

Nutrition Role in The Management of Psychiatric Disorders

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ABSTRACT

The Aim of the current study is to investigate nutrition role in the management of psychiatric disorders. **Research Design:** A quasi- experimental research design was utilized for this study. **Setting** The study was conducted at outpatient clinic at Institute of Psychiatry affiliated to Ain Shams University hospitals, using a convenient sample of 50 psychiatric patients with depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders. **Tools:** data were collected through; an interviewing questionnaire covering socio-demographic characteristics, ,nutrition assessment tools, nutrition risk assessment, and nutrition management program **Results** showed that, there were highly statistically significant improvements in modified nutritional supplements for patients with depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders, after conducting the nutrition management program. Regarding psychiatric patients' knowledge about healthy food, healthy nutritional habits, and patients' awareness & readiness for change, there were highly statistically significant improvements. Concerning signs and symptoms of psychiatric disorders there were highly statistically significant improvements for depression, schizophrenia, bipolar disorders, and obsessive compulsive patients after conducting the management program. **In conclusion**, the nutrition management program was effective in improving symptoms associated with, depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders. **The study recommended that** nurses should have more contribution in counseling psychiatric patients, and their families about healthy diet and healthy food habits. Further research should recommend studying the effectiveness of herbs on enhancing mental health for psychiatric patients.

Key words: Nutrition Role–Management- Psychiatric Disorders

INTRODUCTION

Nutrition “has become a key factor for the high prevalence and incidence of very frequent mental diseases, such as depression. It has been proven that the quality of diet and the deficiencies in certain essential nutrients are determining factors for physical and mental health problems. The human brain “needs an adequate intake of key nutrients, such as polyunsaturated fatty acids Omega-3,

essential amino acids, B-group vitamins (B12 and folate), vitamin D and minerals like zinc, magnesium and iron (Sarris, et al., 2015).

Most people are not aware that mental disorders may require special diets. While dietary changes are necessary to address the metabolic consequences of atypical antipsychotic medications; diet also plays a significant therapeutic role in its ability to reduce the positive and negative symptoms of the disease (Jonathan, 2010).

The brain is the platform for the mind and therefore the platform for the mental health. The understanding of how the brain works is less advanced than the understanding of the other body's organs work. One of the clearest examples is the role of nutrition in relation to mental health. In fact the brain is made up in large part of essential fatty acids, water and other nutrients. Also food affects how can the person feel, think and behave. So, the dietary interventions may hold the key to a number of the mental health challenges in the society (**McCulloch et al, 2014**).

The brain uses 20-30% of a person's daily caloric intake for the day. If the calories consume not enough, verbal fluency, problem solving ability and motivation are affected first, and then bodily functions are decreased in reverse order of necessity for life. The brain requires essential fatty acids to maintain proper function. This is one of the many reasons that extreme low-fat diets are not healthy. Fatty acids are required to maintain connections between neurons. A lack of N3 (aka Omega-3) fatty acids may cause learning and motor disabilities, and may damage the passage of dopamine and serotonin in the frontal cortex (**Luther, 2013**).

Neurotransmitters are messengers passed back and forth within the brain. They allow neurons to communicate information amongst themselves. Neurotransmitters are made from amino acids, which often must be derived directly from the diet. For example, the neurotransmitter serotonin, which is associated with feelings of contentment, is made from the amino acid tryptophan. Adrenaline and dopamine, the 'motivating' neurotransmitters, are made from phenylalanine (**McCulloch, 2010**).

The most common mental disorders that are currently prevalent in numerous countries are depression, bipolar disorder, schizophrenia, and obsessive-compulsive disorder (OCD) (**Sathyanarayana, et al.,**

2008). One in four people will suffer from a mental or a neurological disorder at some point during their lifetime; 450 million people are currently affected by these disorders, 121 million people suffer from depression, 24 million suffer from schizophrenia (**Okasha, 2011**).

Persons with serious mental illness, such as schizophrenia, bipolar disorder, and major depression, have mortality rates that are two to more than three times as high as the rate in the overall population and the primary cause of death in such persons. Concomitantly, this vulnerable population has an extremely high prevalence of obesity, nearly twice that of the overall population (**Allison et al., 2009**). Therefore, it is not surprising that persons with serious mental illness have an increased burden of weight-related conditions, including heightened risk of diabetes mellitus, hypertension, dyslipidemia, and certain cancers (**Bresee, et al., 2010**), & (**McGinty et al., 2012**).

Depression is among the most burdensome disorders worldwide, giving rise to considerable adverse effects on activities of daily living for extended periods of time (**Bruffaerts, et al., 2012**). WHO study of more than 240,000 people across 60 countries, depression was shown to produce the greatest decrease in quality of health compared to several other chronic diseases. Health scores worsened when depression was a co-morbid condition, and the most disabling combination was depression and diabetes (**Trangle, 2016**).

Significance of the Study:

Food is essential for life, physical and psychological wellbeing. Between 30-40 % of people admitted to hospitals, care homes or mental health units are at risk of malnutrition (**Young, 2007**). This research will focus on the nutritional deficiencies that are associated with depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders, and will

outline how nutrition management program can be implemented for treatment of psychiatric patients.

Aim of the Study:

This study aimed to investigate nutrition role in the management of psychiatric disorders.

Subjects and methods:

Research Hypothesis:

Nutrition management program will have positive effect on improving symptoms associated with, depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders among psychiatric patients.

The subjects and methods of the current study were discussed under the following designs:

Technical design, operational design, administrative design. And

statistical design.

