

Farm to Treatment Team:

Modern Mental Health Nutrition

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Abstract

There is surmounting evidence to the undeniable influence that nutritional intake has on the expression of an individual's mental health. Current trends in the modern western diet have led to a nutritionally deficient culture of detrimental caloric consumption that has impacted the holistic health of generations. The intention of this review is to provide an overview of the characteristics and dynamic shifts that relate to the intersection of mental health and nutritional science. Citing dietary research, historical food industry patterns and the utility of practical dietary intervention and referral; the author asserts that mental health clinicians should be ethically bound to educate themselves in basic dietary concepts. Current research reporting the advantage of assessing the gut microbiome and gut-brain axis is provided in order to highlight the insights gained from a holistic approach to treatment of dysfunctional psychological symptomatology. Research points to the benefit of nutritional assessment in efforts to augment current psychopharmacological modalities. The nutritionally competent mental health professional is better adapted to address the growing demand placed on healthcare providers to effect change in response to varying mental health pathology.

Keywords: nutrition, mental health, American diet, gut microbiome, holistic

Discussion

The atmosphere of contemporary western society is dominated by a fervent and search for convenience and industrial efficiency. The familial and professional demands placed on the average westernized individual predisposes one to seek the fastest, easiest and most cheap solution to any presenting problem. Ramifications of the quick-fix characteristic of modernity are pervasive and the negative consequences of this western lifestyle are inescapable. The costs of this global ‘culture of convenience’ are not limited to solely monetary detriments; rather they infiltrate their vast debts into all aspects of an individual's relationships; including the relationship the individual has intrapersonally. One of the most harmful results of this ‘culture of convenience’ is the effect the global quest for ease has had on nutritional intake. There is a nutritional crisis in western culture and the mental health of nations are currently paying a cost that, unless intentionally reorganized, could bankrupt the mental health of society at large. Running with the burgeoning trend of ‘Farm to Table’ Restaurants, the author calls for an extension of this movement to bring the farm, meaning whole food nutritional interventions, to the treatment team table of mental health facilities and clinical case conceptualizations.

Rationale

The aim of this paper is to provide the reader with a review of the pertinent literature as it relates to the intersection of mental health and nutrition. Highlighting current research, dietary trends, cultural demographics, holistic theory and the growing field of nutritional psychiatry the intention of this review is to provoke a call for mental health clinicians to be nutritionally informed. The author asserts that the benefits of proper nutrient consumption can be experienced by both the individual professional and the mental health consumers they provide for.

Furthermore, the added objective of establishing ethical grounds for an informed nutritional practice by mental health providers is affirmed. The conditioning of the medical model that dominates health care often holds less value in prevention of disorder and disease and rather promotes treatment of existing pathology (Null, 2011; Keyes, 2007). The literature concerning psychiatric nutrition points to the functionality of a more focused preventive model (Zell and Grundmann, 2012). A model that coupled with existing psychological theory and psychopharmacological practice has the ability to address underlying dietary deficiencies with the intention of negating pathological presentations and/or augmenting current forms of treatment.

Western Historical Nutrition

Before a report of the negative effects of the Modern American Diet (MAD), an acronym coined by Tyler Graham and Dr. Drew Ramsey (2011) in their work *The Happiness Diet*, a few foundational concepts need to be discussed. A brief history of nutritional consumption in American/western culture will be offered, along with some of the nutritional specifics of said diet and the current demographic prevalence of dysfunctional dietary trends.

There is benefit in understanding the historical implications of the American/westernized diet and how this behavior has evolved over time. The current high sugar, high fat diet consumed by the average westernized human is a relatively new phenomenon (Cordain, et al. 2016). In Cordain et al. (2016) paper on the health implications of this new pattern of nutritional intake the assertion is made that the human genome has not had enough time to catch up with this eating behavior and that this discordance is responsible for many of the evolved chronic diseases that plague western civilization. With little effort one can connect to the absurd imagery of early

human ancestors guzzling down 44 ounce sugar laden soft drinks only after snacking on a 600 calorie candy bars fully charged with harmful fats and preservative chemicals. However, one does not have to look as far back as human's paleolithic predecessors to demonstrate the rapid change in dietary pattern. Sugar consumption is up from 5lbs/year in 1700 to 152lbs/year in 2000, with the trend showing no signs of slowing down (Graham and Ramsey, 2011). The implications of this 30 fold increase in sugar intake can not be underestimated. The Center for Disease Control (2014) estimates that over 60% of American citizens are clinically overweight or obese. Closing the comparative gap even further, there has been a meteoric rise in food eaten that has prepared outside of the home from the 1970's to the 1990's; food prepared outside the home is decidedly higher in sugar and harmful fat (Guthrie, Lin and Frazao, 2002). The apparent physical ramifications of this dysfunctional eating habit are undeniable, what remains more convert is the detrimental effects this consumption culture has had on national and global mental health.

