




**REVIEW**

# Effectiveness of dietary interventions in mental health treatment: A rapid review of reviews

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**Abstract**

**Aim:** This rapid review of reviews aimed to determine the extent of research undertaken on the effectiveness of dietary interventions for individuals with a mental disorder.

**Methods:** Three databases (MEDLINE, Embase, Cochrane Reviews and Cochrane Trials) were searched to February 2021 for systematic reviews including experimental studies assessing the effectiveness of dietary interventions with physical or mental health related outcomes in adults or children with one or more of: severe mental illness, depression or anxiety, eating disorders, or substance use disorder. Results are presented descriptively.

**Results:** The number of included reviews was 46 (67% in severe mental illness, 20% in depression and anxiety, 7% in eating disorders, and 7% in substance use disorders). Most reviews were published since 2016 (59%), and included studies conducted in adults (63%). Interventions in the eating disorders and severe

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mental illness reviews were predominantly education and behaviour change, whereas interventions in the substance use disorders, and depression and anxiety reviews were predominantly supplementation (e.g. omega-3). Twenty-eight and twelve of the reviews respectively reported mental health and dietary outcomes for one or more included studies. Most reviews in severe mental illness, and depression and anxiety reported conclusions supporting the positive effects of dietary intervention, including positive effects on weight-related or mental health outcomes, and on mental health outcomes, respectively.

**Conclusions:** A larger number of systematic reviews were identified which evaluated dietary interventions in individuals with severe mental illness, and depression and anxiety, compared with substance use disorders, and eating disorders. Dietary intervention is an important component of the treatment that should be available to individuals living with mental disorders, to support their physical and mental health.

#### KEYWORDS

diet therapy, mental health, rapid review, scoping review, treatment efficacy

## 1 | INTRODUCTION

Mental health is a global issue, with an estimated 10% of the global population currently living with a mental disorder,<sup>1</sup> and almost 50% of the population estimated to experience a mental disorder in their lifetime.<sup>2</sup> Mental disorders are defined as syndromes which are reflective of psychological, biological or developmental dysfunction, and are characterised by clinically significant disturbance in cognitive function, emotion regulation or behaviour.<sup>3,4</sup> Mental disorders cover a broad set of conditions, including mood disorders (e.g. depression), anxiety, severe mental illness (disorders causing serious functional impairments e.g. schizophrenia and other psychotic disorders), substance use disorders (e.g. alcohol use disorder), and feeding and eating disorders (e.g. binge eating disorder).<sup>3,4</sup>

Over the last two decades, mental health-related services expenditure in Australia increased from \$2.4 billion to \$10.6 billion, but extra resources have not delivered better outcomes.<sup>5</sup> Each year, four million Australians experience episodic depression, anxiety, and addiction disorders, and over half do not receive early treatment due to a range of factors including stigma and issues with diagnosis.<sup>5</sup> Access to cognitive and behavioural therapy, the first line of treatment, has vastly improved recently.<sup>5-7</sup> Yet, people's everyday engagement with these practices remains poor.<sup>8,9</sup>

There is a recognised interrelationship between mental and physical health, and dietary intake, as well as a high incidence of diet-related chronic disease comorbidities in people with mental illness.<sup>10</sup> The importance of lifestyle behaviours in mental health care has been widely

acknowledged, including dietary intake and behaviours specifically.<sup>10</sup> The recent Lancet Psychiatry Commission regarding physical health in individuals with mental illness identified an urgent need for optimised lifestyle interventions and associated implementation strategies.<sup>10</sup> The need for preventative intervention was particularly emphasised, as was the need to partner with qualified health professionals in respective fields for the development and delivery of these interventions. World Health Organization guidelines on the management of physical health in severe mental disorders recommends lifestyle intervention as a first-line treatment,<sup>11</sup> while World Health Organization standards for treatment of substance use disorders outlines the need for nutrition support during withdrawal treatment and to achieve a healthful diet as a treatment outcome.<sup>12</sup> In regards to eating disorders, the Australia and New Zealand Academy for Eating Disorders' eating disorder treatment principles outline the important role of dietitians within the multidisciplinary care team.<sup>13</sup> Further, the Royal Australian and New Zealand College of Psychiatrists now recommends lifestyle interventions (targeting exercise, sleep, diet, and alcohol intake) as the foundation of first-line treatments in their 2020 clinical practice guidelines for mood disorders.<sup>14</sup>

