Nutrition and Depression:
The Effects of dōTERRA's Lifelong Vitality Pack on Depression and Anxiety

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Abstract

Objectives: This research constitutes a preliminary investigation into the effects on people's mood of a potent nutritional supplement pack called Lifelong Vitality (LLV) marketed for daily use by dōTERRA Corporation. This nutritional supplement pack contains vitamins and minerals, essential fatty acids, polyphenols, and other nutritional energy co-factors that are shown to support optimal health.

Design: This study design comprises a single group of participants self-declared as having been diagnosed with a mood disorder (i.e., depression or anxiety). A repeated measures design was used to evaluate mood as the dependent variable using the following measures: 1) Hospital Anxiety and Depression Scale (HADS), 2) General Health Questionnaire (GHQ-12), 3) Center for Epidemiological Studies Depression Scale (CES-D), and 4) Perceived Stress Scale (PSS). Time constituted the independent variable and had four levels: Each of the four measures were taken prior to commencing usage of LLV and at weekly intervals thereafter until conclusion of the study 60 days later.

Methods: Twenty-one participants (ages 18 or older, of any nationality, living in the UK) diagnosed with depression or anxiety and not taking medication were given Lifelong Vitality Pack for 60 days (participants who had recently stopped taking medication for depression were eligible to participate in this study). All participants had no prior usage of LLV. At the beginning and end of the study, and on a weekly basis, participants anonymously answered questionnaires from selected measures to determine if the supplement pack affected their mood. Data was collected online through smartsurvey.co.uk, downloaded to Excel, and uploaded for statistical analysis using IBM SPSS.

Results: A repeated measures ANOVA with 'time' as the repeated measure, followed by statistically controlled pair-wise comparisons, found significant or near significant improvements in mood across all four measures: HADS ($P<0.04$), GHQ-12 ($P<0.0001$), CES-D ($P<0.041$) and a tendency for PSS ($P<0.07$).

Conclusions: dōTERRA's Lifelong Vitality Pack may have improved mood over time and the results may be from dōTERRA's LLV product; however, some additional factors would have to be incorporated into the design in order to further test the role of dōTERRA's LLV more completely. These are preliminary findings and further research is recommended.

Introduction

Depression is one of the largest problems our world faces today. It is rated by the World Health Organization as the leading cause of disease burden among high-income countries. In the US, the National Institute of Health reports that 25 percent of the population suffers from depression (Kessler, 2005). This trend in mental health is not estimated to change in the near future. According to the *Institute of Functional Medicine,* depression is

projected to be the second leading cause of disability worldwide by 2020.

Depression is typically diagnosed on the basis of symptoms and can be determined (in part) from a self-report questionnaire test (Radloff,1977). These self-report tests generally contain questions about mood, emotions, suicidal thoughts, insomnia, agitation, anxiety, stress, and so on. Depending on symptoms and test scores, these questionnaires may help practitioners diagnose the severity of depression.

Depression is generally described as a chemical imbalance, but such a diagnosis encompasses a complex umbrella of possible causes to explain such an imbalance. There are millions, even billions, of chemical reactions that make up the dynamic system responsible for mood, perceptions, and how life is experienced.

Antidepressant medications are the most common form of treatment for depression today. The annual costs of antidepressants in 1985 were $240 million in the United States. More recently, that number has jumped to $12 billion (Zorc, 2001). Even though antidepressants are widely prescribed by doctors, cases of depression continue to increase, suggesting that antidepressant medications are not working as well as expected. Some scholars have alluded to this trend as “a crisis of confidence in antidepressants” (Nierenberg, 2011). In his book Overcoming Depression, Dr. Andrew Stanway, a British physician, says “If anti-depressant drugs were really as effective as they are made out to be, surely hospital admission rates for depression would have fallen over the twenty years they’ve been available. Alas, this has not happened. . . . Many trials have found that tricyclics are only marginally more effective than placebos, and some have even found that they are not as effective as dummy tablets” (1981). Some twenty years after Dr. Stanway’s conclusions were published, researchers

looked through the results of 75 studies in which participants were randomly selected to receive either a placebo or the antidepressant under review. The results were revealing: “The response to placebo in published trials of antidepressant medication for MDD is highly variable and often substantial and has increased significantly in recent years, as has the response to medication. These observations support the view that the inclusion of a placebo group has major scientific importance in trials of new antidepressant medications and indicate that efforts should continue to minimize the risks of such studies so that they may be conducted in an ethically acceptable manner” (Walsh, 2002). The fact that studies continue to demonstrate variable successes with a placebo indicates a need for continuing research into how antidepressants are tested and against what standards.

