Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/5350
DOI URL: http://dx.doi.org/10.21474/IJAR01/5350

RESEARCH ARTICLE

NUTRITIONAL FACTORS TO MENTAL ILLNESS.

Edith N. Ahajumobi.

PhD, Walden University, September 2017.
CHES®, National Commission for Health Education Credentialing, 2015.
Fitness & Nutrition, Stratford Career Institute, 2014.
MPH, Walden University, 2013.
MBA, ESUT Nigeria, 2003.
PGD, ESUT Nigeria, 2001.
B.Sc, Food Science & Tech, Ebony State University, Nigeria, 1992.
Dr. Edith N. Ahajumobi (PhD, MPH, MBA, B. F. Sc., CHES®).

……

Manuscript Info

……

Manuscript History

Received: 07 July 2017
Final Accepted: 09 August 2017
Published: September 2017

Abstract

……

Introduction: This is a systematic review of literature conducted to examine the relationship between nutrition, and mental illness. **Objective**: The objective was to ascertain whether there is substantive evidence showing a relationship between nutrition, and mental illness, to provide substantive evidence that could support revising of the Canadian mental health policies to include nutrition as an independent factor to mental illness. **Methods**: The researcher used a narrative approach of qualitative design to read, digest, interpret, and summarize the evidence gathered. Due to time constraints, the researcher obtained all evidence reviewed from Google Scholar search, Google search, CNAHL, and MEDLINE databases only. All reviewed articles were obtained online only. The search terms were: *food factor to mental illness, dietary factor to mental illness, Peer reviewed articles on nutritional factor to mental illness* and so forth. All search results that did not meet the selection criteria of being a peer-reviewed article that focused on the relationship between nutrition and mental illness, and conducted within 10 years from the date of this study were excluded. Only peer-reviewed articles, and evidence conducted following epidemiology standard were included among the reviewed evidence. **Results**: The studies reviewed were conducted in Canada, United States, UK, Australia, France, South Africa and across the globe. From the synthesis of all the reviewed evidence, the result showed a consistent, and growing evidence establishing a link between nutritional factors, and nutritional comorbidity and mental illness. The social change implication of this study is to inform the public, health practice and designated authorities in view of influencing health policy decision to recognize the direct impact of food on mental health. **Conclusion**: Nutritional factors, and nutritional comorbidity are associated with mental illness.

Corresponding Author:- Edith N. Ahajumobi.

……....

Transparency Declaration:-

This was a study completed in the class room environment under the supervision of an Instructor in-charge of a PhD class. The author felt that this may has positive social change impact to the public, health practice and policy decision, and that was what informed the author to put this forward for publication. The study was not funded by an external body, therefore, the author has no conflict of interest for conducting this study. This Systematic review study was conducted by a single author. The author is a PhD candidate has almost completed PhD dissertation writing. The author is Abstract Reviewer for American Public Health Association and Canadian Public Health Association. The author has completed and submitted a health book manuscript, content is about complementary and alternative nutrition for chronic diseases prevention and management, which is undergoing production.

Acknowledgement:-

I wish to heartly thank Dr. C. Reisma for her academic instructions given to me in the class and her review of this paper.

I owe endless thanks to my dissertation Supervisor Dr. P. B. Anderson for training me to a status of a Scholar.
Many academicians contributed immensely towards my scholarly training namely, Dr. M. Scwab, Dr. J. Osuji, and Dr. H. Marshall among others. I deeply appreciate every bit of your time and knowledge shared with me.

Nutritional Factors to Mental Illness:-

Introduction :-

Researchers have indicated that 20% of Canadians has at least one mental illness (MI), and as high as 70% of those experiencing mental illness are children and youth aged 15 to 24 years (Centre for Addiction and mental Health, 2012). An average of 45% of the Canadian homeless population suffers from metal illness (Centre for Addiction and mental Health, 2012). In Canada, about 4,000 people commit suicide yearly; breaking down to 11 suicide daily. Researchers believe that MI is a major cause of disability, causing disability in 355,000 people (Centre for Addiction and mental Health, 2012). MI prevent as many as 500,000 Canadians from obtaining employment and causing 175,000 absenteeism among full time workers. Researchers have indicated that MI is now placing a huge economic burden on the Canadian government, costing about $51 biliion every year (Centre for Addiction and mental Health, 2012). In this study, the researcher gathered all research information obtained from desk research that was conducted within ten years from the time of this study that focused on the consequences of optimum, deficiency, or excessiveness of nutrients to the mental status of an individual. The purpose was to see whether there is substantial existing evidence that could influence policy decision to recognize the direct impact of nutrition on mental illness. The important positive social change this could bring is an evidence to educate athorities involved, which could support policy formulation and implementation that will enable availability, accessbility, and affordability of such foods by mental patients and the public. On the Long-run, effectively addressing this could cause a reduction in MI, and its impacts on the community and the economy. In this study, I explored whether there was any Canadian existing policy that recognized nutrition as an independent factor to mental health. I used the Community Guide to Preventive Services also, called systematic review in identifying, reading, assessing, digesting, summarizing, discussing and concluding this study as well as, in making recommendations. The articles were summarized using annotated bibliography pattern.

Research Questions:-

RQ1. Is there substantive evidence linking mental illness with nutrition?
RQ2. How does food impact on the mood and general wellbeing of a person?
RQ3. Can food have any impact on prevention, development, and management of mental illness?

Problem Statement.

Could nutrition have an impact on the mental health? How does food impact on the mood and general wellbeing of a person? Could food have any impact on prevention, development, and management of mental illness? Natural substances in food are capable of normalizing or balancing the imbalanced biochemical substances in the ill person offer more effective treatment for physical, and mental health? (Hoffer, 1988). The Canadian mental health need is yet to be met (Diana, 2013; Canadian Mental Health Association, n.d.). Mental Health Survey Commission (2013), recommended that there is a need to "improve mental health data collection, research, and knowledge exchange across Canada." The Canadian statistics on mental illness suggested that 2.8 million Canadians (10.1%), from 15

years and above, exhibit symptoms of mental disorders (Ali, Janz & Pearson, 2013). Over 6 million Canadians abuse substance, 3.5 million (12.6%) suffers from mood disorder, 3.2 million (11.3%) are having depression and 2.4 million (8.7%) are having anxiety disorder ((Ali, Janz & Pearson, 2013).

A One-year prevalence test of mental disorders (MD) showed that MD prevalence is between 12%, and 20%. The meaning is that one in every five Canadian would develop one anxiety disorder in a lifetime. Anxiety disorder was the most common mental disorder in Canada (Diana, 2013; Canadian Mental Health Association, n.d.). For youth between 15 and 24 years, suicide contributed 24% of the death, and 16% of adult aged between 24 and 44 years' deaths were linked to suicide. From 15 to 45 years of age, suicide is the leading cause of death, and 49% of individuals who have suffered from depression and anxiety never consulted a physician (Canadian Mental Health Association, n.d.). The economic cost is alarming, costing $7.9 billion in 1998; $3.2 billion for disability and death costs, and $4.7 billion for providing care. (Canadian Mental Health Association, n.d.).

There is high rate of suicide among the mentally ill. In 2012, suicided contributed to 17% of death among children aged 10-14 years, 28% of youth who are between 15 and 19 years and 25% of youth aged 20-24 years (Canadian Mental Health Association, n.d.).

Food insufficiency could be linked with a range of physical, mental and social health problems. There are high salt level and high cardiovascular risks among the mentally ill patients (Davidson, Judd, Jolley, Hocking, Thompson, & Hyland, 2001). Food insecurity prompts people to alter their nutritional status, which causes an increase in the risk of diet-sensitive chronic diseases (Cao, England, Johnson-Down, Sheikh, & Weiler, 2011). Poor dietary intake is associated with depressive symptoms (Begley, Houtzager, Jeganathan & Purnomo, 2012).

In this study, the writer scanned through Canadian mental health policies available online from 1995 to 2012 and found that the policies were brilliantly formulated. The Policy makers recognized the impact of violence against women, and children, unemployment, maladjustment to cross culture, and informed consent before treatment on mental illness. Others were Aboriginal, and non-aboriginal factors, among others. All these factors were brilliantly factored into the Canadian Mental Health Policies, however; the nutritional factor was not understood nor recognized in the Canadian mental health policies. The Canadian Mental Health Survey Commission called for more research, and data collection to aid meeting the mental health needs of the Canadians. In this study, therefore, the author explored whether there is sufficient evidence supporting the relationship between nutrition and mental illness. There is sufficient existing evidence that could support the Canadian government to formulate policy decision on the food in relation to the mental, and general health Policies. However, conducting Canadian based studies to debunk or support the global evidence maybe ideal for a grounded policy decision support. If Canadian research supports the global evidence, there is a need for the government to review the policies to prompt a reflection and recognition of the impact of food on the mental health of Canadians. Recognizing the direct impact of nutrition on MI in policy decision and implementation actions could support the prevention, management and control of mental illness in Canada.