Lifestyle behaviours include health-related daily activities resulting from values, knowledge, and norms, and the broader socioeconomic environment, including diet, physical activity, and alcohol intake among others.<sup>15</sup> Lifestyle behaviours play a critical role in the aetiology and perpetuation of prevalent mental disorders, such as mood disorders and anxiety, and are highly modifiable.<sup>14,16-18</sup> However, despite >80% of people with

mental health problems expressing a desire for lifestyle medicine from their general practitioner, <5% actually get it.<sup>16,19</sup> Lifestyle modification has also been demonstrated to be therapeutic and cost effective for some mental disorders in individual studies.<sup>20,21</sup> For example, the SMILES and HELFIMED trials of dietary interventions for adults with depression reported lower health sector and societal costs, and lower cost per quality adjusted life year gained respectively when compared with comparative social support interventions.<sup>22–25</sup> Review evidence also suggests the effectiveness of dietary intervention in substance use disorder treatment.<sup>26</sup> However, lifestyle intervention is not routinely integrated into mental health care.<sup>20,27</sup>

Growing evidence demonstrates the effectiveness of lifestyle interventions, particularly exercise interventions, compared with or adjunct to psychopharmacology and psychotherapy for people with common mental illness including depression and anxiety, as well as severe mental illness and substance use disorders.<sup>28–33</sup> Recent publications have largely focused on physical activity and mental health with less of a spotlight on diet.<sup>34,35</sup> Dietitians are qualified health professionals trained to provide dietary assessment, intervention, monitoring, and evaluation in this space, and the available evidence demonstrates it is both needed and effective.<sup>36,37</sup> Dietary intervention can take on a prevention or treatment focus, which is important in the mental health space given the association between diet and mental health is likely to be a bidirectional one.<sup>27</sup> Poor diet has been shown to contribute to poor mental health, while experiencing a mental disorder can negatively influence dietary intake.<sup>27</sup> Dietary interventions can also vary in their focus such as whole of diet, dietary patterns, behaviour change or use of supplements, be integrated into multidisciplinary lifestyle interventions, and be delivered within different clinical settings (e.g. inpatient, community) and across different modalities (e.g. individual, group, in-person, online). However, the application of dietary interventions in mental health care to date have not been synthesised in one place, nor the associated diet and mental health outcomes.

The aim of this rapid review of systematic reviews was to determine the extent of research undertaken on the effectiveness of dietary interventions for individuals with a mental disorder (severe mental illness, depression and anxiety, eating disorders, substance use disorders). This set of mental disorders were selected as they cover some of the most prevalent mental disorders globally,<sup>38</sup> in the major practice areas in which dietitians are currently involved, and/or dietitian involvement is recommended and role statements are available.<sup>10–14,39,40</sup>

## 2 | METHODS

The processes for this review adhered to the Cochrane review guidelines for rapid reviews,<sup>41</sup> as well as the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews Checklist.<sup>42</sup> As a scoping review, the protocol was not registered. Three electronic databases (MEDLINE [Ovid], Embase [Ovid], Cochrane Reviews and Cochrane Trials) were searched for publications from date of inception to February 2021. Grey literature was not searched. Searches within each database were restricted to English language, human studies, and journal articles (i.e. excluding books, theses/dissertations, and conference abstracts). Reference lists of included articles were also searched for additional articles. Given the diversity of mental health disorders and the large number of articles to screen, searches were completed within each of the following areas to streamline the process: severe mental illness, depression and anxiety, eating disorders, and substance use disorders. Each search strategy can be found in Tables S1–S4 (online supplementary material) with the differences being the key words searched for each set of disorders. For clarity in reporting, and being a rapid review, the numbers of articles identified, screened and included are reported for each individual review area separately rather than combined. The search terms were reviewed by the research team prior to database searching, as per guidelines. Prior to abstract screening, 10% of all articles for each review were screened collectively as a team to ensure the search strategy was correct as well as to ensure consistency in screening. This comprised approximately 30–50 abstracts for each topic review to calibrate the review. Following this, titles and abstracts were screened by two reviewers for each review, with all excluded articles also checked by one reviewer. At the completion of each review, given the overlap in co-occurring mental disorders, excluded articles for each review were also checked for inclusion in one of the other review areas (i.e. excluded articles in the severe mental illness review were screened for inclusion in the depression and anxiety, eating disorders, and substance use disorder review, and so on).

