Nutrition as a Predictor of Mental Well-Being

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Abstract

Healthy diets (fruits, vegetables, fish etc.) and unhealthy diets (starch, sweets, soda) were examined in order to see if they would be significant predictors of General Mental Health, Happiness, Optimism and Satisfaction with Life levels while controlling for the possibly confounding variables of age, gender, alcohol, smoking and social support. Initially, after using hierarchical multiple regression, the results showed that diet was a significant predictor of only optimism and happiness levels in participants, however after controlling for the confounding variables, the relationship disappeared. In the final model, diet was not a significant predictor of General Mental Health, Happiness, Satisfaction with Life and Optimism. Final analysis showed that age was the only significant predictor of all measures of mental health used, along with smoking status being a significant predictor of happiness, satisfaction with life and optimism. Lastly, degree of alcohol use was also a significant predictor of optimism levels. Future research should take into consideration the role of confounding variables in diet and nutrition research.

Submission of Thesis and Dissertation

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Introduction

Nutrition has long been known as a gateway for physical health. According to Stein (2014), the importance of nutrition dates back to Hippocrates (400 b.c), where he sated ***''Let food be your medicine and medicine be your food''***. Essential nutrients include carbohydrates, proteins, fats, fibre, vitamins, minerals and water. It has become common knowledge that getting the right amount and balance of these nutrients can have a huge impact on a person's overall physical health. According to Nicoletto and Rinaldi (2011), the nutrient supply of children in the womb is essential to later physical health and development, and that a lack of nutrition at this time point could result in the later development of diseases such as cardiovascular disease and diabetes. It has also been noted by Stacey and Seidl (2014), that nutrition can play a part in preventing Parkinson's disease along with treating it. The study notes the importance of different nutrients and minerals and their role within the disease. Specifically the role of the omega-3 fatty acid docosahexaenoic (fish and salad greens), which has been shown to be neuro-protective in terms of Parkinson's, as well as a deficiency in Vitamin D linked to disruption in homeostasis in the body which may play a part in the development of Parkinson's. According to Ajmera (2013), poor nutrition such as a high intake of fried foods, sugar, salt and fast food has also been linked to obesity, hypertension, heart disease, gout, diabetes among others.

Cancer is another major health concern which has been linked with poor nutritional habits. In their book, Hark et. al (2014), outlined the increasing role

obesity and poor nutrition play in cancer diagnoses. Excess adipose tissue in the body due to obesity can cause alterations in the hormone metabolism process in the body. It is proposed that high insulin levels in individuals who are overweight can promote tumour growth in the body which can ultimately lead to the development of cancel cells.

To further highlight the importance of nutrition, an article developed by UNICEF (2012), discusses the effects of malnutrition and their effects on the body. It states the importance of certain nutrients such as Vitamin A for a healthy immune system, iodine and its importance for a healthy thyroid which promotes healthy growth and development, and iron for the healthy formation of red blood cells which is critical for oxygen to be regulated around the body. UNICEF states that malnutrition can have devastating effects on one's immune system and subsequent physical health.

So as can be seen from the research above and much more beyond what is written here, it is clear that nutrition plays a part in the overall physical well-being of an individual. Although there has been a plethora of research done investigating the effects nutrition and different dietary habits can have on the physical wellbeing of individuals, there has been less research done in terms of the link between nutrition and mental health. It has been somewhat unrecognised within the psychological community. According to the World Health Organisation (2014), mental health and wellbeing is when an individual is able to reach their full potential, when they are able to cope with life stressors, is able to work fruitfully and productively, and is able to make an impact on the community.

Nutrition and the Brain

According to Logan (2007), it was stated that although it is commonly known that nutrition plays a part in many physical ailments such as cardiovascular disease and cancer, it is still less known that nutrition can also play a part in many mental conditions such as depression, anxiety, ADHD, headaches and Alzheimer's Disease. In light of this, investigating this issue further would be of use in order to find out the relationship our daily food habits play in our everyday mental well-being.

According to Moser (2012), many of us are already aware that consuming low nutrient foods such as fat, sugar, fast food etc. can leave individuals feeling void of energy, obese and in a depressed mood and having a diet high in fruits, vegetables and nuts can have the reverse effect. This statement is supported by a study done by Ruusunen (2013), where different dietary habits were investigated. It was found that diets rich in vegetables, fruits, berries, whole grains and fish was good for decreasing risk of depression and negative mental states. It also showed that a Western cultured diet rich in processed meats, chips and soft drinks significantly increased an individual's risk of depression. From this research, it can be seen that there seems to be a relationship between food habits and an individual's subsequent mental health. In order to understand why specific diets impact upon mental health the way it does, it's important to understand how nutrients impact the functioning of the brain.

According to Leyse-Wallace (2013), nutrients, at whatever level in the body, whether that may be in excess, inadequate or so on, can have a significant effect on the functioning of the brain and the central nervous system. A lack of nutrients can lead to consequences as severe as mental retardation or something as simple as mild discomfort such as stress and irritability experienced when a caffeine addict does not get their morning coffee.

According to Schmidt (2007), the brain is made up of 60 per cent fat. It is new research in the area that has outlined the importance of the types of fats and oils we put into our bodies and the way it can affect the efficient functioning of the brain. The ingestion of essential fatty acids and Omega-3 and 6 can have effects on our mental health as young as the gestation period, all the way through until old age. Lacking these essential minerals have been linked to abnormal functioning of the brain such as bipolar, depression, memory loss and alzheimer's and even social skills. Overall it was stated that fatty acids are essential in order to manage the brains complex structure. These fatty acids must be consumed from our diets because the brain cannot generate them itself. Fatty acids are essentially building blocks of the brain that, can be seen, if not supplied to the brain can cause significant mental health decline.

According to Davison et. al (2012), nutrition is essential in the maintenance and efficient workings of the brain. This happens through the interconnection of many nutrients. Some examples of these nutrients and their functions within the brain include carbohydrates which are linked with glucose which is the energy source of the brain, Vitamin B3 which is linked with the production of dopamine,

and vitamin C acts as an antioxidant within the brain and is neuroprotective. Vitamin E or a lack of has also been linked to Alzheimer's disease.

The Psychology of Starvation

It is clear from the above research that not only do nutrients play a part in the normal functioning of the brain but also, that if these nutrients are lacking, there can be negative consequences. In order to understand just how important nutrients are for the efficient workings of the brain it would be beneficial to look at studies done on starvation which is a complete lack of nutrition to the brain. According to Kaplan and Rucklidge (2013), one of the most famous studies investigating starvation was the Minnesota Starvation Experiment which took place in November of 1944 and December of 1945. The aim of the study was to investigate the effects prolonged dietary restriction may have on the functioning of the brain and subsequent mental health of the participants. The investigation involved 36 participants during the World War 2 period. The results were published by Key (1950). The results showed that effects from prolonged nutrient deficiency were things such as increases in depression and hysteria, along with periods of severe emotional distress. Participants also showed a lack of interest in socialising and became quite isolated within the community. There was also slower cognitive functioning such as poorer judgment and poorer concentration levels reported.

