'The Whole Food Solution' - Prof Julia Rucklidge

I’m just going to give a brief overview of the interface between mental health and nutrition and then go into a little bit of detail about some specific studies.

I study the idea that nutrition is relevant to the brain. The only way you can really do that with double-blind control trials, is by doing it with capsules of minerals and vitamins. That's what I’ve been doing over the last 15 years.

If we could address poverty in our society then we would go a long way towards reducing the number of people who are struggling with a mental health issue.

Our Mental Health Problems

You probably don't need to be told about the scale of the problem. The population of the South Island is about a million people, it's a fifth of the population of NZ, and that's the number of people who are struggling with a mental health issue in any one given year. We know the numbers are going up. Based on the New Zealand Health Survey we see in the number of people with a mood disorder from 2006 to 2018 an increase of 47 percent. An increase of 160 percent in the number of people who would meet criteria for an anxiety disorder. About 5 percent of the population are in the severe range, 9 percent moderate and 7 percent mild.

I would say there's a whole host of people who are just struggling subclinically with a whole host of psychiatric or psychological symptoms.

Current Treatments are Inadequate

This is being addressed; by giving medications, and if we look at the data on antidepressants: that's gone up by 48 percent over a decade and the rise in the use of antipsychotics has gone up by 40 percent from 2006 to 2017. We're trying to address this problem with medications primarily, if you're lucky you might get psychotherapy.

I think it's fair to say that we have a problem of epidemic proportions, an increasing number of people being identified with a mental health problem. Conventional treatments are simply not helping and reaching enough people. Certainly medications have saved lots of people's lives but far too many people are still suffering. There are people out there who are on multiple medications doing their best, their doctors are doing their best, and yet they are still struggling.

We can't medicate or treat our way out of the epidemic of mental distress. So what else can we do?

The Brain and Nutrition

We need to be looking at what we're putting on our mouths. Although the brain is only 2 percent of our body weight, it consumes 20 to 40 percent of the glucose and nutrients that come directly from

our food. I like to call it the hungriest organ. Our education around food is often about muscles, our heart, or bones. We very rarely talk about the brain and the nutritional requirements of the brain.

The Modern Food Supply

Our food supply is the biggest social experiment of all time. We've been eating these modern foods for about a hundred years plus or minus, and we've seen an increase in the chronic diseases, diabetes, heart disease, obesity and mental health issues. This is not a coincidence, there's some really robust data that show that our modern food supply has been detrimental to our health. We've changed the foods that we eat from whole foods to processed foods. That's not necessarily a bad thing. Processing could include canning foods or frozen food and that can retain the nutrient quality of that particular food, like your peas or your vegetables. The biggest problem is the ultra processed food that people are consuming.

You could argue that not a lot of us are consuming ultra-processed food, but you have to look at the data. That shows 48 percent of the caloric intake of Canadians is ultra processed, 61 percent for Americans and 69 percent of foods that are sold in supermarkets in New Zealand are considered ultra processed. So ultra-processed food is rampant everywhere and almost half of the calories that people are consuming come from ultra processed food.

I suspect perhaps less in this audience given your interest in your health. We need to really pay attention to this at a population level, because it's killing us. What happens when we eliminate half the nutrients in the diet? What's happening when half of your caloric intake is coming from ultra-processed food? We already know this from Ansel Keys work in the 1950s based on his starvation experiments. I certainly wouldn't recommend replicating this. They took 36 normal healthy men and they were exposed to six months of nutrient deprivation. They reduced their caloric intake by about 50 percent and these people experienced a lot of psychological symptoms, depression, hysteria, irritability, self-mutilation, apathy, lethargy, social withdrawal and inability to concentrate.

These are all symptoms that we're very familiar with. They're the ones that are often associated with psychological problems. So it's not a mystery that that food can seriously impact our mental health and yet my training in clinical psychology, and I suspect the training of any of my medical colleagues in the audience, is that we weren't given a lot of information about the importance of nutrition for the brain. It was viewed as irrelevant to psychological problems when I was training and is still not talked about a lot.

