




Review Article

Impact of nutritional interventions on quality of life in schizophrenia spectrum disorders: a scoping review

Julia Tompkins¹, Francesco Piacenza² , Patrick Harrington², Kieran C. Murphy^{1,3}, Brian O'Donoghue^{1,4,5},
John P. Lyne^{1,2}  and Melanie Föcking¹ 

¹Department of Psychiatry, RCSI University of Medicine and Health Sciences, Dublin, Ireland, ²Health Service Executive, Newcastle Hospital, Wicklow, Ireland, ³Department of Psychiatry, Beaumont Hospital, Dublin, Ireland, ⁴University College Dublin, Dublin, Ireland and ⁵Centre for Youth Mental Health, University of Melbourne, Melbourne, Australia

Abstract

Objectives: Schizophrenia is a chronic condition that requires long-term management. Quality of life is an important outcome measure for individuals diagnosed with schizophrenia; it can be tracked over time allowing evaluation of whether interventions lead to sustainable improvements. Nutrition and dietary interventions are an underutilized treatment for tackling the metabolic consequences of mental illness, which is now recognized as having increased importance in the management of schizophrenia. This study examines the impact of nutrition and dietary interventions on quality of life outcomes for those with schizophrenia.

Methods: A systematic review of the literature was conducted, assessing the impact of nutritional interventions on quality of life outcomes in individuals with a diagnosis of schizophrenia.

Results: A total of 982 articles were screened, of which nine articles met the inclusion criteria. Quality of life measures varied across studies, which made comparison across studies challenging. Previous studies had relatively small sample sizes and did not have long follow-up durations. Some of the studies found that dietary interventions such as counselling, weight management programs, food diaries and nutritional education improved quality of life, whereas others did not detect any effect.

Conclusions: The review provides preliminary evidence that nutrition and dietary interventions may benefit quality of life among individuals with schizophrenia. There were however substantial limitations in studies highlighting the need for further research. The paper also highlights the need to standardize assessment tools for future quality-of-life research.

Keywords: Schizophrenia; psychosis; diet; nutrition; quality of life; weight loss; body mass index

(Received 14 March 2024; revised 30 November 2024; accepted 15 January 2025)

Introduction

Schizophrenia is a severe chronic mental health disorder characterized by delusions, hallucinations, thought disorder, and loss of functioning. Although symptoms may be debilitating, schizophrenia symptoms are often managed with a biopsychosocial approach including antipsychotic medication and psychosocial interventions (Jauhar *et al.*, 2022). Quality of life is recognized as an important outcome of psychotic illness with much research dedicated to this area in the last few decades (Renwick *et al.*, 2017).

Schizophrenia is also associated with a reduced lifespan; studies show that on average, people with schizophrenia have a reduced life expectancy of approximately 14.5 years (95% CI 11.2–17.8) compared to the general population (Galletly, 2017). Much of this

reduction in life expectancy can be accounted for by the cardiovascular disease risk associated with metabolic risk factors such as diabetes, obesity, hypercholesterolemia, and cigarette smoking (Gates *et al.*, 2015). Furthermore weight gain associated with schizophrenia can be influenced by several factors including antipsychotic medication (Allison *et al.*, 1999, Basson *et al.*, 2001), negative symptoms, increased consumption of calorie-dense foods, and increased genetic susceptibility (Gates *et al.*, 2015). All these physical health issues could contribute to a reduced quality of life in those with schizophrenia. Hence, it is plausible that targeting nutrition and diet could improve quality of life outcomes in people with schizophrenia; however, to our knowledge this has not been comprehensively reviewed.

This systematic review evaluates the current literature of the relationship between nutritional interventions and quality of life for patients with schizophrenia. The paper also discusses benefits of these interventions and highlights areas for improving further research. Prior to the review, we hypothesized that nutritional interventions can significantly improve quality of life in individuals with a diagnosis of schizophrenia.