There is also a lot to be learned from major natural disasters such as the Dutch Famine (1944-1945). Such conditions could not ethically be carried out on

human participants in this day and age but valuable data was gathered during these major world events. According to Lumey and Vaiserman (2013), the psychological effects of the famine outlined the importance of nutrition during pregnancy, as babies exposed to famine doubled the incidences of schizophrenia. When the famine exposed children were re-examined at ages 18-19 there was a twofold rate of schizophrenia. There was also found to be an increase in mood disorders and anti-social behaviour. The results were further supported by findings from Clair et. al (2005), who stated that during the China Famine (1959-1961), prenatal exposure to lack of nutrition saw a dramatic increase in the incidences of schizophrenia seen in the men and woman years later. This study noted that even though the famine involved a different culture than that of the Dutch Famine, the rates of schizophrenia doubled and this is a very important finding in that it outlines the importance of nutrition in the womb.

How nutrients affect emotional stability

From the above research it can be seen that nutrition is important if the brain is to develop healthily and work efficiently. There has also been research into what parts of the brain these nutrients work with and how they can affect the emotional stability of individuals. For example, there seems to be a connection between nutrition and stress. According to Talbott (2007), high cortisol levels due to prolonged or high stress periods in a person's life can cause negative effects on a person's overall mental health, as well as it being associated with the subsequent

development of depressive symptoms. According to the same source, there is a specific enzyme named HSD (11 beta-hydroxysteroid dehydrogenase) which is associated with higher cortisol levels in the body. A natural way in which to inhibit the activation of this enzyme was higher ingestion of things such as fruits, herbs and vegetables etc. Most notably are foods such as apples, onions, grapefruit and soybeans which are high in flavonoids which combat HSD levels. This outlines the importance of the ability to control stress levels not just by extraneous factors such as meditation, therapy and other environmental factors, but also that it can be controlled internally by the diets and nutrition individuals exercise each day.

There was also support for the stress and nutrition connection from Long and Benton (2013), where it was found that consumption of foods high in Vitamin B may be a contributing factor to better mood states and the lowering of cortisol levels in the body. Foods high in Vitamin B include things such as pork, poultry, fish, bread, whole cereals, eggs and soya beans.

Another mental condition that may have a source in nutrition is anxiety. Anxiety is one of the most common mental illnesses in today's world. According to Baxter et. al (2013), the worldwide prevalence is 28.3%. In a study done by Lakhan and Vieira (2010), herbs and nutrition play a role in anxiety. In their research, they outlined the importance of food high in magnesium such as beans, nuts, wholegrain foods and green leafy vegetables. They also outlined the essential benefits that herbs can play in our diets to promote positive mental health such as passionflower or kava. Their study showed that subjects who stuck to these nutritional diet guidelines, suffered from less anxiety than before commencing the diet, however there was

questioning about whether this was due to a placebo effect. It was also found that caffeine plays a role in anxiety symptoms (Childs et. al, 2008)

Depression is also a mental condition that is extremely common and can effect everybody at least once in their lifetime. There are many treatments for depression such as psychotherapy and drug treatments. However, even though there are many treatments available for a very common disorder; none seem to be adequate enough in sustaining relapse in patients. Could nutrition play a role in preventing and treating depression? A study done by Coppen (2005), stated that there may be a role for nutrition in prevention and treatment of depression. Folic acid and vitamin B12 were outlined as being very important. In the research, there was found to be a link between folic acid and antidepressant response rates, as well as Vitamin B12 being associated with better treatment outcomes. Both of these nutrients are associated with adenosylmethionine which is essential in efficient neurological functioning.

This idea was further supported in a study done by Bodnar and Wisner (2005), where the importance of nutrition in preventing negative mental health states was investigated. They emphasised the risk that child bearing women are at for developing depression due to the depletion of nutrient reserves during pregnancy. Pregnancy and lactation are major nutritional stressors for the body and again, omega 3, fish oil, folic acid and proper nutritional care is essential in the positive mental health of the mother and child.

The Relationship between Different Diets and Mental Health

It is clear from the above research that nutrients are very important when it comes to the efficient and healthy workings of the brain. But in what ways are they important and what are the specific diets that contribute to specific moods and behaviours? This is an essential starting point. Many people the world over follow different dietary habits for many different reasons such as moral reasons, cultural norms, and health reasons e.g. diabetes etc. Let's take a more in depth look at different diets that people adopt.

One phenomenon worth investigating is the potential effects of individuals who follow a vegetarian diet due to moral or health reasons. Vegetarians are identified as abstaining from eating meat and fish. It is a diet that has been gaining popularity in the last decade and has been linked with many health benefits such as it reducing cancer, lower mortality and better cholesterol levels. (Nordqvist, 2014). However, many research studies studying the impact of vegetarianism on mental health have correlated negatively with positive mental health.

One such study done by Michalak et. al (2012), stated that a vegetarian diet is associated with an elevated risk of mental disorders. This could be for a number of reasons some of which include vegetarians seeing themselves in a negative light, as they are conscious of their dissimilarity to the general population, a lack of omega 3 fatty acids that have been linked to major depressive disorders and also a lack of vitamin B12. The findings seem to suggest that adopting a vegetarian diet can lead to negative mental states although it was argued that a vegetarian diet is not causal of

the onset of mental disorder, rather, individuals who suffer from mental disorders, tend to be more compassionate and ethical and therefore adopt the vegetarian diet because of the mental disorder. This research outlines that foods such as meat, fish and dairy, may play a major part in the overall healthiness of a person's mental health, however there is a lack of research in the area and the subject must be investigated further.

A diet completely opposite to vegetarianism is a Ketogenic diet which has long been investigated and promoted in treating individuals who suffer from epilepsy. It is a high protein and low carbohydrate diet which forces the body to burn fats rather than carbohydrates. According to Paskitti (2001) and Phelps (2013), a ketogenic diet has been associated with the reduction of bipolar symptoms by inhibiting excitory neurons in the brain, and found to be correlated with a more positive mind frame. However the studies included extremely low sample sizes and may be at risk of the placebo effect as the participants were noted as really wanting the diet to work and being extremely motivated for it to do so. In this way the studies may be biased and further investigation will be needed in the area.

The Amish live in a society that has a strong belief in working with nature and growing their own organic foods. They have been shown to have extremely low rates of sickness as well as positive mental health. Although this could be attributed to the lifestyle they live in terms of no technology use, proper sleeping patterns, high levels of sunlight and low stress etc., there is evidence to suggest it could also be linked to the foods they eat. According to Kardaras (2011), they seem to be

consuming very high levels of Omega 3 that has been linked to low depressive mental states.

Decline in Nutrition

Clearly, there is support for the idea that a diet rich in vegetables, fruit, fish, whole foods, nuts etc. has a positive impact on mental health. Unfortunately, in the last decade, the consumption of processed, sugary and fatty foods has dramatically increased. The growth of popularity in cheap, processed, high fat, high sugar, high salt foods etc. has been a major problem in the last 50 years. According to De Vogli et. al (2013), the amount of annual fast food transactions per capita between 1999 and 2008 has increased from 26.61% to 32.76% which involved 27 high income countries. Fast food and processed foods are generally extremely high in salt content which has been linked to later decline of cognitive functioning especially when combined with inactivity (Brooks, 2011).