There has been a dramatic American shift over the last 100 years from procuring foods from local farms to industrial mass production of foods loaded with more concern for bottom line profit margin than integral nutritional fortitude. This industrial shift in America has lead to a nation that produces enough processed food for every citizen to consume more than 3,800 calories a day; almost twice the recommended daily value (Avena, 2013). The USDA (2000) reported that the bulk of this rise in domestic caloric production is attributed to increased intake of refined grains, fats and oils. The report goes onto analyze that only 19 cents of every dollar spent on food in the year 2000 goes to American farmers, while the other 81 cents go to industrial profits. The disproportionate distribution of wealth in the food industry is indicative of

the dysfunctional conception of nutritional health at large. If the profits of western food production line the pockets of industry more than the pockets of those that produce whole food, one is left with a dysfunctional prioritization in the food industry that trickles down to unhealthy prioritization on the plates of American tables.. The physical detriments of western dysfunctional nutritional behavior (ie. obesity, hypertension, type 2 diabetes) receive the most attention, while the relational responsibility of this behavior on mental functioning gets shirked to behaviors outside the dietary realm.

With a historical overview of the evolution of dietary patterns changing more in the past 100 years than humanity has experienced in the past 100,000 years (Graham and Ramsey, 2011), one can move forward with a discussion of what exactly constitutes contemporary industrialized western consumption. Whether referred to as the typical American diet, MAD, western patterned eating, industrialized consumption, ex cetera; the research concerning what humans are putting into their bodies is alarming. The Journal of the American Medical Association (JAMA, 2013) reported that over the past 20 years (1995-2015) the behavior that puts Americans at the highest risk for disease, disability and death is what Americans consume. JAMA's (2013) comprehensive research points to a modern diet dysfunctionally low in fruits, seeds, nuts, fiber, folate, Omega-3 fat, fiber and whole vegetables; all the aforementioned being key components of a healthy and mood balanced diet (JAMA 2013; Challem, 2007; Null, 2011). The American Medical Association (2013) reports dysfunctionally high levels of sugar sweetened snacks/beverages, trans fat, processed meat and sodium consumption; all of which are influential contributors to the growing global mental health and obesity concerns (Null, 2011). This detrimental dietary pattern

goes directly against the guidelines set for in the USDA's *2015-2020 Dietary Guidelines for Americans* (2015).

Fast food consumption is yet another trend reported to be on a steady rise over the last 50 years, and it's role on improper nutritional intake is undeniable. In an effort to examine the nutritional composition and prevalence of fast-food consumption in America; Powell and Nguyen (2013) reported that the percentage of caloric intake from fast-food companies in America has been on a steady rise since the 1970's. Their report goes onto explain that the nutritional integrity of food consumed away from home (FAFH) is markedly lower than home prepared meals and is directly correlated with increasing trends in obesity and preventable disease (Powell and Nguyen, 2013). Food prepared in the home that is subsequently eaten with the family unit is shown to increase the wellbeing of all those gathered around the table (Musik and Meier, 2012; Elgar, Craig and Trites, 2012). The literature points to a dysfunctional movement away from nutritious and communal meals prepared with whole foods and rather a modern family meal consisting of passing around delivered take-outs with little to no nutritional integrity (Pollen, 2014). What remains largely unmentioned in the majority of like contemporary research is the detrimental consequences of this degradation in dietary trend in respects to the individual's specific mental health. With an idea of dysfunctionally changing dietary trend and general characteristics of western consumption, statistics regarding demographic prevalence of harmful nutritional intake will be addressed.