Purpose of the study.
Is there substantive evidence linking mental illness with nutrition?
How does food impact on the mood and general wellbeing of a person?
Can food have any impact on prevention, development, and management of mental illness?

The objectives of this study was to determine if there is substantial evidence linking mental health prevention, development and management with nutrition that could inform health care practice and policy makers to influence policy decision to recognize the direct impact of nutrition on mental illness. Substantial evidence could help to inform health practice and designated authorities in view of influencing policy decision and implementation that will enable easy access, and affordability of such foods by patients with mental illness and the public. Undersdtanding the direct impact of nutrition on MI could cause the development of strategies directed at reducing MI, and its impacts on the community and the national economy.

Key Words. Nutritional Factors, Mental Illness, and Malnutrition Comorbidities.
Definition of key words.

Nutritional factor: These are dietary causes, and dietary comorbidities associated with mental illness. Examples of dietary causes and comorbidity are food and food-related diseases namely chronic diseases and obesity. *Mental Illness:* It could be described as the psychological, and emotional disorders that continuously make someone not to be happy. It makes someone not to like or enjoy what she or he used to enjoy doing or having prior to the onset of the disease. For example, anxiety, stress, depression, trauma, and schizophrenia. *Malnutrition*: It is caused by an excessive or insufficient intake of food, which results into disease. *Comorbidities*: it is a disease that its presence in a human body signals a presence of another kind of disease; both occurring at the same time or one after the other (National Institute on Drug Abuse, 2010).

Methods:-

In this study, I reviewed twenty-one peer-reviewed Studies conducted following the epidemiological method of qualitative, and quantitative study designs. This study is a systematic review that adopted a narrative pattern of the qualitative study process. I did not include any non-peer-reviewed evidence in the examination list. For the reason of time, not all found articles were included. I added the items present in the first pages of search results that met the criteria and continued in that order until the time ran out. I added all studies that established a link between nutrition/nutritional factors or co-morbidities and mental illness in this systematic study. Additionally, factual information from the health, and mental health institutional website were mentioned in this study; however, non-peer reviewed articles were not included among the articles that I reviewed. I searched for articles on the internet using Google, and Google Scholars browsers. I used the search phrases as *Food factor to mental illness*, *Dietary factor to mental illness* and *Peer reviewed articles on Nutritional factors to mental illness*. Also, *peer-reviewed articles on food factors to mental illness* was also among the phrase that I used. The latter provided 2,710 results. I did not include the irrelevant articles. Some were peer-reviewed, and some were not, and some were relevant, and some were not related to this study. The search that I made through the Walden EBSCO Host via CINAHL Plus yielded one to ten (1-10) of 30 results. The Boolean phrases that I used were *Nutritional* in criterion one, *factor* in criterion two, and *Mental Health* for the criterion three. The search that I made through MEDLINE yielded 48 results but, out of this, only two articles were included in the review. The studies that I selected indicated limitations, ethical guidelines followed, and the biases associated with the studies. The studies that I reviewed mentioned the precautions the researchers took to control bias. This study has phases I, and II, Phase one involved pre-assessment of the peer-reviewed articles, and the articles were rated using NICE Framework (Harder, 2012-2014). It rated all randomized controlled studies as high quality with two Pluses (++) and rated all observational and qualitative studies as the medium or good quality (+). The studies that did not describe the methodology, method of data collection, the control of bias, and indicated limitations, or follow ethical guideline were rated as low. Also, substantive web publications by recognized health, and mental health institutions were included or cited in some part of this study presentation. However, such articles were not included in the reviewed article upon, which the discussion and conclusion of this study result was made (Harder, 2012-2014). Next, is the discussion about data collection and then, the phase II, which involved the presentation of the annotated bibliographies of the twenty-one articles that I analyzed. Also, discussed in phase II are the analysis, discussion, conclusion and recommendations of this study

Data collection.

The researcher used the Google and Google Scholar search engines for evidence search. The researcher also searched databases namely, CNAHL and MEDLINE for evidence. The Boolean phrases that I used were, *nutrition* for main search criterion, *factor* for criterion two and *mental health* for criterion three. I selected, read and summarized the evidence, and only the summaries were presented. The chosen articles summaries were presented in the result, and the synthesis of all the studies were presented in the discussion. The results of the summaries constituted the basis for the conclusion and the recommendations. Only full articles were reviewed, and reviewing abstract only was avoided. The sample size was 21 (*n=21*). Among the quantitative studies, the studies that did not mention the limitations, and study gap were rated as medium quality. The studies that stated their authors indicated the limitations of their studies but, did not report study gap that prompted conducting their studies, were rated as good, and the studies that indicated both limitations, and study gap were rated as high quality. Next, the summaries and the synthesis of all the studies are presented in the results.

Limitations:-

This is not a quantitative study, it is not a typical qualitative study, but rather a systematic review or analysis of quantitative and qualitative studies performed to determine a relationship between mental illness and nutrition and nutrition factors. Secondary data were used in conducting this study. The data used for this study were published

articles freely available to all and no ethical concerns namely, informed consent, privacy and confidentiality concerns were involved. Author did not involve studies that did not focus on nutrition, nutritional factors and comorbidities and link with mental illness. All articles were conducted in Canada and five continents of the world performed within 10 years from the date of this study. The items were available online at no cost. All unpublished articles and articles not obtainable online at no cost were excluded.

Ethics

This study was not sponsored by any agency or institution; so, the researcher has no conflict of interest. The author used all published articles freely available online to all readers and users and no ethical concerns namely, informed consent, privacy and confidentiality concerns were involved. All articles that supported this study were referenced and properly cited following APA Style (Creswell, 2013, p.92). The biases that are possible with this study are interpretational errors that the researcher may have made unintentionally from interpreting statements wrongly. The researcher worked hard to ensure that all interpretations were as accurate as they could be. Excluding studies that are not available online or in electronic databases that could have added value to, or negated the information that I obtained from the literatures that I included in the data analysis, could amount to bias. I adopted epidemiological method used by previous researchers in conducting this study to reduce bias and increase reliability and I consistently measured that, which my study was set to measure. I did my best to ensure that I interpreted data as accurate as I could (Creswell, 2013, p.91). I had a reviewer to review the document to further curtail biases.

Results.

Introduction

In this section, writer presented the annotated bibliographies of the 21 studies reveiewed upon, which the analysis, discussion and conclusion of this study was based. The studies included in this research were conducted in five continentes of the world, namely, Africa, America, Asia, Australia and Europe. The articles include; quantitative, qualitative and systematic reviews. The author directly involved 21 studies in the analysis, discussion and conclusion of the study; however, it technically consist of about 100 studies because, some of the articles were systematic reviews that contains many other studies.

Assessment of Malnutrition in Mental Health Clients: Nurses' Judgement Vs Nutrition Risk Tool.

In UK general hospital, psychiatric patients (PsP) often show symptoms of malnutrition, and yet the nutritional assessment of psychiatric patients was barely performed. A study was conducted to generate a scientific evidence about the nutritional scores of PsP in The UK, and to ascertain whether the dietary judgment of the nurse at the ward was right. The researchers conducted the nutritional assessment of the PsP and then made the comparison of the PsP score with the nurse subjective evaluation. The authors collected data from 112 patients, which represented the sample size. The result showed that the nurses' examination failed to determine malnutrition in the patients' score. In the nurse assessment, a total of 27 at-risk patients about 29% were ignored. This authors concluded that making nutritional screening a routine among PsP is necessary for identifying PsP at risk, and that would assist in identifying, and treating of the diabetics among them. *Limitation*. In as much as this study used validated tools in determining the risk scores, the face- and content validity determined, the study was not validated against nutritional status or malnutrition (Abayomi & Hackett, 2004). Rated as **high quality** (++).

Risk Factors Prevalence and Treatment of Anxiety and Depressive Disorders in Pakistan: Systematic Review.

This study was a systematic review conducted to assess the prevalence, etiology, treatment, and how to prevent anxiety, and depressive disorder in Pakistan. The study examined 20 studies, and of this number, only 17 focused on the prevalence, and only 11 included risk factor in the discussion. The focus of this study was on the prevalence of anxiety, and depression, risk factors, and the treatment effects. The result showed significance relationship between the following factors such as; sex, middle age, financial difficulty, low level of education, being a housewife, and relationship issues, and anxiety and depressive disorder. In 3/11 of the studies, constant debate with the spouse, and in-laws unpleasant relationship was associated with anxiety and depression. The individuals who have confidants showed the small risk of developing anxiety, and depression. The authors indicated some level of biases as well as the limitations of this study as coming mainly from the methodology. It was indicated in the limitations that it did not involve rigorously controlled trials for the disorder treatment and warned that users must use the information with caution (Jenkins & Mirza, 2004). R**ated as medium** in the ranking (+).