I) Technical Design

- **Research design:**

This study was a quasi- experimental research design.

- **Research setting:**

The study was conducted at outpatient clinic at Institute of Psychiatry affiliated to Ain Shams University hospitals.

- **Sample size and characteristics:**

A convenient sample of 50 psychiatric patients who attend at outpatient clinic at Institute of Psychiatry, and were available

throughout a period of six months starting from March 2015, up to August 2015.

Inclusion Criteria:

- Patients with psychiatric disorders, as depression, schizophrenia, bipolar disorders, and obsessive compulsive disorders,
- Sex: Both sex
- Age: from 20 to 50 years old

The study sample was divided into four main psychiatric disorders as following:

- 1) Patients with depression (n=16), which divided into three subgroups;
- 2) Patients with Schizophrenia (n = 15), which divided into three subgroups.
- 3) Patients with bipolar disorders (n = 10), which divided into two subgroups.
- 4) Patients with Obsessive compulsive disorders (n = 9), which divided into two subgroups.

- **Tools and technique of data collection :**

A) Interview questionnaire sheet

This questionnaire was designed by the researcher to assess the subjects' knowledge regarding nutritional requirements including:

Part 1) concerned with personal information about the studied psychiatric patients such as age, sex, level of education, etc.

Part 2) concerned with knowledge of the studied sample regarding nutritional requirements (characteristics of healthy diet, and nutritional supplementary).

Scoring system:

The responses of the studied samples' knowledge related to characteristics of healthy diet, and nutritional supplementary, were scored with 2-points scale. The numerical value allotted to each response is as; yes used 2, and no used 1. Regarding to negative items yes used 1, and no used 2.

B) Nutrition Assessment Tools

It was concerned with assessment of the adequacy patients' dietary intake (nutritional habits, and group of foods), health status including anthropometric measurements (height& weight), physical, and clinical condition (physical activity), and behavioral status such as client awareness and readiness for behavior change.

Scoring system:

The responses indicated the studied samples' nutritional habits. Their answers were scored in 4-points scale. The numerical value allotted to each response is as; never used 0, rarely used 1, sometimes used 2, and always used 3. Regarding to negative habits, each response is as; never used 3, rarely used 2, sometimes used 1, and always used 0. The total scores of statements = 33scores.

In relation to food group the responds indicated the type of foods which studied samples preferred. Their answers were scored in 4-points scale. The numerical value allotted to each response is as; never used 0, rarely used 1, sometimes used 2, and always used 3. The total scores of statements = 126 scores.

In the same line, the scoring system for the studied samples' physical activity was scored in 4-points scale. The numerical value allotted to each response is as; never used 0, rarely used 1, sometimes used 2, and always used 3. The total scores of statements = 9 scores.

Concerned the studied samples' awareness and readiness for change in nutritional behavior, their answers were scored with 2-points scale. The numerical value allotted to each response is as; yes used 2 and no used 1.

C-Nutrition Risk Assessment

It was designed by American Dietetic Association, (2006); and modified by researcher to assess the psychiatric patient's level of knowledge about recommended dietary requirements, and the effect of nutrition on body image, eating disorders, and weight management, and the psychological condition for the psychiatric patients.

• **Scoring system:**

Regarding the body image, eating disorders, and weight management, their answers were scored with 2-point scale. The numerical value allotted to each response is as; yes used 2, and no used 1,

Regarding the effect of nutrition on the studied sample psychological condition, their answers were scored with 4-points scale. The numerical value allotted to each response is as; never used 0, rarely used 1, sometimes used 2, and always used 3. The total scores of statements = 99scores

D-Nutrition Management Program:

It was designed to monitor and evaluate the nutrition care process program to determine the degree to which progress is being made through carried out awareness program for the study samples and conducted post test sheet.

The module was designed by the researcher, then revised & modified based on an extensive review of related literature.

II) Operational Design :

The operational design of the study includes preparation phase, pilot study, and fieldwork for data collection.

- **Preparation phase :**

Reviewing literature, in-depth information about the subject, and designing of study tools.

- **Pilot study**

A pilot study was carried out during January 2015 involving 10% of the expected total study sample. Ten psychiatric patients were involved in the pilot study then they were excluded later from the study sample. It served to ensure that the tools used were clear and the methods of data collection were feasible.

Field work

A sample of 50 psychiatric patients was selected from the outpatient clinics. The fieldwork spanned over six months from 4th January 2015, up to 25th June 2015, two days per week from 9 am to 2pm.

The purpose of the study was explained to each psychiatric patient before starting the interviewing questionnaire. The study lasted in six weeks spent in conducting the pre/post test and implementing the awareness program about recommended nutritional requirements for each disorder separately.

The work started by meeting psychiatric patients and gave them brief idea about the study & expected outcomes. Then data were collected using the previous mentioned tools. Any clarification needed for subjects was given by the researcher.

First week:

Giving an introduction about the study, its aim, and the expected outcomes. Making discussion with the psychiatric patients, about their expectation from the study, then they carried out the pre- exam. Then, forming the groups, the researcher divided patients according to their disorder into groups of five.

Second week:

Providing an overview about the psychiatric disorders, and explains the relation between nutrition and those disorders, in one session which included definition, etiology, and clinical manifestation of psychiatric disorders, and neurotransmitters, diet, behavior, and mood (serotonin, dopamine, nor epinephrine, histamine, acetylcholine, and glutamate), in simple understandable words, for each group. Then Arabic handout was distributed.

