


REVIEW

A review of the nutritional challenges experienced by people living with severe mental illness: a role for dietitians in addressing physical health gaps

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Abstract

People experiencing a severe mental illness (SMI), such as schizophrenia, schizoaffective disorder, bipolar affective disorder or depression with psychotic features, have a 20-year mortality gap compared to the general population. This 'scandal of premature mortality' is primarily driven by preventable cardiometabolic disease, and recent research suggests that the mortality gap is widening. Multidisciplinary mental health teams often include psychiatrists, clinical psychologists, specialist mental health nurses, social workers and occupational therapists, offering a range of pharmacological and nonpharmacological treatments to enhance the recovery of clients who have experienced, or are experiencing a SMI. Until recently, lifestyle and life skills interventions targeting the poor physical health experienced by people living with SMI have not been offered in most routine clinical settings. Furthermore, there are calls to include dietary intervention as mainstream in psychiatry to enhance mental health recovery. With the integration of dietitians being a relatively new approach, it is important to review and assess the literature to inform practice. This review assesses the dietary challenges experienced by people with a SMI and discusses potential strategies for improving mental and physical health.

Understanding severe mental illness

Severe mental illness (SMI) is a term most frequently used to describe people experiencing a psychotic illness, where the psychosis refers to a loss of contact with reality. Psychosis is a key component of several psychiatric disorders, including schizophrenia, schizoaffective disorder, bipolar affective disorder, psychotic depression, drug-induced psychosis and organic psychosis⁽¹⁾. People with psychotic symptoms experience changes in thoughts, beliefs, feelings and/or behaviour. Psychotic symptoms include: (i) hallucinations- seeing, hearing, feeling, tasting something

not experienced by others; (ii) delusions- firmly held, false beliefs not consistent with ones culture; and (iii) disorganised speech and behaviour, such as incorporating unrelated topics during conversation, and producing an inappropriate emotional response to a situation. In addition, people living with SMI also experience 'negative symptoms', which include being withdrawn, an inability to feel pleasure, lack of interest, low levels of motivation and emotional blunting. They may also experience cognitive impairments, including memory and planning deficits, as well as sleep disturbances⁽¹⁾. Treatments for psychotic illness include antipsychotic medications (APMs), which are frequently

combined with psychosocial interventions delivered by a multidisciplinary team.

Common psychosocial interventions include mindfulness, cognitive behaviour therapy (CBT) and dialectical behaviour therapy (DBT). Historically, core members of mental health treatment teams have included psychiatrists, clinical psychologists, nursing specialists, social workers and occupational therapists. Dietitians have appeared inconsistently, limited to mental health services committed to physical health, where resources have been permitted. It is well-recognised that people living with a SMI experience a 20-year mortality gap, predominantly as a result of cardiometabolic disease⁽²⁾. Delivering lifestyle and life skills interventions, including dietary education, physical activity and smoking cessation, to reduce cardiometabolic risk factors is an urgent priority. Dietary interventions are an important component of comprehensive lifestyle and life-skills interventions. Until recently, trials and clinical guidelines for dietary interventions targeting physical health in SMI have been scarce. A review of the evidence base is urgently needed. A literature review was conducted through PubMed using key terms related to: (i) severe mental illness; (ii) cardiometabolic health; and (iii) diet and nutrition. Literature was revised and summarised to assess the dietary challenges experienced in SMI and discusses potential strategies to improve mental and physical health.

Adverse physical health effects of antipsychotic medication

One of the key contributors to poor physical health in people living with SMI is severe weight-gain associated with antipsychotic medication. This weight gain is most significant during the first 12 weeks after antipsychotic medication initiation, progressing to a mean of 12 kg over the first 2 years, and 19 kg over the first 4 years of treatment⁽³⁾. An analysis of 34 head-to-head and placebo-controlled studies lasting between 3 weeks and 12 months found the weight gain in APM ranged from 3.8 to 16.2 kg for olanzapine, 0.9 to 9.5 kg for clozapine, 1.9 to 7.2 for risperidone, 2.3 to 6.1 kg for quetiapine and 0 to 4.4 kg and aripiprazole⁽⁴⁾. Obese individuals are more than twice as likely as those with a recommended body mass index to report missing their medication,⁽⁵⁾ warranting investigation into the potential role of weight changes and medication adherence.