Existing drugs are effective in only half of patients with depression (Thase, 2003). Furthermore, these drugs can take three to four weeks before their beneficial effects are manifest. And, as with all drugs, there are a number of side effect issues. Dr. Michael E. Thase, in his review of remission rates in clinical studies for antidepressants, describes why a 50 percent remission rate just isn’t good enough. “A 50% reduction in depressive symptoms may be a reliable indicator of treatment response in clinical trials, but it is an inadequate goal for the initial phase of therapy. Remission, i.e., the virtual elimination of depressive symptoms and restoration of psychosocial capabilities, is fast becoming the criterion by which antidepressants are measured” (2003). If an antidepressant cannot achieve absolute elimination of symptoms, other avenues must be explored, including nutritional supplements, the placebo effect, exercise, and therapy.

Over the past two decades, research has begun to point to nutritional imbalances as contributors to depression, particularly the lack of essential fatty acids, imbalanced homocysteine

levels, imbalanced serotonin levels caused by lack of amino acids, blood sugar imbalance, imbalanced levels of the nutrients chromium and Vitamin D, and food intolerances (Holford, 2003). A vast number of studies have looked at depression and how it affects mood, behaviour, and, of course, physical health. Not all studies indicate direct correlations between mood and nutrition; but nearly all of them present evidence that further study in this area could provide breakthrough results in treating depression, as well as a slew of other mental disabilities.

This research explores the effects of nutrition on depression and anxiety and studies whether or not nutritional supplementation via dōTERRA's Lifelong Vitality (LLV) pack could be an adequate treatment for depression. Lifelong Vitality Pack is a comprehensive, multi-component dietary supplement that has been formulated to contain vitamins and minerals, essential fatty acids, poly-phenols, and other nutritional energy co-factors that are shown to support optimal health (Parker, 2013). Moreover, LLV has been reported by its users to increase mood and improve mental focus (Parker, 2013).

This study involves a preliminary evaluation to determine the before and after effects of dōTERRA's Lifelong Vitality daily nutritional supplement pack (LLV) on four clinical measures of depression (i.e., HADS, GHQ-12, CES-D, PSS) following 60 days of supplementation in individuals diagnosed with depression and currently without anti-depressant medication.

Materials and Methods

Participants: Notice for participants for this study was broadcast through word of mouth, an announcement to a local London Christian church group, and UK distributors of dōTERRA products. Twenty-one participants (15 women and 6 men ages

18 or older, of any nationality, living in the UK) diagnosed with depression and not taking medication were given Lifelong Vitality Pack for 60 days (participants who recently stopped medication for depression were eligible to participate in this study). All participants had no prior usage of LLV.

Lifelong Vitality Pack: Lifelong Vitality Pack (LLV) includes three bottled supplements: Alpha CRS+®, xEO Mega, and Microplex VMz®. Lifelong Vitality Pack was released in 2008 and has undergone minor updates in content since that time. These products are packaged in separate bottles but are contained in one box. There are no known side effects from taking dōTERRA's Lifelong Vitality Pack; the product is wheat free and dairy free. dōTERRA LLV is sold in the UK, and the company has a European office in London. Participants were shipped a one-time supply of LLV to cover the extent of the study (i.e., 2 months or 60 days) and were asked to follow the manufacturer's instructions for daily dosage. The ingredients are generally described by dōTERRA as follows:

Alpha CRS+® CELLULAR VITALITY COMPLEX
This is a formula combining natural botanical extracts and polyphenols to support healthy cell proliferation. Alpha CRS+® contains boswellic acids; silymarin; curcumin; ginkgo; bromelain enzyme; carotenoids; and polyphenols including resveratrol, ellagic acid, baicalin and proanthocyanidins from grape seeds. Alpha CRS+® is formulated to be used daily with xEO Mega and Microplex VMz® as a comprehensive dietary supplement foundation. From this bottle, participants will take two capsules in the morning with breakfast and two capsules in the evening with dinner.

xEO Mega ESSENTIAL OIL OMEGA COMPLEX
dōTERRA's xEO Mega Essential Oil Omega Complex is a formula of Certified Pure Therapeutic Grade® (CPTG) essential

oils and a proprietary blend of marine and land-sourced omega fatty acids. A single daily dose of xEO Mega provides 1000 milligrams of marine lipids with 340 mg EPA, 240 mg DHA, and a blend of plant-sourced essential fatty acids. xEO Mega also includes 800 IU of natural vitamin D, 60 IU of natural vitamin E, and 1 mg of pure astaxanthin, an antioxidant carotenoid harvested from microalgae. The bioavailability of the xEO Mega formula is enhanced through a nanosomal lipid assimilation system and is encapsulated in SLS-free vegetable capsules. From this bottle, participants will take two capsules in the morning with breakfast, and two capsules in the evening with dinner.