Popular Nutritional Perception

Since 2005 the *International Food Information Council Foundation* (IFIC) has conducted surveys of American attitudes towards food safety, nutrition and health. In the foundation's 2012

survey of over 1000 Americans aged 18-80 (age, gender, education and region weighted to represent American population) , the majority reported that it was “easier to figure out how to do one’s own taxes” than it was to figure out ‘what one should and shouldn’t eat to be healthier” (IFIC, 2102). This alarming response paints the picture of a nation in crisis when referring to nutritional intelligence. In their most recent survey the IFIC (2015) report that 32% of Americans have “no idea” what the nutritional recommendations of the healthy diet consist of and another 21% know “very little about it”. The IFIC (2015) goes onto report that only 60% of respondents look to the impact of “healthfulness” when choosing what foods to eat, with more concern being given to taste and cost. Reedy, Krebs-Smith and Bosire (2010) conducted research regarding adolescent nutritional intake and found that empty calories from added sugars and harmful fats contribute to 40% of caloric intake in Americans ages 2 – 18. In 2008, 49.1million people were classified as food-insecure, meaning they had lack of access to means of nutritional success (Nord, Andrews, and Carlson , 2009). The author makes the correlation that food insecurity and emotional insecurity could hold a possibility of a causal relationship, or corollary at the very least. The theme of the overall wellness and nutritional trend in America is best summarized by the IFIC’s (2015) statistical proof that Americans are spending less time than ever controlling happiness, weight, diet, food safety, exercise routine and physical attractiveness. The cost is not is just emotional and physical. Noncommunicable diseases (psychopathology included) is predicted to cost the global economy \$30 Trillion dollars over the next 20 years (Jacka et. al, 2014). The literature makes is apparent that the dramatic shift to a culture of industrial convenience over the past 100 years has lead to a breakdown of all wellness related measures, mental health notwithstanding.

Biopsychosocial Impact of Nutrition

This is not breaking news for many mental health clinicians, what needs to be added to the knowledge of a breakdown in contemporary wellness is how specific nutrients, or lack thereof, affect us biologically and therefore mentally. In order to do so a nutrient breakdown of what the average individual is consuming and what the average modern diet lacks will be reviewed.

A proper specific nutrient to begin this discussion with is sugar. Refined sugars are “enemy number one” in the nutritional battle waged against mental health. However; sugar in the form of glucose is the main energy source of our brain (Kohn et. al, 2015). By no means does the literature point to the utility of a diet devoid of sugar, we need sugar in our system to provide an internal environment of optimal functioning (Ripe and Angelopolous, 2015). What the literature does point to is the functionality inherent in a diet in which sugar consumption is intentionally and properly managed. As previously mentioned, Americans are eating more sugar than ever and the impact of this constant inundation of sugar into our bloodstream carries indisputable mental health consequences. Both short and long term spikes in blood sugar over time damage the hippocampus, the brain's memory center (Robinson, 2013). In a recent article in *Mind, Mood and Memory* (2013) the rapid drop off of an individual's glycemic index caused by consuming excessive amounts of simple sugars, found in most processed foods, was found to predispose the consumer to anxiety, memory detriments and depressive symptoms. Although the studied animal was rats as opposed to humans, high levels of sucrose (a type of sugar) have been found to affect goal oriented behavior and negatively affect muscular reactions (Jorgensen et. al, 2014). The

question is then naturally raised, if consuming sugars creates such negative effects on mood and brain composition then why then why do individuals consume it in such high quantities? The answer to this question lies in sugar's effects on the brain's reward system. The nucleus accumbens is the brain's reward center and plays an important function in how the body responds to reinforcement and emotional regulation. Consuming sugar directly affects the nucleus accumbens and therefore high levels of sugar in an individual's diet leads to overstimulation of this neurological structure (Naneix et. al, 2016). Repeated stimulation by consuming high sugar food leads to dysfunction of the hedonic cycle, the brain's ability to avoid negative stimuli (ie. depression and anxiety symptoms), and therefore poor quality diets are continued (Kenny, 2013). The literature demonstrates the possibility of approaching clients with a substance abuse model where instead of drugs and alcohol, sugar laden drinks and foods are the focus of recovery. There is a wealth of literature concerning the detrimental effects of high levels of sugar on mental function. The research on sugar's effect calls for the addition of augmented dietary competence to the concept of multicultural competence prescribed to mental health practitioners (ACA, 2104). Departing from the damaging effects of sugar on mental health, the focus now turns to a review of the often misinformed conception of dietary fats.

