



Nutrition Issues in Mood and Anxiety Disorders

In Australia, mood and anxiety disorders are the most common mental health conditions, alongside substance use disorders. In 2007 it was estimated that nearly 1 million Australians had affective disorders and over 2.3 million had anxiety disorders in the previous 12 months.¹

Mood disorders

Include major depressive disorder, persistent depressive disorder, and bipolar disorders. Features² of these are outlined in Table 1.

Table 1. Major types and features of mood disorders

Major depressive disorder	<ul style="list-style-type: none"> • Periods of low mood lasting at least two weeks • At least five of the following symptoms: <ul style="list-style-type: none"> • depressed mood most of the day and/or loss of interest or pleasure • appetite or weight changes • sleep disturbance • psychomotor agitation or retardation • fatigue • feelings of worthlessness or guilt • diminished concentration suicidal thoughts
Persistent depressive disorder	<ul style="list-style-type: none"> • Chronically low mood which persists most of the day for two years or more in adults • Depressed mood or irritability which persists one year or more in children • At least two of the following: <ul style="list-style-type: none"> • poor appetite or overeating • insomnia or hypersomnia • fatigue • low self esteem • poor concentration or difficulty making decisions • feelings of hopelessness
Bipolar disorders	<ul style="list-style-type: none"> • People experiencing bipolar disorder can have: <ul style="list-style-type: none"> • Depressive episodes (features similar to depressive disorders described above) • Hypomanic or manic (more intense symptoms of hypomania) episodes: extremely high mood and activity or agitation, racing thoughts, little need for sleep and rapid speech • Bipolar I disorder involves a manic episode but does not require an episode of major depression • Bipolar II Disorder includes at least one major depressive episode lasting two weeks and one experience of hypomania lasting at least four days

Anxiety disorders

Consist of a group of conditions marked by excessive anxiety or fear; they are more than just feeling worried or stressed. There are many types of anxiety disorders including:

- Panic disorder
- Social phobia
- Generalised anxiety disorder (GAD)
- Specific phobias (e.g. flying, heights, animals)
- Post-traumatic stress disorder (PTSD)²

Nutrition issues in mood and anxiety disorders

Table 2 provides a summary of the potential effects that mood and anxiety disorders can have on dietary intake, ultimately influencing nutritional status and physical health.

The coexistence of mood disorders in many chronic diseases, including obesity, diabetes mellitus and cardiovascular disease (CVD), is well documented.⁴⁻⁶ The onset of a physical illness is a risk factor for depression, and depression may itself also be a causal factor in certain physical illnesses including CVD and diabetes.^{5,7} Additionally, obesity has been shown to increase the risk of depression later in life by 55 percent, whilst depression increases the risk of developing obesity by 58 percent.⁸

The co-occurrence of depression and physical illness also potentially worsens medical prognosis, due to reduced adherence to treatment, impaired physical and cognitive function, and reduced quality of life.⁷ One review found that when the effects of lifestyle and medication were controlled for, the association between bipolar disorder

and CVD remains significant.⁹ Likewise metabolic syndrome has been shown to be associated with bipolar disorder independent of medication effects and is associated with a more complex illness presentation, less favourable response to treatment and adverse outcomes including increased disease burden and suicide.¹⁰ People with mood disorders should be screened for potential comorbidities and metabolic disturbances upon diagnosis and throughout their lives.¹¹

The premature mortality of individuals with mental illness is well recognized, with life expectancies approximately 10 to 20 years shorter than the general Australian population¹² with an increased risk of morbidity and mortality due largely to preventable cardiometabolic factors.^{13,14} Antipsychotic and mood stabilizer medications are associated with metabolic disturbance and varying degrees of weight gain.¹⁵ Other medications including antidepressants and anti-anxiety medications can have side effects that may impact on nutritional status and physical health ([see MHANDI resource *Nutrition Consequences of Psychotropic Medications*](#)).