Microplex VMz® MICRONUTRIENT COMPLEX
dōTERRA's Microplex VMz® Food Nutrient Complex is an all-natural, whole-food formula of bioavailable vitamins and minerals that are deficient in our modern diets. The formula includes a balanced blend of essential antioxidant vitamins A, C, and E, and an energy complex of B vitamins presented in a patented glycoprotein matrix. It also contains food-derived minerals of calcium, magnesium, and zinc and 72 organic trace minerals for bone and metabolic health. Microplex VMz® contains dōTERRA's Tummy Tamer™ botanical blend of peppermint, ginger, and caraway to calm the stomach for those who may have experienced stomach upset with other vitamin and mineral products (not sold by dōTERRA). Microplex VMz® is encapsulated using sodium lauryl sulfate-free vegetable capsules, does not contain wheat or dairy products, and does not include any animal products or synthetic ingredients. From this bottle, participants will take two capsules in the morning with breakfast, and two capsules in the evening with dinner.

Design: This was a single group study. Each week, one measure of psychological distress was taken such that each measure was used four times during the study. All measures

were collected at the start and the end of the study. Each week during the remainder of the study a new measure was taken, allowing for each measure to be taken twice over a two-month period between the initial evaluation and the final evaluation (where all measures were collected at once).

Standard Measures of Depression and Anxiety: All measures used were self-report questionnaires that deal with life events, frustrations, perceptions of stress, and emotional states. These measures do not deal with traits of emotionality (dispositions), coping skills, social support, or health cognitions. Four standard measures of depression and anxiety were selected for this study: 1) Hospital Anxiety and Depression Scale (HADS), 2) General Health Questionnaire (GHQ-12), 3) Center for Epidemiological Studies Depression Scale (CES-D), and 4) Perceived Stress Scale (PSS).

Results

Of 21 initial participants, one, a woman, withdrew from the study claiming bloating from taking the supplements. Thus, there were 14 women and 6 men over the age of 18 with an average age of 39 to 45. While there were 20 in the study who were asked to complete the measures weekly via online survey, not all 20 followed through and answered each week's survey. Because the data was collected anonymously and the study was voluntary, it was difficult to get all participants to follow through each week (weekly reminders were e-mailed to participants but individual reminder notes or phone calls could not be made to collect missing data since the data was being collected anonymously). Because of this, the number of participants who completed the measures varies from week to week, thus accounting for N not being 20, but 8 or 10 in Tables 1 to 4.

dōTERRA's Lifelong Vitality supplement pack had an effect over time for HADS ($P<0.04$), GHQ-12 ($P<0.0001$), CES-D ($P<0.041$), and PSS ($P<0.07$) as indicated in Tables 1 to 4, respectively. Means scores for each of the four measurements for depression and anxiety progressively decreased from an initial assessment before LLV and at weekly intervals thereafter until final assessment at end of the study.

Table 1. HADS Results

Time	Mean	Std. Deviation	N
HADS (initial evaluation)	15.50[a]	3.472	10
HADS (week 1 evaluation)	11.20[ab]	4.733	10
HADS (week 5 evaluation)	10.30[b]	4.448	10
HADS (final evaluation)	7.80[c]	4.367	10

[bc]Means with different superscript are statistically different ($P<0.05$).

Table 2. GHQ Results

Time	Mean	Std. Deviation	N
GHQ (initial evaluation)	25.00a	5.268	9
GHQ-12 (week 2 evaluation)	12.78b	7.049	9
GHQ12 (week 6 evaluation)	12.22b	7.839	9
GHQ12 (final evaluation)	9.11b	4.343	9

[ab]Means with different superscript are statistically different ($P<0.05$).

Table 3. CES-D Results

Time	Mean	Std. Deviation	N
CES-D (initial evaluation)	34.38a	11.807	8
CES-D (week 3 evaluation)	23.62a	11.070	8
CES-D (week 7 evaluation)	18.88a	12.966	8
CES-D (final evaluation)	13.87a	12.403	8

[a]Means with different superscript are statistically different ($P<0.05$).