Inclusion criteria for the review were broad and inclusive in line with the objectives of a scoping review,<sup>42</sup> to capture all relevant evidence and to determine the extent of evidence for dietary intervention in the specified areas of mental illness. *Participants/population*: Systematic reviews of children and/or adults (aged 18 years and older) with a mental disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders were included.<sup>3</sup> Determination of a mental disorder could have included a range of assessments such as clinical interview or related assessment tool (e.g. Hamilton Depression Rating Scale). Those with multiple conditions/ diagnoses

were included in the most relevant review as determined by the research team (i.e. severe mental illness, depression and anxiety, eating disorder, or substance use). *Intervention(s)/exposure(s)*: Systematic reviews with one or more experimental study which included a dietary intervention, and where the results were analysed and reported separately for the studies with dietary interventions, were included. This was achieved via consensus among the review team. Included dietary interventions for this review were those aiming to improve dietary intake, physical/metabolic health, or mental health symptomatology, including but not limited to behaviour change interventions, prescribed diet or supplementation interventions, and multi-behaviour interventions with a dietary component. Regarding supplementation interventions, those where supplements were from food sources (e.g. omega-3 supplement) were included, while those where supplements were from herbal or botanical sources (e.g. ginkgo) were excluded. *Comparator(s)/control*: Systematic reviews were not included or excluded on the basis of comparator groups of included studies, i.e. reviews were not required to include studies with or without specified comparator groups. For those that did include studies with comparator groups, these could include any comparator (i.e. other dietary intervention, no intervention or waitlist control group). Types of studies: Only systematic reviews of experimental studies (e.g. randomised controlled trials, pre post studies) were included. Systematic reviews which included experimental studies as well as other study designs were included if the experimental study findings were reported separately. Narrative reviews or those without a clear search strategy were excluded. *Main outcome(s)*: Included reviews must have included a mental health or physical health related outcome. Mental health outcomes could have included symptoms of mental ill-health, mental disorder diagnosis, or severity of mental disorder. Physical health outcomes included but were not limited to: dietary intake such as reporting energy, nutrient, or food group intake, dietary patterns or diet quality, metabolic outcomes including body composition (e.g. body fat percentage measured by dual energy X-ray absorptiometry), weight, body mass index, waist circumference, blood lipids, blood pressure, smoking-related outcomes (e.g. smoking cessation), or blood glucose-related outcomes (e.g. HbA1c, fasting blood glucose). Other outcomes included other biomarkers (e.g. inflammatory markers) and quality of life.

Data extraction was completed using a standardised extraction tool developed by the authors and pilot tested prior to use. Data was extracted by one reviewer and checked by a second reviewer for consistency and correctness. A third reviewer was consulted in the case of any disagreements. Data extracted included systematic