A key role for nutrition intervention

In recent years there has been increasing recognition that diet and nutrition may be important modifiable risk factors for depressive and anxiety disorders.¹⁶

Emerging evidence shows the potential benefits of the Mediterranean diet and its role in reducing incidence of depression and depressive symptoms.^{17,18} According to a systematic review and meta-analysis, high intakes of fruit, vegetables, fish, and whole grains may be associated with a reduced depression risk,¹⁹ whilst a second meta-

Table 2. Effects of mood and anxiety disorders on nutrition³

Mood disorder symptoms	Potential nutrition consequences
Depression	Inadequate or inappropriate intake
Loss of appetite	Compromised nutritional status
Apathy and disinterest in food	Weight changes
Fatigue/tiredness/lack of concentration	Limited food preparation or difficulty cooking
Loss of thirst sensation	Dehydration or constipation
Food craving/ erratic eating	Weight changes
Reduced cognitive functioning	Poor organization and meal planning skills
Seeking positive emotions from food	Overeating, potentially of discretionary foods
Anxiety disorder symptoms	Potential nutrition consequences
Anxiety	Increased energy expenditure
Restlessness or hyperactivity	Inadequate or excessive intake
Dry mouth	Difficulty chewing and swallowing
Nausea, vomiting, diarrhoea	Compromised nutritional status
Loss of appetite	Weight loss
Food refusal	Tiredness or lack of concentration
Comfort eating	Weight gain
Elevated mood and associated hyperactivity	Increased nutrient requirements

analysis found that people following a Mediterranean style diet have roughly a 30 percent reduction in their risk of developing depression.²⁰ Its use as an adjunctive therapy for people diagnosed with depression has also shown significantly reduced depressive symptomology in people diagnosed with moderate to severe depression.¹⁷ Similarly, adults diagnosed with depression who were randomised to receive nutrition education; food hampers; fortnightly cooking workshops based on Mediterranean-style dietary principles for three months; and fish oil supplementation for six months, showed greater reduction in depression and improved mental health scores at three months which were sustained at six months, compared to those receiving social support.²¹

Additionally, the consumption of highly processed, pro inflammatory foods (including processed meats, alcohol and trans fats) is linked to a higher incidence of depressive outcomes.²² Systemic inflammation, indicated by raised inflammatory markers (CRP), increases the risk of major depressive disorder in a dose-response manner.²³ There is robust data suggesting that poorer diet quality is an independent risk factor for the development of adolescent mental health problems.²⁴ However, further high-quality randomized controlled trials and cohort studies are needed to confirm these findings.

The relationship between the brain and gut has gained attention for its influence on immune function, metabolism, body weight, and mental health.²⁵⁻²⁷ Additionally, mental health disorders are associated with gut problems including constipation, diarrhoea, and bloating.²⁸⁻³¹ Emerging research has explored the role of dietary interventions in altering gut microbiota and as a potential therapy for neurological disorders.²⁵ Fermented foods (including cheese, yoghurt, kimchi, miso, tempeh and sauerkraut) contain functional probiotic

components. Probiotics, prebiotics and biogenics (bioactive metabolites such as vitamins and amino acids) in fermented foods replenish the gut barrier.²⁸⁻³¹ Given that the gut microbiome has been linked to anxiety and depression, fermented foods may act upon the biological mechanisms underpinning mood disorders.²⁵ Specific probiotics (Bifidobacterium and Lactobacillus) are potentially beneficial in improving psychiatric-disorder related behaviours in anxiety and depression.^{25,29} However the current evidence requires higher quality studies to make specific recommendations.²⁷⁻²⁹

The adjunctive treatment role of nutrition

Research studies have tended to focus whether supplementation of specific nutrients may have a therapeutic effect on mental health conditions.³² Table 3 summarises key findings.

Over the next several years, it is likely that the evidence base for dietary advice for mental health will continue to develop considerably. Referral to a dietitian is suggested especially when: the person's diet or nutrition-related quality of life is poor; when an individual is struggling with food preparation; when a person's mood disorder is impacting their eating behaviours; or when there are medical issues that make dietary requirements more complex.¹⁷ Given the importance of other lifestyle factors including physical activity in mental illness, it would be effective for dietitians to work closely and collaboratively with other health professionals including exercise physiologist in a multidisciplinary team to promote sustainable lifestyle behaviour change.^{30, 31, 35}