Table 4. PSS Results

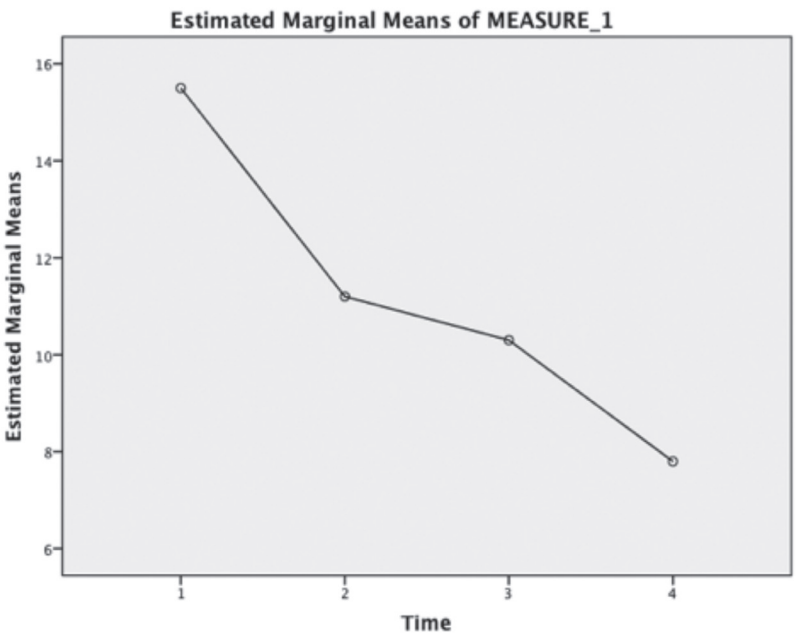
Time	Mean	Std. Deviation	N
PSS (initial evaluation)	34.11a	5.776	9
PSS (week 4 evaluation)	29.67ab	9.260	9
PSS (week 8 evaluation)	27.56b	7.828	9
PSS (final evaluation)	25.67ab	10.607	9

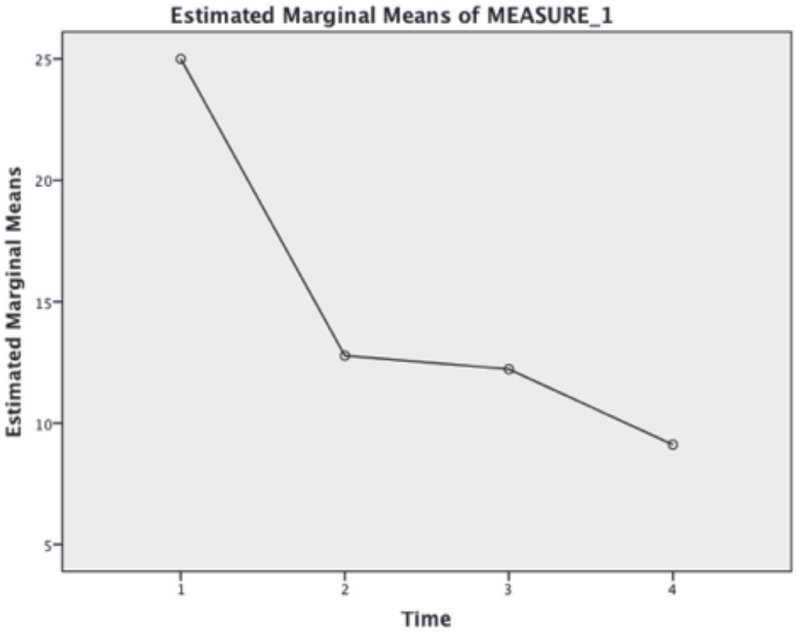
[ab]Means with different superscript are statistically different (P<0.05).

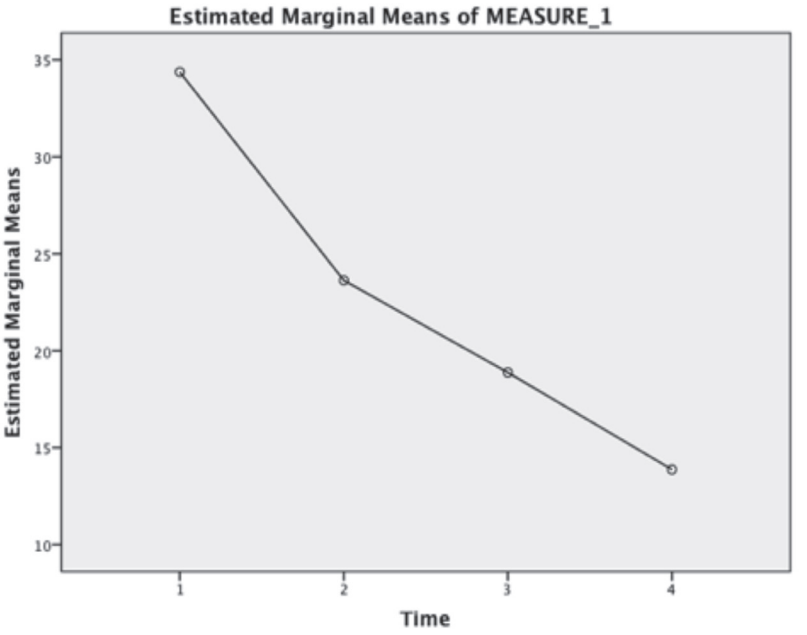
There were positive and significant correlations (range, r=0.480 to 0.704, P<0.019 to 0.0001) among the 4 measures as indicated in Table 5.