Similar to rising trends in sugar consumption, humans are eating more harmful fats than ever before (Murray, 2013). Diets high in saturated and trans-fatty acids have been shown to play a causal role in cognitive decline and otherwise preventable onset of dementia (Granholtm and Freeman, 2010). Consistent with the effect of sugar on the neurology of the hedonic reward system, constant high levels of fat in the diet have been shown to dysfunctionally affect an individual's ability to resist unhealthy food (Grabenhorst et. al, 2010). Similar to the need for

sugar in the diet, it is important to mention that elimination of fats from an individual's nutritional intake is not what the literature points to. Much like the brain's need for glucose to perform optimally, the brain has a 60% composition of fat and needs a consistent source of quality fat to maintain performance (Graham and Ramsey, 2011). The operative word in the previous statement is “quality”. As opposed to the literature on saturated and transfatty acids; the effects of Omega-3 fatty acid, eicosapentaenoic acid and docosahexaenoic acid (quality fats) have been found to create an optimal neurochemical environment that can alleviate pathological psychiatric symptoms (Messamore and McNamara, 2016). The western diet is characterized as being remarkably high in safflower, corn and soy oil consumption (Graham and Ramsey, 2011). The three aforementioned fats are prominent dietary sources of saturated and trans fats that harmfully affect mental health. Diets high in these harmful fats have been shown to create depressive symptoms in lab rats and effect neuroplasticity, or the growth potential, of a developing brain (Sharma and Fulton, 2013). With a proper review, the nutritionally competent mental health clinician has the ability to assess the quality of fat and sugar intake in a client's diet, in turn creating an effective case formulation, treatment plan and appropriate referral.

Established Theories to Address Mental Health Nutrition

The reviewed literature shines light onto the fact that the healthcare industry is aware of the nutritional crisis in the western world and new branches of medicine have the intersection of nutrition and mental health as their focus and platform treatment (Null, 2011). The orthomolecular approach has been studied as a field of medicine for almost 50 years, introduced by two time Nobel prize winner and molecular biologist Linus Pauling in 1968 with a focus of treating schizophrenia (Paradowski, 2015). The fields of orthomolecular and nutritional

psychiatry have cemented their respective reputations as the leading approaches to addressing an individual's mental health through dietary interventions and wellness modalities. The orthomolecular approach uses naturally occurring prescriptions, such as vitamins and minerals, to balance essential substance deficiencies in the body that otherwise could lead to psychopathology. Anecdotally describing the assumptions of orthomolecular medicine, Dr. Gary Null (2011) in his book *The Food Mood Connection*, provides an example of not only the preventative characteristics but also the treatment efficacy of addressing an individual's vitamin deficiency by highlighting the significance of the discovery that oranges to prevent scurvy by supplementing vitamin C. Orthomolecular medicine has received resistance in the healthcare industry at large and been deemed unscientific from more dominate medical modalities (Zell and Grundman, 2012). Part of the resistance that orthomolecular medicine received was due to its coupling with the ever controversial electroconvulsive therapy and its use of adjunctive psychotropic drugs (Eli, 1974). Also, the threat of hepatotoxicity in orthomolecular megavitamin therapies have been found to be one of its potential dangers (Haslam, Dalby and Rademaker, 1984) There is rising evidence promoting the efficacy of a relatively new field that branches off of the assumptions of a vitamin focused orthomolecular approach. This brother in arms is operates from a more pure dietary focus and carries the name: nutritional psychiatry (Logan and Jacka, 2014).

Nutritional psychiatry makes the assertion that diet plays just as paramount a role to psychological health as it does cardiology, gastroenterology and endocrinology (Sarris et. al, 2015). Felice Jacka, associate professor at the IMPACT strategic research center, is leading the charge in the field of nutritional psychiatry and her research is gaining momentum in its

influence in public health policy and clinical practice (Jacka, 2015). Jacka's current body of work claims that the high sugar, high fat diet consumed by the majority of westernized individuals is toxic for the brain. There is growing evidence that depending on the respective nutrient density of an individual's diet, what one put into his/her body that it can have either a harmful or beneficial effect on specific mental health conditions such as bipolar disorder, schizophrenia, dementia and depression (Jennings, 2015). The low nutritional value inherent to current dietary patterns has the potential to reduce brain-derived neurotrophic factor (BDNF; the brain's protein building blocks), reduce neural/synaptic plasticity, create dysfunction in learning a memory retention, up-regulate stress response and provoke high levels of oxidative stress in the bloodstream (Jacka, 2015). These more biological consequences have a holistically negative effect on the mental health of a respective individual. Recent research makes the profound claim that nutrition affects our mental and physical health at a molecular level and therefore dictates the expression of our genes (Dauncey, 2012). A healthy nutrient rich diet has the ability to create optimal gene expression whereas the unhealthy nutrient poor diet has the opposite effect. Momentum is growing concerning the intersection of nutrition and mental health, and mental health professionals are doing themselves a disservice if they remain ignorant of this powerful new psychiatric modality.