Vital link between chronic disease and depressive disorders.
Depression may be ranking second by 2020 after heart disease in disease ranking. This study saw the need for clear understanding of the relationship between depression, and chronic illness. The aim was to support efficient health assessment and the delivery of health care. In this study's methodology, the MEDLINE was searched using some search criteria. The Standard phrases used were the *mental disorde*r, or *depression* crossing with the following *chronic diseases: asthma, arthritis, cardiovascular diseases, cancer, obesity,* and *diabetes*. This study used only empirical papers and the criteria for selecting the studies were based on depression, and the chronic diseases, because of high chronic diseases prevalent in that area. The result showed a significant depressive or psychiatric symptoms among arthritic, diabetic, obese, cardiovascular risk factors, and cancer. It showed a significant relationship between depression or psychosocial, and the indicated chronic diseases above, suggesting that depression could be counted among chronic etiology. The authors specified the criteria for conducting this study and prudently followed it. It identified the gap it filled and invited for more studies that could use multivariate examination in determining a relationship between depressive disorder, and chronic diseases and other illnesses. This is necessary for determining the true health, and quality of life (Chapman, Perry & Strine, 2004). R**anked good** (+).

The Determinants of Food Choice.
This was a meta-analysis of determinants of food choices identified key determinants of food choices. The aim of this study was to determine that factors that influence individual's food choices. The author suggested that some determinants were influential, and some were barriers namely, the influence of biology- it described this as the hunger, appetite, and taste. Next, was a barrier created by the economy. The economy was referred to as the cost, income, affordability and availability. Then, the physical barriers described as the access, education, and cooking skills and time availability. The fourth being the social influence described as the culture, family, and peers that affect the meal patterns. Followed by the influence of psychology, defined as the mood, stress, and guilt influencing the choice of food. And the last, was the barriers created by the human attitude, which was described as the beliefs, and food knowledge. Choice of food was determined by different factors some were influential to the choice, and some were barriers to healthy choices of food. Therefore, an appropriate intervention may be appropriate (including policy formulation). Since different demographics were involved, a high-level of tailoring may be necessary for championing an efficient campaign and education to address it. Also, providing an intervention to sustainably eliminate the barriers that are seriously influencing healthy food choices across social differences was suggested (Bellisle, 2005). **Raked good** (+).

Risk and Protective Factors for Adult and Child Hunger Among Low-Income Housed and Homeless Female-Headed Families Conducted to Determine Factors Behind Adult and Child Hunger.
This study was performed to examine the risks and protective factors for adult, and child hunger among low-income housed, and homeless female-headed families to determine factors behind adult, and child hunger. The authors used questionnaires and interview for data collection about the socioeconomic, psychological, health and food sufficiency. The result suggested that adult hunger was associated with mental, physical, and psychological health such as depression, stress, and anxiety among other factors (Fletcher, Goldberg, Gundersen, Hosmer, Huntington, Wehler & Winreb, 2004). This was **ranked high quality** (++)

Prevalence of Depression by Race/Ethnicity: Findings from the National Health and Nutrition Examination Survey III.
In this study, researchers examined the prevalence of the major depressive disorder among the United States general population based on race/ethnicity. The authors used the diagnostic interview for collecting data from people between 15, and 40 years old. Only 96.1% participants responded out of 8,449 recruited. The results showed significance prevalence of depressive disorder more among Caucasians than among African Americans, and Mexican Americans. But, the dysthymic disorder was more among African Americans, and Mexican Americans than the Caucasian Americans, and gender, and education influenced the difference. Poverty was also significantly associated with a depressive disorder, and depressive disorder was prevalent among those who have used psychotropic disorder medication. The limitations of the study were many. Nonverbal signs of depression example psychomotor retardation were not measured. Other factors or comorbidity were not measured namely, unemployment, rural residence, substance abuse and anxiety disorders were not measured. Assessment was based on patients' self-report only. The researchers used Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) criteria for the diagnosis, which has some weaknesses. Although the weaknesses in its use was made up by asking the respondents to indicate whether any medication have been received. The authors used DSM-III-R for estimating

the level of impairment. The result indicated that people aged 20-24 and 25-34 exhibits high symptoms of lifetime major depressive disorder. The self-reporting of many years of past diagnosis suspected the possibility of bias (Nguyen & Riolo, 2005). R**ated as high quality** (++)

Depression in Heart Failure: Meta-Analytic Review of Prevalence, Intervention Effects, and Association with Clinical Outcomes.

This was a meta-analysis study of the literature on the prevalence, intervention, effects of depression, and its Association with heart failure. It was a quantitative study, and the result of all the published studies showed a significant association between depression and clinical outcomes. The effect size was calculated, fail-safe population (N) was calculated to control for bias. The result showed that there is high prevalence of depression for patients with heart failure (HF), and high rate of mortality, clinical issues, hospitalization and re-hospitalization among them. The limitations were that many of the studies linked psychosocial symptoms other than depression with clinical outcomes. Some identified anxiety, social support, and social isolation. The researchers did not include articles that were not published and non-peer-reviewed articles. All items used were only retrievable from the study's search criteria, and from the searches that the authors made. The authors did not add materials that fell outside the study scope and it included those that were within the scope. It identified the study gap that warranted their study and asked some new questions. The authors invited for more studies on how to measure depression effectively to facilitate treatment. The publisher of this article described it as "the state-of-the- art study (Greenberg, Linke, Mills, Reis & Rutledge, 2006). R**anked as high quality** (++).

Who Uses Complimentary and Alternate medicine (CAM)? A Narrative Review of Demographic Characteristics and Health Factors Associated with CAM Use.

This was a systematic literature review of within reach studies conducted in the United Kingdom (UK) to identify who uses Complimentary, and Alternate Medicine (CAM). The demography of the users, and the health implication of CAM use. This study took a qualitative approach in narrating the stories of the reviewed studies. The aim was to understand the characteristics or behavior of CAM users. The researchers collated and evaluated all known, and within reach evidence that focused on identifying the characteristics of the CAM user demography, and health conditions of using CAM within the non-clinical population in a community in general. The authors used a computer to search for the literatures in the computerized databases, meaning that the researchers used only published articles in the study. The criterion for including items in the study was the only evidence that showed a relationship between the use of CAM, and demography. The study evaluated and discussed the evidence. The result showed an association between CAM use and the following factors: Female, middle age women, and the educated. The study found that CAM users have more than one health issues. Feeling of physical and psychological distress also prompted the use of CAM. In conclusion, the authors suggested that CAM use was associated with the demography of the users, and the health condition of the users. The authors indicated that this study had some methodological limitations, which was identified as a gap. It invited for further studies on this very issue using a more standardized and improved methodology to minimize bias. (Bishop & Lewith, 2008). This was rated as **good (+).**

The 5-Item Mental Health Index Predicts the Initial Diagnosis of Nonfatal Stroke in Older Women.

In trying to know more about the psychosocial risk factors for developing stroke, this study was performed to determine whether psychosocial issues were risk factors to stroke diagnosis. This was a quantitative study conducted using a prospective cohort study approach from 1996 to 1999 of women aged 70 and 75.

The sample size was 7839 (*n=7839*). The study examined a group of psychosocial factors such as life event, Mental Health Index (MHI-5), have a partner and perceived stress Scale. others are Duke Social Support Index, educational, place of residence, feeling of pressure due to time constraints. The study used binary regression models of analysis in measuring the self-reported item that would predict stroke. The three-year (3-year) follow-up result showed that mental health index (MHI-5) was significantly associated with alcohol status, diabetes, heart disease, hypertension, and nutritional risks. in conclusion, poor mental health seemed to be a risk factor for self-reported stroke diagnosis among elderly women (Kenardy & Strodi, 2008). Rated as **high quality** study (++).

Feeding Minds: The Impact of Food on Mental Health

The researcher used multi-methodological approaches in performing this research. It investigated the breadth, and depth of evidence so far available on the relationship between mental health, and nutrition. By my assessment, this is the state-of-the-art study that gathered evidence from peer-reviewed journals, included non-peer-reviewed articles

among the articles reviewed. It also went further to collect evidence from personal communications, professional conference proceedings, and articles from the Internet. This was an indication that no stone was left unturned in examining the breadth, and scope of existing evidence on mental health, and nutrition. Other approaches used in collecting the evidence were National opinion poll (NOP), site visiting, and liaising with six mental health agencies. And from the review of nutrition, and the mental health specialist reference group.

