant difference was found between the two groups with respect to depression and conscientiousness. Furthermore, anxiety, stress, depression and neuroticism were positively correlated in all the four groups.

10. References

1. Askari, M., Daneshzad, E., Darooghegi Mofrad, M., Bellissimo, N., Sutor, K., & Azadbakht, L. (2020, September 4). Vegetarian diet and the risk of depression, anxiety, and stress symptoms: a systematic review and meta-analysis of observational studies *Critical Reviews in Food Science and Nutrition*, 62(1), 261–271. <https://doi.org/10.1080/10408398.2020.1814991>
2. Barlow, D. H., & Durand, V. M. (2015). *Abnormal Psychology: An Integrative Approach* (Seventh ed.). Cengage Learning.
3. Beezhold, B., Radnitz, C., Rinne, A., & Di Matteo, J. (2014, November 21). Vegans report less stress and anxiety than omnivores. *Nutritional Neuroscience*, 18(7), 289–296. <https://doi.org/10.1179/1476830514Y.0000000164>
4. Butcher, J. N., Mineka, S., Hooley, J. M., & Nock, M. K. (2016). *Abnormal Psychology, Global Edition* (seventeenth ed.). Pearson Education Limited.
5. Choi, J. (2020). Impact of stress levels on eating behaviours among college students. *Nutrients*, 12(5), 1241. MDPI AG. Retrieved from <http://dx.doi.org/10.3390/nu12051241>
6. Costa PT, McCrae RR The NEO-PI/NEO-FFI manual supplement, Odessa, FL: Psychological Assessment Resources, 1989
7. Costa PT, McCrae RR, NEO PI-R professional manual: revised NEO personality inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) Odessa, FL: Psychological Assessment Resources; 1992
8. Conner, T. S., Thompson, L. M., Knight, R. L., Flett, J. A. M., Richardson, A. C., & Brookie, K. L. (2017, February 7). The Role of Personality Traits in Young Adult Fruit and Vegetable Consumption. *Frontiers in Psychology*
9. Forestell, C. A., Spaeth, A. M., & Kane, S. A. (2012, February). To eat or not to eat red meat, A closer look at the relationship between restrained eating and vegetarianism in college females *Appetite*, 58(1), 319–325. <https://doi.org/10.1016/j.appet.2011.10.015>
10. Forestell, C. A., & Nezelek, J. B. (2018, March 29). Vegetarianism, depression, and the five factors model of personality. *Ecology of Food and Nutrition*, 57(3), 246–259. <https://doi.org/10.1080/03670244.2018.1455675>
11. Faith, M. S., Matz, P. E., & Jorge, M. A. (2002, October). Obesity-depression associations in the population. *Journal of Psychosomatic Research*, 53(4), 935–942. [https://doi.org/10.1016/s0022-3999\(02\)00308-2](https://doi.org/10.1016/s0022-3999(02)00308-2)
12. Goldberg, L. R., & Strycker, L. A. (2002). Personality traits and eating habits: the assessment of food preferences in a large community sample. *Personality and Individual Differences*, 32, 49–65. https://projects.ori.org/lrg/pdfs_papers/personality-eatinghabits.pdf
13. Healthy diet. (2020, April 29). *Healthy Diet*, <https://www.who.int/news-room/fact-sheets/detail/health>
14. Jacka FN, Kremer PJ, Berk M, de Silva-Sanigorski AM, Moodie M, et al. (2011) A Prospective Study of diet quality and mental health in adolescents, *PLOS ONE* 6(9):e24805. <https://doi.org/10.1371/journal.pone.0024805>
15. Jacka, F. N., Pasco, J. A., Mykletun, A., Williams, L. J., Hodge, A. M., O'Reilly, S. L., Nicholson, C., Kotowicz, M. A., & Berk, M. (2010, March). Association of Western and Traditional Diets with Depression and Anxiety in Women *The American Journal of Psychiatry*, 167(3), 305–311. <https://doi.org/10.1176/appi.ajp.2009.09060881>
16. Keller, C., & Siegrist, M. (2015). Does personality influence eating styles and food choices? Direct and indirect effects. *Appetite*, 84, 128–138. <https://doi.org/10.1016/j.appet.2014.10.003>
17. Khalid, S., Williams, C., & Reynolds, S. (2016). There is an association between diet and depression in children and adolescents? A systematic review *British Journal of Nutrition*, 116 (12), 2097–2108. <https://doi.org/10.1017/S0007114516004359>
18. Khanna, P., Chattu, V. K., & Aeri, B. T. (2019). Nutritional Aspects of Depression in Adolescents, A Systematic Review, *International Journal of Preventive Medicine*, 10, 42. https://doi.org/10.4103/ijpvm.IJPVM_400_18
19. Kikuchi, Y., Inoue, T., Ito, M., Masuda, M., Yoshimura, K., & Watanabe, S. (1999). Health Consciousness of Young People in Relation to their Personality. *Journal of Epidemiology*, 9(2), 121–131. <https://doi.org/10.2188/jea.9.121>
20. Kikuchi, Y., & Watanabe, S. (2000). Personality and Dietary Habits. *Journal of Epidemiology*, 10(3), 191–198. <https://doi.org/10.2188/jea.10.191>
21. Le Port, A., Gueguen, A., Kesse-Guyot, E., Melchior, M., Lemogne, C., Nabi, H., Goldberg, M., Zins, M., & Czernichow, S. (2012, December 12). Association between Dietary Patterns and Depressive Symptoms Over Time: A 10-Year Follow-Up Study of the GAZEL Cohort, *PLoS ONE*, 7(12), e51593. <https://doi.org/10.1371/journal.pone.0051593>
22. Lovibond, S.H., and Lovibond, P.F. (1995). *Manual for the Depression, Anxiety, and Stress Scales* (2nd Ed.) Sydney: Psychology Foundation
23. Matta, J., Czernichow, S., Kesse-Guyot, E., Hoertel, N., Limosin, F., Goldberg, M., Zins, M., & Lemogne, C. (2018, November 6). Depressive Symptoms and Vegetarian Diets: Results from the Constances Cohort. *Nutrients*, 10(11), 1695. <https://doi.org/10.3390/nu10111695>
24. Paslakis, G., Richardson, C., Nöhre, M., Brähler, E., Holzapfel, C., Hilbert, A., & de Zwaan, M. (2020, April 22). Prevalence and psychopathology of vegetarians and