Gut-Brain Axis and Microbiome

One of the most important concepts in the past 20 years regarding the mental health and nutrition intersection is the gut-brain axis and the influence of the internal environment of an individual's gut microbiota. The basic concept of the gut microbiota is that the gut is home to trillions of microbes and bacteria that undeniably affect the brain's ability to regulate stress

(Cryan, 2015). The gut-brain axis refers to the bidirectional communication that occurs between the gut and the brain, and the ramifications either functional or dysfunctional communication has on an individual's behavior (Zhou and Foster, 2015). Linghong Zhou and Jane Foster (2015) go on to report that altered gut microbiota is linked with not only metabolic disorders, but also mental health pathology such as depression and autism spectrum disorder. The good news for those that suffer from mental health disorders and the clinicians that serve them, is that nutritional interventions have the ability to greatly affect the atmospheric quality of the gut microbiome. This intervention involves the introduction of psychobiotics to the microbiome. Psychobiotics are the newest player in the psychiatric scene and regard bacteria such as bifidobacterium infantis, escherichia, bacillus, saccharomyces, candida, streptococcus, enterococcus and lactobacillus as psychotropic agents that affect the production of neurotransmitters like serotonin, norepinephrine and gamma-aminobutyric acid (Gnanavel, 2015). The literature points to early management of the microbiome as paramount in the brain's development and therefore future performance of an individual's central nervous system (Clarke et al, 2104). The western dietary pattern has been shown to create a dysfunctional microbiome ecology in the individual which carries the possibility of pathological health symptomology (Lanparra and Sanz, 2010). Recent research points to the microbiotic effect of the gut environment on the brain's ability to lay myelin or engage in neuroplasticity, therefore creating optimal functioning and asserting targeted biotic interventions as effective treatment for psychiatric disorders like schizophrenia, anxiety and stress responsivity (Hoban et. al, 2016). With this information in mind the mental health clinician is better equipped to create a

comprehensive holistic case conceptualization that can augment the effectivity of traditional psychiatric approaches.

Psychopharmacology vs. Nutritional Intervention

Traditional psychiatric approaches perpetuate the aforementioned ‘culture of convenience’ by hawking psychotropic drugs to the masses who experience even the most basic psychiatrically insignificant psychopathology. The author is not claiming the inefficacy of medical psychiatry, rather the possibility of other less manufactured forms of psychiatric intervention, with the potential for equal or greater efficacy. The classic psychiatric approach is more popular than ever, evidenced by a recent study of over 2 million Americans that reports 1 out of every 5 Americans have used an antidepressant, anti-anxiety, ADHD or antipsychotic medication (Medco, 2010). These medications often carry the consequence of unavoidable negative side effects (Garcia, Logan and Gonzalez-Heydrich, 2012). The World Health Organization (WHO) predicts that depression will be the 2nd leading cause of mortality in by the year 2020. Research concerning major depressive disorder claims that simple antidepressant prescription is falling short in regards to dealing with this chronic disease and the call for adjunctive/primary nutritional interventions to combat chronic depression is mounting (Popa and Ladea, 2102). Therefore, the case is rising for nutritional interventions becoming a more palatable modality for individuals experiencing mental health difficulties (Zell and Grundman, 2012). For instance, prescription of antipsychotic medication is on the rise and users are apt to experience negative side effects such as weight gain, sexual dysfunction or increased suicidal ideation (van Strien, Keijsers, Derijks and van Marum, 2015). Furthermore, there are correlations to metabolic conditions such as diabetes and obesity and the use of prescribed antipsychotics

(Holt and Peveler, 2006; 2009). A prescribed healthy diet from a nutritionally informed mental health clinician or dietitian carries with it low to no risk of negative side effects and a great potential for a positive effect on client outcomes.

Practical Applications

Progressing through the foundational literature regarding nutritional effects on mental health the reviewer is confronted with a lack of literature concerning practical clinical applications. The nutritionally intentional mental health clinician who makes the effort to self educate, then must take the next step to apply his or her gained wisdom. The author finds it useful to highlight what the literature says about the steps a mental health clinician can take in efforts to become a nutritionally informed practitioner.

The maintenance of continuing education credits in a nutritionally intentional manner is a proper place to start. In order to maintain licensure, a mental health provider is ethically bound to prove the periodic acquirement of continuing education credits (American Counseling Association, 2014). There are a number of organizations that provide certification programs in nutritionally informed psychological practice. John F. Kennedy University (2016) provides an online certification program in Nutritional Psychology with specific courses such as; *Integrating Nutritional Psychology in Clinical Practice*, *Sugar and Emotion* and *The Gut-Brain Axis*. The Institute for the Psychology of Eating (2016) is another organization offering online continuing education concerning nutritional interventions deemed beneficial to both client and clinician. Most of the reviewed certifications in nutritional psychology offer the options of selecting single courses to take that would require less financial and time commitment from the professional.