People receiving antipsychotic therapy frequently complain of insatiable hunger, particularly those on clozapine and olanzapine^(6–9). Combining these factors with alterations in taste and smell, cravings for processed sugary or high fat foods⁽¹⁰⁾, low levels of motivation/sedation⁽¹¹⁾,

sedentary behaviour⁽¹²⁾ and often restricted budgets⁽¹³⁾, provides a potent mix for poor metabolic health. Additionally, low mood and depression can also lead to overeating and comfort eating⁽¹⁴⁾. Furthermore, people living with SMI may have lower resting energy expenditure than the general population, contributing to rapid weight gain^(15,16). Possible explanations are changes in body composition (i.e. fat-free mass) and/or direct effects of medication^(15,16).

The reasons for the significant increase in hunger levels are not yet clear. Dopamine, serotonin, muscarinic and histamine receptors have all been implicated in antipsychotic-induced increases in hunger, with drugs with high affinity for 5-HT_{2C} and muscarinic receptors being associated with the greatest risk of weight gain^(17,18). A wide variety of neuroreceptor and neuroendocrine factors regulate eating behaviour and appetite in SMI⁽¹⁹⁾. Changes in ghrelin and leptin hormones have also been reported, particularly in the early stages of medication use, likely reflecting rapid increases in fat mass often associated with antipsychotic initiation^(20,21).

Disordered eating behaviours related to mental illness and psychotropic medication are widely known. Binge eating, fast-eating syndrome, risk of an eating disorder and other nonstandard eating habits such as continual snacking are commonly reported in SMI^(22,23). A cross-sectional comparison of people experiencing bipolar affective disorder with the general population found that the poorer dietary habits in the former were related to high levels of binge-eating and emotional eating⁽²⁴⁾. Fast-eating syndrome is commonly observed in people experiencing SMI and, although hunger plays a role in the rapid consumption of food, a lack of mindfulness often means consuming excessive amounts without recognition of satiety cues. Evidence suggests that mindfulness-based interventions may play a role in reducing the prevalence of these disordered eating habits⁽²⁵⁾. Financial limitations and limited access to both food and cooking equipment often lead to food insecurity⁽²⁶⁾. When combined with a lack of motivation, as well as potentially limited nutrition and cooking knowledge and skills, people with SMI often have a limited structure to their eating patterns, frequently resorting to convenience options without any forward thinking and planning for meals. Enhancing shopping and meal planning skills may play a substantive role in those struggling to structure daily routines. In addition, including parents/carers in education and goal-setting exercises, or providing information resources, can assist in developing a home environment conducive to healthy lifestyle through meal planning, purchasing of healthier food options, assisting clients to improve life-skills and reinforcement of key messages.

Dietitians also need to be mindful that positive symptoms of the illness may affect food intake. Delusions (e.g. believing water has been poisoned) and hallucinations (e.g. voices saying not to eat certain foods) can significantly alter food intake and, when identified, need to be discussed further with the mental health team to ensure adequate and appropriate intervention/management strategies. Substance use is higher in people with mental illness compared to the general population. This can be closely associated with food insecurity and can be a significant barrier to behaviour change⁽²⁷⁾. Dietitians need to consider individual nutrient concerns associated with substance use (e.g. thiamine with alcohol abuse)⁽²⁸⁾. For clients with food insecurity, referral to appropriate services may assist in improving access to reduced-cost nutritious foods, and adequate food storage and cooking equipment.

Additional diet-related considerations for this population include poor oral health, constipation, osteoporosis and gastro-oesophageal reflux disease (GORD). A number of factors contribute to a poor oral health, such as dry mouth (common side effect of APMs), poor oral hygiene, amotivation, fear of visiting the dentist, dental costs and limited access to services. A key dietary contributing factor is an excessive intake of sweet and acidic foods and drinks, and suboptimal daily oral hygiene practices. The poor oral health in people experiencing SMI may be an important, overlooked factor contributing to premature cardiovascular disease (CVD)⁽¹³⁾. Constipation is commonly associated with APMs, particularly clozapine⁽²⁹⁾. The severe states of constipation may be reflective of impaired peristaltic movement associated with clozapine. Nutrition assessment of people receiving clozapine medication should include a review of bowel habits, as well as fluid and fibre intakes. More severe and/or persistent cases of constipation may require liaison with the medical team. GORD is also highly prevalent in people receiving APM treatment, particularly clozapine⁽³⁰⁾. The symptoms of GORD may be contributed to by the consumption of large quantities of caffeinated and carbonated drinks, fast eating and obesity. Other potential mechanisms have been suggested, including the effect of clozapine on vagal regulation of oesophageal peristaltic movement, possibly impairing swallowing, similar to the effect on bowel habits, or the anticholinergic properties of clozapine, which may decrease peristalsis and gastric emptying⁽³⁰⁾. Osteoporosis is more prevalent in SMI than in the general population. APM-induced hyperprolactinaemia with gonadal hormone deficiency not only impacts libido and the menstrual cycle (and thus fertility), but also bone metabolism, with low bone density being reported⁽³¹⁾. Other lifestyle factors impacting bone health include poor