Third week:

Session (3), was conducted for each group separately, in which the researcher explain the potential uses of nutritional supplements, including omega-3 fatty acids, folate, and chromium, herbal in improving psychiatric disorders, and developed day multivitamin / mineral preparation containing the full recommended daily intake of each vitamin and mineral.

Forth week:

Session (4), was conducted for each group separately, in which the researcher, and psychiatric patients investigated the nutritional status (habits & manners) to prevent nutritional hazard, and choose food component to form balanced meals.

Fifth week:

Session (5), was conducted for each group separately, in which the researcher, and psychiatric patients designed healthy diet regime, and monitored, maintained body weight through diet & exercise.

Six week:

Session (6), was conducted for each group separately, in which the researcher, evaluate the effect and the results of the program implementation by conducting post exam.

III) Administrative Design:

To carry out the study in the selected settings, official permission was obtained through official letters directed from the dean of the faculty of nursing to the relevant authorities explaining the purpose and importance of the study.

Ethical Considerations:

The researcher explained the purpose of the study to the psychiatric patients; An oral consent was obtained from those who agreed to participate in the study before data collection; Participants were reassured about confidentiality of any obtained information as the data were anonymous and only used for the purpose of the study; Participants were also informed about their right to withdraw from the study at anytime without giving a reason.

IV) Statistical Design:

The data collected were organized, tabulated & statistically analyzed by SPSS (statistical package for the-social science software) version 19.

Quantitative data were expressed as means & standard deviation ($\bar{x} \pm SD$) and analyzed by applying T-test for comparison

of two groups of normally distributed variables. ANOVA test for analysis of variance (f-test) was used for comparison of more than two groups of normally distributed variables.

Qualitative data were analyzed by applying chi-square test. Pearson correlation (r) was used to detect association between quantitative variables.

Significance was considered when P value is less than 0.05, and highly significance was considered when P value is less than 0.01.

Results

As illustrated in **table (1)**: the relation between nutrition assessment screen items before and after nutrition management program for psychiatric patients. In relation to pt's knowledge about healthy food the mean & standard deviation pre program was 27.92 ± 2.156 , while post program was 33.6 ± 1.539 . Concerning nutritional habits the mean & standard deviation pre program was 16.54 ± 3.052 , while post program was 22.58 ± 1.98 . Regarding client's awareness & readiness for change the mean & standard deviation pre program was 6.8 ± 1.773 , while post program was 9.46 ± 1.515 . Concerning Physical activity, the mean & standard deviation pre program was 2.74 ± 1.192 , while post program was 3.88 ± 1.081 . However, the difference proved highly statistically positive significant (P value < 0.01).

Regarding relation between sign & symptoms of psychiatric disorders before and after nutrition management program for patients with schizophrenia, depression, bipolar disorder, obsessive compulsive disorder. **Table (2)** reveals that concerning signs & symptoms of depression the mean & standard deviation pre program was 6.42 ± 3.5 , while post program was 14.2 ± 2.665 . Owing to signs & symptoms of schizophrenia the mean & standard deviation pre program

was 8.2 ± 2.711 , while post program was 11.14 ± 1.784 . Regarding signs & symptoms of obsessive compulsive the mean & standard deviation pre program was 12.88 ± 2.624 , while post program was 17.26 ± 1.988 . In relation to signs & symptoms of bipolar disorder, the mean & standard deviation pre program was 7.06 ± 3.334 , while post program was 9.96 ± 2.07 . However, the difference proved statistically highly significant (P value < 0.01).

Correlations between socio demographic data (age, gender, and economic status), and food groups among patients with depression as revealed in **table (3)** It is important to mention that, there are insignificance correlations before conducting the nutrition management program. There are highly significant reverse correlations between increasing protein consumption, and lowering Signs& Symptoms of depression ($p < 0.01$) after conducting the program. Regarding to beans, and age there are negative significant correlations, ($p < 0.05$). While there are negative significant correlations between fruit, and age ($p < 0.05$). In the otherwise, there are insignificant correlation between gender and socioeconomic status and the food choices in patients with depression under the study.

As demonstrated in **table (4)** the correlations between socio demographic data (age, gender, educational level, and economic status), and food groups among patients with schizophrenia. It is important to mention that, there is a reverse significance correlations between increasing fruit consumption and lowering Signs& Symptoms of schizophrenia after conducting the program ($p < 0.05$).

There are positive significant covariant correlations between increasing protein consumption, and high educational level, otherwise there is negative reverse correlation between lowering carbohydrate consumption and high education level ($p < 0.05$). While there are no association between age and gender with food choices among patients with schizophrenia under the study.

The correlations between socio demographic data (age, gender, education level, and economic status), and food groups among patients with bipolar disorders as shown in **table (5)**. Before conducting the program, there are positive highly significant correlations between carbohydrate consumption, and pts' gender ($p < 0.01$). On the other hand there are negative significant covariant correlations, between lowering economic status and low proteins intake, ($p < 0.05$). After conducting the program, there is positive significant covariant correlation between increasing fruit intake, and highly educational level ($p < 0.05$).

Table (6) Reveals the correlations between socio demographic data (age, gender, education level, and economic status), and food groups among patients with obsessive compulsive disorders. Before conducting program, there are positive significant correlations between carbohydrate consumption, and pts' gender ($p < 0.05$). Regarding to sugar, there are positive significant covariant correlations with education level, ($p < 0.05$), and there are negative highly significant reverse correlations between sugar and age, ($p < 0.01$). However, there are insignificance correlations after conducting the program.