The result showed that it is an undisputed fact that age, genetics, and environmental tendencies influence the mental status of an individual; however, the nutritional aspect of the environment was not recognized as an independent factor. This study joined the body of rising evidence in establishing the relationship between nutrition, and mental health. Nutrition has a short-term, and long-term impact on mental health. Food primarily influences the prevention, development, management of Schizophrenia, attention deficit hyperactivity disorder, and Alzheimer's diseases. Academic and clinical studies have strongly supported this claim. There is a need for food, and mental health policies review to embrace and gear up effort to sustainably address the mental health situation in the country. Not recognizing the impact of nutrition on mental health is a suggestion on the need for mental health promotion, including education, advocacy, and campaign to sufficiently inform all the stakeholders on the evidence. Limitations of this study could be traced to its strength, which is the inclusion of opinion poll, the inclusion of all evidence including non-peer reviewed. Additionally, interviews/personal communications, conferences proceedings, and reports of innovative mental health agencies data were included in the analysis. Suspecting methodological and interpretational biases, although the study did not specifically indicate the limitations of this study, but, it reported the barriers to all the studies reviewed. The author used only six of mental health agencies that promote the use of diet, and nutrition, which is an indication of a source of bias. (McCulloch, n.d.). R**anked high quality** (++).

Food Security, Maternal Stressors, and Overweight Among Low-Income US Children: Results from the National Health and Nutrition Examination Survey (1999-2002).
This was a quantitative study. The authors examined the relationship between maternal stressors, and food security and child obesity. It was the National Health and Nutrition Survey that sampled a total of 841 participants aged three to seventeen (3-17) from 1999-2002 whose mothers were below the U.S.A. poverty line by 200%. The researchers used the United States Department of Agriculture protocol, in describing, and assessing the maternal stressor in describing Food Security based on the survey outcome. The authors used BMI for determining the weight of the participants, and Probit regression for predicting the potential for a child to become overweight, or obese. In the result, among children between 3-10 years of age, there was no direct relationship between food insecurity, and maternal stressors, and overweight, or obesity, however, food insecurity, and maternal stressors were associated with overweight and obesity. Conclusion: Children who have food insecurity and are from low-income families were linked up with having maternal stressors.

For some ethical concerns, only four maternal stressors were examined in this study, the rest were not examined. The association between maternal stressors, and child food insecurity was not considered. Examining specifically the association between individual child food insecurity, and maternal stressors were encouraged. Considering the limited dataset used in this study, future researchers were encouraged to use a more comprehensive dataset in conducting future studies. The authors restricted participants to children from families that were 200% below the poverty line. Conducting future studies to include all children living below the poverty line was suggested to determine whether those category of children experiences maternal stressors, and the extent to which they experience maternal stressors (Eisenmann, Garasky, Gundersen, Lohman & Stewart, 2008). R**ated as high quality** (++)

Promoting Nutrition for People with Mental Health.
The researchers investigated the claim of an association between food, and mental health, to create the awareness with evidence among nurse practitioners handling mentally ill patients, to predispose them to advise the patients appropriately. The sample was from all ages of the adult. The result identified folate, complex carbohydrates, omega-3, and tryptophan as significant foods for the brain. It found poor nutrition, obesity, and malnutrition to be associated with mental health. (England/Mentality, 2004). Malnutrition was associated with a psychosocial disorder and diet was related to clinical depression. Tryptophan was linked with improving mood, but the evidence was yet unclear

Including omega-3 in the treatment of depression was suggested, but further evidence is required to establish the association (The Drug and Therapeutic Bulletin, 2007). Amino-acid called tryptophan was used for the production

of a chemical in the human brain called serotonin, and serotonin is essential for mood improvement (British Dietetic Association (BDA), 2006; Mental Health Foundation (MHF), 2006). The folate deficiency was associated with low mood feeling (British Dietetic Association, 2006). The result showed that weight loss is related to physical health risk reduction. The use of anti-psychotic medication (anti-depressant) was associated with weight gain. There is comprehensive evidence on the link between diet, and physical health, but not much evidence was there to determine the connection between food, and mental health. Alteration of diet from whole meal to processed food was related to increasing in the prevalence of a mental disorder. This study was performed in UK and Ireland to learn more about nutrition in relation to mental health; either as a direct cause of mental health, or as aiding in mental health development, or in worsening the mental health situation. This authors concluded that there is a relationship between the food we eat, and the human mental health status and obesity, and under-nutrition was prevalent among mental health patients (Bottomley & McKeown, 2008). Rated as **good quality** (+)

A Critical Review of the Literature On Children and Young People's Views of the Factors that Influence their Mental Health.

This was a systematic review of the studies performed to identify the factors that affect the psychological health of children and young adults. The authors obtained qualitative, and quantitative peer-reviewed articles conducted and written in English. The qualitative items constituted the bulk of the literature reviewed. It included a few participatory studies. After the literature search, out of the total of 11,549 articles generated, only 82 met the criteria for inclusion, and all were assessed following the same criterion. The search terms were; "*mental health, anxiety, depression, life satisfaction,* and *self-esteem*". At different times of searching, the search terms were interchanged. The databases searched for articles were, The Applied Social Sciences Index Abstracts (ASSIA), Cumulative Index to Nursing and Allied Health Literature (CINAHL). The authors also searched the International Biology of Social Sciences (BSS), the MEDLINE, PsycINFO, and the Social Sciences Citation Index (SSCI).

They searched the web for the articles including the related agencies' websites to locate all materials conducted in The UK until the time of the study. The researchers contacted all the agencies dealing with this issues in search of any new study that is not yet published to ensure that all relevant articles were included in this systematic analysis. It was revealed in the synthesis of all items reviewed that acute or chronic physical health situation among many social and other factors were associated with the mental health of the children, and young adults. The authors took so many precautionary measures to eliminate biases. Only peer-reviewed articles were included, non-peer-reviewed articles were excluded and only studies conducted in English language were included. Articles published between 1999, and 2008, and only items that the participants were 18 years, and below were included (McNaughton, Philip, Shucksmith & Spratt, 2009). R**anked high quality** (++)

Poverty and Common Poverty Disorder in Low and Middle Income Countries: A Systematic Review.

This study was a systematic review that examined the relationship between poverty and common mental disorder (CMD). It involved only articles conducted following epidemiological standard. The researchers examined a total of 115 items and a larger amount of the studies suggested a positive link between a range of poverty indicators and CMD. The result of the study showed a positive relationship between poverty indicators, and common mental disorder (CMD) including depression. Food insecurity among other poverty indicators was continuously found to indicate a strong relationship with complementary, and Allied medicine use. Limitations. Authors only involved peer-reviewed articles but, did not include a systematic review of gray articles, and only studies from 33 countries included, reducing chances of generalizability. The researchers focused only on variations between poverty predictors and mental illness. They did not examine variations between the outcomes such as differences between depression, and anxiety.

The authors indicated a possibility of bias in the publication of the result of this study. In that case, some studies with the negative association may have been technically excluded from being published. The writers also identified a gap in the study of this very issue and, therefore, suggested conducting more studies including qualitative studies to provide an in-depth understanding of mental illness, and its determinants. The authors encouraged further quantitative studies to examine the comorbidity between mental illness, and physical health, and more longitudinal studies were strongly suggested to consider causality pattern (Breen et al., 2010). This was ranked **high quality study** (++).

Maternal Common Mental Disorders and Malnutrition in Children: A Case Control Study.
This was a case-control study approach conducted in Brazil, where the nutritional status of Brazilian child has improved in recent years, but not much known about whether there was a link between mental disorder and child malnutrition. The objective was to examine the effect of maternal common mental disorders (MCMD), and child malnutrition. It used a total of 294 samples of infants, aged 0-5 involving male and female children. Out of 294 samples, only 147 were diagnosed with malnutrition. The authors used Self-report questionnaire (SRQ-20) version 20 provided to the children's families for socio-economic data collection. It evaluated the data using Home Observation for the Measurement of the Environment (HOME).

The criteria for the diagnosis were: moderately malnourished, and severely malnourished (Barreto et al., 2010). The Z scores for weight-for-height that has a standard deviation (SD) less than minus two (-2 SD) were rated either moderately malnourished or severely malnourished. The result showed that maternal common mental disorder (MCMD) was significantly associated with malnutrition in children. The writers suggested recognizing mental caregiving as crucial consideration to be made in providing treatment for child malnutrition. The authors concluded that in all treatments, and prevention of malnutrition among children, there is a need to recognize the maternal common mental disorder. The study was conducted following the ethical guideline, and the Research Ethics Committee approved the study. The finding was matched for age, sex and the confounder controlled.