nutritional status, low vitamin D levels, low physical activity levels, alcohol intake and smoking.

Metabolic complications

Rapid weight gain contributes to the high rates of overweight and obesity in people living with SMI, with one and a half times the rate of metabolic syndrome, twice the rate of diabetes and five times the rate of hypercholesterolaemia, compared to that in the general population^(32–35). In addition, olanzapine and clozapine may directly influence glucose homeostasis, as well as lipid and triglyceride levels, independent of other metabolic changes⁽³⁶⁾. These cardiometabolic complications are key driving factors in the increasing mortality gap. The potential for specific antipsychotic medications to promote weight gain, and glucose and/or lipid disturbances are described in Table 1. Given the adverse effects of antipsychotic medications, frameworks have been developed for routine metabolic monitoring in people treated with antipsychotic medications^(37–40). Furthermore, positive cardiometabolic algorithms have been developed for both mental health teams and associated allied health clinicians providing clinical guidelines on psychotropic and metformin medication prescribing, and also recommended interventions^(41,42).

Dietary intake

Numerous cross-sectional studies have assessed the dietary intake of those living with SMI, as reviewed elsewhere⁽⁴³⁾. The majority of these studies have focused on lifestyle factors that contribute to metabolic abnormalities and risk of CVD in established illness compared to the

Table 1 Weight gain, and lipid and/or glucose disturbance potential of antipsychotic medications

Antipsychotic medication	Weight gain potential	Risk of lipid and/or glucose disturbance
Chlorpromazine	Substantial	High (with limited data)
Clozapine	Substantial	High
Olanzapine	Substantial	High
Paliperidone	Intermediate	Mild
Quetiapine	Intermediate	Moderate
Risperidone	Intermediate	Mild
Thioridazine	Intermediate	High (with limited data)
Amisulpride	Low	Mild
Aripiprazole	Low	Low
Fluphenazine	Low	Low (with limited data)
Haloperidol	Low	Low
Perphenazine	Low	Low
Ziprasidone	Low	Low

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general population. The review concluded that poor diets are likely contributors to weight gain and metabolic abnormalities⁽⁴³⁾. The most common findings were diets lower in fruit and fibre, and a higher intake of takeaway food and sweet foods and drinks compared to the general population⁽⁴³⁾. Studies that assessed energy intake found higher intakes in those with SMI^(44–46), whereas evidence is also available demonstrating that the diets of those with SMI are lower in vegetables, legumes and dairy compared to the general population⁽⁴⁷⁾. It is important to note that the general population, which forms the comparison group in many studies, may also fail to meet national dietary standards, potentially masking the degree of the adverse dietary patterns in people with SMI^(48,49). In addition, caffeine overconsumption is common, with people living with schizophrenia being twice as likely to consume $>200\text{ mg day}^{-1}$ ^(50,51). Many consumers are likely using caffeine to combat negative symptoms and the sedating effects of medication; however, large doses of caffeine have been linked to worsening anxiety, sleep disturbances and psychomotor agitation⁽⁵²⁾, which are issues already commonly experienced by people with mental illness. There have also been suggestions that psychosis may worsen with excessive caffeine intake⁽⁵²⁾.

Nutrient-medication interaction

Similar to many medications, there are clinically relevant interactions between nutrients and APMs. Some of the key interactions can be outlined. Caffeine has been found to inhibit clozapine clearance. Caffeine competes for the same metabolic pathway as clozapine, likely inhibiting clozapine metabolism through the CYP1A2 enzyme, elevating its serum levels. A study in healthy volunteers suggested that daily doses of caffeine from 400 to 1000 mg inhibit the metabolism of clozapine to an extent that may be clinically significant⁽⁵³⁾. A second study found similar effects on hospitalised patients receiving clozapine⁽⁵⁴⁾. In addition, regular caffeine consumers who stopped caffeine intake showed a significant reduction (47%) in serum clozapine levels⁽⁵⁵⁾. Clinicians (doctors and dietitians) should be aware that many APMs (particularly clozapine) are sedating and that consumers will drink caffeinated drinks as a stimulant to offset the effects of sedation. Caffeine intake should not only be documented over time for stability, but also to detect escalating use and even abuse, with information being fed back to the prescribing psychiatrist, in case APM dose adjustment might be necessary.