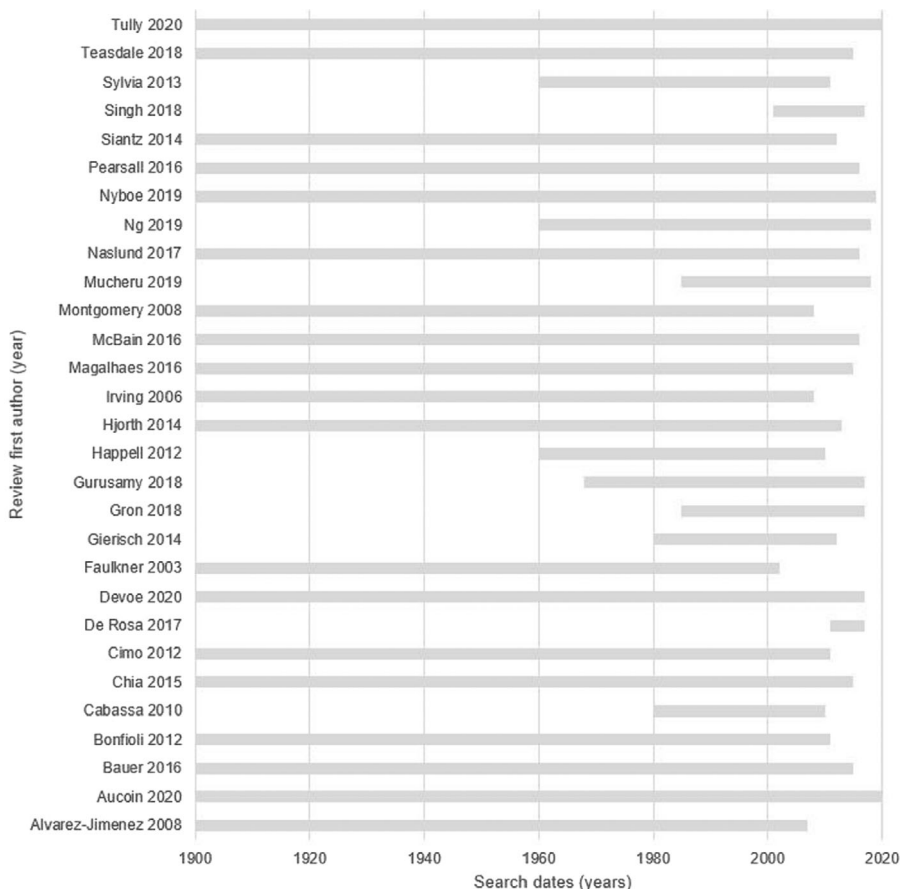
review characteristics (author, publication year, search dates, characteristics of included study populations, number and design of included studies), type of included dietary interventions and any comparators, outcomes (mental health, physical health [including dietary] and other outcomes reported), whether critical appraisal of included studies was conducted or not, presentation of results (meta-analysis/narrative summary), and broad conclusions of the review. The search dates of each review are presented in the results as timeline bar graphs to demonstrate potential overlap in search time periods. Data were extracted only for relevant studies within systematic reviews, for example if a review included both experimental and observational studies only the experimental studies were extracted and only this data reported. Given this was a scoping, rapid review, with a focus to determine the extent of evidence, the quality of included studies was not assessed.

### 3 | RESULTS

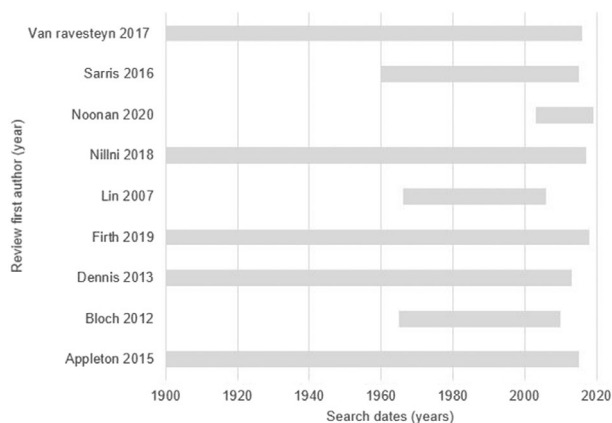
The total number of articles identified in the searches for each review area included severe mental illness ( $N = 759$ ), depression and anxiety ( $N = 3639$ ), eating disorders ( $N = 623$ ), and substance use disorders ( $N = 3082$ ). Flow diagrams are included as online supplementary material (Figures S1–S4). Of these, 46 systematic reviews were included in the rapid review, including 67% in severe mental illness, 20% in depression and anxiety, 7% in eating disorders, and 7% in substance use disorders. Further results are reported for each review area separately, with detailed characteristics of included studies reported in Tables S5–S8.

Thirty-one systematic reviews with a total of 340 dietary intervention studies in individuals with severe mental illness were included.<sup>21,37,43–71</sup> The reviews were published between 2003 and 2020, with 16 of the reviews<sup>37,44,45,50,51,54,55,59,60,62–64,66,67,69,71</sup> published within the last 5 years (i.e. since 2016). Figure 1 depicts the search dates of the included reviews. Three of the reviews had no included studies,<sup>65,67,71</sup> and therefore the remainder of the results are described for the 28 reviews which had included studies. Eighteen of the 28 reviews included studies of adult populations,<sup>21,37,43,48–50,53–57,60,62–64,68,69</sup> and 10 included children/adolescents and adults.<sup>44–47,51,52,58,61,66,70</sup> Twenty-seven reviews included studies with male and female participants, and in one review this was unclear.<sup>57</sup> Twenty-five reviews included studies where the majority of individuals had schizophrenia or schizophrenia spectrum disorders,<sup>21,37,43,44,46–60,62–64,66,68,69</sup> and three reviews included studies where the majority of individuals had bipolar disorder.<sup>45,61,70</sup>

**FIGURE 1** Search dates of included systematic reviews – severe mental illness. Search start dates described as ‘from database inception’ are recorded in the figure as 1900. Bradshaw 2005 and Nover 2013 are missing from the figure as full information on search dates was not reported.