Processed foods also tend to be extremely high in sugar. A study done by Peet (2004), found that consuming a diet high in sugar was highly correlated with levels of schizophrenia and depression. This seems to be due to a key brain hormone called BDNF. High sugar suppresses the growth of this hormone which in low volumes has been associated with depression and schizophrenia. Secondly, high levels of sugar can cause inflammation in the body which can disrupt the immune system and the efficient working of the brain which again, has been linked to depression and schizophrenia.

The idea that a Western diet high in processed foods, high fat, high sugar, salt, low organic fruit and vegetables etc. can wreak havoc on your brain and essential mood and behaviour has been supported by a study done by Green et. al (2003), where it was found that people of the Arctic have been in increasingly more contact with the western world and results showed that there has been an increase in mental health problems such as anxiety, depression and even suicide in the Arctic Society.

Overall, there has been a general decline in consumption of foods rich in nutrients that have been shown to have a significant impact on the mental health of an individual. Specifically, there has been a general decline in the consumption of fruits, vegetables and fish, with individuals having a higher and higher preference for quick, easy, low nutritious, fast food. According to Popkin et. al (2012), since the turn of the millennium, there has been a major increase in western society of refined carbohydrates, sugars, fats, oils, sweeteners and a major reduction in the consumption of vegetables, grains and fruits. Also, according to Healy (2014), in terms of the intake of fast food, Ireland has a 322 euro per capita rate, higher than any other country in the EU.

The Current Study (Aims and Hypotheses)

Due to these findings, it would be beneficial to investigate this matter further. It has already been shown in the above research that foods low in nutritious content can impact upon mental health; therefore the current study aims to continue to

investigate this matter. The study will investigate the unhealthy (sweets, soda drinks, starch) and healthy diet (fruit, vegetables, protein) habits of individuals and if this will have an impact on mental health specifically General Mental Health, Happiness, Life Satisfaction and Optimism.

If it was found that participant's dietary habits had an impact on positive or negative mental health, it could have positive implications for the psychological community such as promoting specific eating habits in therapeutic settings e.g. treating people with anxiety, depression etc. Also, it is a much more inexpensive treatment compared to drug treatments, and clients would also be more inclined to try this as opposed to drug treatments. If a link was found, it could be promoted more so in the media, newspapers, clinical settings etc. These findings could help people deal more effectively with mental health problems and also promote the positive mental health of the community.

The main aims of the current study are outlined below:

Aim 1: To investigate whether there is gender differences in terms of healthy and unhealthy diet habits.

Aim 2: To investigate whether educational status has an impact on healthy and unhealthy diet habits.

Aim 3: To investigate whether smoking has an impact on healthy and unhealthy diet habits.

Aim 4: To investigate whether a person's alcohol habits have an impact on healthy and unhealthy diets.

Aim 5: To investigate whether healthy and unhealthy dietary habits will have an impact on mental health while controlling for the variables of age, gender, smoking status, alcohol status and social support.

As such, the current study will hypothesise that unhealthy dietary habits will result in significantly lower mental health status and healthy diet habits will result in significantly higher mental health status.

Methods

Participants

The sample included 32 males (20.1%) and 127 females (79.9%) and these individuals ranged in age from 18 to 61, with a mean age of 32.03 years (SD = 10.95). Over half of the participants lived in a suburban area (54.3%) with the rest scattered through urban areas (32.7%) and rural areas (13%). Most participants declared that they were currently single (52.5%) and had acquired a Bachelor's Degree or higher in terms of their education (52.4%). Most participants were employed for wages (61.7%), did not smoke (72.8%) and drank alcohol (87%).

Research Design

This research study was cross-sectional, quantitative and survey based. Data gathered from participants was entered into a software package called SPSS for analysis.

Aim 1: The analysis used was an independent samples t-test. The independent variables included males and females and the dependant variables were healthy and unhealthy diet scores.

Aim 2: The analysis used was a one way between-groups anova. The independent variable was education which had three levels (groups) which were secondary

school, some college, bachelor's degree or higher. The dependant variables were a healthy and unhealthy diet scores.

Aim 3: The third aim was similar to aim 1 except the independent variables were a person who smokes and a person who does not.

Aim 4: The fourth aim was also similar to aim 1 except the independent variables were whether the participant drank alcohol or not.

Aim 5: The analysis used here was a hierarchical multiple regression analysis. This was used to investigate whether healthy and unhealthy dietary habits remained a significant predictor of mental health in the participants after controlling for age, gender, smoking status, alcohol status and social support. The independent variables were entered in groups. The first step included healthy and unhealthy diet scores. The second step added the variables of age, gender, smoking status, alcohol status and social support. The dependant variables were General Mental Health, Happiness, Life Satisfaction and Optimism.

Procedure

Participants were gathered through social media once the study was ethically approved by the Ethics Committee at the National College of Ireland. It took approximately 20 minutes for each participant to complete the questionnaires and data collection lasted roughly 7 days. The participants were first presented with an information sheet (Appendix A) in which all participants were informed of the nature

of the study, what they will be required to do and that their participation in the research is completely voluntary. Participants were reminded of the confidentiality of the questionnaires and that all information required would be completely anonymous. All information would be returned and stored using Google Documents and destroyed after 10 years in line with the American Psychological Association ethical guidelines.

Participants were then required to fill out online questionnaires that included questions regarding demographics e.g. age, gender, living area etc., their social support status, eating habits, satisfaction with life, happiness, optimism and general mental health. More in depth knowledge of the specific questionnaires is outlined below.

Materials

Interpersonal Support Evaluation List *(ISEl:* Cohen, Mermelstein, Kamarck, & Hoberman, 1983) includes 12 items that measure individual's perception of social support. It includes 3 different subscales that measure Appraisal Support, Belonging Support and Tangible Support. Each dimension is measured using a 4 point Likert Scale ranging from ''Definitely True'' to ''Definitely False''. Scores range from 12 to 48 with a high score indicating high levels of social support and satisfaction with that support as opposed to low scores that indicate the opposite. It shows strong psychometric properties with it being shown to have strong reliability with a Cronbach's alpha score of .83 and also proved to have strong reliability within each

of the four subscales and across gender and ethnicity. (Payne et. al, 2012). The internal reliability for the current sample was adequate with a Cronbach's Alpha score of .8.

The Oxford Happiness Questionnaire (OHQ: Argyle & Hills, 2002) is a 29 item questionnaire that investigates an individual's current level of happiness. It is measured using a 6 point Likert Scale ranging from ''Strongly Disagree'' to ''Strongly Agree''. Higher scores indicate higher levels of happiness. According to Hills and Argyle (2001), the OHQ has been shown to be a valid and reliable scale of measuring happiness with a reliability value of 0.92. There was a Cronbach's Alpha score of .9 for the current sample which indicates high internal consistency.