Limitations: The result showed an association between MCMD, and malnutrition, but did not examine the mechanism of association. The sample was a convenient sample, and could be a source of bias. The authors did not measure the effect of maternal caregiving, and other factors to the child's malnutrition. Gap: More studies were encouraged to examine the mechanism of association between malnutrition and MCMD, and to measure the effect of maternal caregiving, and other factors to the child's malnutrition (Barreto, Hasselmann, Santos, Santos & Silva, 2010). This was rated a **good quality stud**y (+).

Household food insufficiency and mental health in South Africa:-
The authors examined whether there is a relationship between food insufficiency and mental health disorder. Mental disorder was prevalence among the low-income group, but the sufficient evidence establishing the association between food insufficiency, and mental disorder was not there. The aim was to provide evidence to add to the few existing ones to support policy decision necessary to address the mental health situation in South Africa. This looks like the mixed-method study because, it collected data using questionnaires, as well as using the face-to-face interview. The researchers conducted a survey of 4185 adults in South Africa, and this falls within the World Health Organization International (WHO) standard. The authors used the WHO International Composite Diagnostic Interview System for collecting the psychiatric diagnosis data. It used a single-item household measurement of food insufficiency. The researcher used standard questionnaires to collect the socioeconomic demography of the participants such as age, race, marital status, educational level completed, employment, income, urban or rural. Participants were selected using random sampling that was the same with the national census strata.

The writers determined the effect of food insufficiency, and demographic characteristics on 12-month, and lifetime DSM-IV diagnosis for mental health, and used logistic regression for conducting the assessment. The result found 29% of the respondents *not having sufficient food sometimes*, 9% *did not often have sufficient*. The outcome showed a relationship between food insufficiency and 12-month disorder (OR 1.44, CL 95% 1.1to 1.9), and a lifetime disorder (OR 1.35, CL 95%, 1.1 to 1.7) DSM-IV. The authors suggested in conclusion that there is a high prevalence of food insufficiency in South Africa, and there is a relationship between food insufficiency and possessing 12-month, and lifetime DSM-IV (a mental disorder). Intervention to address the mental health situation in South Africa was recommended. Limitations: Food insufficiency increases mental illness among HIV/AIDS patients. However, this study did not examine the relationship between HIV and food insufficiency, and no data was collected from 15% of the samples. There was no account given of the data that was not collected (Slopen, Sordahl, & Williams, 2011). Rated as **high quality** (++)

Depression and Dietary Intake in a Cohort of HIV-Positive Clients in Sydney:-
This was a cross-sectional quantitative study conducted in Sydney Australia to make a comparison between HIV patients experiencing depressive symptoms, and the HIV patients that were not experiencing depressive symptoms. The authors used convenient sampling for sample recruitment. They used the Centre for Epidemiologic Studies Depression Scale (CES-D10 for depressive symptom risk classification. In the use of CES-D10, dietary history and food frequency questionnaire are used to determine the participants' dietary nutrient intake. The researchers used

samples of 21 depressed HIV patients (*n=21*), and 37 non-depressed (N-D) (*n=37*) subjects. In the comparative analysis, the depressed (D) subjects were found to have the less fiber intake (16.1) than non-depressed that showed 25.4g/day. For vitamin A., the depressed had less (801.5mg/day) and the non-depressed had (1524.8mg/day) (Begley et al., 2012).

The D had 299.8mg/day of magnesium, and N-D had 380.0mg/day of magnesium, and D had 264.8 µg/day, and N-D had 402.9µg/day for folate. Apart from folate level, the D group was found to have less ability to keep Australian daily recommended dietary allowance than the N-D group who mostly kept the Australian daily recommended dietary allowance. The authors concluded that depressive symptom among depressed patients with HIV was linked to poor dietary nutrient intake among the depressed group (Begley, et al., 2012). Limitations of the study: small sample sizes were used, and the study used convenient sampling for selecting participants, so the outcome is not generalizable. It used self-report in collecting the dietary data, giving room for recall bias due to the tendency to forget, among others (Begley, Houtzager, Jeganathan & Purnomo, 2012). R**ated as high quality** (++).

Food and Mood: Evidence for Diet-Related Changes in Mental Health.
This study was performed in the UK to determine whether there is a relationship between diet and range of mental disorders. It was more of a narrative story. And this reviewer could not find the methodology used for this study. It may have taken environmental health study approach. The purpose was to contribute to the increasing evidence that is linking food to mental health. The result suggested a link between food, and depression, anxiety, Schizophrenia, attention deficit hyperactivity disorder, and Alzheimer's disease (Sustain, 2006). This study is still on and is not yet completed. The authors concluded by suggesting that the consumption of some food could improve the individual's mood, but if there is a medical cause of the mood, that should be treated. Gap: this study invited for more studies on the relationship between food, and mental health to establish the causal fact (Dunne, 2012). Rated as **good quality** study (+).

Importance of Human-Hydration: Perceptions Among Healthcare Professionals Across Europe.
This was conducted in six countries in Europe to highlight the importance of hydration on health, from the perspectives of various health care practitioners (HCPs). The HCPs were recruited from six different countries namely Spain, Italy, Greece, France, UK, and Germany. The Practitioners were general medical practitioners (GP), pharmacists, nurses, nutritionists, and dieticians. It was a randomized controlled study. The authors recruited samples through random sampling through an independent agency that recruited samples from WorldOne lead professionals, WorldOne Healthcare Professional database, and a free found sample obtained from a public domain. The researchers collected data from a total of 1980 respondents, GP 600, nurse 300, pharmacists 550, nutritionists 265, and dieticians 265. It used computer-aided web-based interview question for data collection from participants from Italy, Spain, Germany, France and UK and used computer-aided telephone interview to collect data from participants from Greece. In the first five questions asked respondents centered around getting the respondent's view about the importance of hydration, what the practice, and advice given to patients about it.

The next question was whether the experience found patients to be optimally hydrated, followed by questions about the impacts of food and beverages on the individual hydration. The result found water to be an essential nutrient. The HCPs from Italy, Spain, Greece, and France recognized the importance of water, and they practice giving patients advice often than HCPs from the UK, and Germany. However, the HCPs mostly do not attach so much importance to water in their practice. The GPs and the Pharmacists do not regularly evaluate the hydration level of patients, but they do the evaluation more than the nurses, the nutritionists, and the dieticians. HCPs from France and Italy failed to recognize hydration as an important component of mental health. Over 50% of the HCPs who recognized hydration as important to good health do not practice giving hydration advice all that.

The impact of hydration on mental health, and cognitive was not conclusively established, and optimum hydration was associated with mental well-being and mental performance. It encouraged more studies to establish clearly the link between water and mental health. Recommended daily water allowance (intake) is 2.6 liters in France. Study limitations: the sample panels did not involve all HCPs in all the countries sampled. There was low response rate so, the generalizability may be hampered, and the opinion response of the HCPs might be socially biased. The HCPs interviewed were not segmented, their practice environment were not indicated. The researchers focused more on the view, and perception of the HCPs on hydration, and less on what they practiced. More studies are needed to determine the quantity of water the food could supply to the body, so, as to determine the exact quantity of water the

body needs per day. Also, determining the environmental impact on the daily quantity of water needed by individual was encouraged (Holdsworth, 2012). Rated as a **high-quality study** (++).

Identification of Nutritional Risk by Nursing Staff in Secure Psychiatric Settings: Reliability and Validity of St Andrew's Nutrition Screening Instrument.

Mental health patients also exhibit physical health issues namely diabetes, and overweight or obesity. This study was conducted to determine the impact of food on the mental health of an individual. The authors were concerned that if food has an impact on the mental health of an individual that it is an indication that nutrition should be taken very seriously, and due consideration given to it in providing healthcare. This is most especially during diagnosis and in all aspect of care. St Andrew being a health care provider for mental patients aged 13 years and above has considered nutrition as an important aspect of physical, and mental health. It, therefore, developed a nutrition screening tool called St Andrew's Nutrition Screening Instrument (SANSI) and suggested including SANSI in the patient's health record. Also, it suggested the need to complete the SANSI monthly to record the patient's body mass index (BMI) and regular meals. The SANSI would help the Healthcare Providers (HCPs) in identifying patients at risk of poor health owing to nutrition. SANSI was easy and simple to use, and the staff was to agree on the definition given to the diagnosis.