Table 3. Summary of evidence on key nutrients and mood and anxiety disorders

Omega 3-fatty acids (EPA & DHA)	<ul style="list-style-type: none"> • Shown to be effective for improving depressive symptoms for those with bipolar disorder³³ • Omega-3 fatty acid supplementation in anxiety disorders is inconclusive³⁴ • International guidelines exist for the use of omega 3 fatty acid supplementation during acute episodes of Major Depressive Disorder as a part of adjunctive therapy. The current recommendations are 1 to 2g dose of pure EPA or 1 to 2g/day of EPA/DHA (2:1 combination) after a thorough clinical diagnosis and assessment. Insufficient evidence exists to inform guidelines for recurrent MDD and maintenance treatment³⁵
Folate/folic acid	<ul style="list-style-type: none"> • Studied for its role in depression and schizophrenia^{36, 37} • Shown to improve symptoms of schizophrenia, however only in individuals with a genetic variant for folate metabolism³⁸ • Folate may have a potential role as a supplement to other treatment for depression, though it is currently unclear if this is the case both for people with normal folate levels, and for those with folate deficiency³⁹
Zinc	<ul style="list-style-type: none"> • Zinc deficiencies are associated with depressive symptoms, thus supplementation could be beneficial as an adjunctive intervention with antidepressants⁴⁰ • N-acetyl cysteine may have symptom reduction for bipolar disorder and possibly in major depression⁴¹
Multivitamins	<ul style="list-style-type: none"> • No benefits are evident for the use of general multivitamins in the treatment of mood disorders⁴²

Further reading

- MHANDi suite:
 - 2.10: Nutrition consequences of psychotropic medications
 - 3.1: Helpful tips for working with people with mental health issues
 - 3.2: Working in a mental health team
 - 4.1: Mental health CPD for dietitians
- Equally well in Victoria: Physical health framework for specialist mental health services. Department of Health & Human Services; 27 Mar 2019 [cited 2019 October]. Available from: <https://www2.health.vic.gov.au/about/key-staff/chief-psychiatrist/chief-psychiatrist-guidelines/equally-well-in-victoria>
- Malhi GS et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for mood disorders. *Aust N Z J Psychiatry*. 2015 Dec;49(12):1087-206. doi: 10.1177/0004867415617657.
- Firth et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *Lancet Psychiatry*. 2019 Aug;6(8):675-712. doi: 10.1016/S2215-0366(19)30132-4. Epub 2019 Jul 16.
- Promoting Mental Health through Healthy Eating and Nutritional Care. Dietitians of Canada [cited 2020 Jan 3]. Available from: <https://uat.dietitians.ca/DietitiansOfCanada/media/Documents/Resources/Nutrition-and-Mental-Health-complete-2012.pdf?ext=.pdf>
- Rowell A, Long C, Chance L, Dolley O. Identification of nutritional risk by nursing staff in secure psychiatric settings: reliability and validity of St Andrew's Nutrition Screening Instrument. *J Psychiatr Ment Health Nurs*. 2012 Oct; 19(8): 722-8. doi:10.1111/j.1365-2850.2011.01848