Table (1): Reveals the Relation between Nutrition Assessment Screen Items before and after Nutrition Management Program for Psychiatric Patients (N= 50)

| Nutrition Assessment Screen Items | | Mean ±S.D. | t | P value | Sig. | Sig. |
|---|------|---------------|-------|---------|------|------|
| Pt's knowledge about healthy food | Pre | 27.92 ± 2.156 | 15.23 | <0.01 | 0.00 | ** |
| | Post | 33.6 ± 1.539 | | | | |
| Nutritional habits | Pre | 16.54 ± 3.052 | 13.29 | <0.01 | 0.00 | ** |
| | Post | 22.58 ± 1.98 | | | | |
| Client's awareness & readiness for change | Pre | 6.8 ± 1.773 | 8.585 | <0.01 | 0.00 | ** |
| | Post | 9.46 ± 1.515 | | | | |
| Body Image, and weight managements | Pre | 15.44 ± 1.091 | 6.043 | <0.01 | 0.00 | ** |
| | Post | 16.82 ± 1.24 | | | | |
| Physical activity | Pre | 2.74 ± 1.192 | 5.947 | <0.01 | 0.00 | ** |
| | Post | 3.88 ± 1.081 | | | | |

Table (2): Reveals the Relation between Sign & Symptoms of Psychiatric Disorders before and after Nutrition Management Program for Psychiatric Patients (N= 50)

| Signs & Symptoms | | Mean ± S. D. | t | P value | Sig. |
|--|------|---------------|-------|---------|------|
| Signs & Symptoms of Depression | Pre | 6.42 ± 3.5 | 14.87 | <0.01 | ** |
| | Post | 14.2 ± 2.665 | | | |
| Signs & Symptoms of Schizophrenia | Pre | 8.2 ± 2.711 | 8.308 | <0.01 | ** |
| | Post | 11.14 ± 1.784 | | | |
| Signs & Symptoms of Obsessive Compulsive | Pre | 12.88 ± 2.624 | 10.84 | <0.01 | ** |
| | Post | 17.26 ± 1.988 | | | |
| Signs & Symptoms of Bipolar Disorder | Pre | 7.06 ± 3.334 | 9.143 | <0.01 | ** |
| | Post | 9.96 ± 2.07 | | | |

Table (3): Correlations between Socio Demographic Data, and food elements among patients with depression.

| Program | Food elements | Age | Sex | Education | Income | Depression S&S |
|---------|---------------|----------|--------|-----------|--------|----------------|
| PRE | Carbohydrate | - 0.108 | -0.168 | 0.214 | -0.060 | 0.001 |
| | Fats | - 0.081 | -0.084 | 0.355 | -0.309 | 0.307 |
| | Protein | - 0.117 | -0.210 | 0.423 | -0.153 | 0.028 |
| | Fruits | - 0.094 | -0.254 | 0.42 | -0.285 | 0.278 |
| POST | Carbohydrate | 0.294 | -0.018 | -0.132 | 0.198 | 0.104 |
| | Fats | - 0.255 | -0.016 | 0.393 | -0.028 | 0.199 |
| | Protein | 0.13 | -0.378 | 0.393 | -0.058 | - 0.684** |
| | Fruits | - 0.565* | 0.264 | 0.032 | -0.119 | 0.168 |

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Table (4): Correlations between Socio Demographic Data and Food Elements among Patients with Schizophrenia.

| Program | Food elements | Age | Sex | Education | Income | Schizophrenia S&S |
|---------|---------------|-------|-------|-----------|--------|-------------------|
| PRE | Carbohydrate | 0.37 | 0.324 | -0.257 | 0.00 | 0.316 |
| | Fats | 0.038 | 0.037 | -0.137 | -0.150 | 0.34 |
| | Protein | 0.054 | 0.213 | 0.125 | -0.053 | 0.251 |
| | Fruits | 0.257 | 0.12 | -0.226 | -0.408 | -0.040 |
| | Vegetables | 0.245 | 0.187 | -0.108 | -0.412 | 0.118 |
| POST | Carbohydrate | 0.023 | 0.336 | -0.556* | -0.505 | -0.04 |
| | Fats | 0.00 | 0.107 | -0.140 | 0.322 | 0.13 |
| | Protein | 0.294 | 0.086 | 0.518* | -0.172 | 0.315 |
| | Fruits | 0.087 | 0.108 | -0.071 | 0.027 | -0.579* |
| | Vegetables | 0.439 | 0.164 | -0.365 | 0.329 | 0.251 |

Table (5): Correlations between Socio Demographic Data and Food Elements among Patients with Bipolar Disorders.

| Program | Food elements | Age | Sex | Education | Income | Bipolar S&S |
|---------|---------------|---------|---------|-----------|----------|-------------|
| Pre | Carbohydrate | 0.015 | 0.788** | 0.375 | - 0.267 | -0.138 |
| | Fats | 0.501 | - 0.294 | 0.026 | 0.294 | -0.214 |
| | Protein | - 0.145 | - 0.374 | 0.44 | - 0.726* | -0.012 |
| | Fruits | 0.115 | 0.188 | -0.221 | 0.23 | 0.421 |
| | Vegetables | 0.133 | - 0.041 | 0.366 | - 0.366 | -0.509 |
| Post | Carbohydrate | 0.125 | - 0.014 | -0.151 | 0.372 | 0.071 |
| | Fats | - 0.153 | 0.385 | -0.247 | 0.49 | -0.358 |
| | Protein | 0.072 | - 0.262 | 0.394 | - 0.503 | -0.513 |
| | Fruits | - 0.551 | - 0.262 | 0.694* | - 0.830 | 0.318 |
| | Vegetables | 0.106 | 0.354 | -0.164 | 0.129 | 0.536 |