Corresponding author: Melanie Föcking; Email: mfocking@rcsi.ie

Cite this article: Tompkins J, Piacenza F, Harrington P, Murphy KC, O'Donoghue B, Lyne JP, and Föcking M. Impact of nutritional interventions on quality of life in schizophrenia spectrum disorders: a scoping review. *Irish Journal of Psychological Medicine* <https://doi.org/10.1017/ipm.2025.3>

© The Author(s), 2025. Published by Cambridge University Press on behalf of College of Psychiatrists of Ireland. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

Methods

Inclusion and exclusion criteria

The study population for included studies consisted of individuals with a diagnosis of schizophrenia-spectrum disorder, including schizophrenia, schizophreniform disorder, and schizoaffective disorder or a psychotic disorder. Studies that had multiple diagnoses, including bipolar disorder, were excluded from the review. All studies for inclusion needed to implement a dietary intervention, such as cooking classes, psychoeducation on diet, or make recommendations for dietary intake. The study design needed to include both a pre- and post-measure of the intervention, or a control group comparison. Studies that contained an exercise intervention in addition to a dietary intervention were also included in the review. Included studies needed to report an outcome relating to quality of life, which was inclusive of both subjective and objective quality of life measures. Only studies published in a peer-reviewed journal in the English language and using human participants were included. Studies that lacked a diet or nutritional intervention were excluded, as they were not relevant in evaluating our proposed hypothesis for this review. Studies that only included a nutritional supplement intervention, such as the intake of vitamins, were also excluded from the review.

Search strategy

Systematic database searches were performed to find relevant trials. Studies were gathered for review using key nutritional, anthropometric, and psychiatric terminology from inception of databases up to December 2023. This search strategy was conducted on Medline, EMBASE, APA PsychINFO, CINAHL, and the Cochrane Library. The search terms used for Medline are outlined in Table 1, with more detailed information in relation to the other searches outlined in Supplementary Table 1. Additional scholarly systematic reviews and meta-analyses were manually searched to identify further studies.

Data extraction

Following the search strategy, the screening of relevant research articles consisted of two phases: a) an initial screening of the articles' titles and abstracts; b) a full-text review. (Fig. 1). Two reviewers working independently screened all titles and excluded duplications and studies not meeting inclusion criteria. The two reviewers then carried out an independent screen of the abstracts and made further exclusions. The results from the two reviewers were compared at a meeting inclusive of senior investigators. Discrepancies and disagreements were resolved through consensus discussion with the full research team.

Results

After removing duplicates, a total of 982 articles were screened and 21 articles were assessed for eligibility. Nine articles met the inclusion criteria and results were collated in a spreadsheet (Table 2). Supplementary Table 2 provides further information in relation to weight outcomes in the selected studies. As studies in this review used a wide variety of questionnaires to evaluate the quality of life, Supplementary Table 3 explains each survey used and details the specific parameters that were assessed.

When testing the effectiveness of an intervention, a variety of studies implemented a group approach. Five studies, namely Attux (Attux *et al.*, 2013), Centorrino (Centorrino *et al.*, 2006), Kwon (Kwon *et al.*, 2006), Melamed (Melamed *et al.*, 2008) and Sameby

Table 1. Search terms used for systematic literature search*

OVID medline all	
1 Diet .MP. OR exp Diet/ OR exp 'Diet, Food, and Nutrition'/ OR exp Cooking/ OR cooking.mp. OR nutrition.mp. OR culinary.mp. OR eating.ti,ab.	2123682
2 exp Schizophrenia/ OR schizophrenia.mp. OR psychosis.mp. OR Psychotic Disorders/	195398
3 exp 'Quality of Life'/ OR QoL.mp. OR wellbeing.mp. OR (well adj1 being).mp. OR exp Healthy Lifestyle/ OR health.ti,ab.	2278127
4 1 AND 2 AND 3	785
5 Limit to English and Human	611

*Figures outlined refer to articles shortlisted on Medline database (more detailed information is available in Supplementary Table 1).

(Sameby *et al.*, 2008), all include an evaluation of the effectiveness of group-based cognitive behavioral therapy focusing on nutritional education, identifying barriers to change and how to implement healthier choices into their routine. All these studies demonstrated a statistically significant improvement in weight or body mass index (BMI) with the intervention during the active study phase, however results for quality of life outcomes differed.