Seven reviews included studies of diet-only interventions,<sup>48,51,58,59,61,64,70</sup> all of which were supplementation interventions (predominantly omega-3 supplementation). Thirteen reviews included studies of multi-behaviour interventions which had a dietary component.<sup>21,43,45,46,49,50,53–55,60,63,66,68</sup> Eight reviews included studies of diet-only and multi-behaviour interventions with a dietary component,<sup>37,44,47,52,56,57,62,69</sup> with most of these interventions involving combinations of nutrition education, counselling and behaviour change elements. Fourteen reviews reported mental health outcomes for one or more included study,<sup>43–45,47,48,50,51,56,58,59,61,64,68,70</sup> and eight reviews reported dietary outcomes for one or more included study.<sup>37,45,47,50,56,57,60,62</sup> Twenty-five of the reviews also reported other outcomes for one or more included study,<sup>21,37,43–50,52–63,66,68,69</sup> with 21 of these including a weight-related outcome (e.g. weight, body mass index, waist circumference).<sup>21,37,43–47,49,50,52–57,60,62,63,66,68,69</sup> Twenty reviews reported results in favour of dietary intervention for the treatment of severe mental illness, either by meta-analysis or with the majority of included studies reporting significant, positive results.<sup>21,37,43–49,52–57,62,63,68–70</sup> The remaining reviews cited lack of evidence and/or heterogeneity in results, and therefore inconclusive findings.<sup>50,51,58–61,64,66</sup>

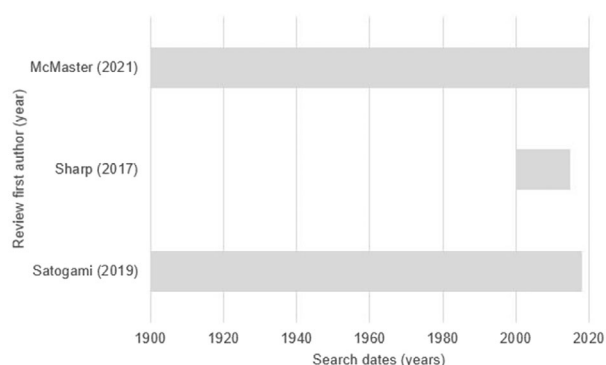


**FIGURE 2** Search dates of included systematic reviews – depression and anxiety. Search start dates described as ‘from database inception’ are recorded in the figure as 1900.

Twenty-two reviews conducted a critical appraisal of included studies.<sup>21,37,43,46,47,49–54,56,58–64,66,68,69</sup>

Nine systematic reviews with a total of 102 dietary intervention studies in individuals with depression or anxiety were included.<sup>36,72–79</sup> The reviews were published between 2007 and 2020, with five of the reviews<sup>36,76–79</sup> published within the last 5 years (i.e. since 2016). Figure 2 depicts the search dates of the included reviews.

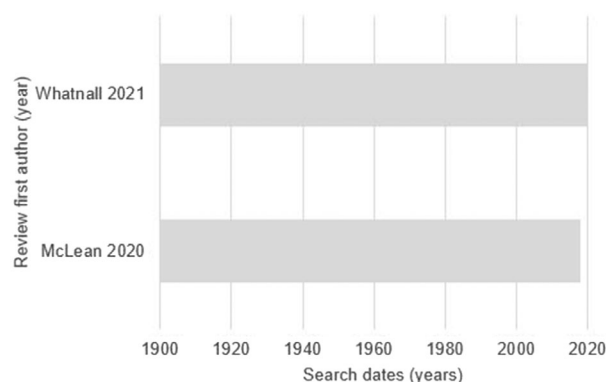




**FIGURE 3** Search dates of included systematic reviews – eating disorders. Search start dates described as ‘from database inception’ are recorded in the figure as 1900.

