

HEALTHY BRAINS BACKGROUND PAPER

May 2020

The role of nutrition in helping healthy New Zealanders maintaining positive mental health.

The importance of positive wellbeing has been highlighted as we experience life during COVID-19. Our ability to socialise with friends and family and to live and work normally changed massively after the 2020 outbreak.

The combination of stress and uncertainty in our lives can all affect our mental wellbeing. At Activity and Nutrition Aotearoa (ANA) we wanted to understand how our health and eating habits could affect our mental wellbeing and whether what we eat and drink can be used to help promote positive mental wellbeing.

Well-being means different things to different people.

While a dictionary may tell us that well-being is the 'state of being happy, healthy or prosperous'¹, we know that achieving this is a careful balance of many different things. Achieving and maintaining positive mental health is one of the aspects that allow us to experience this state of happiness, health and prosperity we call 'well-being'.

And mental well-being isn't just a concern during COVID-19.

Even before the global COVID-19 pandemic mental well-being has been a concern for many in New Zealand. In 2018 nearly 1 in 4 adults reported experiencing 'poor' mental well-being². Those particularly at risk were Māori and Pacific adults, young adults aged 15-25 years, women and people living in socioeconomically deprived areas. And results from the 2017 Mental Health and Addiction Services Annual Report reported record numbers of people using mental health and addiction services in New Zealand³. Daily stress, anxiety and depression may be felt by many, and yet go without a formal mental health diagnosis by a medical practitioner.

There are different ways mental distress may be experienced.

Mental distress may be experienced as isolation, lack of connection, depression, anxiety, stress and feeling overwhelmed or unable to cope⁴.

Many things in our life can affect our ability to experience positive mental health, including: pre-existing medication conditions and disabilities, discrimination, cultural fulfillment, financial security, working conditions, family life, resilience and personal contact⁵.

Not experiencing positive mental well-being can affect the relationships we have with ourselves and our whanau and friends, and our productivity and experiences at school, university or in the workplace.

How nutrition, physical health and mental health come together

How we eat, what we eat and how our body uses what we eat all have the ability to impact our physical and mental health.

1. The influence of nutrition during pregnancy and breastfeeding
2. The nutrients available from the food choices we make
3. Our physical health
4. Whether we can access safe, nutritious and affordable food

5. Our ability to access culturally important foods and take part in culturally important food traditions
6. Emotional eating or changes in eating behaviour during anxiety or depression

1. How our body has developed: The influence of nutrition during pregnancy and breastfeeding

You could say that the relationship between nutrition and positive mental well-being begins before we are even born.

Nutrition and stress we're exposed to during pregnancy can both affect brain development before we're born. Having the right balance of nutrients, protein, fats, energy, vitamins and minerals available during pregnancy provides the right building blocks for ideal brain development. ^{6,7} Specific nutrient deficiencies during pregnancy can cause neural tube defects, delayed language, changes to cognitive abilities and delays in mental development. As we grow up these changes caused by nutrition and stress may affect factor that influence our mental well-being. Brain development in preschoolers is linked to later life achievements, such as higher socioeconomic status and income. And education in turn is linked to an increased feeling of personal control and self-esteem. ⁸

2. The nutrients available from the food choices we make

Our ability to produce all the things we need to keep our body systems (including our brain and mood regulation) is influenced by the foods we eat, what we drink and the range of nutrients available to our body. Therefore, too much or too little of the right nutrients can impact our ability to concentrate, focus and produce the chemicals needed to feel happy or sleep. All affecting our ability to experience positive mental health.

Long term food choices and the ability of our body to use nutrients may also affect our ability to maintain positive mental health. Several deficiency symptoms of micronutrients, vitamins and minerals include those that are associated with our mood and wellbeing. ⁹

Micronutrient	Deficiency sign	Foods sources
Vitamin B1 (Thiamin)	Short-term memory loss, confusion	Wholegrains, meat, fish
Vitamin B3 (Niacin)	Depression, apathy, fatigue, memory loss	Beef liver, chicken, salmon, fortified breakfast cereals
Vitamin B12	Depression, confusion, poor memory	Meat, fish, eggs, milk, dairy products
Vitamin C	Fatigue, depression	Citrus fruit, kiwifruit, broccoli, tomatoes
Iron	Fatigue, impaired cognitive function, poor performance	Red meat, fish, beans, fortified breakfast cereals
Magnesium	Sleep disruption, personality changes	Almonds, spinach, cashew nuts, black beans, edamame beans
Zinc	Impaired cognitive function	Seafood, beans, nuts, wholegrains

Along with oxygen to breathe, and nutrients from our food, the other essential ingredient we need to live is water. We get water from drinks and from food that we eat. And we lose water through sweat, breathing and digestion. Thirst is the sensation that is triggered by several different systems in the body

and brain to let us know we need fluids.¹⁰ However, thirst is not a reliable indicator of whether we need fluid or not. Age, exercise and illness all change our perception of thirst and our triggers to drink enough.