Attux *et al.*, reported no significant difference in quality of life (measured using WHO-QOL) after three months when comparing a lifestyle wellness group with a control group (Attux *et al.*, 2013). Similarly, Centorrino *et al.* found that the intervention did not provide a significant improvement in the quality of life for patients as measured using the Quality-of-Life-Questionnaire (QLS), and of note, this study had no control group (Centorrino *et al.*, 2006). Kwon *et al.*, using the WHO-QOL-BREF to measure quality of life found no significant impact using the intervention for psychological well-being, social relationships and the environment domain, or improvement in the physical health score (Kwon *et al.*, 2006). The study by Sameby *et al.*, reported an improved quality of life (measured using MANSAs) in six of the seven participants (86%) with an average increase of 10.7 points (please see Supplementary Table 3 for details of the scale), however this paper had a small sample size with no control group and did not report significance testing in relation to quality of life outcomes (Sameby *et al.*, 2008).

The study by Melamed *et al.*, implemented a nutritional education program for inpatients with schizophrenia, along with group based behavior therapy (18). A significant improvement ($p=0.04$) in quality of life (measured using Quality of Life Enjoyment and Satisfaction Questionnaire) was revealed in the study group (3.27 at baseline versus 3.62 at 3 months follow-up, please see Supplementary Table 3 for details of this scale) compared to the control group (3.4 at baseline versus 3.4 at three months follow-up (18).

The majority of studies identified through this review implemented an in-person intervention where participants were required to attend at different intervals to meet with their group or individual care provider (Attux *et al.*, 2013, Centorrino *et al.*, 2006, 27, Holt *et al.*, 2019, Jakobsen *et al.*, 2017, Kwon *et al.*, 2006, 18, Sameby *et al.*, 2008). One study delivered nutritional education via telephone-based classes consisting of eight telephone-delivered sessions focusing on goal setting, motivational interviewing, and cognitive behavioral strategies (Baker *et al.*, 2014). A resource booklet was posted to participants to guide them through their twice-weekly session, which included information on diet,