That's less true in our clinical psychology program at Canterbury University, but it's not something that we normally get educated about and that means that we don't share that information with our patients and therefore they won't be exposed to this principle. There is an enormous amount of research being done in this area now.

Eat a Better Diet

One obvious solution though is that we should just tell everyone to eat better. What does that mean?

There's a lot of debate around that. What I can share with you are the epidemiological studies that have been done around the world; in Australia and Spain and the UK and Japan and they're all advocating a whole food diet.

It is difficult to quantify and say what that dietary pattern looks like. They identify people who are following a “whole food” often a Mediterranean Style Diet, but not always. Sometimes it's foods local to their area, or when you're eating foods that are high in fruits and vegetables, but with fish and healthy fats, low in takeaways. That is associated with the reduction of mental health illness, depression and anxiety. The more we consume foods that are consistent with a western type of diet the greater our risk for mental health issues.

There is also longitudinal data where they follow people over time (studies are up to five years) and they look at their diet, and they look at their psychological symptoms over time. They compare what you're eating at time one, with your mental health at time two. Poor diet is certainly a risk factor, it doesn't explain all mental health issues but it certainly seems to be a pretty robust factor.

What does it mean to eat better? When the public thinks about the content of food what do they think?

I’ve spent a lot of time thinking about food labels and to try and better understand the messages that are ubiquitous when you're walking around the supermarket. What are we being told by the food industry?

We focus the most on the macronutrients and that's your carbs, proteins and fats. If you look at any food label you'll see that they'll tell you about the saturated fat content, and the calorie content.

What is missing, not entirely but virtually missing, is the micronutrient content of that food.

We've spent decades counting calories to no avail, we've just gotten fatter, so that's clearly not the way forward .

If you're someone who's been told about counting your calories and making sure you cut to about that 2000 to 2500 calories per day then you might make different purchase choices.

Sometimes you might see a few micro-nutrients mentioned. I’ve found on food packages with very few micro-nutrients yet the label might highlight something like vitamin D.

I don't know why they bother listing that, or calcium at two percent. You're not getting a lot of information even something that's rich in micro-nutrients. They won't tell you on the package. Take a package for some nuts. You still won't learn how much there is in terms of micronutrient content like the selenium, or the magnesium, it's just simply not there.

We've developed in new Zealand a traffic light system. For the most part that might help you choose a better ultra-processed food over another one. Even that's not entirely true because there are some really healthy options that have got poor health star ratings. Often they do more poorly than the really ultra-processed food because of the focus of the healthy star ratings on energies.

If you're product is low in energy, low in calories, low in saturated fats, low in sugar, low in sodium, and you have one nutrient like vitamin D, then you're gonna get five stars. Or if it was fortified with iron it would get five stars. A cardboard box would get four star rating that that doesn't mean you should eat it.

I think we really need to be focusing more on what's in your food rather than what's not in it.

micro-nutrients s and Health

I want to switch to the macro-nutriment thinking to thinking about micro-nutrients. Micro-nutrients are vitamins and minerals and they're required in small amounts for the most part although there are some micro-nutrients, like calcium that we consume that in a much higher quantity relative to other other micro-nutrients. Why do we need them? They're the building blocks of our brain, our mitochondria need them for energy production. For instance you would take a very small dose of vitamin B which is essential for the production of enzymes, hormones, and neurotransmitters.

If you look at the Krebs cycle along all the pathways for making all of those chemicals that eventually will produce ATP you need micro-nutrients. They're identified as co-factors all the way along and it's not one special micronutrient it's the full array. When we think about the manufacture of neurotransmitters, we need to understand that to make serotonin or dopamine these really important neurotransmitters that are essential for emotion regulation or for concentration, you need micro-nutrients. Micro-nutrients are also essential for the regulation of DNA and keeping our DNA healthy.

We need micro-nutrients for other things that are important ; like eliminating toxins that you are exposed to in the environment like plastics. The detoxification pathway requires nutrients. Looking at brain metabolism specifically, the transformation of one compound to another, chemical “A” to chemical “B”, you need an enzyme and you need co-factors. That could be converting tryptophan to serotonin, you'll have an enzyme that's important for that, but you'd need those co-factors.