Lithium is predominantly filtered by the glomerulus in the kidneys and excreted in the urine. Lithium excretion is affected by fluid and electrolyte balance and the glomerular filtration rate: sodium promotes lithium

clearance, whereas a lowering of fluid and sodium levels causes reabsorption of lithium in the proximal tubule, with a risk of lithium intoxication⁽⁵⁶⁾. Dietitians should suggest a gradual reduction in sodium, and work in conjunction with treatment teams to ensure that lithium levels are monitored. In addition, the risk of clinical hypothyroidism during lithium treatment should be considered in countries where iodisation programmes are not implemented⁽⁵⁷⁾. Grapefruit juice increases the bioavailability of benzodiazepines (diazepam, triazolam, midazolam) and antidepressants (carbamazepine, buspirone, sertraline) and should be avoided by patients receiving these medications⁽⁵⁸⁾. Given the risk for a hypertensive crisis, clients prescribed a monoamine oxidase inhibitor need to limit the amount of tyramine in their diet and have their blood pressure monitored⁽⁵⁹⁾. A comprehensive description of psychotropic medication-nutrient interactions has been published previously⁽⁶⁰⁾.

Dietary interventions in severe mental illness

Recent evidence has demonstrated that nutrition interventions, as part of a lifestyle programme, can prevent weight-gain in early psychosis^(61,62) and reduce weight in established illness^(63,64). These findings, in addition to improvements in additional markers of metabolic health, have been confirmed through meta-analyses^(65–67). A recent meta-analysis in severe mental illness found that dietitians were highly effective when providing dietary interventions in people with severe mental illness⁽⁶⁸⁾. Although future studies need to assess the long-term impacts on anthropometric, biochemical, nutrition and physical outcomes, psychiatric symptomatology, and readmission rates, there is sufficient evidence to support the use of nutrition interventions in combination with exercise as core components of mental health services.

Current research is now transitioning to effectiveness studies for the implementation of such lifestyle programmes as routine care. Future models of best practice, for example, may be to embed dietitians and exercise professionals within mental health teams, to provide intervention as part of standard care from the commencement of antipsychotic medication. In one cohort, this method found that increases in weight and waist circumference could be minimised, and diet quality improved, when people commence antipsychotic medication^(61,69).

Individualised nutrition counselling

Individualised intervention could be seen as gold standard for nutrition intervention in people with SMI, as it is for the majority of populations. The same elements that are used to promote positive cardiometabolic health in the

Table 2 Challenges for dietary counselling in people with severe mental illness and practical strategies to address them

Barrier or challenge	Strategy
Attendance	<ul style="list-style-type: none"> • Phone or text message the patient the day before, or the day of, the scheduled appointment • Offer late morning or afternoon appointments (antipsychotics are major sedatives and create challenges for early waking)
Impaired ability to process and retain information	<p>At each appointment provide clear, written advice on:</p> <ul style="list-style-type: none"> • dietary recommendations and goals • physical activity goals (where appropriate) • next appointment date and time
Reduced motivation levels	<ul style="list-style-type: none"> • Ensure information and education are provided when the patient is least sedated. • Reinforce advice at each visit • Disappointment at not achieving goals can be a major barrier, show motivation and enthusiasm, and celebrate small achievements
Medication effects on promoting obesity and diabetes	<ul style="list-style-type: none"> • Collaborate/communicate with prescribing psychiatrist and form a therapeutic alliance
Sedentariness	<ul style="list-style-type: none"> • Set physical activity/structured exercise goals together with family, carer or case worker • Provide handouts with written and visual supports • Consider referral to exercise physiologist
Social exclusion and isolation	<ul style="list-style-type: none"> • Gain support from mental health case workers, friends, carers and allied health professionals
Financial Restraint	<ul style="list-style-type: none"> • Consider the consumers living situation? • Consider when the consumer receives income or support from services, to assist in developing a food budget where appropriate • Is there access to appropriate food storage facilities? • Is there access to adequate cooking equipment? • Is there access to cheaper healthy foods?
Poor nutritional intake	<ul style="list-style-type: none"> • Improve food literacy: <ul style="list-style-type: none"> ◦ provide clear written educational information ◦ consider cooking classes ◦ consider sessions on shopping and budgeting • Provide simple clear goals for the consumer to work on • Use visuals for portion control advice • Consider mindfulness techniques • Maintain follow-up; learning may need reinforcement