Eating Patterns Questionnaire (EPQ: Harder Family Practice, 2003). This questionnaire is an 8 item scale that enquires about many aspects of a person's daily eating habits. E.g. Do you follow a special diet? The psychometric properties of the EPQ have yet to be investigated, however reliability for the current sample was quite low (Cronbach's Alpha = 2.63)

The Life Orientation Test Revised *(LOT-R:* Carver, C.S, 2013) is a test that was developed to initially investigate individual differences in levels of optimism and pessimism. It was revised in 1994 to distinguish between optimism and neuroticism traits. It is a ten item test that is measured using a 5 item Likert Scare ranging from ''I agree a lot'' to ''I disagree a lot''. If a high score is obtained, an individual is experiencing high optimism levels. According to Hirsch et al. (2010), the LOT-R has

been shown to have adequate internal consistency with a value of .72. There was also high internal consistency of the current sample with a Cronbach's Alpha score of .8.

The Satisfaction With Life Scale (SWL: Pavot, W., & Diener, E, 2013) is a 5 item scales that measure global levels of an individual's current life satisfaction. It measured using a seven point Likert Scale where participants are asked to what degree they agree or disagree with the five items presented. The answers range from "Strongly Agree'' to "Strongly Disagree''. Low scores correspond with low life satisfaction and higher scores indicate an individual is experiencing high life satisfaction. According to Noonan and Chan (2013), this scale has been shown to have excellent internal consistency with a Cronbach's Alpha score of .9. It has also shown to have excellent validity with it having high correlation with other similar scales. There was high internal consistency within the current sample (Cronbach's Alpha score = .9).

The General Health Questionnaire (GHQ-12: Goldberg & Williams, 1970) is a scale that is used to measure the risk an individual has of developing psychiatric disorders (e.g. depression, anxiety etc.). The original GHQ has 60 items but the current scale being used is a shortened version containing 12 items that enquire about a person's mental health over the last couple of weeks. A sample question is ''Have you recently been losing confidence in yourself?''. The responses range from ''Not at all'' to ''Much more than usual''. A high score indicates mental illness and lower scores indicate a healthy state of mind. According to Lopez and Dresch (2008), the GHQ-12 has been shown to be a reliable measure with a Cronbachs

Alpha of .78. Internal consistency for the current sample was high with a Cronbach's Alpha score of .91.

Results

Descriptive Statistics

The descriptive statistics for the current sample are presented in Table 1 below. As can be seen, the sample had a mean GHQ score of 13.22 (SD = 6.89). The higher the GHQ scores the more severe the mental health status so this score indicates that individuals had generally good mental health. Optimism scores had a mean of 14.04 (SD = 5.13), Happiness scores had a mean of 2.41 (SD = 2.76), Satisfaction with Life scores had a mean of 22.21 (SD = 7.88) and Social Support scores had a mean of 30.60 (SD = 2.29). The current sample tended to cluster around the average score with all scores for these variables neither being too high or low. This indicates that the current sample had overall average levels of positive mental health and social support. Finally, the healthy diet scores had a mean of 3.29 (SD = 2.51) and unhealthy scores had a mean of 2.51 (SD = 1.33). This indicates that the current sample tended to consume a more healthy diet as opposed to an unhealthy diet.

Table 1

Descriptive statistics for the current sample (GHQ, Optimism (OPTM), Happiness, Satisfaction with Life (SWL), social support (SS), healthy diet (HD) and unhealthy diet (UD)). ***(next page)***

	(GHQ -12)	Happiness	SWL	OPTM	SS	HD	UD
N	162	127	162	161	162	162	162
Mean	13.22	3.50	22.21	14.04	30.60	2.29	2.52
SD	6.89	.71	7.88	5.13	2.51	1.24	1.33
Range	1 - 36	1 - 5	5 - 35	0 - 24	22-41	0 - 5	0 - 6

T tests

Three separate independent sample t tests were conducted in order to compare the healthy and unhealthy diet scores for males and females, smokers and non-smokers and individuals who drink alcohol and non-alcoholic drinkers which are presented in the table below (Table 2).

The first independent samples t-test was conducted to compare the healthy and unhealthy diet scored for males and females. There was no significant difference in healthy diet scores for males (M = 2.03, SD = 1.31) and females (M = 2.35, SD = 1.22; t (160) = -1.35, p = 0.178). There was also no significant difference in unhealthy diet scores for males (M = 2.69, SD = 1.49) and females (M = 2.47, SD =

1.29; t (160) = .861, p = 0.391. These results suggest that gender does not have an effect on either healthy or unhealthy diets.

The second independent samples t-test was conducted to compare the healthy and unhealthy diet scores for smokers and non-smokers. There was no significant difference in healthy diet scores for non-smokers (M = 2.32, SD = 1.23) and smokers (M = 2.20, SD = 1.27; t (160) = .54, p = 0.59. There was also no significant difference in unhealthy diet scores for non-smokers (M = 2.57, SD = 1.28) and smokers (M =2.36, SD = 1.46; t (160) = .90, p = 0.37. These results suggest that an individual's smoking status does not have an effect on healthy and unhealthy dietary habits.

The third independent samples t-test was carried out to compare the healthy and unhealthy diet scores in terms of an individual's alcohol habits. There was a significant difference found in healthy diet scores for individuals who are non – drinkers (M = 2.90, SD = 1.26) and drinkers (M = 2.19, SD = 1.21; t (160) = 2.47, p = .014. The magnitude of the differences in the means (mean difference = .71, 95% *CI*: .14 to 1.27) was small (eta squared = .019).

There was also a significant difference found in unhealthy diet scores for individuals who were non-drinkers (M = 3.09, SD = 1.37) and drinkers (M = 2.43, SD = 1.31; t (160) = 2.14, p = 0.033. The magnitude of the differences in the means (mean difference = .66, 95% *CI*: .05 to 1.27) was small (eta squared = .017). These results suggest that an individual's drinking status has an effect on their dietary habits. However there is a very small difference between which diet drinkers of

alcohol may adopt and could be simply due to the fact that individuals who drink alcohol tend to eat more regardless of what types of foods they consume.

Table 2

Group differences between gender, smoking status, and alcohol status and Healthy and Unhealthy diets.

Variable	*Group*	*M*	*SD*	*t*	*p*
Healthy Diet	Male	2.03	1.31	160	.18
	Female	2.35	1.21		
Unhealthy Diet	Male	2.69	1.48	160	.39
	Female	2.47	1.29		
Healthy Diet	Non Smoker	2.32	1.23	160	.59
	Smoker	2.20	1.26		
Unhealthy Diet	Non Smoker	2.57	1.28	160	.37
	Smoker	2.36	1.46		
Healthy Diet	Non-drinker	2.90	1.26	160	.01
	Drinker	2.19	1.21		
Unhealthy Diet	Non – drinker	3.09	1.37	160	.03
	Drinker	2.43	1.31		

One Way Anova

A one-way between groups analysis of variance was conducted to explore the impact of education on adopting a healthy diet. Participants were divided into three groups

according to their level of education (Secondary school; some college; and Bachelor's Degree or above). There was no statistically significant difference at the $p > .05$ level in both healthy diet scores for the three educational groups $F (2, 159) = .63$, $p = .53$. These results suggest that educational level is not a significant predictor of adopting healthy diets.