Seven of the reviews included studies of adult populations,<sup>36,72–77</sup> one included children/adolescents and adults,<sup>78</sup> and in one review this was unclear.<sup>79</sup> Four reviews included studies with male and female participants,<sup>36,72,77,78</sup> three included studies with females only,<sup>74,76,79</sup> and in two reviews this was unclear.<sup>73,75</sup> Five of the reviews included studies of individuals with depression,<sup>36,72–74,78</sup> while the other four reviews included studies of individuals with depression and/or other disorders including anxiety, bipolar disorder, and post-traumatic stress disorder.<sup>75–77,79</sup> In eight of the reviews the included dietary interventions within studies were supplementation interventions, including six reviews with omega-3 supplementation interventions,<sup>72–76,79</sup> one review with pre- and probiotic supplementation interventions,<sup>77</sup> and one review with any dietary supplementation intervention (with most studies including folic acid, omega-3 or tryptophan supplementation).<sup>78</sup> All nine reviews reported mental health outcomes for one or more included study, while none reported dietary outcomes. Six of the reviews conducted meta-analyses,<sup>36,72,73,75,78,79</sup> and four of these reported significant results in favour of the analysed dietary interventions for depression treatment,<sup>36,72,75,78</sup> however with small effect sizes and noted limitations (e.g. low quality evidence, evidence of publication bias). Seven of the reviews conducted a critical appraisal of included studies.<sup>36,72–74,76,77,79</sup>

Three systematic reviews with a total of 24 dietary intervention studies in individuals with eating disorders were included.<sup>80–82</sup> The reviews were published in 2017,<sup>82</sup> 2019,<sup>81</sup> and 2021.<sup>80</sup> Figure 3 depicts the search dates of the reviews. Two reviews focused on individuals with a diagnosis of anorexia nervosa, bulimia nervosa, binge eating disorder, or eating disorder not otherwise specified.<sup>80,81</sup> This includes the review by McMaster et al. including studies of nutrition education/behaviour change interventions in adults,<sup>80</sup> and the review by



**FIGURE 4** Search dates of included systematic reviews – substance use disorders. Search start dates described as ‘from database inception’ are recorded in the figure as 1900. Galduroz 2020 is missing from the figure as full information on search dates was not reported.

Satogami et al. including studies of omega-3 supplementation in adults and children.<sup>81</sup> Sharp et al. focused on avoidant/restrictive intake disorder in children, and included multi-behaviour interventions.<sup>82</sup> The reviews by McMaster et al. and Satogami et al. reported mental health outcomes for one or more included studies,<sup>80,81</sup> while McMaster et al. and Sharp et al. reported dietary outcomes for one or more included studies.<sup>80,82</sup> The reviews by McMaster et al. and Satogami et al. reported mixed and non-significant findings respectively, with both concluding that further research is needed.<sup>80,81</sup> The review by Sharp et al. reported positive findings in favour of intensive, multidisciplinary intervention for children with avoidant/restrictive intake disorder.<sup>82</sup> All three reviews conducted a critical appraisal of included studies.

Three systematic reviews with a total of 20 dietary intervention studies in individuals with substance use disorders were included.<sup>26,83,84</sup> Two reviews were published in 2020<sup>83,84</sup> and one in 2021,<sup>26</sup> and all included studies with adult populations. Figure 4 depicts the search dates of the reviews. Two reviews focused on individuals with alcohol use disorder, with Galduroz et al. including studies of omega-3 supplementation,<sup>83</sup> and McLean et al. including any nutrition intervention.<sup>84</sup> Whatnall et al. focused on any nutrition intervention in adults with substance use disorders for illicit substances or illicit use of pharmaceutical substances.<sup>26</sup> All three reviews reported mental health outcomes for one or more included study, while only Whatnall et al. and McLean et al. reported dietary outcomes for one or more included studies.<sup>26,84</sup> The consistent conclusion across the three reviews was the lack of and/or limited range of dietary intervention studies, with Galduroz et al. including one study, and Whatnall et al. including five studies. While McLean

et al. included 14 studies, all but one was supplementation interventions and therefore limited in terms of other types of dietary intervention. All three reviews conducted a critical appraisal of included studies.

## 4 | DISCUSSION

This rapid review of systematic reviews identified 46 reviews addressing the effectiveness of dietary interventions for individuals with severe mental illness, depression and anxiety, eating disorders, or substance use disorder. The majority of reviews were published in the last 5 years, which is in line with the growing recognition of the role of dietary intervention in mental disorder treatment. There were a larger number of reviews and with more included studies in the areas of severe mental illness, and depression and anxiety. The majority of reviews in both these areas reported conclusions in support of the positive effects of dietary intervention in the treatment of the respective mental disorders. The number of reviews, and therefore breadth of evidence, was more limited in the areas of substance use disorder, and eating disorders.