These are but a few of the online certifications regarding nutritional applications to mental health.

Informal self-guided study that seeks out the literature, empirical research and academic text residing under the umbrella of nutrition/mental health is another avenue to pursue in search of practical application. The self-informed clinician can use his or her augmented knowledge to provide guided psychoeducation and bibliotherapy to the client in hopes of leading the individual to a more intentional way of consuming. A simple google.com or amazon.com search of “nutrition and mental health” returns thousands of books, article and blogs concerning the topic. Books previously mentioned in this review; *The Happiness Diet* (2011), *The Food Mood Connection* (2011) and *Lift Your Mood with Power Foods* (2015) all provide mental health informed recipes and guides to changing psychologically dysfunctional dietary patterns. The use of bibliotherapy has been demonstrated to be a valid intervention when speaking to alternative mental health modalities (Dog Low, 2010). The prescription of the aforementioned books and like literature can then be added to the interventional quiver of the nutritionally mindful mental health professional.

Amassing a diverse and far reaching referral network is paramount for effective mental health practice. If the clinician is to adopt a holistic view of the client, the quality of the services rendered is made more beneficial by having health collaborators in the community work together to make progress towards the client's identified goals (Nelson et. al, 1999). The growing trend in nutritional psychology calls for the addition of the dietary professionals, by way of explicit collaboration with Registered Dietitians (RD), to be added to the treatment referral network of mental health clinicians. The role of the dietitian is tantamount to any respective health

professional in efforts to maintain optimal mental health functioning; however, mental health consumers rarely have a dietician readily available to them (MacDonnel, 2009). In her research on the barriers for the mentally ill to access treatment from registered dietitians, Karen Davison (2006) claims that RDs are uniquely qualified to address the nutritional concerns of the mentally ill and their collaboration with mental health clinicians and primary care physicians is crucial in cost effective treatment. Both the mental health professional and the Registered Dietitian gain symbiotic benefit from establishing a therapeutic relationship; evidenced by literature asserting that most RDs treat mentally ill clients though often feel ill equipped to handle specific mental health pathology (Soh and Bruce, 2015). The author asserts that potential for this beneficial relationship forged between collaborative reciprocation between mental health clinicians and dietitians is undeniable. The comorbidity of mental illness and dysfunctional metabolic conditions (obesity, diabetes, etc.) creates the opportunity for all healthcare professionals to utilize nutritional interventions.

Summary

The purpose of this review was to provide a picture for the reader of the existing literature concerning the crossroads between nutritional and mental health. Of the reviewed text and analyzed research there were no publications that contraindicated or refuted the impact that nutrition has on the mental health of an individual and therefore, society at large. For both future and current mental health practitioners there is an ethical call to intentionally educate oneself on the trends, indications and access points for nutritional referrals and informal dietary intervention. If the momentum initiated in the historical evolution (or devolution) of current western dietary patterns remains unchallenged there is understandable concern for the

correlational detriment this momentum will effect on global mental health. Mental health practitioners are uniquely positioned to be agents of change in the battle against the mental health issues caused by the modern western diet. The knowledge provided will hopefully inspire the reader to start their own education and networking in order to add knowledge and experience of nutritional psychiatry to their arsenal of both clinical and personal practice.

References

- 2015-2020 Dietary Guidelines for Americans. (n.d.). Retrieved March 31, 2016, from <http://www.cnpp.usda.gov/2015-2020-dietary-guidelines-americans>
- Challem, J. (2007). *The food-mood solution: All-natural ways to banish anxiety, depression, anger, stress, overeating, and alcohol and drug problems--and feel good again*. Hoboken, NJ: John Wiley.
- Christensen, L. B. (1991). *The food-mood connection: Eating your way to happiness*. College Station, TX: Pro-Health Publications.
- Clarke, G., O'mahony, S., Dinan, T., & Cryan, J. (2014). Priming for health: Gut microbiota acquired in early life regulates physiology, brain and behaviour. *Acta Paediatrica Acta Paediatr*, 103(8), 812-819.
- Cryan, J. F., & Dinan, T. G. (2015). More than a Gut Feeling: The Microbiota Regulates Neurodevelopment and Behavior. *Neuropsychopharmacology*, 40(1), 241-242.
doi:10.1038/npp.2014.224
- Dauncey, M. J. (2009). New insights into nutrition and cognitive neuroscience. *Proceedings of the Nutrition Society Proc. Nutr. Soc.*, 68(04), 408.
- Davison, K. (2006). Primary Health Care, Mental Health, And the Dietitian's Role. *CANADIAN JOURNAL OF DIETETIC PRACTICE AND RESEARCH*, S47-S53.