Table (6): Correlations between Socio Demographic Data and Food Elements among Patients with Obsessive Compulsive Disorders (n = 9).

| Program | Food elements | Age | Sex | Education | Income | OCD S&S |
|---------|---------------|--------|--------|-----------|--------|---------|
| PRE | Carbohydrate | -0.471 | 0.674* | 0.287 | -0.639 | 0.194 |
| | Fats | -0.235 | -0.164 | 0.309 | -0.052 | 0.537 |
| | Protein | -0.513 | -0.494 | 0.451 | 0.014 | -0.184 |
| | Fruits | -0.258 | 0.474 | 0.262 | -0.600 | -0.203 |
| | Vegetables | 0.068 | -0.333 | -0.018- | 0.105 | -0.356 |
| POST | Carbohydrate | -0.427 | 0.091 | 0.206 | -0.187 | 1.00 |
| | Fats | -0.154 | 0.094 | -0.115 | 0.209 | -0.043 |
| | Protein | -0.219 | 0.452 | 0.228 | -0.635 | -0.051 |
| | Fruits | 0.129 | 0.632 | 0.017 | -0.550 | -0.072 |
| | Vegetables | -0.146 | -0.500 | 0.465 | -0.294 | -0.591 |

Discussion

One of the most obvious, yet under-recognized factors in the development of major trends in mental health is the role of nutrition. The body of evidence linking diet and mental health is growing at a rapid pace. As well as its impact on short and long-term mental health, the evidence indicates that food plays an important contributing role in the development, management and prevention of specific mental health problems such as depression, schizophrenia, attention deficit hyperactivity disorder, and Alzheimer's disease (**Mental Health Foundation 2010**).

The current study revealed that there is highly statistically significant relation between carbohydrate, fats, milk, protein, fruits, and vegetables consumption before & after conducting the nutrition management program for psychiatric patients. In the same line **Jonathan (2010)**, modified version of the diet would be more suitable. It include all refined carbohydrate products, while abundant in fruits and vegetables, with the allowance of lesser portions of whole grains (if not gluten-sensitive or gluten-intolerant), eggs, fish, poultry, pork and beef. Such a diet would reduce oxidative stress (a cornerstone of most mental disease processes). Food affects, different people in different ways. Excessive amounts of sugar, caffeine, alcohol, or chocolate may be more likely to contribute to mood disturbances. Food such as vegetables, fruits, oil fish and whole grains may be more likely help with stability (**Depression & Bipolar Support Alliance (2009)**).

Another agreement from **Dietitians of Canada** who proud to release new role paper, Promoting Mental Health through Healthy Eating and Nutritional Care as stated by **Sharma (2009)**, a comprehensive document discussing intersections of nutrition with mental health, from promotion to nutrition care and therapeutic approaches. Vitamins Play a major role in number of vital

functions, acting as cofactors or as coenzyme and catalyze a number of reactions that occur in the body. Most vitamin deficiencies result in psychiatric symptoms in a significant number of people. In people with psychiatric diagnoses, these deficiencies are often associated with more severe symptoms and poorer outcome from conventional treatment as stated by **Sahoo et al, (2011)**.

The current study revealed the carbohydrate consumption among psychiatric patients, before the program most common foods consumption among psychiatric patients were simple carbohydrate such as sugar, white bread, buttered bread, pastry bakery & etc. This may cause an initial 'high' of energy that soon wears off as the body increases its insulin production, leaving the patient feeling tired and low. After program whole grain cereals, rice and pasta (complex carbohydrate) are become more consumption among psychiatric patients under the study, these foods are need more time for absorption which provide the body with more stability, and didn't cause mood swings. There are a number of studies **Lieberman, et al, (1986)** supporting the result that carbohydrate consumption mediates its mood enhancing effects through its indirect effect on the synthesis and release of central serotonin.

In the same line **Dohan and colleagues, (1984)**, observed a decrease in hospital admissions for schizophrenia in countries that had limited bread consumption during World War II, which suggested a possible relationship between bread and schizophrenia. Also observed that overt schizophrenia was rare in remote tribal areas of several South Pacific islands where grains were rare, as compared to similar populations which had a higher prevalence of overt schizophrenia and grain consumption. Additionally, **Kalaydjian et al (2006)**, found several small controlled studies in which a gluten-free diet showed promise in ameliorating schizophrenic symptoms. In one such study, approximately 10% of schizophrenic patients had improvement in

their symptoms by elimination of dietary gluten **Vlissides, et al, (1986)**, as quoted by **Kraft, & Westman (2009)**. Another agreement from **Greenblatt, (2013)**, who stated that serotonin, is a neurotransmitter (brain chemical) that plays a key role in regulating mood, appetite and sleep. Low levels of serotonin are believed to be a contributing cause of OCD. Many factors can reduce serotonin. For example, it's thought that serotonin levels can be lowered by a diet high in processed foods, sugar and fat and stress.