A second one-way between groups analysis of variance was conducted to explore the impact of education on adopting an unhealthy diet. Participants were divided into three groups according to their level of education (Secondary school; some college; and Bachelor's Degree or above). There was no statistically significant difference at the $p > .05$ level in unhealthy diet scores for the three educational groups $F (2, 159) = .18$, $p = .84$. These results suggest that educational level is not a significant predictor of adopting unhealthy diets.

Hierarchical Multiple Regression

Four hierarchical multiple regressions were performed to investigate the ability of diet to predict levels of general mental health, optimism, happiness and satisfaction with life while controlling for the variables of age, gender, smoking status, alcohol status and social support. Preliminary analyses were conducted prior to each hierarchical multiple regression analyses to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Additionally, the correlations amongst the predictor variables (healthy diet, unhealthy diet, age, gender, smoking status, alcohol status and social support) included in the study were examined and these are

presented in Table 3. All correlations were weak to moderate, ranging between r = .00 and r = -.28. This indicates that multicollinearity was unlikely to be a problem.

Table 3

(Correlations amongst all variables including GHQ, H, SWL, O, HD, UD, Age, Gender, S, A, SS)

Variables	***GHQ***	***H***	***SWL***	***O***	**HD**	**UD**	**Age**	**Gender**	**S**	**A**	**SS**
General Mental Health (GHQ)	1										
Happiness (H)		1									
Satisfaction with Life			1								
Optimism (O)				1							`
Healthy Diet (HD)	-.04	.18	.07	.06	1						
Unhealthy Diet (UD)	.13	-.23	-.10	-.22	-.22	1					
Age	-.23	.26	.22	.28	-.03	-.28	1				
Gender	-.11	.15	.13	.08	.11	-.07	.15	1			
Smoking Status (S)	.14	-.21	-.17	-.16	-.04	-.07	-.08	.03	1		

Alcohol Status (A)	-.14	.14	.13	.20	-.19	-.17	.12	-.06	.07	1	
Social Support (SS)	.11	.08	-.04	-.09	-.01	.18	-.25	.00	.09	-.14	1

Note: GHQ (General Health Questionnaire, H (Happiness), SWL (Satisfaction With Life), O (Optimism), HD (Healthy Diet), UD (Unhealthy Diet), S (Smoking Status), A (Alcohol Status) and SS (Social Support).

The first hierarchical multiple regression was investigating the ability of diet to predict General Mental Health. In the first step of this hierarchical multiple regression, two predictor variables were entered which included the healthy diet and unhealthy diet. This model was not statistically significant F (2,157) = 1.27, $p > .05$ with a reported p value of .28 and explained 1.6% of variance in General Mental Health (Table 4). After the entry of age, gender, smoking status, alcohol status and social support at Step 2 the total variance explained by the model as a whole was 9.6% F (7,152) = 2.31, $p < .001$ and was statistically significant with a reported p value of .03. The introduction of age, gender, smoking status, alcohol status and social support explained additional 8% of variance in general mental health, after controlling for healthy and unhealthy diets. (R2 Change = .08; F (5,152) = 2.70; $p < .001$).

The second hierarchical multiple regression was investigating the ability of diet to predict levels of happiness. In the first step of this hierarchical multiple regression, two predictor variables were entered which included the healthy diet and unhealthy diet. This model was statistically significant F (2,123) = 4.45, $p < .001$ with a reported p value of .01 and explained 6.7% of variance in Happiness levels (Table 4). After the entry of age, gender, smoking status, alcohol status and social support at Step 2 the total variance explained by the model as a whole was 18.8% and was statistically significant F (7,118) = 3.90, $p < .001$ with a reported P value of .00. The introduction of age, gender, smoking status, alcohol status and social support explained additional 12% of variance in happiness levels, after controlling for healthy and unhealthy diets. (R2 Change = .12; F change (5,118) = 3.50; $p < .001$).

The third hierarchical multiple regression was investigating the ability of diet to predict levels of satisfaction with life. In the first step of this hierarchical multiple regression, two predictor variables were entered which included the healthy diet and unhealthy diet. This model was not statistically significant F (2,157) = .98; $p > .05$ with a reported p value of .38 and explained 1.2% of variance in Satisfaction with Life (Table 4). After the entry of age, gender, smoking status, alcohol status and social support at Step 2 the total variance explained by the model as a whole was 10.6%, F (7,152) = 2.59, $p < .001$) and was statistically significant with a reported p value of .01 The introduction of age, gender, smoking status, alcohol status and social support explained additional 9.4% of variance in satisfaction with life, and

was statistically significant after controlling for healthy and unhealthy diets. (R2 Change = .09; F (3,152) = .01; $p < .001$) with a reported p value of .01

The fourth and last hierarchical multiple regression was investigating the ability of diet to predict levels of optimism. In the first step of this hierarchical multiple regression, two predictor variables were entered which included the healthy diet and unhealthy diet. This model was statistically significant F (2,156) = 3.90, $p <$ .001 with a reported p value of .02 and explained 4.8% of variance in Optimism levels (Table 4). After the entry of age, gender, smoking status, alcohol status and social support at Step 2 the total variance explained by the model as a whole was 15.4% F (7,151) = 3.92 ; $p < .001$) and was statistically significant with a reported p value of .00. The introduction of age, gender, smoking status, alcohol status and social support explained additional 10.6% of variance in optimism levels and was statistically significant, after controlling for healthy and unhealthy diets. (R2 Change = .11; F (5,151) = 3.79; $p < .001$).

In the final models of the multiple regression hierarchical multiple regressions, age was the only significant predictor of General Mental Health with a Beta value of (β = -.18, $p < .001$) showing that older age is a weak predictor of lower GHQ scores. Only smoking and age were meaningful predictors of Happiness levels with smoking recording a Beta value of (β = -.21, $p < .001$) and age recording a Beta value of (β = .18, $p < .001$). Age and smoking were also the only significant predictors of Satisfaction with Life levels with age recording a Beta value of Beta value (β = .17, $p < .001$) and smoking recording a Beta value of (β = -.17, $p < .001$). Lastly, age, smoking and alcohol were the only significant predictors of Optimism

levels with age recording a Beta value of (β = .21, $p < .001$) along with alcohol status (β = .19, $p < .001$) and smoking (β = -.17 $p < .001$).

These results indicate that age was the only continuous predictor of General Mental Health, Happiness, Satisfaction with Life and Optimism Levels. Individuals smoking status was also significant predictors apart from General Mental Health and alcohol was a significant predictor of Optimism levels.