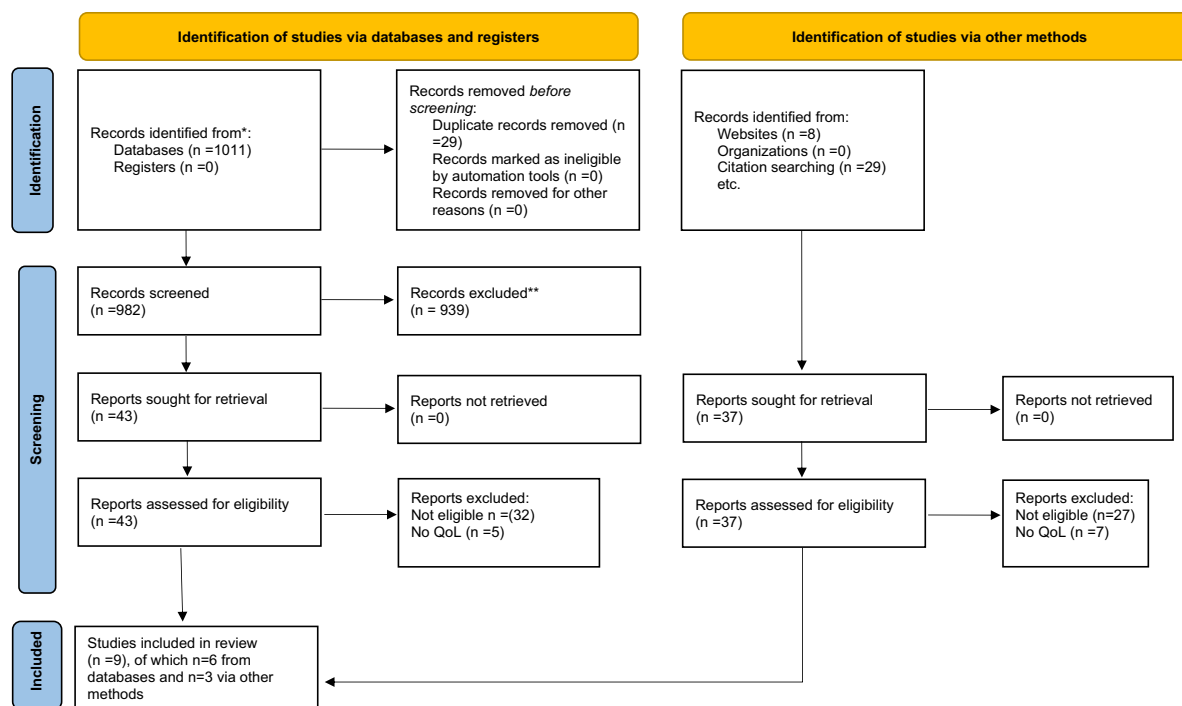


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources (Page et al., 2021), for more information, visit: <http://www.prisma-statement.org/>.

sedentary behavior, smoking and alcohol, and recommendations for behavior change. The quality of life score (measured using WHO-8 QoL scale, please see Supplementary Table 3 for details of the scale) improved significantly ($p = 0.017$) from 25.6 to 28.4 by the end of the 4-week trial, however there was no control group in this study limiting its interpretation. In addition to the improvement in quality of life, the daily fruit and vegetable consumption increased significantly together with a reduction in reported leisure screen time, reduction in number of cigarettes smoked per day and an increase in walking per day.

Two of the studies included in this review, Holt (Holt et al., 2019) and Jakobsen (Jakobsen et al., 2017) did not find a statistically significant difference in quality of life score, weight or BMI. Holt and colleagues tested a 12-month intervention consisting of four 2.5-hour weekly group behavioral therapy sessions, followed by 2-weekly maintenance contact and group sessions at four, seven, and 10 months (Holt et al., 2019). The study included patients with a BMI > 25 and focused on food as well as psychological processes underlying weight management and the challenges of living with psychosis and its impact on eating and weight. The study found no significant difference in quality of life (measured using RAND SF-36 and EQ-5D-5L) between the intervention and control group. There was a small but non-significant improvement in quality of life for the intervention group during the first 3 months, but the results were not maintained after 12 months. The study conducted by Jakobsen et al., evaluated the CHANGE intervention, a multifactorial training course consisting of lifestyle coaching and individual care coordination (Jakobsen et al., 2017). They aimed to motivate and support participants in finding realistic and attractive options for daily-life physical activity, healthy dietary choices (involving purchasing of food and cooking sessions), and smoking cessation. Participants received a personal meeting once per week by either a home visit, phone calls, text messages, or emails. The CHANGE

lifestyle coaching intervention lasted 12 months and had a two-year follow-up. There was no statistically significant difference found in any of the three groups on BMI ($p = 0.077$) or quality of life outcomes as measured using the MANSA ($p = 0.60$) (Jakobsen et al., 2017).

Hjorth and colleagues (27) implemented a combination of individual and group sessions focusing on physical health in combination with treatment as usual. They assessed how their intervention affected newly diagnosed patients compared to long-term patients with schizophrenia. The group sessions discussed topics such as physical health problems and how to improve physical health and risk factors for poor health in a variety of health conditions. Individual sessions focused on optimizing physical health by modifying diet and physical activity levels. The study found that the increase in quality of life (measured using WHOQoL-BREF 26) among newly diagnosed patients was statistically significant in the physiological domain ($p = 0.03$) of the questionnaire and was also significant in the quality of life total score ($p = 0.05$) (27). The quality of life score did not change among long-term patients in any of the questionnaire parameters including physical health, psychological health, social relationships, and environment.