This review identified a large amount of evidence of dietary intervention in the treatment of severe mental illness, and depression and anxiety, with the majority of reviews providing evidence to support dietary intervention for these mental disorders. In the case of severe mental illness, those dietary interventions found to be effective were nutrition education and behaviour change type interventions, many of which focused on weight loss or weight management and reported positive changes in weight-related outcomes. The use of the term positive to describe change in outcomes here is reflective of the terminology and intended outcomes of the included reviews and their included studies. However, it should also be noted that weight in the context of diet and mental health is complex, and a weight increase or decrease may reflect an improvement or decline in mental health dependent on an individual's mental disorder diagnoses and other characteristics of the individual, intervention and setting. For depression and anxiety, supplementation interventions were found to be effective, predominantly omega-3, and in most cases reporting positive changes in depressive symptoms. The present review found limited evidence of the use of dietary intervention in eating disorders and substance use disorders, despite the high and/or increasing prevalence of these disorders in the last decades.<sup>85,86</sup> Although the included reviews in the areas of eating disorders and substance use disorders reported lacking evidence and inconsistent outcomes, benefits of integrated approaches to treatment were also shown,

supporting previous calls for greater multidisciplinary collaboration in evidence-based management of not just these mental disorders, but mental disorders collectively.<sup>10,11,14,87</sup> When considering the breadth of evidence, it is important to factor in the types of interventions identified as well as the quantity of studies. With the exception of the severe mental illness review, there was consistency across other areas (i.e. depression and anxiety, substance use disorders, eating disorders) in that limited types of dietary interventions were identified.

The predominant type of dietary intervention studies identified and included within the systematic reviews differed by mental disorder diagnosis. Those interventions identified in the eating disorders and severe mental illness review areas were predominantly education and behaviour change interventions, where those identified in the substance use disorders, and depression and anxiety review areas were predominantly supplementation interventions. This highlights that a broader range of dietary interventions are needed, including more holistic dietary approaches that focus on addressing for example dietary patterns, diet quality and behaviour change, particularly in the areas of substance use disorders, and depression and anxiety. Consistently across reviews, dietary interventions were provided as an adjunctive treatment, however that is more so reflective of the inclusion criteria for the rapid review in that individuals within studies had to have a mental disorder diagnosis. If prevention interventions were also included then it is likely that more stand-alone dietary and/or lifestyle interventions might have been identified.<sup>88,89</sup>

Overall most reviews included studies of adult populations. Most reviews were limited to studies of adult populations, and those that were inclusive of studies in any age group identified mostly studies in adults. This suggests a greater focus on dietary intervention targeting adults with the mental disorders under study than children and adolescents. However, it might also be due to the fact that mental disorders more common in childhood, such as attention hyperactivity deficit disorder and behavioural conditions,<sup>90</sup> were not included in this set of reviews. Almost all reviews included studies with male and female participants. Three reviews within the area of depression and anxiety included only studies of female participants, however this was in accordance with a focus on either antenatal or perinatal depression.

This set of rapid reviews provides a much-needed overview of the research to date in terms of dietary interventions used in the treatment of severe mental illness, depression and anxiety, eating disorders, and substance use disorders. It is essential to guide future research and practice as to where the gaps are. Although a large amount of evidence (demonstrated by the number of

reviews identified) is available to synthesise in the areas of severe mental illness, and depression and anxiety, there are some noted limitations. This includes the ability to compare across studies due to their heterogeneity, the fact that three reviews in severe mental illness found no articles of relevance to include, and the predominance of supplementation interventions and the need therefore for further research of broader interventions (e.g. whole of diet or food-based interventions, and settings-based interventions). Future research should identify areas within the broad range of evidence identified here to conduct more focused systematic reviews and/or primary intervention studies to move the field forward in terms of identifying and implementing effective dietary intervention for individuals with a mental disorder diagnosis. For example, extending from the current review by considering each area or set of mental disorders within individual systematic reviews aiming to synthesise the possible effectiveness or efficacy of dietary interventions, or further specific types of dietary intervention approaches. Future research should synthesise the effectiveness of dietary approaches for both the prevention and treatment of mental disorders. Specifically, the focus should be on conducting studies that are powered to detect changes in both mental health outcomes and dietary outcomes as a result of evidence-based dietary interventions. This should also include comprehensive and validated assessment of dietary intakes of those with a mental disorder, particularly as this may assist in the early identification of those individuals who would benefit from a dietary intervention, for example those commencing medications where dietary intake may be affected.