Table 4

(Hierarchical Multiple Regression for General Mental Health (GHQ), Happiness, Satisfaction With Life (SWL) and Optimism)

Analysis 1 (GHQ-12)	*R*	R^2	R^2 *Change*	*B*	*SE*	*β*	*T*
Step 1	.13	.02					
Healthy Diet				-.08	.45	-.01	-.17
Unhealthy Diet				.63	.42	.12	1.51
Step 2	.31	.10*	.08*				
Healthy Diet				-.26	.46	-.05	-.58
Unhealthy Diet				.22	.44	.04	.50
Age				-.11	.05	-.18*	-2.13
Gender				-1.40	1.34	-.08	-1.04
Smoking Status				2.05	1.21	.13	1.69
Alcohol Status				-1.66	1.66	-.13	-1.56

				2.59			
Social Support				.07	.24	.03	.32
Analysis 2							
(Happiness)							
Step 1	.26	.07**					
Healthy Diet				.08	.05	.13	1.48
Unhealthy Diet				-.10	.05	-.20*	-2.20
Step 2	.43	.19***	.12				
Healthy Diet				.09	.05	.17	1.86
Unhealthy Diet				-.06	.05	-.12	-1.27
Age				.01	.01	.18*	1.97
Gender				.19	.15	.11	1.30
Smoking Status				-.33	.13	-.21*	-2.49
Alcohol Status				.33	.18	.16	1.77
Social Support				-.01	.03	-.20	-.23
Analysis 3 (SWL)							
Step 1	.11	.01					
Healthy Diet				.32	.52	.05	.61
Unhealthy Diet				-.52	.48	-.09	-1.09
Step 2	.33	.11***	.09**				
Healthy Diet				.52	.52	.08	1.00
Unhealthy Diet				-.11	.50	-.02	-.22

Age				.13	.06	.18*	2.12
Gender				2.08	1.53	.11	1.36
Smoking Status				-2.98	1.38	-.17*	-2.16
Alcohol Status				3.51	1.89	.15	1.86
Social Support				.14	.28	.04	.52
Analysis 4 (Optimism)							
Step 1	.22	.05*					
Healthy Diet				.06	.33	.01	.18
Unhealthy Diet				-.83	.31	-.22***	-2.68
Step 2	.39	.15**	.11***				
Healthy Diet				.27	.33	.07	.81
Unhealthy Diet				-.49	.32	-.13	-1.54
Age				.10	.04	.21*	2.52
Gender				.59	.97	.05	.61
Smoking Status				-1.90	.88	-.17*	-2.17
Alcohol Status				2.83	1.20	.19*	2.36
Social Support				.06	.18	.03	.33

Note. Statistical significance: *$p < .05$; **$p < .01$; ***$p < .001$

Discussion

The main aim of the current study was to investigate whether there is a role for nutrition in mental health. Primarily, healthy (fruits, vegetables, fish) and unhealthy dietary habits (starch, sweets, soda) were analysed to investigate whether they would be significant predictors of overall general mental health, happiness, satisfaction with life and optimism levels. The role of gender, smoking, alcohol and education on dietary habits was also investigated. When investigating the role of dietary habits on mental health, the variables of social support, age, gender, smoking and alcohol habits were strictly controlled for to ensure that the results were specifically due to a participant's eating habits. The latent variables of age, gender, smoking and alcohol habits and educational status were also investigated in order to see if they would be significant predictors of healthy and unhealthy diets.

This research was developed in order to contribute to the already existing literature that dietary habits can impact upon our mental health, in order to expand the already existing knowledge. It was also undertaken in order to investigate if the decline in nutrition in the last 50 years has had an impact on our overall mental health. Furthermore, if a link was found, it could contribute greatly to the psychological community in terms of highlighting a new way in which to promote mental health status in today's community.

Aim 1: Initially, an independent samples t test was carried out to investigate the ability of gender to predict healthy and unhealthy dietary habits. The analysis revealed that gender was not a significant predictor.

Aim 2: Secondly, a one way between-groups anova was carried out to investigate educational status and their relationship with healthy and unhealthy dietary habits. The analysis also showed that there was no significant link.

Aim 3: The third aim was to investigate the ability of smoking to predict healthy and unhealthy dietary habits. Similarly, there was no significant relationship found here either.

Aim 4: The fourth aim was to investigate alcohol's ability to predict levels of healthy and unhealthy dietary habits. This analysis revealed that alcohol was a significant predictor. However, there was not a huge difference in terms of healthy and unhealthy diet habits and as outlined in the results section above, this could be just due to the fact that individuals who drink alcohol tend to consume more food.

Aim 5: The fifth aim, and ultimately the centre focus of this study, was to investigate the ability of healthy and unhealthy dietary habits to predict levels of mental health (General Mental Health, Happiness, Life Satisfaction and Optimism). The results from the hierarchical multiple regressions showed that age was the only predictor of levels of General Mental Health with lower age being a weak predictor of low GHQ scores. It also showed that smoking less and age was the only significant predictor of happiness levels and age and smoking less were the only significant predictors of how satisfied a person was with their life. Lastly, age, alcohol and smoking were the only significant predictors of optimism levels in participants. Ultimately, it can be said that diet did not impact on all aspects of mental health included in this study while controlling for age, gender, social support, alcohol and tobacco use. These results are completely inconsistent with previous

research in the area and it can be said that the null hypotheses is supported in that there is no relationship between diet and mental health.

An interesting finding in this study, even though it was not the sole focus of this study, however, was that across all measures of mental health, age was a continuous significant predictor of mental health. (General Mental Health, Optimism, Satisfaction with Life and Happiness). This might be a useful finding in terms of research in the area of age and mental health however because it was not a main focus of the current study, it will not be discussed.

The impact of confounding variables

Interestingly, in terms of happiness and optimism levels, diet was a significant predictor of these variables, but the relationship disappeared after the controlling variables were entered. This is an important finding, it could be said that previous studies that have been done in this area, may have found a link for diet in terms of mental health, but may not have controlled for other confounding variables such as the ones controlled for here. Due to this finding, it could be an explanation as to why the analysis revealed that diet was not a significant predictor of optimism and happiness levels.

An article supporting this idea further was outlined by Jacka (2014), where it is acknowledged that there is currently a well-established research base that is already published in terms of how diet can affect mental health, much of which is mentioned in the introduction above e.g. vitamin B12 and depression (Coppen,

2005), or vegetarians being at a higher risk for the onset of mental disorder. (Michalak et. al, 2012). However, it is outlined in this article that diet cannot solely by itself be the variable that is contributing to our mental health, if at all. There are other variables such as exercise, getting enough sleep, sociodemographic factors among others that cannot be ruled out as having an impact on our mental status. This is really important to note, as many of the studies that have been published on this particular issue, have insisted on a causal relationship between diet and mental health. It may be true that there is a relationship, but it cannot be said that diet causes depression, stress, anxiety, schizophrenia etc. The variables of sleep, exercise, social support, education etc. among many others which we have no control over such as genetics, childhood trauma etc. and this must be taken into consideration. Otherwise a relationship may arise in results, outlining a causal relationship, when really the positive mental health is actually due to the fact that the participants had high education, good family and friends around them and got adequate sleep or something else unrelated to what participants were eating. This idea is further supported in a study by Ruusunen (2013), where it was stated in the discussion section of this paper that variables such as smoking, age and gender should be taken into consideration as possible confounding variables. This was a strength of the current study as these types of confounding variables, were taken into consideration. This could be the reason why the results seemed to suggest that diet habits were not significant predictors of mental health. In terms of future research, it may be helpful to continue to control for the confounding variables that have been used in this study and much

more beyond that. There needs to be a lot more research done in this area to investigate whether this is a plausible explanation.