Discussion

This study suggests a modest impact of nutritional interventions on quality of life in schizophrenia spectrum disorders in some of the studies, with no impact found in others. Among these studies, weight and BMI also improved significantly for some of the interventions. Of the nine studies that were included in this analysis, only two of the studies (27, Melamed et al., 2008) reported statistically significant improvement in overall quality of life between the intervention and control group. The studies by Baker et al., 2014, Centorrino et al., 2006 and Sameby et al., 2008 reported

Table 2. Gives a chronological list of all studies included in the review together with information on participants' number, country of origin, measures, study design used for quality of life determination and interventions undertaken

Authors, year, country	Participants	Study Design	QoL measuring tools	Quality of Life outcomes	Interventions	Findings
Centorrino (Centorrino <i>et al.</i> , 2006), USA	17 (10 F, 7M)	24 week program of diet, exercise and counseling	QLS Measured before and after	QLS revealed <u>no significant differences</u> from baseline to study endpoint in both groups	Intensive program of diet, exercise, and counseling followed by additional less intensive extension phase.	paired t-tests no significant differences from baseline to study end point.
Kwon (17), South Korea	48 (33F, 15M)	12-week randomized controlled clinical trial	WHO-QoL-BREF Measured before and after	Physical health: Score increase of 1.12 in the intervention group; -0.93 in the control group ($p = 0.067$) Psychological well-being, social relationship and environment domain groups showed <u>no significant difference</u> .	Weight management program. Control group.	t-test Trend toward statistical difference in the physical health score changes (1.12 in the intervention group vs. -0.93 in the control group, $p = 0.067$). For psychological well-being, social relationship, and environmental domain, the scores did not show a statistically significant difference between the intervention group and control group.
Melamed (Melamed <i>et al.</i> , 2008), Israel	59 (16F, 43M)	Multi-modal weight control; Intervention and control group	Q-LES-Q Measured before and after	<u>Significant improvement</u> in quality of life in the intervention group (3.27 @ baseline → 3.62 @ 3 months) compared to the control group (3.4 → 3.4 @ 3 months). <u>Statistically Significant ($p = 0.04$)</u>	Small group nutrition counseling + group-based behavior therapy + walk. Control group.	t-test $t(51) = 2.1; p = 0.04$
Sameby (Sameby <i>et al.</i> , 2008), Sweden	14 (no detail for F and M)	14 educational gatherings at an outpatient clinic	MANSA Measured before and after	Improved quality of life in 6 of the 7 patients (86%); improvement of +10.7 (+23, -1) <u>Statistical Significance not reported</u>	Cognitive and behavioral change methodology.	The score was higher at the end of the program in 6 of the 7 patients (86%), which suggested an improvement in experienced quality of life during the program, however there was no significance testing.
Attux (Attux <i>et al.</i> , 2013), Brazil	160 (64F, 96M)	6-month randomized controlled trial	WHOQOL-BREF QoL assessment Measured before and after	Increase in the psychological domain of the WHO-QoL quality of life scale; <u>not statistically significant</u> .	Group sessions + food assessment. Control group.	ANOVA Intervention vs. standard care Physical $p = 0.270$ Psychological $p = 0.736$ Social relations $p = 0.803$ Environmental $p = 0.489$ Intervention (baseline vs. follow up) Psychological $p = 0.014$
Baker (Baker <i>et al.</i> , 2014), Australia	17 (8F, 9M)	Feasibility trial of participants	WHO-8 QoL scale Measured before and after	Increase in Quality of life from 25.6 to 28.4 at the end of the 4 weeks (+2.8) No p-value available; Significance not clear	Telephone delivered sessions.	t-test scores (df, p-value) -2.67 (16, .017)
Hjorth (27), Denmark	190 (82F, 108M)	Naturalistic longitudinal 30-month follow-up study	WHO QoL-BREF 26 Measured before and after	The increase in QoL among newly diagnosed patients was <u>statistically significant</u> in the physiological domain ($p = 0.03$) No improvement in QoL in long term illness patients (56.67 at the start to 56.79 at follow up) Score of 57.92 in newly diagnosed and 56.79 in long term illness <u>minimal significant difference</u> in the overall QoL total score ($p = 0.05$) Statistically Significant	Individual and group sessions. Patients were free to attend, so number of sessions attended varied. Interventions were adjusted to individual patients and integrated into daily practice	t-tests, patients newly diagnosed with schizophrenia $p = 0.56$; patients with long-term schizophrenia $p = 0.970$