However, the issue of giving the staff the authority to agree on the diagnosis seemed to me like a source of bias, as sometimes this could become more political than professional. Especially in a situation of conflict, a wrong diagnosis would be scored to be right, and vice versa, and if not controlled, this could undermine the aim of SANSI. And this could place the patients' live at risks. SANSI may necessarily need some reconsideration and standardization (Personal thought). The purpose of this study was to examine the reliability and validity of the SANSI. The result found SANSI to be a valid, and reliable instrument for determining the nutritional risk of mentally ill patients. It was recommended as a secure tool by regulatory bodies, and they called for water importance awareness creation, and training of HCPs to encourage its efficient use. The study limitations: This study did not examine how to close the gap of the individuals' daily choices of food, and the awareness of how best to make healthy choices. This study called for more qualitative studies to explore how psychiatric patients feel with respect to different foods they eat (Chance, Dolley, & Rowell, 2012). Rated as a **high quality study**. (++).

Nutrition and Depression at the Forefront of Progress.

This study was conducted in Romania in response to the rising claims about depression as a second leading cause of morbidity by 2020. The objectives of this study were to examine the efficacy of antidepressant therapy use and the main negative consequence of depressive disorders. The result has joined the growing evidence establishing the link between nutrition and major depressive disorders. The result found nutrition to be connected with mental health establishing a correlation between nutrition and mental health. The researchers found nutrition to be an important aspect of mental health; this is against the earlier conception, and therefore, suggested adherence to a healthy diet for good mental health. Paying attention to the foods that increase the production of neurotransmitters, and other brain cell improving diets in appropriate quantity.

While some foods promote good mental health, fast foods aggravate mental disorders. Amino acids namely, tryptophan, tyrosine, and phenylalanine (precursor of tyrosine) are good for a psychiatric disorder. Phenylalanine is neurotransmitter (dopamine and norepinephrine) convertible. Examples of neurotransmitters are serotonin, dopamine, noradrenaline, and ϒ-aminobuteric acid (GABA). Deficiency of neurotransmitters were associated with mental disorder. Neurotransmitters could be found in amino acids foods namely tryptophan, tyrosine, and glutamine. In minerals, it comes as zinc, copper, iron, and magnesium. Also in B group vitamins namely B6, B12, and folic acid, found in green leafy vegetables, whole grain cereals, cabbage, beans, broccoli and so forth. And omega-3 found in fish, olive oil, among others.

Omega-3 fatty acid compounds called eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) were suggested to have an anti-depressant effect. Mentally ill patient needs low meat and low milk products. The mineral deficiency was linked to the mental disorder; low selenium was linked to mood disorder and zinc was found to be low among depressed individuals, optimum zinc intake could be a therapy for the antidepressant. Low I-tyrosine was linked up with mood and anxiety disorder. Sufficient vitamins C and E prevent the harm of free radicals caused by oxidation. In conclusion, the authors suggested that healthcare practitioners should pay attention to improving healthy nutrition among patients. Nutritional supplements were encouraged by the researchers.

Limitations: The scope of this study did not cover nutrients and the need for nutrients assessment. It did not establish the exact line of causality between nutrition and the development of derisive disorder and cause of a mental disorder. It did not examine the link between the individual food and mental disorder. It did not examine the exact best dose of the nutrients for the best mental health and it suggested that the use of a supplement is just to support treatment (Ladea & Popa, 2012). Rated a **high quality study.** (++).

Discussion:-

The researcher used all peer-reviewed articles from across the continents of the world namely Europe, America, Canada, Asia, Africa, and Australia to investigate whether there is a link between mental disorder and nutrition. The findings of this study could be regarded as authentic because, it obtained all evidence from credible sources across the globe. The researcher read the full articles and avoided using abstract only in reviewing the evidence to reduce bias. This study was conducted following an epidemiological pattern of a systematic review, and it performed the ranking of the evidence using NICE framework of ranking (Harder, 2012-2014). In order words, this study was conducted following the internationally recognized standard of performing a systematic review of studies. Ranking indicated that the results of the evidence reviewed in the pre-assessment section, and the rating was performed following the NICE pattern of ranking.

All evidence reviewed ranked from medium to high quality. Out of the twenty-one evidences reviewed, fourteen (14) of the evidence were of high quality and six (6) were good quality. One (1) was medium quality because it has large methodological biases. Apart from Jenkins, and Mirza (2004), study that did not link mental illness directly with nutrition, the rest of the study linked nutritional factors with mental illness (Chapman, Perry & Strine, 2004). A study linked chronic diseases with a mental disorder. Psychological disorders namely, mood and stress were associated with some factors including Meal pattern, food choices and hunger (Bellisle, 2005). Adult hunger and food insufficiency were associated with mental, physical and psychological health. Examples of mental illness are depression, stress, and anxiety among other factors (Fletcher et al., 2004).

Poverty was also significantly associated with a depressive disorder, and depressive disorder was prevalence among those who have used psychotropic disorder medication (Nguyen & Riolo, 2005). It is an indication that immediate response in developing appropriate strategies to address sustainable nutritional causes of mental illness may be necessary. Also, in the use of depressive prescription, depression was indicated as an after-effect. There is a significant association between depression and clinical outcomes such as heart failure (Greenberg et al., 2006). Physical and psychological distress also prompted the use of CAM. CAM use was associated with the demography and health condition of the users (Bishop & Lewith, 2008). Folate, complex carbohydrates, omega-3 and tryptophan were significantly associated with brain health (Bottomley & McKeown, 2008). Poor nutrition, obesity and malnutrition were connected with mental health (England/Mentality, 2004).

Malnutrition was associated with a psychosocial disorder. Diet was linked with clinical depression (Bottomley & McKeown, 2008). Academic and clinical researchers have strongly supported the claim of a relationship between nutrition and mental health. Nutrition has a short-term and long-term impact on mental health. The prevention, development, management of Schizophrenia, attention deficit hyperactivity disorder, and Alzheimer's diseases are largely influenced by nutrition (McCulloch, n.d.).

The review of all government policies that could lead to the improvement of the community mental health situation was encouraged (McCulloch, n.d.) For example, there is a need for a review of policies related to healthy food processing, the distribution, and sale of mental health giving foods. Subsidizing all mental health supporting and healing foods may be necessary because that will also support an effective control of other chronic diseases. The consequences of policies review and implementation on the short-run might involve some tangible costs. However, on the long-run, there would be a substantive drop in government spending on all aspects of health, when the metal, psychological and physical health get healthier. Easy and regular access to mental health-giving food will reduce the social issues associated with mental illness such as alcoholism, drug abuse and dependent, and law enforcement cases. It will in turn reduce government spending on crime control, including jail maintenance, and expenses because, when there is less mental illness, social misdemeanors could reduce. People may start thinking and acting right, behaving responsibly well and become more meaningfully engaged in productive live. Also, on the long-run increase in government revenue through tax from healthy and productive people. Additionally, the government could make more savings on the amount spent on social security and other security issues involved in crime control.

It could reduce idling or wasting away, and increase productivity because more and more folks would be meaningfully and responsibly employed, and more employment will generate more revenue through tax.

There is a need to review the government policies on the food, mental and general health. The revised policies could include making mental health giving food available, accessible and affordable to the affected individual as well as the public. The early, easy, regular and affordable healthy food consumption may prevent the development of mental illness. It may increase a sustainable management of mental illness (Kushel, Laraia & Seligman, 2010; McCulloch, n.d.). Food insecurity and maternal stressors have a connection with overweight, obesity than children who have food security. However, those from low-income families were linked with having maternal stressors (Eisenmann, Garasky, Gundersen, Lohman & Stewart, 2008). The acute or chronic physical health situation among social and other factors were associated with the mental health of the children and young adults (McNaughton, Philip, Shuck smith & Spratt, 2009). There is a positive relationship between poverty indicators and common mental disorder including depression. Food insecurity among other poverty indicators continuously have a strong relationship with a common mental disorder (Breen et al., 2010).

In South Africa, there was a high prevalence of food insufficiency, and there was a relationship between food insufficiency and possessing mental disorder (Slopen et al., 2011). Depressive symptom among the depressed HIV patients was linked to poor dietary nutrient intake among the depressed group. The non-depressed were found to have sufficient intake of Vitamin A, Fibre, Magnesium and Folate. In order words, poor nutrient level namely Vitamin A., magnesium, folate, and fiber intake is prevalent among depressed subjects (Begley et al., 2012). Food was associated with a range of mental disorders namely, depression, anxiety, Schizophrenia, attention deficit hyperactivity disorder, and Alzheimer's disease. Therefore, mental health diagnosis should start with nutrient diagnosis including blood analysis (Dunne, 2012; Sustain, 2006).