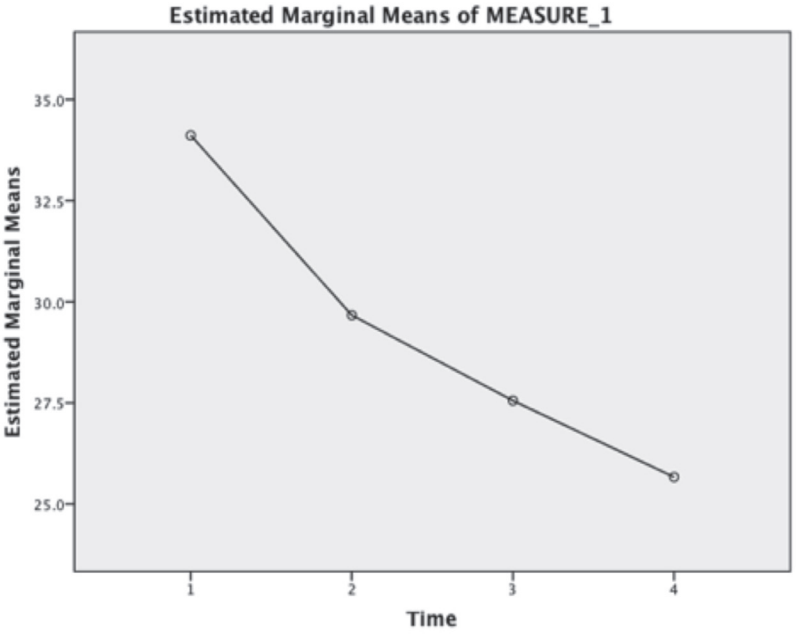
Table 5. Depression Measures of Correlation Matrix (N=19)

	Hadsinit	GHQinit	CESinit	PSSinit
HADSinit Pearson Correlation Sig. (1-tailed)				
GHQinit Pearson Correlation Sig. (1-tailed)	.704** .000			
CESinit Pearson Correlation Sig. (1-tailed)	.622** .002	.590** .004		
PSSinit Pearson Correlation Sig. (1-tailed)	.534** .009	.480* .019	.525* .010	


Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
16
14
12
10
8
6
1
2
3
4
Time


Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
25
20
15
10
5
1
2
3
4
Time


Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
35
30
25
20
15
10
1
2
3
4
Time


Estimated Marginal Means of MEASURE_1
Estimated Marginal Means
35.0
32.5
30.0
27.5
25.0
1
2
3
4
Time

Discussion

In a December 2012 review study in the *Journal of Medicine and Life* titled "Nutrition and depression at the forefront of progress", authors Maria Ladea and Teodora Popa of the Clinical Hospital of Psychiatry in Bucharest, Romania, wrote that depression is undeniably linked to nutrition, as suggested by the mounting evidence of research in neuropsychiatry. An adequate intake of good calories, healthy proteins, omega-3 fatty acids, and all essential minerals is of utmost importance in maintaining good mental health. In addition, the link between fast food and depression has recently been confirmed. The mounting scientific evidence clearly indicates that the global epidemic of depression and anxiety, which has been growing exponentially over the past three decades, may be linked to diet or nutritional deficiencies.

Why would nutrition affect depression? Neurotransmission plays a role in mood. Neurotransmission is a process that is dependent on having sufficient nutrition for the body to manufacture neurotransmitters such as serotonin, dopamine, norepinephrine, acetylcholine, and glutamate. This study looked at different nutritional contributors to healthy brain function. A partial list of nutrients required for synthesis of neurotransmitters includes amino acids (tryptophan, tyrosine, glutamine), minerals (zinc, copper, iron, magnesium), and B-vitamins (B6, B12, folic acid).

Not having proper nutrition is directly related to depression (Villegas et al, 2011). According to a recent study headed by scientists from the University of Las Palmas de Gran Canaria and the University of Granada, eating commercial baked goods (cakes, croissants, doughnuts, etc.) and fast food (hamburgers, hotdogs and pizza) is linked to depression. The results of a study headed by Almudena Sanchez-Villegas was published in

the *Public Health Nutrition* journal and reveal that consumers of fast food (compared to those who eat little or no fast food) are 51 percent more likely to develop depression. Furthermore, a dose-response relationship was recognized suggesting that the more fast food one consumes, the more at risk they are of depression.