<p>Jakobsen (Jakobsen et al., 2017)</p>	<p>428 (240F, 188M)</p>	<p>24-month lifestyle coaching</p>	<p>MANSA Measured at baseline and at the two follow-up assessments</p>	<p>There were no statistically significant differences in quality of life identified in any of the three groups. ($p = 0.60$)</p>	<p>Lifestyle coaching plus care coordination. Care coordination alone. Control group.</p>	<p>Analyses were by the intention-to-treat principle. Linear mixed-model analysis with repeated measures and unstructured covariance matrix</p> <p>Mean \pm SD Change 4.8 ± 0.1 Care coordinator 4.9 ± 0.1 Treatment as usual 4.9 ± 0.1 P (group \times time) = 0.60</p>
<p>Holt et al., (2019), UK</p>	<p>412 (202F, 210 M)</p>	<p>Randomized controlled trial</p>	<p>RAND SF-36 and EQ-5D-5L Measured before and after</p>	<p>Self-reported quality of life were similar between groups, with minor improvement in QoL in the intervention group then the control group, but the results were statistically insignificant Slight increase in the QoL for the intervention group during the first 3 months, but the results were not maintained after 12 months. No significant difference</p>	<p>Group sessions. Control group.</p>	<p>sensitivity analysis based on intention to treat mean (s. d.) RAND SF-36 3 months follow up -0.3 (-3.4 to 2.8) EQ-5D-5L 3 months follow up 0.02 (-0.02 to 0.054) RAND SF-36 12 months follow up 2.2 (-1.3 to 5.6) EQ-5D-5L 12 months follow up -0.02 (-0.06 to 0.003)</p>

Abbreviations: F=female, M=male, QoL=Quality of Life, QLS, WHO=World Health Organization, WHOQOL-BREF= World Health Organization Quality of Life scale Brief Version, RAND=36-Item Health Survey including physical functioning, bodily pain, role limitations due to physical health problems, role limitations due to personal or emotional problems, emotional well-being, social functioning, energy/fatigue, and general health perceptions, MANSA= Manchester Short Assessment of Quality of Life questionnaire, Q-LES-Q= Quality of Life Enjoyment and Satisfaction Questionnaire, EQ-5D-5L= comprises five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression.

pre- and post- study findings, but these studies were limited by the lack of a control group. Eight of the studies additionally investigated change in weight and BMI as one of their outcomes, in which five studies (Attux et al., 2013, Centorrino et al., 2006, Kwon et al., 2006, Melamed et al., 2008, Sameby et al., 2008) reported statistically significant improvements. Overall, the studies suggest that interventions studied to date have at most a weak impact on quality of life, although the physical health benefits of nutritional interventions may still play an important role in delivering care.

People with serious mental illness are more likely to engage in unhealthy lifestyle practices, such as poor nutrition. However, best-practice models exist that provide the knowledge and tools to assist people with serious mental illness in making informed decisions about healthier lifestyle behaviors, including addressing tobacco use and excess weight (World Health Organisation (WHO), 2018). A challenge is how to integrate these practices effectively into routine behavioral health care (Ganguli et al., 2007, Vreeland et al., 2003, Pye et al., 2022). We believe there is a potential for greater impact and better quality of life in patients with an early dietary intervention, and the necessity of a multidisciplinary team getting involved at the outset of patient treatment has been acknowledged (see for instance Teasdale et al., 2020).

There were several limitations noted among the studies. Some of the studies had a small number of participants and a high patient dropout rate with poor compliance to the intervention. Larger studies from a wide variety of cohorts are needed to investigate this further and improve generalizability. Follow-up duration is a further limitation of the studies with very limited evidence related to the impact of nutrition and dietary interventions in the longer term. It is possible that intervention benefits are only short-term and further research is needed with longer-term follow up. To improve the quality of life for patients with schizophrenia it is important to consider methods, which deliver health improvements for the full duration of these conditions.