We're so focused on finding that magic bullet, just take more vitamin D and you'll feel better, or just take zinc. When you think about brain metabolism you recognize really quickly that that's the wrong way to think about it. If we look at the pathways to make serotonin you can see that there's a whole host of different nutrients that are required.

If I ask you whether or not we can get those nutrients out of ultra processed food? Hopefully you now know the answer.

Both nutrient density and variety of food are essential.

Research Into Better Diets

People who were depressed and had a poor diet were enrolled in research where they were randomized to either a Mediterranean style diet or the control group which had social support.

The Mediterranean style diet consisted of a little bit of meat and some portions of fish but mostly it's high in legumes, fruits and vegetables. There was also dairy food, eggs, poultry and even some dark chocolate. They found that there was far greater reduction of the number of people who were struggling with a major depression. They showed a very large group different effect size of 1.16 The number needed to treat for remission was 4.1. Looking at the reduction in the their depression scores; the diet intervention versus social support, 32 percent of those on the diet intervention went into remission of their depression, compared to 8 percent of the control group.

This study has now been replicated twice in other centres in Australia and so we can feel pretty confident that a change in your diet can have a very very positive effect on your mental health status.

I really want to emphasize that I’m not talking about physical health here. The Mediterranean diet and does seem to be a really good recommendation for people who are struggling with mental health issues. First look at reducing their consumption of ultra-processed food and increase their consumption of whole real food.

Food Quality Issues

Even if we managed to get the public to eat more nutrient dense food is that enough?

There are some reasons why I think we need to be concerned about our food supply. In commercial production, we choose foods that are rich in Xxxxx, that grow quickly, that transport well, that don't bruise, that look pretty, but we're not choosing foods necessarily for their nutrient content. We have a lot of data across the world suggesting that the nutrient density of our food has been decreasing. We know that there are specific nutrients that are depleted in soils in New Zealand like iodine and selenium but we also only seem to put back nitrogen, phosphorus, and potassium (PKN) when adding fertilisers to the soil.

Some you know that local farmers may be putting glyphosate on our crops. That can be considered a mineral chelate which has been shown to reduce the nutrient density of our food. The increase in carbon dioxide in the air also has a detrimental negative side effect. Plants are growing more quickly. The downside of that is that the plant then doesn't have this sufficient amount of time to take the minerals up through the soil into the plant. Plants can be deprived of the full array of nutrients. In Canada soil testing in 40 different fields, looked at the nutrient density of the soils. The percentage of those fields in which the nutrient was above the lowest level was poor. Magnesium is the only one that seems to be sufficient across all of those fields. There was huge deficiency in many of the fields of things like manganese and copper, zinc, boron etc.

We do need to be concerned about this problem of the nutrient quality of our soils.

Using Vitamin and Mineral Supplements

Eating quality food first is my message. Changing from that ultra processed diet to eating more whole real foods but for some people that's not sufficient.

Under what conditions might you need more nutrients than what you can get from your food?

That could be because of genetic differences, or some people are simply more vulnerable, they don't code as well for certain enzymes that are important for say your methylation cycle or the Krebs cycle. That will influence those metabolic processes. As we age unfortunately we're less able to absorb the nutrients that we do get out of our food. Medications that many people take, like statins or antidepressants, have been shown to have an effect on nutrients in terms of nutrient depletion.

Inflammation can have a huge effect on our nutrient supply. Our nutritional needs are much higher during pregnancy, and I would also say adolescence. I like to think about it as a brain under reconstruction and that they need a lot more nutrients as they grow and that frontal lobes are developing. I’ve already talked about the exposure to toxins our gut health is really key. It will influence how much we absorb.

Environmental Stress

Finally I want to focus on stress because I suspect many of us are experiencing this.
In terms of stress: do any of these things apply you now, financial stress, or overload at work, or your family medical issues, climate change, worry about what's happening in the future. I think that people have had to experience a constant vigilance and that for me is very similar to the constant vigilance that we all experienced in Christchurch after the Christchurch earthquakes.