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general population can be used in people with SMI. However, dietitians need to consider certain characteristics of the illness and medication side effects, which may present as barriers to effective practice. Kwan *et al.* ⁽⁷⁰⁾ described key practice points for dietitians for providing individualised counselling in people experiencing SMI. In particular, dietitians need to consider the impact of low attendance rates, a reduced ability to process and retain information as a result of impaired cognition and the sedating effects of medication, lower motivation levels, sedentariness, social exclusion and isolation, and financial restraint. Strategies to combat these barriers are highlighted in Table 2.

Dietitians need to utilise appropriate behaviour change strategies to induce sustainable change in clients with SMI. The Transtheoretical Behaviour Change Model (Stages of Change Model), Mindful Eating Awareness and Motivational Interviewing are common strategies implemented by dietitians and can be useful approaches in SMI. Cognitive adaptive training (CAT), CBT and DBT are common psychosocial strategies implemented for mental health outcomes ⁽⁷¹⁾. In addition, CBT and DBT may be used to modify food intake in eating disorders ⁽⁷²⁾. To date, the effect of these on eating behaviours in people with SMI is largely unknown but, given their successful use in other outcomes in people with SMI, may be

adaptable to focus on eating behaviours. The use of CAT, CBT and DBT may require additional training with dietitians who have previously reported inadequate training for these techniques ⁽⁷³⁾.

Recommended dietary patterns

Given the 20-year mortality gap in people with SMI driven by unacceptably high rates of CVD, traditional dietary patterns with proven benefits on health should be implemented (e.g. the Mediterranean-style diet) by replacing less healthy eating options with olive oil, vegetables, fruit, fish, nuts, legumes, wholegrains, and unsweetened dairy and poultry. Adherence to the Mediterranean diet reduces all-cause mortality and CVD by 20% in the general population ⁽⁷⁴⁾. Furthermore, the PREDIMED study demonstrated superior results following the Mediterranean diet compared to a low-fat control diet in the primary prevention of CVD in high-risk individuals ⁽⁷⁵⁾. Although perfect adherence to traditional dietary patterns may not be feasible for all people with SMI (just as in the general population), dietitians can individualise interventions to assist clients to adopt small, sustainable, positive changes, by reducing or eliminating high energy, non-nutritious foods and beverages and replacing them with foods from the core food groups. Small improvements in diet quality can reduce risk of all-cause mortality ⁽⁷⁴⁾.

Physical activity

As with the vast majority of people, encouraging individuals to move more and sit less should be a core strategy. The high levels of sedentary time are well documented in SMI ⁽⁷⁶⁾, which has been shown to be an independent risk factor for cardiometabolic disease ⁽¹²⁾. In addition, physical activity can reduce symptoms of both depression and schizophrenia, and improve quality of life ⁽⁷⁷⁾. All clinicians should encourage physical activity; however, it is important to note that specialist clinicians trained in exercise prescription, such as physiotherapists and exercise physiologists, are best placed to provide targeted, individualised interventions for people with SMI ⁽⁷⁸⁾.

Future areas of interest

Dietary patterns have long been associated with mood with a trial now describing cause and effect ⁽⁷⁹⁾; however, evidence describing the impact of diet on symptoms in SMI is lacking. A recent focus on mental illness involves the association with poorer gut microbiota; however, we are yet to fully understand this relationship and the extent to which this may impact mental health. At this point, the available evidence suggests that a healthful,

balanced diet, with attention to nutrients relating to heart and brain health, may be beneficial and should remain the focus of intervention.

Summary

People living with SMI are beset with a range of nutritional challenges that dietitians are well resourced and trained to assist with. These include best practice weight management and cardiometabolic intervention strategies. Consideration of additional barriers and challenges, as well as special needs associated with both mental illness and antipsychotic medications, is required. Dietitians need to work closely with mental health teams to maximise intervention effectiveness through additional motivation and reinforcement of messages and goals.

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