Another limitation in several of the studies was that the participants were selected based on their willingness and motivation to lose weight (Attux et al., 2013, Baker et al., 2014, Centorrino et al., 2006, Holt et al., 2019), which could have introduced bias to the studies as participants were already at the stage where they were ready to make changes. The studies fail to reflect how these interventions would affect individuals who are not at that stage of change yet or are experiencing significant mental health deterioration. Additionally, some studies provided participants with compensation prizes for their time, which could have introduced further bias (Baker et al., 2014). It may be worth examining those without an exercise component separately, as exercise could be a confounder for the impact on quality of life. However, due to the inclusion of studies that reported on nutritional interventions together with a measure on Quality of life, the number of eligible studies was relatively small and we were unable to investigate studies without exercise interventions separately. Strengths of this study include the review of a wide variety of diet and nutritional programs; the studies also applied the different diet programs in both inpatient and outpatient settings.

Clinical implications

When considering implementing a diet management program, it is essential to ensure the intervention can be feasibly delivered for the majority of the population. We suggest that a program that provides participants with the tools to carry out these new nutritional measures at home and at a low cost is likely to be most beneficial. Implementing

nutritious eating and weight management interventions during the first stages of antipsychotic medication could prevent weight gain during the most significant period (Cordes et al., 2014, Teasdale et al., 2017, Teasdale et al., 2020). This could have critical long-term effects, including weight reduction, reducing metabolic risk factors, and improving the quality of life in patients diagnosed with schizophrenia.

In conclusion, the review provides preliminary evidence that nutrition and dietary interventions may have a weak but positive impact on some aspects of quality of life in the short term. The review strongly highlights that currently it is still difficult to inform practice and further research is needed due to substantial limitations in current literature such as small sample sizes, short follow-up durations and the use of diverse quality of life measures (see Supplementary Table 3). Further research is needed to investigate the potential for nutritional interventions to impact on quality of life, as well as other physical health outcomes in schizophrenia spectrum disorders.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/ipm.2025.3>.

Financial support. This work did not receive any financial support.

Competing interests. The authors have no conflicts of interest to disclose.

Ethical standards. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as revised in 2008. The authors assert that this study did not require ethical approval.