References

1. Australian Bureau of Statistics. 4824.0.55.001- Mental Health in Australia: A Snapshot, 2004-05, <https://www.abs.gov.au/ausstats/abs@.nsf/mf/4824.0.55.001> (2006).
2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fifth ed. Arlington, VA: American Psychiatric Association, 2013.
3. Webster-Gandy J MA, Holdsworth M. *Oxford Handbook of Nutrition and Dietetics*. New York: Oxford University Press, 2006.
4. Clarke DM and Currie KC. Depression, anxiety and their relationship with chronic diseases: a review of the epidemiology, risk and treatment evidence. *Medical Journal of Australia* 2009; 190:S54-S60. DOI: 10.5694/j.1326-5377.2009.tb02471.x.
5. Knol MJ, Twisk JWR, Beekman ATF, et al. Depression as a risk factor for the onset of type 2 diabetes mellitus. A meta-analysis. *Diabetologia* 2006; 49: 837. DOI: 10.1007/s00125-006-0159-x.
6. Firth J, Siddiqi N, Koyanagi A, et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry* 2019; 6: 675-712. DOI: 10.1016/S2215-0366(19)30132-4.
7. Evans DL, Charney DS, Lewis L, et al. Mood disorders in the medically ill: scientific review and recommendations. *Biol Psychiatry* 2005; 58: 175-189. 2005/08/09. DOI: 10.1016/j.biopsych.2005.05.001.
8. Luppino FS, de Wit LM, Bouvy PF, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Arch Gen Psychiatry* 2010; 67: 220-229. 2010/03/03. DOI: 10.1001/archgenpsychiatry.2010.2.
9. Leboyer M, Soreca I, Scott J, et al. Can bipolar disorder be viewed as a multi-system inflammatory disease? *Journal of Affective Disorders* 2012; 141: 1-10. DOI: <https://doi.org/10.1016/j.jad.2011.12.049>.
10. McIntyre RS, Danilewitz M, Liauw SS, et al. Bipolar disorder and metabolic syndrome: an international perspective. *J Affect Disord* 2010; 126: 366-387. 2010/06/15. DOI: 10.1016/j.jad.2010.04.012.
11. Malhi GS, Outhred T, Hamilton A, et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for mood disorders: major depression summary. *Medical Journal of Australia* 2018; 208: 175-180. DOI: 10.5694/mja17.00659.
12. Lawrence D, Hancock KJ and Kisely S. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers. *BMJ: British Medical Journal* 2013; 346: f2539. DOI: 10.1136/bmj.f2539.
13. Latoo J MM, Dunne OF. Physical morbidity and mortality in people with mental illness. *British Journal of Medical Practitioners* 2013; 6: a621. DOI: BJMP 2013;6(3):a621.
14. Pearsall R, Thyarappa Praveen K, Pelosi A, et al. Dietary advice for people with schizophrenia. *Cochrane Database of Systematic Reviews* 2016. DOI: 1002/14651858.CD009547.pub2.
15. Teasdale SB, Ward PB, Rosenbaum S, et al. Solving a weighty problem: Systematic review and meta-analysis of nutrition interventions in severe mental illness. *British Journal of Psychiatry* 2017; 210: 110-118. 2018/01/02. DOI: 10.1192/bjp.bp.115.177139.
16. Jacka FN and Berk M. Depression, diet and exercise. *Medical Journal of Australia* 2013; 199: S21-S23. DOI: 10.5694/mja12.10508.
17. Jacka FN, O'Neil A, Opie R, et al. A randomised controlled trial of dietary improvement for adults with major depression (the 'SMILES' trial). *BMC Medicine* 2017; 15: 23. DOI: 10.1186/s12916-017-0791-y.
18. Lassale C, Batty GD, Baghdadli A, et al. Healthy dietary indices and risk of depressive outcomes: a systematic review and meta-analysis of observational studies. *Molecular Psychiatry* 2019; 24: 965-986. DOI: 10.1038/s41380-018-0237-8.
19. Lai JS, Hiles S, Bisquera A, et al. A systematic review and meta-analysis of dietary patterns and depression in community-dwelling adults. *The American Journal of Clinical Nutrition* 2013; 99: 181-197. DOI: 10.3945/ajcn.113.069880.
20. Psaltopoulou T, Sergentanis TN, Panagiotakos DB, et al. Mediterranean diet, stroke, cognitive impairment, and depression: A meta-analysis. *Annals of Neurology* 2013; 74: 580-591. DOI: 10.1002/ana.23944.