The current study revealed the **fats** consumption among depresses patients the mean \pm stander deviations preprogram was 8.63 ± 1.746 , while post program was 6.94 ± 1.569 . Before the program psychiatric patients were rising intake of western diet which rich in saturated fats (SFA) and trans-unsaturated fats (TFA), while after program they increase consumption of olive oil, butter, & seed oils. The cohort study (1999–2010) has analyzed a broad spectrum of fat subtypes in relation to depression risk, **Mozaffarian, et al ,2010**). According to **Fernández- Jarne et al, (2002)**, **Barzi, et al, (2003)**, & **Belmaker, et al, (2008)**, polyunsaturated fats acids (PUFA) and olive oil (OO) have been considered as healthy lipids because they reduce the incidence of cardiovascular disease (CVD), & depression. In trials using fish oils for the treatment of depression, mood scores improved significantly for both the fish oil group and the control group who received olive oil (OO), as found by **Silvers et al, (2005)**. A possible explanation was that both fish and olive oil (OO), or simply an increased fat intake, were equally effective against depressive symptoms, because low fat diets may adversely affect mood as concluded by **Logan, (2005)** & **Bourre, (2006)**.

Another support from **Kuan-Pin, et al (2003)**, who decided that patients with depression have been extensively reported to be associated with the abnormality of omega-

3 polyunsaturated fatty acids (PUFAs), including significantly loweicosapentaenoic acid and docosahexaenoic acid in cell tissue contents (red blood cell membrane, plasma, etc.) and dietary intake.

The current study revealed the **protein** consumption among psychiatric patients. Regarding protein consumption among depressed patients, the mean \pm stander deviation preprogram was 10.31 ± 2.213 , while post program was 12.25 ± 1.807 . Concerning Protein consumption among schizophrenic patients, the mean \pm stander deviation preprograms was 9.40 ± 2.746 , while post program was 11.80 ± 1.699 . As regard proteinconsumption amongbipolar patients, the mean \pm stander deviation preprograms was 9.40 ± 1.955 , while post program was 11.90 ± 1.969 . This results in agreement with clinical and experimental evidence which proved by **Shabbir, et al, (2013)**, indicates that an appropriate diet can reduce symptoms of depression. The neurotransmitter, serotonin (5-HT), synthesized in the brain, plays an important role in mood alleviation. However the serotonin precursor, tryptophan can readily pass through the blood brain barrier and converted into 5-HT. Tryptophan-rich diet is important in patients susceptible to depression, schizophrenia, and Alzheimer. However, CNS serotonin synthesis can be controlled by proper intake of tryptophan-rich diet.

The current study revealed the consumption of **vegetables & fruit** (which provide the human bodies with minerals such as calcium, zinc, magnesium, and vitamin such as A, B, C, and E) among psychiatric patients; regarding fruit consumption the mean \pm stander deviation preprogram was 7.47 ± 2.031 , and while post program was 9.67 ± 1.799 for depressed patients. As regard Vegetables the mean \pm stander deviation preprogram was 3.47 ± 1.302 , while post program was 7.27 ± 0.594 . Also

the fruit consumption, the mean \pm stander deviation preprogram was 7.47 ± 2.031 , while post program was 9.67 ± 1.799 for schizophrenic patients. As regard Vegetables the mean \pm stander deviation preprogram was 3.47 ± 1.302 , while post program was 7.27 ± 0.594 . Regarding vegetables consumption among obsessive compulsive patients the mean \pm stander deviations preprogram was 4.67 ± 1.500 , while post program was 6.89 ± 1.167 . This result was in agreements with **Sathyanarayana, et al (2008), and Goldstein, (2013)**. They concluded that minerals are often overlooked as necessary for brain health. Chromium, magnesium, selenium and zinc affect the moods and low levels are correlated with depression. Another study used data from the Canadian Community Health Survey (CCHS), a repeated cross-sectional study of Canadians with five waves between 2000 until 2009 (n = 296,121 aged 12 years or older). In the first wave, greater fruit & vegetable intake (FVI) was significantly associated with lower odds of depression. These findings suggest a potentially important role of a healthy diet in the prevention of depression and anxiety as stated by **McMartin & Jacka., (2013)**. In the same line **Watt., (2012)**, who stated that for bipolar people, a healthy, well-managed diet can help them keep weight gain under control. Some vitamins and minerals have also been linked to improved mood or stable mood, while deficiencies in these have been linked to mood swings.

The current study reveals the relation between sign & symptoms of psychiatric disorders before and after awareness program about dietary requirements for psychiatric patients. In relation to signs & symptoms of depression the mean \pm stander deviation preprogram was 6.42 ± 3.5 , while post program was 14.2 ± 2.665 . Concerning signs & symptoms of schizophrenia the mean \pm stander deviation preprogram was 8.2 ± 2.711 , while post program was 11.14 ± 1.784 . Regarding signs & symptoms of obsessive compulsive the mean \pm stander deviation preprogram was 12.88 ± 2.624 ,

while post program was 17.26 ± 1.988 . In relation to signs & symptoms of bipolar disorder, the mean \pm stander deviation preprogram was 7.06 ± 3.334 , while post program was 9.96 ± 2.07 . However, the difference proved statistically highly significant (P value < 0.01). This result could be due to that the human brain requires "an adequate intake of key nutrients, such as carbohydrate, polyunsaturated fatty acids omega-3, essential amino acids, B-group vitamins ... vitamin D, and minerals like zinc, magnesium, and iron to perform optimally,

According to **Logan, (2007), & Goldstein, (2013)**, new research indicates that nutritional supplements are often effective in reducing psychiatric symptoms. Nutrient dense diets combined with omega-3 fatty acids, amino acids, and vitamins and minerals have been shown to be effective for controlling to some extent, preventing depression, bipolar disease, and schizophrenia, among many psychiatric patients. In the early 1960's **Abram Hoffer**, a Canadian biochemist and medical doctor pioneered an approach that was mindful of the role of nutrition in schizophrenia and other diseases. Called orthomolecular therapy, he defined it as the provision of the optimum environment of the mind. He treated patients with prescribed B vitamins, vitamin C, vitamin E and the minerals selenium, zinc and chromium. He also had his patients eliminate all foods containing sugar along with foods that might cause an allergic reaction, as coated by **Unger (2014)**.