Eating healthy, nutrient-packed foods is vital to neurotransmitter function. In order for the body to make neurotransmitters, it must 'gather' the necessary ingredients and have the correct cofactors. This allows for the action of the neurotransmitter to be efficient and effective. Let's take zinc as an example. Zinc is present in particularly large concentrations in the mammalian brain. Brain zinc is located in pre-synaptic terminals. Adequate levels of zinc are necessary for action of synaptic vesicles in some gluatamatergic and serotonergic neurons. It is released with neural activity, probably as a modulator of synaptic transition.

In teens experiencing a growth spurt, zinc is taken to the bones for growth, thereby depleting the nutrient's levels in the brain; this reduces serotonin function at the receptor. Clinically, this will be seen as irritability, depression, acne, and zinc spots (white spots) on nails (Maes, et al, 1994). According to Maes, "lower serum zinc in major depression is a sensitive marker of treatment resistance and of the immune/inflammatory response in that illness." Additionally, in animal models of zinc deficiency there is impairment of whole body accumulation of Omega 3 polyunsaturated fatty acids. On the other hand, excess levels of zinc are associated with neuronal loss (Coppen, 2000), and zinc levels fluctuate inversely with copper levels. Because of this, proper, balanced levels of zinc are important.

Balance is a key in the nutritional path. Omega-3 fatty acids are known to support proper brain function. Dr. Rossella

Liperoti and colleagues at the Catholic University of the Sacred Heart in Rome, Italy, explain that the Omega-3 fatty acids eicosapentaeoic acid (EPA) and docosahexaenoic acid (DHA) are the most common polyunsaturated fatty acids in the brain. These compounds help regulate cell membranes, dopamine and serotonin levels, communication between brain cells, and brain glucose metabolism. As more research is done, evidence demonstrates the role omega-3 depletion may play in several disorders (Liperoti, 2009).

Omega-3s are also significant for both pregnant mothers and infants. It has been established that mothers, unborn infants, and new-born babies benefit from a sufficient amount of long-chain fats in their diets (Judge et al, 2011), as long-chain polyunsaturated fatty acids are essential for synaptogenesis, membrane function, and myelination. Also, referring back to the role of zinc, zinc deficiency alters autonomic nervous system regulation and also hippocampal and cerebral development (Ref). Also, iron deficiency alters myelination, monoamine neutrotransmitter synthesis, and hippocampal energy metabolism for the growing foetus (Georgieff, 2007). Protein and copper are important dietary components. Copper is essential for dopamine metabolism, brain-energy metabolism, antioxidant activity and iron accretion (Prohaska & Gybina 2005).

Lifelong Vitality as a Choice

This research looked at Lifelong Vitality and it's affects on depression because this product reported to contained efficacious dosages of key nutritional ingredients including: polyphenols (such as baicain, resveratrol, ellagic acid, proanthocyanidins, silymarin, and curcumin), carotenoids (such as lutein, lycopene and silymarin), protease enzymes, boswellia serrate, astaxanthin carotenoid, land and fish based omega 3's (1000 mg pure fish oil with 340 mg EPA/240mg DHA including omegas from flax seed oil, borage seed oil, cranberry seed oil,

and pomegranate seed), bacopoa monnieri, vitamins (vitamin A, B, C, D, and E), minerals (such as zinc, calcium, magnesium, chromium, selenium, and 75 other trace minerals all delivered in a food matrix with a patented enzyme delivery system), and essential oils (such as clove, thyme, frankincense, ginger, chamomile, and peppermint).

Lifelong Vitality includes key nutritional support already mentioned in this study (omegas, B-vitamins, zinc, etc). In addition, research into other key ingredients showed direct treatment correlations to stress, anxiety, depression, and other mental health disorders (Sathyanaravanan, et al, 2013, Krishnakumar, 2009, Nakagawa, 2011, Umezu, 2012, Moussaieff, et al, 2012).

The ingredient astaxanthin has been shown in studies to support healing of dementia patients (Nakagawa et al, 2011). Polyphenols are shown to help boost the production of brain stem cells (neurogenesis) and they reinforce their multiplicity in various types of neuron cells (Valente, 2009). Bacopa monnieri has been shown to improve cognition because it reduces anxiety. Bacopa monnieri intermingles with the dopamine and serotonergic systems of the body and its primary job is to promote neuron communication. It does this by enhancing communication in the nervous system that increases the growth of nerve endings or dendrites in the brain. Bacopa monnieri is also an antioxidant and it is shown to be a useful nootropic. Both peppermint and chamomile essential oils (aromatic compounds from peppermint and chamomile leaves) have been shown to have CNS stimulant effects (Umezu, 2012) and frankincense essential oil is shown to have antidepressant properties (Moussaieff, et al, 2012).