Limitations

As with all psychological research undertaken, there were limitations to this study. The first limitation was the eating habits scale used. As can be seen in the method section of this paper, the eating habits questionnaire that was used in this study has never been used before. Therefore this is the first psychological study assessing its reliability and validity, which for the current sample was low. As is well known in psychology, in order to assess reliability and validity, the same scale must be used numerous times in order to see if the results produced can be taken seriously. As this is the first time that it is being used, this cannot be assessed yet. Therefore, the results produced for this study, may not be a reliable estimation of healthy and unhealthy diet scores. This is a major limitation of the study and in terms of future research; a validated scale must be used to see if this would have an impact on the ability of dietary habits to predict overall levels of mental health.

The second limitation of the study is the gender balance. As already stated above, there were 32 males (20.1%) and 127 females (79.9%). This could be a limitation in that it is not representative of all individuals. Future research may want to take this into consideration.

The third limitation of the study is the types of diets that were focused on during this study. The sample gathered here reported having an average diet, that

being mainly healthy foods but there were times when participants would eat unhealthy sweets and eat out at restaurants or order fast food in. However, if a significant link between diet and nutrition was to be found, it might be beneficial to consider investigating individuals that follow strict diets e.g. vegetarianism, veganism, sports individuals who have to follow strict dietary guidelines after controlling for the exercise element etc. Therefore, it would be easier to control exactly what a person is eating. For example, even though participants in the current study stated that they ate healthily in some cases or unhealthily, it is very difficult to know if the participants were being honest, or for how long they have been eating this way. Some participants may have been only eating this way for a week, and not consistently throughout their lifetime. Especially since this questionnaire was administered to individuals around December and January of 2014/2015. Christmas and New Year is a time when people's eating habits can be quite erratic and unstable. These ideas must be taken into consideration in order to more control for individuals eating habits. Future recommendations may include a longitudinal study where individuals are placed on a strict diet that they cannot sway from for a specific allocated amount of time.

Strengths

In a study already mentioned in the introduction section of this paper by Ruusunen (2013), it was mentioned that a lot of the research papers in psychological literature have taken a sample that is already investigating the mental health issue at stake e.g.

depression, anxiety. For example investigating the role herbs play in anxiety by Lakhan and Vieira (2010) had a sample of participants that were already suffering from anxiety. The current study used a sample that was not suffering from any type of mental illness which was a strength of the current research paper as it was more representative of the general population and was not solely a clinical sample.
As already mentioned above, it is also a strength of the current study that the confounding variables of age, gender, alcohol, smoking and social support were taken into account. Future research should take this into consideration.

Issues relating to future research

Suggestions regarding further research include, continuing to control for confounding variables, after which, if a relationship is continually found to not be due to the foods that individuals eat, it would have a huge impact on the already existing literature that states that eating habits do cause mental conditions and affects emotional stability. As well as that, it would be beneficial to replicate this study several times using the eating habits questionnaire used, as it is still unclear whether or not, this invalidated scale may have been a contributing factor in the results. Or similarly, to replicate this study using an already validated scale, as well as controlling for confounding variables.

It would also be beneficial to use a longitudinal study with participants on a strict diet in order to control more in terms of the diets individuals eat and to make sure that they are honestly following the diet that is in investigation.

Implications

These results have important implications for the psychological community. Mental health is an essential part of how individuals function in their everyday life. It is essential to continue to investigate this matter even further and to expand on the already large database for this issue. Although in this research, there was no relationship found between dietary habits and mental health, there are limitations to this study and it must be replicated taking these into consideration. If a diet does impact on mental health in one way or another, or even if a relationship is continually not found, this is something that will impact the psychological community in a positive way, and it is worth continuing the research in this area. If future research found that diet was to be found to be a significant predictor of mental health in further follow research projects investigating the same aims, it would be beneficial to the psychological community in that it is far less expensive than drug treatments and is also a far more positive way to treat people who are suffering from mental health disorders that individuals would be more open to.

Conclusion

In conclusion, this study was important and significant even though it was not consistent with previous research. It found a gap in the research in terms of the role of confounding variables such as the ones included in this study (age, gender, smoking, alcohol, and social support) and how these may be contributing to the mental health status of the participants. This study found that dietary habits was a significant predictor of happiness and optimism levels but after controlling for the demographic variables (age, gender, social support, alcohol and tobacco use), the relationship disappeared and overall age was a continuous significant predictor however smoking and alcohol habits were also found to be overall predictors of mental health. Too many research studies outline a causal relationship between nutrition and mental health and may not be taking variables like this into consideration.

As well as confounding variables, the issues of controlling more for diet intake, doing more longitudinal studies in that individuals can be followed over a long period of time, consuming the same diet and also for future research to reach out to a more diverse sample especially in terms of gender. This would all contribute considerably to the already large research database that exists in this area.

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Appendix A

Information sheet for participants taking part in research

Thank you for agreeing to take part in this research. Before you take part, I would like to take the opportunity to explain what the research is about and what you will be required to do. I am a final year psychology student at the National College of Ireland working on my dissertation. The study aims to investigate the relationship between different dietary habits and mental health.

In this study you will be asked to fill out a number of questionnaires which will enquire about your dietary habits, your general mental health, your life satisfaction, your general happiness and your optimism levels. It will take approximately 20 minutes to complete.

It is also important to note that you have the right to withdraw at any point, also, the information collected is completely anonymous and please not that the information that is collected will be destroyed once the research is complete.

I will be glad to speak to you about any aspect of the research at any time. I can be contacted at dionne.smithhodson@ncirl.ie. Also contact this email address if you are interested in finding out the results of the research which will be available in May 2015.

Regards,

Dionne Smith Hodson (National College of Ireland)

Appendix B

Demographics Questions

1) What is your age?

_____

2)What is your gender?

Male __ Female __

2) What is your highest level of education?

Secondary School __ Some college __ Bachelors Degree or higher __

3) What is your current marital status?

Divorced __ Living with another __ Married __ Separated __

Single __ Widowed __ Would rather not say __

4) Which of the following best describes the area you live in?

Urban __ Suburban __ Rural __

5) What is your current employment status?

Employed for wages __ Self-employed __ Out of work __

Student __ Military __ Retired __ Unable to find work __

6) Do you smoke?

Yes __ No __

7) If so, how many cigarettes would you smoke daily?

_____

8) Do you drink alcohol?

Yes __ No __

9) If so, how many units of alcohol would you consume in a week?

_____

Appendix C

General Health Questionnaire (GHQ-12)

We want to know how your health has been in general over the last few weeks. Please read the questions below and each of the four possible answers. Circle the response that best applies to you. Thank you for answering all the questions.
Have you recently:

1) **been able to concentrate on what you're doing?**

Better than usual (0) same as usual (1) less than usual (2) much less than usual (3)

2) **lost much sleep over worry?**

Not at all (0) No more than usual (1) rather more than usual (2) much more than usual (3)

3) **felt that you are playing a useful part in thing?**

More so than usual (0) same as usual (1) less so than usual (2) much less than usual (3)

4) **felt capable of making decisions about things?**

More so than usual (0) same as usual (1) less than usual (2) much less than usual (3)

5) **felt constantly under strain?**

Not at all (0) No more than usual (1) rather more than usual (2) Much more than usual (3)

6) **felt you couldn't overcome your difficulties?**

Not at all (0) no more than usual (1) rather more than usual (2) much more than usual (3)

7) **been able to enjoy your normal day to day activities?**

More so than usual (0) same as usual (1) less so than usual (2) much less than usual (3)

8) **been able to face up to your problems?**

More so than usual (0) same as usual (1) less than usual (2) much less than usual (3)

9) been feeling unhappy or depressed

Not at all (0) | no more than usual (1) | rather more than usual (2) | much more than usual (3)

10) been losing confidence in yourself?