In the same line **Reynolds., (2002), & Tolmunen et al (2003)**, who reported that a number of studies have shown, that acute tryptophan depletion produces depressive symptoms and results in worsening of mood. Folic acid deficiency may also correlate with depression, and it has particular effects on mood, cognitive as well as social functioning. Recently, it have been reported that low levels of dietary folic acid are associated with

elevated depressive symptoms in middle-aged men.

Another support from **Tolmunen et al (2004)**, who concluded that folate can be used in combination with vitamin B12 (or by itself) to combat hyperhomocysteinemia (high homocysteine levels) and reduce depressive symptoms without the use of additional antidepressant medication. One extensive study done in final and recruited 2,313 men (ages 42–60) in between 1984 and 1989, and recorded their average folate intake until the year 2000. Those that were below the average intake level (256 mcg/day) were found to have a significantly higher risk of severe depression than those above the median level. Also **Lerner et al (2006) & Sachdev et al, (2006)**, they found several other studies show that many patients diagnosed with depression have significantly lower folate levels than controls. Both folate and B12 deficiencies are marked by high levels of homocysteine, which are increased among depressed patients as proved by **Coppen et al (2005)**.

Another agreement from **Hoffer, (2005)**, who discovered that, once the patient is on the full nutritional program and has achieved stability over a long time, the drugs are gradually withdrawn until the patient is off the medication or on such low doses that there are no side-effects. The orthomolecular approach is much more effective than conventional treatment. About 90 percent of patients on the program will recover in less than two years. However, the program takes about two months to kick in. For chronic patients, it may take several years to recover and recovery rates are not as high. Recovery includes freedom from symptoms, a good relationship with family and the community and the ability to be gainfully employed or preparing for it.

As a result, more psychiatrists and other providers are beginning to advocate for and practice nutritional therapy, addressing diet

and lifestyle along with prescribing vitamins, minerals and other supplements. Persons with a diagnosis of a mental disorder are entitled to a life expectancy that is comparable to that of the general population. As we continue to expand our understanding of what the brain needs and the role of nutrition to improving and maintaining mental health, hopefully their life expectancy will improve over time **Campbell-McBride, (2010)**.

The current study reveals the relation between nutrition assessment screen items before and after nutrition management program for patients with schizophrenia, depression, bipolar disorder, and obsessive compulsive disorders were highly positive significance (P value < 0.01). This may be due to, it is very difficult for patients under the study to practice healthy eating habits every single day, in Egypt most of cases have low budget, and busy schedules. Sometimes they are lucky to have time to eat, or have enough money to afford fast food, and some of cases unaware about balanced diet, they are ignoring about elements of nutrition. Therefore, this awareness program tends to increase healthy diet awareness among psychiatric patients under the study and enable them to make their own healthy cheap meals at home.

In relation to body image, and weight managements, the mean & standard deviation pre program was 15.44 ± 1.091 , while post program was 16.82 ± 1.24 . This result is in agreement with, **Luppino et al, (2010)**, who found results from the most recent systematic review of longitudinal studies point towards bi-directional associations between depression and obesity. The authors conclude that: 'Obese persons had a 55% increased risk of developing depression over time, whereas depressed persons had a 58% increased risk of becoming obese'. Another recent systematic review and meta-analysis found a weak but positive association between obesity and anxiety disorders as

stated by **Garipey et al (2010), Luppino et al., (2010),**

The same result approved by **Watt & Legg, (2016)** who found that up to 68 percent of people seeking treatment for bipolar disorder are overweight or obese.

Regarding client's awareness & readiness for change the mean & standard deviation pre program was 6.8 ± 1.773 , while post program was 9.46 ± 1.515 . I think that the patients' readiness for change influenced by socioeconomic status, religious, social, cultural, and education variables, so this awareness program provide alternative healthy cheap food elements, modified unhealthy food habits by enhance patients' knowledge about healthy diet. In the same line **Tepper, et al (1997) that quoted by Corney & Du Plessis, (2011),** who stated that demographic factors such as socio-economic status, as well as ethnicity, social, and cultural variables also influence food choices. At the individual level numerous aspects such as hunger and satiety, food preferences, and attitudes and beliefs about food influence decisions around food.

The current study revealed the Physical activity among patients with schizophrenia, patients with depression, patients with bipolar disorder, and patient with obsessive compulsive disorder, before and after conducting awareness program the mean \pm stander deviation preprogram was 2.74 ± 1.192 , while post program was 3.88 ± 1.081 . However, the difference proved statistically highly significant (P value < 0.01). This result may be due to that the exercise promotes changes in the brain, such as growth, and feelings of calm and well-being. Exercise releases endorphins that energize the spirits and make the person feel good. Exercise can be distraction, and allowing time to break out the cycle of negative feelings. The evidence comes from experimental studies conducted by **Weir, (2011).**

In the same line, **Van Citters et al. (2010),** who developed a manual for an intervention program lifestyle intervention manual for patients with serious mental illness. The pilot study included participants with schizophrenia, bipolar disorder, major depressive disorder observed improvement in these disorder.

Another agreement from **Frey et al., (2013); Fernandes et al., (2014),**they concluded that exercise exerts a salutary effect on these interacting networks and therefore, are capable of improving psychiatric and somatic health in bipolar disorder.