Lifelong Vitality incorporates a nanosomal lipid assimilation system (patented by dōTERRA) to ensure greater efficiency

and utilization of nutrition. This nanosomal lipid assimilation system helps nutrients pass through the intestinal wall, delivering nutrients through the water layer of the gut. This occurs because the ingredients are encapsulated in micells, a hydrophilic structure used to contain the lipophilic structure. This method provides greater surety that the nutrient is received into the lymphatic channel for rapid assimilation. Since lipids have trouble passing through the intestinal wall, greater absorption of nutrients is a unique quality of this particular product (Hill, 2013).

According to dōTERRA's chief medical officer, Dr. David Hill, Lifelong Vitality is also unique in that it uses essential oils and mixes them with both land and sea based fatty acids offering a minimum of ten times the stability. In this case, Dr. Hill indicates that clove essential oil works as a powerful antioxidant, potentially reducing inflammation by an additional thirty percent. German chamomile works as an anti-inflammatory as well, frankincense supports stabilization, and thyme essential oil preserves, protects, and helps to raise levels of DHEA, also supporting brain function.

Dr. Hill said in an online webinar regarding the Lifelong Vitality pack, "The omega 3's are valuable for brain tissue and they support the myelin sheath, and when they are delivered in their most usable form without converting them to another substance, and when they are added with astaxanthin, a cartonoid, they cross blood-brain barrier and become a powerful antioxidant providing additional cellular protection to brain tissues."

In a previous study conducted on Lifelong Vitality, Dr. Troy Parker (the lead researcher who conducted the study) reported that participants who took this particular supplement pack described having more energy, decreased pain, better mental clarity, improved feelings of balance, and increased happiness

(Parker, 2013). This study, combined with the uniqueness of the product, influenced the decision to use Lifelong Vitality for this particular research.

Depression, Obesity, and Systemic Inflammation

Numerous studies have found evidence connecting depression to obesity. Obesity, of course, is linked to nutrition. A meta-analysis of 17 studies on the link between nutrition and obesity—that included a total of 204, 507 participants—determined that obesity increases the risk for depression, and depression is predictive of developing obesity. The association between depression and obesity for females was significantly higher than that for males (de Wit, 2010). While genetic and environmental factors may also contribute to both obesity and depression, this significant correlation between the two should not be ignored.

As further studies review the correlation between obesity and depression, it will be important not to overlook the role of systemic inflammation as a cause for both diseases. To understand how systemic inflammation is caused, some scientists have focused research on cytokines, an expansive group of pleiotropic and redundant polypeptides that play important roles in the function and pathology of the central nervous system. Cytokines are thought to be involved in various central nervous system functions that are dysregulated in major depression. These include sleep, food intake, cognition, behavior, temperature, and neuroendocrine regulation. Likewise, cytokines have been shown to play a role in insulin resistance and increased risk for cardiovascular disease. They also have been proven to cause inflammation within the brain when they are allowed to pass the gut-brain barrier. Researchers at the Clinical Neuroendocrinology Branch of the National Institutes of Health in Bethesda, Maryland have published work linking inflammatory cytokines (especially the IL-1 family) to major depression (Licinio, 1999).

Among other problems linked to systemic inflammation, and possibly depression, are an increase in insulin and leptin hormones, based on a 2003 study concluding that insulin resistance is, at least in part, a chronic inflammatory disease (Xu, 2003). Insulin resistance leads to sympathetic nervous system over-arousal, which in turn can lead to increased cortisol levels and can cause the body to lose magnesium (Takase, 2004). Decreased magnesium can lead to migraines and poor sleep, which are both thought to contribute to episodes of major depression. Where such is the case, the depressed mind may not be affected by serotonin production (which traditional antidepressants work to regulate) but by magnesium deficiencies--again, another link between nutrition and depression.

Lifelong Vitality contains carotenoids (such as Lutein, Lycopene, Silymarin, and Curcumin) which are powerful, free-radical scavengers (reported to be ten times more powerful than vitamin E) and these carotenoids are known to increase glutathione levels in liver, increase superoxide dismutase enzyme, stimulate growth of new liver cells, and mediate inflammatory markers (Hill, 2013). Further research into these vital nutritive elements would be necessary to define a more direct correlation to inflammation, obesity, and mood.

Food intolerances are another likely cause of systemic inflammation. Intolerance to dairy products, legumes, and grains has been shown most often to lead to systemic inflammation. This is typically due to a large population of modern human beings who lack the enzymes capable of breaking down the proline proteins in grains, especially gluten and gliadin. The saponins in legumes and lactose and casein in dairy are also problematic for many people. When undigested particles of poline, gluten, gliadin, saponins, lactose, or casein cross the intestine into the bloodstream, the body treats them like foreign invaders and

sends an immune response. That immune response includes inflammatory cytokines, suggesting again that research should look into how these cytokines affect depression and what we should or shouldn't eat to prevent their release.