An optimum hydration was associated with mental well-being and mental performance. However, more studies were encouraged to establish clearly the link between water and mental health (Holdsworth, 2012). Having found nutrition as an indispensable aspect of health including mental health, St. Andrew's Healthcare has developed a nutritional diagnostic tool for mental patients. SANSI offers reliable and valid nutritional screening of the mental patients. It provides improved care for mental health patients, especially those at the risk of chronic diseases comorbidity such as the diabetes, and the obesity (Chance et al., 2012). SANSI now provides the much-needed answer to the fear of wrong nutritional diagnosis as was expressed by Abayomi and Hackett (2004), study. Additionally, malnutrition in children was significantly associated with maternal common mental disorder (MCMD) and recognizing mental caregiving as a very important consideration in providing treatment for child malnutrition was suggested (Barreto, Hasselmann, Santos, Santos, & Silva, 2010).

Nutrition was linked with mental health, and there was a correlation between nutrition and mental health (Ladea & Popa, 2012). Nutrition is an important aspect of mental health, and this was against the earlier conception (notion). Therefore, the adherence to healthy diet, paying attention to the foods that increase the production of neurotransmitters and another brain cell improving diets in appropriate quantity is necessary for a good mental health. While some foods promote good mental health, fast foods aggravate mental disorders (Ladea & Popa, 2012). Amino acids such as tryptophan, tyrosine, and phenylalanine are good for a psychiatric disorder. Deficiencies of neurotransmitter are associated with a mental disorder (Ladea & Popa, 2012). Omega-3 fatty acid compounds called eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA) was found to have an anti-depressant effect. The deficiency of mineral was linked to a mental disorder; Low I-tyrosine was linked up with mood and anxiety disorder (Ladea & Popa, 2012).

Sufficient vitamins C and E prevent the harm of free radicals caused by oxidation. Healthcare practitioners should pay attention to diagnosing as well as, improving healthy nutrition among patients (Ladea & Popa, 2012). Achieving this is possible with SANSI, and this could be included in the patient's health record. And it should be encouraged to be completed monthly for keeping the record of the patient's body mass index (BMI) and regular meals (Chance, Dolley & Rowell, 2012).

Social implication/Rational

Other factors associated with mental health was recognized in the Canadian mental Health policy, but nutrition. The goal is to inform health care service providers and policy makers about the importance of food to the preservation and degeneration of health including mental health. This study could bring many health critical social change

implications on the public, health practice and health policy decision. The primary goal is to inform all concerned about the impact of nutrition on the mental, physical and general health of an individual, and the need to recognize that in health practice and care provision in view of influencing health policy decision to recognize the direct impact of food on mental health. Success could cause a reduction in an individual MI, and its impacts on the community and the economy on the long-run.

Recommendations

"The time is now right for nutrition to become a mainstream everyday component of mental health care" (McCulloch, n.d.). In line with the evidence reviewed in this study, nutrition could even be the mainstream of the general health care based on the substantive evidence gathered from across the globe in this study. Based on the outcome of this study there is consistent and continuous evidence across the continent supporting the claim that Nutrition has a relationship with mental health as well as, the physical health. This study, therefore, recommends that:

Intervention is necessary to address the mental health of Canadians (Slopen et al., 2011).
Health institutions, agencies, mental health agencies, Associations, and the government are requested be aware that there is a relationship between mental health and nutrition. Therefore, making effort to include that in the food, general, and mental health policies in Canada may be inevitable (McCulloch, n.d.)

More thorough Canadian Community-based randomized controlled, peer-reviewed clinical studies may be necessary for Canada to support or debunk these claims to act fast in developing strategies to improve the community's mental health status.

Canadian government to consider subsidizing mental health-giving foods and if possible, extend the health insurance coverage to include mental health-giving foods is encouraged.

Government to increase mental health research funding, and widen the political support for all processes leading to the improvement of the mental health of the community (McCulloch, n.d.). Attention to be directed at healthy food processing, distribution and sale of mental health giving foods, subsidizing all mental health and healing foods.

The government policy on food, mental and general health should include making mental health giving food regularly and easily available, accessible and affordable to the affected individual and the public. Because, early, easy, regular and affordability may prevent the development of mental illness and sustain the management of mental illness (McCulloch et al., 2010).

Medical diagnosis of a range of mental disorders namely depression, anxiety, Schizophrenia, attention deficit hyperactivity disorder and Alzheimer's disease should start with nutrient diagnosis; including blood analysis (Sustain, 2006; Dunne, 2012). And reliable instrument such as SANSI is recommended for an effective nutritional diagnosis to ensure reliability and validity.

Health education specialists need to work with mental health care and general health care system to provide mental health education to patients, family, and mental health caregivers.

Conclusion:-

There is a consistent and growing evidence establishing a relationship between nutrition and its factors with mental illness. There is evidence suggesting a direct impact of food on the mood and the general well-being of an individual. And there is evidence showing the impact of food on the development, prevention and the management of mental illness. The key potential social change implication of this study is to inform the public, health practice and designated authorities about the impact of nutrition on the mental, physical and general health of individual in view of influencing health policy decision to recognize the direct impact of food on mental health and health generally. Success could cause a reduction in an individual MI, and its negative impacts on the national and global economy.

References:-

1. Abayomi, J. & Hackett, A. (2004). Assessment of malnutrition in mental health clients:
    a. nurses' judgement vs nutrition risk tool. *Journal of Advanced nursing, 45*(4), 402-407. Doi: http://dx.doi.org.ezp.waldenulibrary.org/10.1046/j.1365-2648.2003.02926.x
2. Ali, J., Janz, T. & Pearson, C. (2013). Health at a glance: Mental and substance use disorder in Canada. Retrieved from http://www.statcan.gc.ca/pub/82-624-x/2013001/article/11855-eng.pdf
3. Barreto, M. L., Hasselmann, M. H. Santos, D. N., Santos, D. S., & Silva, R. C. (2010). Maternal common mental disorders and malnutrition in children: a case control study. *Social Psychiatry and Psychiatric Epidemiology, 46*(7), 543-548. Doi: 10.1007/s00127-010-0220-4
4. Begley, K., Houtzager, L., Jeganathan, S., & Purnomo J. (2012). Depression and dietary intake in a cohort of HIV-positive clients in Sydney. *International Journal of sexually Transmitted Diseases AIDS, 23*(12), 882-886. Retrieved from
5. http://std.sagepub.com/content/23/12/882.full.pdf+html
6. Bellisle, F. (2005). The determinants of food choice. Retrieved from
7. http://www.eufic.org/article/en/expid/review-food-choice/
8. Bishop, F. L. & Lewith, G. T. (2008). Who uses complimentary and alternate medicine (CAM)? A narrative review of demographic characteristics and health factors associated with CAM use. *eCAM, 7*(1) 11-28. DOI: 10.1093/ecam/nen023
9. Bottomley, A. and McKeown, J. (2008). Promoting nutrition for people with mental health. *Nursing Standard, 22*(49), 48-56. Retrieved from http://web.ebscohost.com.ezp.waldenulibrary.org/ehost/detail?vid=3&sid=d5cf8c05-4ef9-4097-b3d0-d2d96af27473%40sessionmgr110&hid=123&bdata=JnNjb3BlPXNpdGU%3d#db=rzh&AN=2010003430
10. Breen, A., Corrigall, J., Flisher, A. J., Joska, J. A., Kakuma, R., Lund, C., Patel, v. & Swartz, L. (2010). Poverty and common disorder in low and middle income countries: A systematic review. *Social Science & Medicine 71*(), 517-528. Doi: 10.1016/j.socscimed.2010.04.027
11. Bushe, C. J. P. et al. (2007). A well-being programme in severe mental illness. Baseline findings in a UK Cohort. *The international Journal of Clinical Practice, 61*(12), 1971-1978. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1742-1241.2007.01605.x/full
12. Canadian Mental Health Association. (2013). Mental Health Public Policy. Retrieved from http://www.cmha.ca/public-policy/?offset=0
13. Canadian Mental Health Association (n.d.). Fast facts about mental illness. Retrieved from http://www.cmha.ca/media/fast-facts-about-mental-illness/#.UolfTWRgZss
14. Cao, Z. R., England, G. M., Johnson-Down, L., Sheikh, N., & Weiler, H. (2011). Food insecurity and nutrition transition combine to affect nutrient intakes in Canadian Artic communities. *Journal Of Nutrition, 141*(9), 1746-1753. Retrieved from http://nutrition.highwire.org/content/141/9/1746.full
15. Centre for Addiction and mental Health. (2012). Mental Illness and addictions: Facts and statistics. Retrieved from http://www.camh.ca/en/hospital/about_camh/newsroom/for_reporters/Pages/addictionmentalhealthstatistics.aspx
16. Chapman, D. P., Perry, G. S., & Strine, T. W. (2005). The vital link between chronic disease and depressive disorders. *Journal of Preventing Chronic Disease, 2*(1), *p.* Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1323317/
17. Chance, L., Dolley, O. & Rowell, A. (2013). Identification of nutritional risk by nursing staff in secure psychiatric settings: reliability and validity of St Andrew's Nutrition Screening Instrument. *Journal of Psychiatric and Mental Nursing, 19*(8), 722-728. Doi: http://dx.doi.org.ezp.waldenulibrary.org/10.1111/j.1365-2850.2011.01848.x
18. Corcoran, M. E., Heflin, C. M., Siefert, K. & Williams, D. R. (2008). Food insufficiency and physical and mental health of low income women. *Online Journal of Women & Health, 32*(1-2), 159-177. Retrieved from
19. http://www.tandfonline.com/doi/abs/10.1300/J013v32n01_08#.UmC8qpRgYSg
20. Crum, R. M., Eaton, W. W., Lee, B. H., Lyketsos, G. C. & Onyike, C. U. (2002). Is obesity associated with major depression? Results from the third national nutrition examination survey. *American Journal of epidemiology, 158*(12), 1139-1147. Retrieved from http://aje.oxfordjournals.org/content/158/12/1139.short
21. Davidson, S., Judd, F, Jolley, D., Hocking, B., Thompson, S. & Hyland, B. (2001). Cardiovascular risk factors for people with mental illness. *Australian and New Zealand Journal of psychiatry, 35*(2), 196-202. Retrieved from
22. http://anp.sagepub.com/content/35/2/196.short