Not drinking during the day, working in air conditioned workplaces, a hot environment and physical activity without drinking enough all have the potential to cause us to become mildly dehydrated. Severe dehydration can cause confusion and hallucinations, but even mild dehydration can influence our mood, increasing the feelings of tension and anxiety.^{11, 12}

3. How our physical health affects our mental health

Links have been found between health conditions and our ability to experience positive mental well-being.

Obesity increases the risk of experiencing depression. The reasons for this are possibly due to the underlying reasons behind changes in eating behaviour, reduced physical activity or impacts on the stress pathways in the body. Experiencing stress increases the release of hormones which can increase food intake and insulin resistance, increasing the risk of weight gain.¹³ Fat shaming experienced by overweight and obese people also causes an increased risk of depression and reluctance to seek help, in children and adults.^{14, 15.}

Rates of depression are 2 to 3 times higher in people with all forms of diabetes than the general population.¹⁶ It's estimated that about 30 per cent of people with type 1 or type 2 diabetes experience depression and links have been found between high blood sugar and complications in people with diabetes and depression.¹⁷

People with depression are at higher risk of developing cardiovascular disease. People with coronary artery disease and depression also have worse health outcomes, with a 2-3 times increased risk of experiencing non-fatal and fatal cardiac events.¹⁸ Ten per cent of New Zealanders take a medication to control high cholesterol and four percent have had a heart attack or have angina.

Activity

Many of the conditions that affect mental well-being are managed in part by life-style changes including encouragement to take regular physical activity. As well as helping to manage the underlying health conditions, physical activity has also been found to reduce subclinical depression and anxiety in adults and children.^{19, 20} And regular physical activity can reduce the odds of depression by 45 per cent and anxiety by 28 – 48 per cent.²¹

Being aware of how physical health is woven together with our mental health allows us to provide help and assistance to individuals that is more tailored to their needs. Realising that an improvement in mental well-being can improve physical health, and improving physical health can impact on mental well-being.

4. Accessing safe, nutritious and affordable food

Food insecurity, when there is limited or uncertain access to nutritionally adequate or safe food and these food can't be obtained in a socially acceptable way,²² is not only a cause of stress and anxiety, but can affect the quality and quantity of food available.^{23, 24, 25}

Food insecurity may be affected by^{26, 27, 28}

- Household income
- Cooking skills

- Cost of food, and especially healthy food
- Ability to travel to supermarkets/food shops

Being able to access safe, nutritious, affordable and familiar food is something that's not guaranteed, even in New Zealand. The last New Zealand Nutrition Survey (2008/09) reported that 7% of respondents had low food security, and an additional 30% were only moderately food secure.²⁹ In 2015/16 one in five New Zealand children lived in a household that experienced severe to moderate food insecurity.³⁰ More than 40% of secondary school students in New Zealand are concerned about food security, which is negatively affecting their feelings of wellbeing.³¹

It was reported in A Focus on Maori Nutrition: Findings from the 2008/09 New Zealand Adult Nutrition Survey³² that Maori men and women were over twice as likely to experience low food security than non-Maori.

Household food insecurity among children: NZ food survey³³ reported that families said that they cannot afford to eat, food runs out, we eat less, variety limited, rely on others for food, use food grants or banks, stressed not enough money or they feel stressed at social events.

Addressing underlying issues that stop people accessing safe, nutritious and affordable food not only can improve physical well-being but can improve our ability to achieve positive mental well-being.

5. Food, culture and mental health

All round the world, our culture play an important role in how we choose food, and what food we choose to eat.³⁴ Being able to participate in cultural activities has been found to increase positive emotions and improve our social interactions.³⁵ The ability to experience positive mental health is also linked to the role that food and meal sharing play in well-being.³⁶

Sharing food with others is part of one of the strongest Maori social values, hospitality³⁷. And gifts of food are common.³⁸ The Household food insecurity among children: NZ food survey³⁹ reported stress caused by inability to provide food at social events. And not being able to provide enough food could cause a sense of shame.

Encouraging access to culturally important foods and food-related activities may help build positive mental well-being.

6. How we eat during times of stress, anxiety or depression

When we go through times of stress, anxiety or depression our appetite may be affected. In children, appetite may not be affected, but types of food they eat can focus more on unhealthy food choices.^{40, 41} Experiencing stress, anger, shame and boredom are all associated with eating more.⁴² The food choices we make during periods of stress, anxiety and depression can also affect our feelings of wellbeing. Food can be used to trick our brain into behaving differently by changing levels of natural chemicals in the brain.

Are there any foods and eating patterns that may support positive mental health?