The major strengths of this review are the use of a comprehensive search strategy and screening process, and adherence to the Cochrane review guidelines for rapid reviews<sup>41</sup> and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews Checklist.<sup>42</sup> Acknowledging the heterogeneity of the mental disorders considered in this review as well as that of the included reviews (e.g. in population groups, dietary intervention types), the broad overview of evidence that this review provides is a strength in terms of the need to document the current evidence and guide future research and practice regarding dietary interventions in mental health care, including for specific sub-populations. Limitations of this review should also be acknowledged. The included systematic reviews were only those published in English, which may have excluded some relevant evidence in other languages. This review included only those systematic reviews which included studies of treatment interventions for those with a mental disorder diagnosis. Therefore reviews of interventions aiming to prevent mental disorders or including

individuals without a mental disorder diagnosis were excluded as this was outside the scope. This also meant that reviews of interventions in mixed study participants (i.e. individuals with and without a mental disorder diagnosis) were excluded which may have excluded some relevant evidence, however to include these would have affected the specificity of the review findings. Reviews of dietary interventions using any experimental research design were included. While this is inclusive of some lower quality evidence rather than limiting to reviews of randomised controlled trials, it is important to include a broader range of study designs as it may not always be ethical or feasible to conduct a randomised controlled trial. For example it may not be ethical to include a control group depending on the mental disorder diagnoses of the individuals in the target population, the type of intervention being offered, or the setting. While the scoping review approach is appropriate for the aims of this review, a limitation of this approach is that data is extracted at the broad level, and with this being a review of reviews, the level of detail in data extraction is also dependent on that of the included reviews. For the purposes of the review, studies were grouped on the major mental disorder diagnosis. However, this does not reflect that in many instances an individual may have multiple mental disorders or other comorbidities as well as a mental disorder. When interpreting the findings of this review, it is important to note there is some overlap of included studies within the included systematic reviews, as demonstrated by the timeline bar graphs of review search dates. However, differences in review inclusion criteria should also be considered such as including only supplementation trials or trials of any nutrition intervention.

In terms of implications for practice, the large number of systematic reviews identified overall in this review, as well as the recency of these reviews, demonstrates a growing evidence base of dietary interventions for mental health. Dietitians should be aware of this growing evidence base, especially in relation to highly prevalent mental disorders. Future research and implementation of dietary interventions for individuals with mental disorders should utilise the expertise of dietitians practising in this area throughout the research process (e.g. dietary assessment, intervention development, participant recruitment, intervention delivery), to assist in moving the field forward. It is critical that these and future research findings are widely disseminated in advocacy efforts, to promote the role of dietitians in mental health care and strengthen calls to government regarding funding and access to dietitians in mental health care settings. Dietary intervention is an important component of the care and treatment that should be available to individuals living with mental disorders, in order to support their physical health as well as



mental health. Greater recognition of the role and importance of dietitians and dietary intervention, and funding to support this, is needed to further implement initiatives such as the National Mental Health Commission's Equally Well Consensus Statement 2016.<sup>91</sup> In addition, a recent report from New Zealand highlighted the large evidence-to-practice gap regarding the discrepancy between the growing number of individuals with mental ill health, and the low number of dietitians employed in mental health care and therefore available to support these individuals.<sup>92</sup> Dietitian involvement as part of the core multidisciplinary care team is essential in order to deliver lifestyle interventions for individuals with mental disorders as per recommendations for best practice.<sup>11,14,92</sup>

## AUTHOR CONTRIBUTIONS

All authors conceptualised the study design. TB, TR, ST, AF, DH, JS and MW conducted the article screening. TB, MW, ST, TR and AF conducted the data extraction. TB and MW drafted the initial manuscript. All authors contributed to the interpretation of results, critically reviewed the manuscript and approved the final version.

## CONFLICT OF INTEREST


All members of the research team are members of Dietitians Australia. Julia Schindlmayr is a staff member of Dietitians Australia. The authors have no other conflicts of interest to declare.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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