Dog Low, M. (2010). The Role of Nutrition and Mental Health. *Alternative Therapies in Health and Medicine*, 42-60.

Elgar, F. J., Craig, W., & Trites, S. J. (2013). Family Dinners, Communication, and Mental Health in Canadian Adolescents. *Journal of Adolescent Health*, 52(4), 433-438.
doi:10.1016/j.jadohealth.2012.07.012

Foster, J., & Zhou, L. (. (2015). Psychobiotics and the gut–brain axis: In the pursuit of happiness. *NDT Neuropsychiatric Disease and Treatment*, 715.

Foster, J., & Zhou, L. (. (2015). Psychobiotics and the gut–brain axis: In the pursuit of happiness. *NDT Neuropsychiatric Disease and Treatment*, 715. doi:10.2147/ndt.s61997

Gnanavel, S. (2015). Psychobiotics: The latest psychotropics. *Indian J Psychol Med Indian Journal of Psychological Medicine*, 37(1), 110. doi:10.4103/0253-7176.150862

Grabenhorst, F., Rolls, E. T., Parris, B. A., & D'souza, A. A. (2010). How the Brain Represents the Reward Value of Fat in the Mouth. *Cerebral Cortex*, 20(5), 1082-1091.
doi:10.1093/cercor/bhp169

Graham, T., & Ramsey, D. (2011). *The happiness diet: A nutritional prescription for a sharp brain, balanced mood, and lean, energized body*. Emmaus, PA: Rodale.

Granholt, A. E., & Freeman, L. (2010). Long-term Treatment With a High-fat Diet Causes Memory Loss and Breached Blood-brain Barrier in Aged Rats. *Alzheimer's & Dementia*, 6(4). doi:10.1016/j.jalz.2010.08.096

- Guthrie, J. F., Lin, B., & Frazao, E. (2002). Role of Food Prepared Away from Home in the American Diet, 1977-78 versus 1994-96: Changes and Consequences. *Journal of Nutrition Education and Behavior*, 34(3), 140-150.
- Haslam, R., Dalby, T., & Rademaker, A. (1984). Effects of Megavitamin Therapy on Children with Attention Deficit Disorders. *Pediatrics*, 74(1), 103-111.
- Hoban, A. E., Stilling, R. M., Ryan, F. J., Shanahan, F., Dinan, T. G., Claesson, M. J., . . . Cryan, J. F. (2016). Regulation of prefrontal cortex myelination by the microbiota. *Translational Psychiatry Transl Psychiatry*, 6(4).
- Holt, R. I., & Peveler, R. C. (2006). Association between antipsychotic drugs and diabetes. *Diabetes Obes Metab Diabetes, Obesity and Metabolism*, 8(2), 125-135.
- Jacka, F. N. (2015). Lifestyle factors in preventing mental health disorders: An interview with Felice Jacka. *BMC Medicine BMC Med*, 13(1). doi:10.1186/s12916-015-0490-5
- Jennings, E. (2015). The importance of diet and nutrition in severe mental health problems. *Journal of Community Nursing*, 29(5), 68-73.
- John F. Kennedy University. (n.d.). Retrieved March 31, 2016, from <http://www.jfku.edu/Programs-and-Courses/Continuing-Extended-Education/Nutritional-Psychology.html>
- ACA Code of Ethics. (2014). *Journal of Counseling & Development*, 84(2), 235-254.

Jørgensen, B. P., Hansen, J. T., Krych, L., Larsen, C., Klein, A. B., Nielsen, D. S., . . . Sørensen,

D. B. (2014). A Possible Link between Food and Mood: Dietary Impact on Gut

Microbiota and Behavior in BALB/c Mice. *PLoS ONE*, 9(8).

doi:10.1371/journal.pone.0103398

Kenny, P. J. (2013). The Food Addiction. *Sci Am Scientific American*, 309(3), 44-49.

doi:10.1038/scientificamerican0913-44

Laparra, J., & Sanz, Y. (2010). Interactions of gut microbiota with functional food components

and nutraceuticals. *Pharmacological Research*, 61(3), 219-225.