Another factor to consider is that when cellular mitochondria receive proper nutrition, often the result is a change of interest in diet. It has been reported that proper nutrition that supports the mitochondria results in less interest in foods that are unhealthy (unhealthy carbohydrates and/or foods high in sugar). Lifelong Vitality (and other quality nutritional supplementation) generally support feeding mitochondria and in the process, food interests and choices may be altered or improved by those who take supplements. It's possible that those who take Lifelong Vitality naturally begin to change their interest in certain unhealthy foods and begin making selections that provide better overall nutritional support simply because the body is being properly fed. As a result, the health of other systems of the body may improve (i.e., organ function, cellular repair, healthy weight loss, and inflammatory response) all of which may improve immune function and support overall mood and general well being.

As we look at nutrition for health and well being there are recent research reports that indicate that some commercial agriculture techniques may be leaving the soil where food is grown deficient in important minerals, causing the food that's bought and sold in grocery stores to be mineral deficient (Davis, 2004). A study conducted by Dr. Donald Davis from the University of Texas (USA) Department of Chemistry and Biochemistry found reliable declines over the last fifty years in the amount of protein, calcium, phosphorus, iron, riboflavin (vitamin B2) and vitamin C found in foods. This research suggests that declining nutritional content is caused by a host of agricultural practices created to improve some traits (like size, growth rate, pest management) rather than increase nutritional value. Davis said the following

about his study results: “Perhaps more worrisome would be declines in nutrients we could not study because they were not reported in 1950—magnesium, zinc, vitamin B-6, vitamin E and dietary fiber, not to mention phytochemicals.” While additional studies in which old and new crop varieties should be looked at side-by-side and measured by modern methods, his research details key nutrients possibly missing in today’s foods that are necessary to support healthy mind and mood.

There are other factors that are reported today to affect the quality of food found at local grocery stores. Today, foods are shipped long distances and are stored for long periods of time, both of which may cause depletion of vitamins and minerals, including B-vitamins, needed for brain function and known to support the central nervous system. Some food processing techniques used today deplete nutrients from fruits and vegetables. For example, there are genetically grown crops now that are meant to improve visual appeal and increase harvests, but nutritional value is not necessarily increased in these practices. Also, increased levels of environmental pollution and toxins often cause the body to use more nutrients than normal (such as antioxidants) to detoxify and eliminate harmful substances. All of these factors contribute to why even those who eat a healthy diet may find support from additional targeted nutrition.

The bottom line in the research cited here as well as the results from this study of dōTERRA’s Lifelong Vitality pack, is that nutrition and depression have a connection. While depression is complex and not always caused by only one factor, supporting the body by providing adequate nutrition is a positive step in the right direction; and in some cases deficiencies of certain vitamins, minerals, amino acids do directly relate to emotional wellbeing. The impact of diet on depression may have been underestimated or unknown until recently. Nutrition for mental health is one of the important factors that need further

consideration and research to adequately address and explain the complexities surrounding nutrition and mental health.

Conclusion

The results of this study submit the possibility that there is a relationship between nutrition (Lifelong Vitality), depression, and anxiety. These results are consistent with other preliminary research on nutrition and depression, including a previously conducted study on Lifelong Vitality (Parker, 2013).

While there are many factors that can contribute to depression (i.e., psychological issues, trauma, family background, life changes, and so forth), there is significant research indicating that here are a number of nutritional factors that can contribute toward depressive symptoms.

We know that depression is not caused by just one factor and research tells us that eating well and supplementing may be a positive step in the right direction. According to NHS's website, we learn that it's possible that deficiencies of certain vitamins, minerals, amino and fatty acids relate to our emotional wellbeing (NHS, 2014). Today, many other medical websites (along with NHS) instruct those with mild depression to look to what they eat to assist symptoms of depression.

"Diet is one of the important factors for our mental health," said Andrew McCulloch, the chief executive at the Mental Health Foundation (Williams, 2014). McCullough, like others, has said that the influence of diet on depression has been undervalued. In the next decade or so, it's anticipated that more research of this kind will yield additional answers for those suffering with mental health disorders. For now, eating a well-balanced, assorted healthy diet that may include a full range of micronutrients, and adding supplementation to a healthy diet may provide beneficial results for more than just mood.

While it's not possible to state for certain that a positive relationship exists between Lifelong Vitality and depression without further research, this preliminary research raises interest in a growing area of research and heightens awareness in the possibility that Lifelong Vitality may support individuals suffering from depression and anxiety.

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