21. Parletta N, Zarnowiecki D, Cho J, et al. A Mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression: A randomized controlled trial (HELFI-MED). *Nutr Neurosci* 2019; 22: 474-487. 2017/12/08. DOI: 10.1080/1028415x.2017.1411320.
22. Sarris J, Logan AC, Akbaraly TN, et al. Nutritional medicine as mainstream in psychiatry. *The Lancet Psychiatry* 2015; 2: 271-274. DOI: 10.1016/S2215-0366(14)00051-0.
23. Pasco JA, Nicholson GC, Williams LJ, et al. Association of high-sensitivity C-reactive protein with de novo major depression. *Br J Psychiatry* 2010; 197: 372-377. 2010/11/03. DOI: 10.1192/bjp.bp.109.076430.
24. Jacka FN, Kremer PJ, Berk M, et al. A Prospective Study of Diet Quality and Mental Health in Adolescents. *PLOS ONE* 2011; 6: e24805. DOI: 10.1371/journal.pone.0024805.
25. Jacka F. *Brain changer*. Sydney Australia: Pan Macmillan Australia, 2019.
26. Aslam H, Green J, Jacka FN, et al. Fermented foods, the gut and mental health: a mechanistic overview with implications for depression and anxiety. *Nutritional Neuroscience* 2018: 1-13. DOI: 1080/1028415X.2018.1544332.
27. Wallace CJK and Milev R. The effects of probiotics on depressive symptoms in humans: a systematic review. *Annals of General Psychiatry* 2017; 16: 14. DOI: 10.1186/s12991-017-0138-2.
28. Morkl S, Wagner-Skacel J, Lahousen T, et al. The Role of Nutrition and the Gut-Brain Axis in Psychiatry: A Review of the Literature. *Neuropsychobiology* 2018: 1-9. 2018/09/18. DOI: 10.1159/000492834.
29. Dawson S, Dash S and Jacka F. Chapter Fifteen- The Importance of Diet and Gut Health to the Treatment and Prevention of Mental Disorders. In: Cryan J and Clarke G (eds) *International Review of Neurobiology*. Academic Press, 2016, pp.325-346.
30. Canadian Collaborative Mental Health Initiative. *The Role of Dietitians in Collaborative Primary Mental Health Care Programs*. 2006. Dietitians of Canada.
31. DAA, ESSA and APS. Joint Position Statement: Addressing the Physical Health of People with Mental Illness, <https://daa.asn.au/wp-content/uploads/2016/05/addressing-physical-health-mental-illness.pdf> (2017).
32. Parker G, Gibson N, Brotchie H, et al. Omega-3 fatty acids and mood disorders. *American Journal of Psychiatry* 2006; 163.
33. Montgomery P and Richardson A. Omega-3 fatty acids for bipolar disorder. *Cochrane Database Syst Rev* 2008; 16. DOI: 10.1002/14651858.
34. Sarris J, Moylan S, Camfield DA, et al. Complementary Medicine, Exercise, Meditation, Diet, and Lifestyle Modification for Anxiety Disorders: A Review of Current Evidence. *Evidence-Based Complementary and Alternative Medicine* 2012; 2012: 809653. DOI: 10.1155/2012/809653.
35. Guu TW, Mischoulon D, Sarris J, et al. International Society for Nutritional Psychiatry Research Practice Guidelines for Omega-3 Fatty Acids in the Treatment of Major Depressive Disorder. *Psychother Psychosom* 2019; 88: 263-273. 2019/09/04. DOI: 10.1159/000502652.
36. Papakostas GI, Shelton RC, Zajecka JM, et al. L-methylfolate as adjunctive therapy for SSRI-resistant major depression: results of two randomized, double-blind, parallel-sequential trials. *Am J Psychiatry* 2012; 169: 1267-1274. 2012/12/06. DOI: 10.1176/appi.ajp.2012.11071114.
37. Young SN. Folate and depression--a neglected problem. *J Psychiatry Neurosci* 2007; 32: 80-
38. Brown HE and Roffman JL. Vitamin Supplementation in the Treatment of Schizophrenia. *CNS Drugs* 2014; 28: 611-622. DOI: 10.1007/s40263-014-0172-4.
39. Taylor MJ, Carney SM, Goodwin GM, et al. Folate for Depressive Disorders: Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Journal of Psychopharmacology* 2004; 18: 251-256. DOI: 10.1177/0269881104042630.
40. Lai J, Moxey A, Nowak G, et al. The efficacy of zinc supplementation in depression: Systematic review of randomised controlled trials. *Journal of Affective Disorders* 2012; 136: e31-e39. DOI: <https://doi.org/10.1016/j.jad.2011.06.022>.
41. Berk M, Copolov DL, Dean O, et al. N-acetyl cysteine for depressive symptoms in bipolar disorder--a double-blind randomized placebo-controlled trial. *Biol Psychiatry* 2008; 64: 468-475. 2008/06/07. DOI: 10.1016/j.biopsych.2008.04.022.
42. Pipingas A, Camfield DA, Stough C, et al. The effects of multivitamin supplementation on mood and general well-being in healthy young adults. A laboratory and at-home mobile phone assessment. *Appetite* 2013; 69: 123-136. DOI: <https://doi.org/10.1016/j.appet.2013.05.016>.