Logan, A. C., & Jacka, F. N. (2014). Nutritional psychiatry research: An emerging discipline and

its intersection with global urbanization, environmental challenges and the evolutionary

mismatch. *J Physiol Anthropol Journal of Physiological Anthropology*, 33(1), 22.

Macdonell, J. (2009). The role of the dietician in improving mental wellbeing. *Mental Health*

Practice, 12(6), 20-22.

Messamore, E., & Mcnamara, R. K. (2016). Detection and treatment of omega-3 fatty acid

deficiency in psychiatric practice: Rationale and implementation. *Lipids Health Dis*

Lipids in Health and Disease, 15(1). doi:10.1186/s12944-016-0196-5

It's common sense: Healthy habits reduce risk for memory loss. (2013). *Mind, Mood and*

Memory, 9(10), 5-6.

Murray, C. J. (2013). The State of US Health, 1990-2010. *Jama*, 310(6), 591.

doi:10.1001/jama.2013.13805

Musick, K., & Meier, A. (2012). Assessing Causality and Persistence in Associations Between Family Dinners and Adolescent Well-Being. *Journal of Marriage and Family*, 74(3), 476-493. doi:10.1111/j.1741-3737.2012.00973.x

Naneix, F., Darlot, F., Coutureau, E., & Cador, M. (2016). Long-lasting deficits in hedonic and nucleus accumbens reactivity to sweet rewards by sugar overconsumption during adolescence. *European Journal of Neuroscience Eur J Neurosci*, 43(5), 671-680. doi:10.1111/ejn.13149

Nelson, J., Rashid, H., Galvin, V., Essien, J., & Levine, L. (1999). Public/private partners: Key factors in creating a strategic alliance for community health. *American Journal of Preventive Medicine*, 16(1), 94-102.

Nord, M., Andrews, N., & Carlson, S. (2009). Household Food Security in the United States. *Economic Research Service*.

Nord, M., Andrews, N., & Carlson, S. (2009). Household Food Security in the United States. *Economic Research Service*.

Nord, M., Andrews, N., & Carlson, S. (2009). Household Food Security in the United States. *Economic Research Service*.

- Null, G. (2011). *The food-mood connection: Nutritional and environmental approaches to mental health and physical wellbeing*. New York: Seven Stories Press.
- Paradowski, R. J. (2015). Orthomolecular Medicine. *Salem Press Encyclopedia of Health*.
- Pollan, M. (2014). *Cooked: A natural history of transformation*. Penguin Books.
- Psychology of Eating. (n.d.). Retrieved March 31, 2016, from <http://psychologyofeating.com/>
- Reedy, J., Krebs-Smith, S. M., & Bosire, C. (2010). Evaluating the Food Environment. *American Journal of Preventive Medicine*, 38(5), 465-471. doi:10.1016/j.amepre.2010.01.015
- Rippe, J. M., & Angelopoulos, T. J. (2015). Sugars and Health Controversies: What Does the Science Say? *Advances in Nutrition: An International Review Journal*, 6(4).
- Robins, E. (1974). Megavitamin and Orthomolecular Therapy in Psychiatry. *Am J Public Health American Journal of Public Health*, 64(4), 410-410.
- Sarris, J., Logan, A. C., Akbaraly, T. N., Amminger, G. P., Balanzá-Martínez, V., Freeman, M. P., . . . Jacka, F. N. (2015). Nutritional medicine as mainstream in psychiatry. *The Lancet Psychiatry*, 2(3), 271-274. doi:10.1016/s2215-0366(14)00051-0
- Sharma, S., & Fulton, S. (2013). Diet-induced obesity promotes depressive-like behaviour that is associated with neural adaptations in brain reward circuitry. *Int J Obes Relat Metab Disord International Journal of Obesity*, 37(3), 382-389. doi:10.1038/ijo.2012.48
- Soh, N., Plain, J., & Bruce, K. (2014). Mental health role statement: The role of dietitians in mental health and the role of a statement. *Nutrition & Dietetics*, 72(1), 91-92.

Strien, A. M., Keijsers, C. J., Derijks, H. J., & Marum, R. J. (2015). Rating scales to measure side effects of antipsychotic medication: A systematic review. *Journal of Psychopharmacology*, 29(8), 857-866.

Zell, M., & Grundmann, O. (2012). An orthomolecular approach to the prevention and treatment of psychiatric disorders. *Advances in Mind-body Medicine*, 26(2), 14-28.