23. DeMelo, M., Gucciadi, E., Stewart, D. E., & Vogt, J. A. (2009). Exploration of the relationship between household food insecurity and diabetes in Canada. *Journal of Diabetes Care, 32*(12), 2218-2224. Retrieved from
24. http://care.diabetesjournals.org/content/32/12/2218.full
25. Diana, (2013). Statistics Canada releases mental health result survey result. Retrieved from http://mindyourmind.ca/community/blog/35-mental-health-a-coping/4861-statistics-canada-releases-mental-health-survey-results
26. Dunne, A. (2012). Food and mood: evidence for diet-related changes in mental health. British Journal of Community Nutrition, S20-1(26 ref). Retrieved from
27. http://web.ebscohost.com.ezp.waldenulibrary.org/ehost/pdfviewer/pdfviewer?sid=92bfa90b-4199-4772-959b-8a9c2575bd75%40sessionmgr113&vid=4&hid=123
28. Eisenmann, J., Garasky, S., Gundersen, C., Lohman, B. J., & Stewart, S. (2008). Food security, maternal stressors, and overweight among low-income US children: Results from the National Health and Nutrition Examination survey (1999-2002). Pediatrics, 122(3), e529-e540. Retrieved from http://www.pediatricsdigest.mobi/content/122/3/e529.full
29. Fletcher, K., Goldberg, R., Gundersen, C., Hosmer, D., Huntington, N., Wehler, C. & Winreb, L. F. (2004). Risk and Protective factors for adult and child hunger among low-income housed and homeless female-headed families. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449835/
30. Gomez-Pinilla, F. (2008). From the environment to epigenome and cognitive processing. Retrieved from https://www.ibp.ucla.edu/research/Gomez-Pinilla/
31. Gomez-Pinilla, F. (n.d.). Mechanism of neural repair. Retrieved from
32. http://www.physci.ucla.edu/research/Gomez-Pinilla/
33. Gomez-Pinilla, F. (July 2008. Brain foods: the effect of nutrient on brain function. *Nature Science Neuroscience Journal, 9*(7), 568-578. Retrieved from
34. www.nature.com/nrn/journal/v9/n7/abs/nrn2421.html.
35. Greenberg, B. H., Linke, S. E., Mills, P. J., Reis, V. A., & Rutledge, T. (2006). Depression in heart failure: Meta-analytic review of prevalence, intervention effects, and Association with clinical outcomes. *American Journal of College of Cardiology, 48*(8), *p.* Retrieved from http://content.onlinejacc.org/article.aspx?articleid=1137979
36. Harder, T. (2012-2014). Project on a framework for rating evidence in public health (PRECEPT). Retrieved from http://www.rki.de/EN/Content/Prevention/PRECEPT/PRECEPT_node_en.html
37. Hoffer, A. (1988). Book review: Nutritional influences on illness: A sourcebook of clinical research by Melvin R. Werbach. *Journal of Orthomolecular Medicine, 3*(2), 79-81. Retrieved from http://orthomolecular.org/library/jom/1988/pdf/1988-v03n02-p079.pdf
38. Holdsworth, J. E. (2012). Importance of human-hydration: perceptions among healthcare professionals across Europe. *Nutrition Bulletin, 37*(1), 16-24. Doi: http://dx.doi.org.ezp.waldenulibrary.org/10.1111/j.1467-3010.2011.01942.x
39. Kenardy, J., & Strodi, E. (2008). The 5-item mental health index predicts the initial diagnosis of nonfatal stroke in older women. *Journal of Women's Health 17*(6), 979-986. Doi: http://dx.doi.org.ezp.waldenulibrary.org/10.1089/jwh.2007.0516
40. Kushel, M. B., Laraia, B. A. & Seligman, H. K. (2010). Food insecurity is associated with chronic disease among low-income NHANES participants. *Journal of Nutrition, 140*(2), 304-310. Retrieved from
41. http://nutrition.highwire.org/content/140/2/304.abstract
42. Jenkins, R., & Mirza, I., (2004). Risk factors prevalence and treatment of anxiety and depressive disorders in Pakistan: Systematic review. *British Medical Journal, 328(7443), 794.* Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC383372/
43. Ladea, M., & Popa, T. A. (2012). Nutyrition and depression at the forefront of progress. *Journal of Medicine and Life, 5*(4), 414-419. Retrieved from
44. http://web.ebscohost.com.ezp.waldenulibrary.org/ehost/detail?vid=4&sid=3fca4bf1-3a9c-4674-a583-a22856547cc8%40sessionmgr114&hid=113&bdata=JnNjb3BlPXNpdGU%3d#db=mnh&AN=23346242
45. Loopstra, R. & Tarasuk, V. (2013). Severity of household food insecurity is sensitive to change in household income and employment status among low-income families. *Journal of nutrition, 113*(8), 1316-1323. Retrieved from
46. http://nutrition.highwire.org/content/143/8/1316.abstract
47. McCulloch, A. (n.d.). Feeding minds: The impact of food on mental health. Retrieved from http://www.mentalhealth.org.uk/content/assets/PDF/publications/Feeding-Minds.pdf

48. McNaughton, R., Philip, K., Shucksmith, J, & Spratt, J. (2009). A Critical review of the literature on children and young people's views of the factors that influence their mental health. *National Health Scotland*, 1-121. Retrieved from http://ec.europa.eu/health/mental_health/eu_compass/reports_studies/review_literature_children_young.pdf
49. Mental Health Foundation.co.uk. (n.d.). Diet and mental health. Retrieved from www.mentalhealth.co.uk
50. Mood Disorder Society of Canada. (2009). Quick facts: Mental illness and addiction in Canada. Retrieved from http://www.mooddisorder.ca
51. National Institute on Drug Abuse, (2010). Comorbidity addiction and other mental Illness. Retrieved from https://www.drugabuse.gov/publications/research-reports/comorbidity-addiction-other-mental-illnesses/what-comorbidity
52. Nguyen, T.A., & Riolo, S.A. (2005). Prevalence of depression by race/ethnicity: findings from the National health and Nutrition Examination Survey III. *American Journal of Public health, 95*(6): 998-1000. Retrieved from
53. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449298/
54. Nauert, R. (July 10, 2008). Healthy Food can improve mental health. Retrieved from
55. http://psychcentral.com/news/2008/07/10/healthy-food-can-improve-mental-he alth/2587.html
56. Pearson, C. (2015). Health at a glance: The impact of mental health problems on family members. Retrieved from http://www.statcan.gc.ca/pub/82-624-x/2015001/article/14214-eng.htm#a2
57. Peet, M. (2004). International variations in the outcome of schizophrenia and the prevalence of depression in relation to national dietary practices: an ecological analysis.
58. Slopen, N., Sordahl, K. & Williams, D. (2011). Household food insufficiency and mental health in South Africa. *Journal of Epidemiology and Community Health, 65*(5), 426-431. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3195371/
59. Tarasuk, V. S. & Vosoris, N. T. (2002). Household food insufficiency is associated with poorer health. *American Association of Nutritional Science, 133*(1), 120-126. Retrieved from http://nutrition.highwire.org/content/133/1/120.short