Not at all (0) | no more than usual (1) | rather more than usual (2) | much more than usual (3)

11) been thinking of yourself as a useless person?

Not at all (0) | no more than usual (1) | rather more than usual (2) | much more than usual (3)

12) been feeling reasonably happy, all things considered?

More so than usual (0) | same as usual (1) | less so than usual (2) | much less than usual (3)

Appendix D

Satisfaction with Life Scale

DIRECTIONS:

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree

2 = Disagree

3 = Slightly Disagree

4 = Neither Agree or Disagree

5 = Slightly Agree

6 = Agree

7 = Strongly Agree

1. In most ways my life is close to my ideal. _____

2. The conditions of my life are excellent. _____

3. I am satisfied with life. _____

4. So far I have gotten the important things I want in life. _____

5. If I could live my life over, I would change almost nothing. _____

Appendix E

LOT-R Optimism Scale

Instructions:

Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:

(0) = strongly disagree

(1) = disagree

(2) = neutral

(3) = agree

(4) = strongly agree

Be honest as you can throughout, and try not let your responses to one question influence your response to other questions. There are no right or wrong answers.

1. In uncertain times, I usually expect the best ____

2. It's easy for me to relax ____

3. If something can go wrong for me, it will ____

4. I'm always optimistic about my future ____

5. I enjoy my friends a lot ____

6. It's important for me to keep busy ____

7. I hardly ever expect things to go my way ____

8. I don't get upset too easily ____

9. I rarely count on good things happening to me ____

10. Overall, I expect more good things to happen to me than bad ____

Appendix F

The Oxford Happiness Questionnaire: a compact scale for the measurement of psychological well-being

INSTRUCTIONS:
Below are a number of statements about happiness. Would you please indicate how much you agree or disagree with each by entering a number alongside it according to the following code:

1=strongly disagree;
2=moderately disagree;
3=slightly disagree;
4=slightly agree;
5=moderately agree;
6=strongly agree.

You will need to read the statements carefully because some are phrased positively and others negatively. Don't take too long over individual questions; there are no 'right' or 'wrong' answers and no trick questions. The first answer that comes into your head is probably the right one for you. If you find some of the questions difficult, please give the answer that is true for you in general or for most of the time.

1. I don't feel particularly pleased with the way I am __

2. I am intensely interested in other people __

3. I feel that life is very rewarding __

4. I have very warm feelings towards almost everyone __

5. I rarely wake up feeling rested __

6. I am not particularly optimistic about the future __

7. I find most things amusing __

8. I am always committed and involved __

9. Life is good __

10. I do not think that the world is a good place __

11. I laugh a lot __

12. I am well satisfied about everything in my life __

13. I don't think I look attractive __

14. There is a gap between what I would like to do and what I have done __

15. I am very happy __

16. I find beauty in some things __

17. I always have a cheerful effect on others __

18. I can fit in everything I want to __

19. I feel that I am not especially in control of my life __

20. I feel able to take anything on __

21. I feel fully mentally alert __

22. I often experience joy and elation __

23. I do not find it easy to make decisions __

24. I do not have a particular sense of meaning and purpose in my life __

25. I feel I have a great deal of energy __

26. I usually have a good influence on events __

27. I do not have fun with other people __

28. I don't feel particularly healthy __

29. I do not have particularly happy memories of the past __

Appendix G

Social Support Questionnaire

This list is made up of a list of statements, each which may or may not be true about you. Check the answer which you think is most appropriate or true about you.

1) **If I wanted to go on a trip for the day (for example, to the country or mountains), I would have a hard time finding somebody to go with me.**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

2) **I feel like there is no one I can share my most private worries and fears with.**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

3) **If I were sick, I could easily find someone to help me with my daily chores**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

4) **There is someone I can turn to for advice about handling problems with my family**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

5) **If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

6) **When I need suggestions on how to deal with a personal problem, I know someone I can turn to.**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

7) **I don't get invited to do things by others**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

8) **If I have to go out of town for a couple of weeks, it would be difficult to find someone who would look after my house or apartment**

Definitely False ___ Probably False ___ Probably True ___ Definitely True

9) If I wanted to have lunch with someone, I could easily find someone to join me

Definitely False ___ Probably False ___ Probably True ___ Definitely True

10) If I was stranded 10 miles from home, there is someone I could call who would come and get me

Definitely False ___ Probably False ___ Probably True ___ Definitely True

11) If a family crisis arose, it would be difficult to find somebody who could give me good advice about how to handle it

Definitely False ___ Probably False ___ Probably True ___ Definitely True

12) If I needed some help in moving to a new house or apartment, I would have a hard time finding somebody to help me

Definitely False ___ Probably False ___ Probably True ___ Definitely True

Appendix H

Eating Patterns Questionnaire

1) Do you follow a special diet?

No __

Low fat __

Low Sodium __

Kosher __

Diabetic __

Vegetarian __

Vegan __

Other __

2) **Give examples of what guidelines of diets, if any, you follow.**
_____
_____
_____

3) Which meals do you regularly eat?

Breakfast __

Brunch __

Lunch __

Dinner __

4) When do you snack?

Morning __

Afternoon __

Evening __

Late night __

Throughout the day __

5) What are your favourite snack foods?

_____
_____

6) Do you eat out or order in?

Yes __

No __

7) **How often?**

Daily __

Weekly __

Monthly __

Other __

7) What kinds of restaurants or eating facilities?

_____
_____

8) How your food is usually prepared? Check all that apply.

Baked __

Broiled __

Fried __

Steamed __

Poached __

Other __

10) How many times each day do you have the following food items?

1) Starch (bread, bagel, roll, cereal, pasta, noodles, rice, potato)

Never __

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

2) Fruit

Never __

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

3) Vegetables

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

4) Dairy (milk, yoghurt etc.)

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

5) Meat, fish, poultry, eggs, cheese

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

6) Fat (butter, margarine, mayonnaise, oil, salad dressing, sour cream, cream cheese)

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

7) Sweets (candy, cake, regular soda, juice)

1 – 2 __

3 – 5 __

6 – 8 __

9 – 11 __

9) What beverages do you drink daily and how much?

Water (times or glasses per day)

_____

Coffee (times or cups per day)

_____

Tea (times or cups per day)

_____

Soda (times or cups per day)

_____

Alcohol (times or cups per day)

_____

Other (times or glasses per day)

_____

11) Would you like to change your eating habits?

Yes ___

No ___

10) Which habits would you like to change?

`_____
_____