In the same line, studies show that the physical exercise can treat mild to moderate depression as effectively as antidepressant medication—but without the side-effects, of course. In addition to relieving depression symptoms, research also shows that maintaining an exercise schedule can prevent from relapsing as proved by **Robinson et al, (2016).**

The recurrent study, reveals that there are a correlations between socio demographic data (age, gender, and economic status), and food groups among depressed, patients schizophrenic patients, bipolar patients and obsessive compulsive patients. There are positive highly significant reverse correlations between protein consumption, and depression ($p < 0.01$). Otherwise there is negative reverse correlation between lowering carbohydrate consumption and high education level ($p < 0.05$). This result may be due to that, the patients with lower levels of education and income have lake of knowledge about healthy diet, and have less healthy dietary habits, partly because of their higher priority for price and familiarity, and their lower priority for health.

The evidence demonstrates that the diet quality of young people has deteriorated significantly in recent decades. This decline in diet quality, in addition to an apparent

parallel increase in the prevalence of depression **Twenge, (2011)**, has led to an interest in the possible role of nutrition in the development or progression of depressive symptoms. diet quality and symptoms of depression **Jacka, et al., (2013)**, **Nanri et al, (2010)**.

In the same line **Walsh, & Nelson, (2010)**, who suggested that most researchers believe that dietary habits and food preferences develop in childhood, are established by age 15yrs, and become habitual in due course. Adolescence is thus still a key formative period in the development of eating habits.

This result in agreement with **Konttinen et al., (2013)**, who suggested that, the less educated people with a low income tend to consume more energy-dense food whereas their higher SES counterparts have a higher fruit and vegetable intake. This association between SES and the healthiness of the diet is not fully understood yet but investigating the motives underlying food choice might provide more insight.

This result was supported by **Watt & Legg (2016)**, who they found that serotonin is a chemical messenger in the brain that affects appetite, mood, and other critical body functions. It's widely thought to be at lower levels in people with mood disorders, such as bipolar disorder. A serotonin deficiency can trigger cravings for carbohydrates and sweets. Eating these foods can increase your serotonin levels. The result may be a brief boost in mood at the cost of additional pounds.

The current result support by **Fink, &Kraynak, (2016)**, they suggested that fruits and vegetables are rich in antioxidants which aids in defending the body from the distinct diseases and illness that may deteriorate bipolar disorder symptoms too. Nutrient-rich green leafy vegetables such as broccoli, cabbage, cauliflower, beet greens,

asparagus, celery, kale, lettuce, dandelion, pea pods, mustard greens etc. Eat fresh fruits include apples, bananas, grapes, watermelon, apricots, cherries etc. instead of desserts and sweets. When these vegetables and fruits are consumed in proper amounts, will be offered with nutrients and stable blood sugar, and they are certainly excellent than the canned fruit juice.

Another support from **Weil, (2014)**, who concluded that, protein is typically associated with muscle, but it also contributes too many other areas of the body and how the body functions. The basic building blocks of proteins are amino acids, several of which act as neurological regulators. When you consume protein, your body immediately breaks it down into amino acids so it can transport them to where your body needs them. One of these amino acids, tyrosine, is a building block of excitatory neurotransmitters – dopamine and norepinephrine – which can increase energy, make you feel more alert, and improve performance.

This result in agreement with **Yannakoulia et al., (2008)**, & **Olson (2014)**, shown that high sugar diets decrease a Brain - derived neurotrophic factor (BDNF), which is responsible for the development of new brain tissue. In fact, a low amount of BDNF actually leads to insulin resistance, metabolic syndrome and even diabetes. Sugar consumption in population studies have been shown to have a close link with obsessive compulsive. Researchers suggest that the sugar and brain association may be due to the oxidative stress that sugar can cause or the change in beta-endorphins (brain chemicals that make us feel good) that comes about because of sugar use.

Conclusion:

Based on the results of this study, it can be concluded that: The results of the present study revealed that there was significant

improvement in the following items; improvement of psychiatric patients' awareness, about healthy dietary requirements post intervention, realize the relation between food and good mental health, the relation between change food choices for psychiatric patients and their age and education level that they reach. In addition there was highly positive significant relation between food type modification and improvement of mental signs and symptoms for those patients. **Recommendations:** Psychiatric nurses should have ready access to information on the link between diet and mental health as well as a working knowledge of the information and expertise available to support psychiatric patients through dietary change and should offer nutrition counseling services for the psychiatric patients and family also should promote within the general community of nutritional services that support the needs of psychiatric patients at risk of malnutrition. Dietetics should develop a screening and assessment tool for nutritional status for psychiatric patients to use it in health care setting, and at home. Government should develop a financially accessible legal nutritional advice service for psychiatric patients at risk of malnutrition and their family for follow up. Egypt population and particular groups who are at increased risk of mental health problems should be provided with information about foods that promote their mental, emotional and physical well-being.

Regulations should be introduced to support the promotion of healthy food to children, and to protect them from all forms of broadcast and non-broadcast marketing of unhealthy food.

Practical food skills, including cooking and growing, should be reintroduced as a compulsory part of the national curriculum.

Nutrition now set out to help all members of the multi-disciplinary team better understand the importance of good

nutritional care, their role in providing it and how they can improve the care provided in their own settings by collaborating with colleagues.

Suggesting further studies:

Replicated the study on a larger probability sample from different geographical areas, to attain more generalized results.

Further studies should be recommended to study the effectiveness of herbs on enhancing mental health for psychiatric patients.

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