There's a wealth of data that a lot of people aren't familiar with showing that B vitamins specifically supplementing with B vitamins is helpful first for reduction of stress. This has been done mostly in the workplace or with students but they're placebo-controlled trials. It's a small effect but then these people aren't super super stressed, they're not clinically stressed they're just feeling a little bit more anxious because of what's going on in their environment.

When we are exposed to a natural disaster like an earthquake we make very poorer food choices. That led me to think that supplementing with micro-nutrients following a major stressor could be beneficial.

Remember the Christchurch earthquake of 2010-2011. There was another environmental disaster that I've studied following a flood in Calgary Alberta. Then of course our the devastation of 15th March, 2019 when a gunman came and killed 51 people and injured 40 others in two mosques in Christchurch.

Here is some information that we got from those three events.
(After the mosque attack we didn't do any research with the mosque victims. I'm a white woman not connected with the Muslim community it was not appropriate for me to do any research then. But we I did some clinical observations where we I raised money and we donated micro-nutrients s to anybody who was interested in taking them. We monitored them clinically over time so I'm just going to share these data with you.)

I'm just going to go through different studies with you.

After the earthquakes we had people taking broad spectrum micronutrients, who reduced their stress from the moderate range on average to the normal stress range so they're no longer clinically elevated. Following that flood where we showed exactly the same thing. That was a beautiful replication. And in the clinical observation following the mosque shooting the story is similar.

(I did everything I could have to get these studies funded through the public health care system. I sent data to the GP, local GPS, to the mayor, to the science advisors, and the Minister of Health. It wasn't that I was silent about this, but we just couldn't get them to consider funding our research as an option.)

With the earthquake as a comparator we had people who chose not to take micro-nutrients. The result is not just the feel-good effect of being in a clinical trial. We monitored these people and there was no change in their symptoms. In the flood we had a vitamin D comparator where they stayed in the clinically elevated range.

So we have three replications and in terms of a number of people who said they felt a lot better like much to very much improved, and this shows you that the broad spectrum the vitamins and minerals in combination are are better than B complex which was our comparator which has been shown to be better than placebo. About 40 percent of them saw themselves as much to very much

improved compared to 20 percent on B complex and 10 percent of those who were treatment as usual.

In the flood study it was up to 50 percent of those on broad spectrum compared to 20 percent on B complex and just under 20 percent for vitamin D alone.

We have this just looked at broad spectrum following the massacre, and you see a really high percentage, over 50 percent of those who are reporting, say they are much to very much improved. So our really simple treatment that has broad reach.

Post Traumatic Stress

In terms of trauma we looked at probable PTSD and that reduced from 65 percent down to 19 percent with those who were given the micro-nutrients in the earthquake. With treatment as usual there was no change.

With the mass shooting we also had that massive reduction relative to the earthquake so 77 percent down to about 23 percent. Trauma rates and symptoms associated with PTSD also decreased over a short period of time and here's just one person who spoke to the press about his experience, Mr Mirwais Waziri.

“I started taking the (micro)nutrients about two months after the attack. After a week I was sleeping for six or seven hours a night, my appetite came back, I was happier and much more energetic. I’m still not 100 percent but I’m much better than I was before.”

This was seven years ago.

The Future? Better Diet for Mental Health

A well-nourished body and brain is better able to withstand ongoing stress and recover from mental illness. Giving micro-nutrients in appropriate doses can be an effective and inexpensive public health intervention to improve the mental health of a population following an environmental catastrophe. I wonder whether or not our resilience is lower due to our poor nutrient intake. The better future I see for mental health is that we can really address the dietary issues. It's the elephant in the room. If I could have a magic wand and the number one thing that I would ask for is that we just get rid of ultra-processed food from our supermarkets from the schools so that our children are just simply not given that food as a choice.

It's not a real food choice it's nutrient-deleted junk. We obviously need to do other things, like teach our children how to cook and exercise and be socially connected. Then we should consider micro-nutrients supplementation when these other interventions don't work.

If you want to know about the nutrients we've studied then email my lab mentalhealthnutrition@canterbury.ac.nz