- vegans: results from a representative survey in Germany, *Scientific Reports*, 10(1), <https://doi.org/10.1038/s41598-020-63910-y>
25. Pattar, S., Shetty, P., & Shetty, G. B. (2023, March): Impact of vegetarian versus non-vegetarian diets on health outcomes in male individuals: a comparative study *Advances in Integrative Medicine*, 10(1), 1–7. <https://doi.org/10.1016/j.aimed.2023.02.001>
26. Pfeiler, T. M., & Egloff, B. (2018a). Examining the “veggie” personality: Results from a representative German sample. *Appetite*, 120, 246–255 <https://pubmed.ncbi.nlm.nih.gov/28890390/>
27. Pfeiler, T. M., & Egloff, B. (2018b). Personality and attitudinal correlates of meat consumption, Results of two representative German samples *Appetite*, 121, 294–301. <https://www.sciencedirect.com/science/article/abs/pii/S0195666317312047?via%3Dihub>
28. Quirk, S.E., Williams, L.J., O’Neil, A., et al. The association between diet quality and dietary patterns and depression in adults: a systematic review *BMC Psychiatry* 13, 175 (2013), <https://doi.org/10.1186/1471-244X-13-175>
29. Raynor, D. A., & Levine, H. (2009, July). Associations Between the Five-Factor Model of Personality and Health Behaviours Among College Students, *Journal of American College Health*, 58(1), 73–82. <https://doi.org/10.3200/jach.58.1.73-82>
30. Rossa-Roccor V, Richardson CG, Murphy RA, Gadermann AM (2021) The association between diet and mental health and wellbeing in young adults within a biopsychosocial framework. *PLOS ONE* 16(6): e0252358. <https://doi.org/10.1371/journal.pone.0252358>
31. Ruby, M. B., Heine, S. J., Kamble, S., Cheng, T. K., & Waddar, M. (2013, December) Compassion and contamination. Cultural differences in vegetarianism *Appetite*, 71, 340–348. <https://doi.org/10.1016/j.appet.2013.09.004>
32. Stark, C. Guidelines for Food and Nutrient Intake In biochemistry, physiology, and molecular Aspects of Human Nutrition, 3rd ed.
33. Tan, N. P., Conner, T. S., Sun, H., Loughnan, S., & Smillie, L. D. (2021, August). Who gives a veg? Relations between personality and vegetarianism *Appetite*, 163, 105195 <https://doi.org/10.1016/j.appet.2021.105195>
34. Tremellen, K. (2018). Oxidants, Antioxidants, and the Impact of the Oxidative Status in Male Reproduction. <https://doi.org/10.1016/C2016-0-03860-3>