When we scanned the research we found there ARE food choices we can make that can support our ability to maintain positive mental well-being.

Eat more fruit and vegetables

The more fruit and vegetables we eat may mean we're at less risk of depression and anxiety.⁴³ Indications are that every 100g increase of fruit and vegetable intake could reduce our risk of experiencing depression by three per cent.⁴⁴ Eating fruit and vegetables less than five times a day is associated with an increased risk of depressive and anxiety.⁴⁵

What does 100g of fruit and vegetables look like?

- 1 small apple
- 1 small banana
- ¾ cup blueberries
- 2 small carrots
- 1 cup peas
- 1 cup chopped broccoli

In NZ fruit and vegetable intake is dropping, with only one third of adults and nearly half children meeting their recommended fruit and vegetable intake. Encouraging fruit and vegetable intake may be an easy way to help improve our mental well-being, and might be a manageable action for many.

Choosing a 'healthy' way of eating

Studies have found that 'healthy' versus 'unhealthy' food choices can influence our emotional health.^{46, 47}

'Healthy' behaviours included eating breakfast, mid-morning snack and lunch; eating breakfast, mid-morning snack and lunch at home; eating fruits and vegetables; and eating dinner as a family.

'Unhealthy' behaviours included: consuming soft drinks; takeaways; unhealthy snacks (for example, biscuits, potato chips and instant noodles); fried or high fat foods (for example, French fries and pies); sweet foods (for example chocolates, lollies and ice cream); and purchasing snacks from takeaways or convenience shops.

We're encouraged to eat oily fish as part of a healthy diet because the omega-3 fatty acids from oily fish can help our heart health. But studies have found that people who have 50g per day of fish, or 1.8g omega-3 fatty acids daily of fish and omega-3 fatty acids experience lower risk of depression.⁴⁸

Processed foods

Where traditional dietary patterns have been found to be protective against developing depression and anxiety, 'Western' style dietary patterns that are high in red and/or processed meats, refined grains, sweets, and high-fat dairy products are associated with an increased risk of depression.⁴⁹

Eating and activity guidelines are the best to help us maintain positive mental wellbeing

The eating and activity guidelines for New Zealanders encourage us to eat a range of nutritious foods every day. Choosing foods that are high in fruit and vegetables, legumes, wholegrain cereals and fish. And lower in red meat, added sugar and processed foods.^{50, 51, 52}

- Plenty of vegetables and fruit
- Grain foods, especially whole grain and high fibre
- Some milk and milk products, mostly low and reduced fat
- Some legumes, nuts, seeds, fish, seafood, eggs, poultry and/or red meat with fat removed
- Choose less processed foods
- Make plain water the first choice over other drinks
- Keep physically active

Cook and eat together

It's not just the food we eat but also how we eat that can help us maintain positive mental well-being. Being able to prepare a meal, cooking and eating together has been found to be positively associated with better nutrition, better mental health and stronger family connections in New Zealand adolescents.⁵³ The mental health foundation in New Zealand reported 31 percent of New Zealanders felt lonely a little, some, most, or all of the time in the last month. People more likely to feel lonely include younger people, women, people living in rented accommodation, one-parent families, and unemployed people.⁵⁴

Are there any foods or eating patterns don't support positive mental well-being?

High sugar, caffeine and energy drinks

It's not just the food we eat that can affect our mental wellbeing. Not drinking during the day, working in air conditioned workplaces, a hot environment and physical activity without drinking enough can all make us become mildly dehydrated. Severe dehydration can cause confusion and hallucinations, but even mild dehydration can influence our mood, increasing the feelings of tension and anxiety.

Sugar-sweetened and caffeinated drinks may not be the best choice if we're trying to achieve positive mental wellbeing. Our review of the research found that two cups of a cola equivalent can increase the risk of depression by five per cent and three cans a day increases risk of depression by approximately 25 per cent. If we drink more than 5-6 cups of coffee a day may increase the risk of experiencing depression.^{55, 56, 57}

A study of 8500 New Zealand high school students found that 35 per cent had consumed energy drinks in the past week, and 12 per cent over four times. Energy drink consumption was significantly associated with greater depressive symptoms, greater emotional difficulties and lower general subjective wellbeing.⁵⁸

Tap water should be our first choice

Swapping out a usual fizzy, coffee or energy drink for water is a great way to start reducing the amount of sugar and caffeine we drink, and help us to prevent dehydration.

Alcohol

People with poor mental health are more likely to increase their alcohol intake as their mood declines.⁵⁹ Alcohol intake is linked to a variety of mental health issues, including depression and suicide.

Recommendations

1. Choose (tap) water first
2. Eat vegetables and /or fruit at every meal
3. Share meals together

¹ Merriam-webster dictionary. <https://www.merriam-webster.com/> Accessed April 2020.

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