References

- Allison DB, Mentore JL, Heo M, Chandler LP, Cappelleri JC, Infante MC, Weiden PJ (1999). Antipsychotic-induced weight gain: a comprehensive research synthesis. *American Journal of Psychiatry* **156**, 1686–1696.
- Attux C, Martini LC, Elks H, Tamai S, Freirias A, Camargo MGM, Mateus MD, Mari JJ, Reis AF, Bressan RA (2013). A 6-month randomized controlled trial to test the efficacy of a lifestyle intervention for weight gain management in schizophrenia. *BMC Psychiatry* **13**, 60.
- Baker AL, Turner A, Kelly PJ, Spring B, Callister R, Collins CE, Woodcock KL, Kay-Lambkin FJ, Devir H, Lewin TJ (2014). 'Better health choices' by telephone: a feasibility trial of improving diet and physical activity in people diagnosed with psychotic disorders. *Psychiatry Research* **220**, 63–70.
- Basson BR, Kinon BJ, Taylor CC, Szymanski KA, Gilmore JA, Tollefson GD (2001). Factors influencing acute weight change in patients with schizophrenia treated with olanzapine, haloperidol, or risperidone. *The Journal of Clinical Psychiatry* **62**, 231–238.
- Centorrino F, Wurtman JJ, Duca KA, Fellman VH, Fogarty KV, Berry JM, Guay DM, Romeling M, Kidwell J, Cincotta SL, Baldessarini RJ (2006). Weight loss in overweight patients maintained on atypical antipsychotic agents. *International Journal of Obesity* **30**, 1011–1016.
- Cordes J, Thünker J, Regenbrecht G, Zielasek J, Correll CU, Schmidt-Kraepelin C, Lange-Asschenfeldt C, Agelink MW, Kahl KG, Gaebel W, Klimke A, Hauner H (2014). Can an early weight management program (WMP) prevent olanzapine (OLZ)-induced disturbances in body weight, blood glucose and lipid metabolism? Twenty-four- and 48-week results from a 6-month randomized trial. *The World Journal of Biological Psychiatry* **15**, 229–241.
- Galletly CA (2017). Premature death in schizophrenia: bridging the gap. *The Lancet Psychiatry* **4**, 263–265.
- Ganguli R, Vreeland B, Newcomer JW (2007). Monitoring and managing weight gain in the mentally ill. *The Journal of Clinical Psychiatry* **68**, e14.
- Gates J, Killackey Eóin, Phillips L, Álvarez-Jiménez M (2015). Mental health starts with physical health: current status and future directions of non-pharmacological interventions to improve physical health in first-episode psychosis. *The Lancet Psychiatry* **2**, 726–742.
- Holt RIG, Gossage-Worrall R, Hind D, Bradburn MJ, McCrone P, Morris T et al. (2019). Structured lifestyle education for people with schizophrenia, schizoaffective disorder and first-episode psychosis (STEPWISE): randomised controlled trial. *The British Journal of Psychiatry* **214**, 63–73.
- Jakobsen AS, Speyer H, Nørgaard HCB, Karlsten M, Birk M, Hjorthøj C, Mors O, Krogh J, Gluud C, Pisinger C, Nordentoft M, van Wouwe JP (2017). Effect of lifestyle coaching versus care coordination versus treatment as usual in people with severe mental illness and overweight: two-years follow-up of the randomized CHANGE trial. *PLOS ONE* **12**, e0185881.
- Jauhar S, Johnstone M, Mckenna PJ (2022). Schizophrenia. *Lancet* **399**, 473–486.
- Kwon JS, Choi J-S, Bahk W-M, Yoon Kim C, Huang Kim C, Chul Shin Y, Park B-J, Geun Oh C (2006). Weight management program for treatment-emergent weight gain in olanzapine-treated patients with schizophrenia or schizoaffective disorder: a 12-week randomized controlled clinical trial. *The Journal of Clinical Psychiatry* **67**, 547–553.
- Melamed Y, Stein-Reisner O, Gelkopf M, Levi G, Sivan T, Ilievici G, Rosenberg R, Weizman A, Bleich A (2008). Multi-modal weight control intervention for people with persistent mental disorders. *Psychiatric Rehabilitation Journal* **31**, 194–200.
- Page MJ, Mckenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *The British Medical Journal* **372**, n71.
- Sameby B, Soderberg H, Hedstrom M (2008). Health improving measures for patients suffering from Psychosis. *Vård i Norden* **28**, 29–33.
- Teasdale SB, Ward PB, Rosenbaum S, Samaras K, Stubbs B (2017). Solving a weighty problem: systematic review and meta-analysis of nutrition interventions in severe mental illness. *British Journal of Psychiatry* **210**, 110–118.
- Vreeland B, Minsky S, Menza M, Rigassio Radler D, Roemheld-Hamm B, Stern R (2003). A program for managing weight gain associated with atypical antipsychotics. *Psychiatric Services* **54**, 1155–1157.
- Renwick L, Drennan J, Sheridan A, Owens L, Lyne J, O'Donoghue B, Kinsella A, Turner N, O'Callaghan E, Clarke M (2017). Subjective and objective quality of life at first presentation with psychosis. *Early Intervention in Psychiatry* **11**, 401–410.
- Hjorth P, Medici CR, Juel A, Madsen NJ, Vandborg K, Munk-Jørgensen P (2017). Improving quality of life and physical health in patients with schizophrenia: a 30-month program carried out in a real-life setting. *International Journal of Social Psychiatry* **63**, 287–296.
- Pye A, Bash K, Joiner A, Beenstock J (2022). Good for the planet and good for our health: the evidence for whole-food plant-based diets. *British Journal of Psychiatry International* **19**, 90–92.
- World Health Organisation (WHO) WHO; Geneva: 2018. *Management of Physical Health Conditions in Adults with Severe Mental Disorders: WHO Guidelines*. Licence: CC BY-NC-SA 3.0 IGO.
- Teasdale S, Mörkl S, Müller-Stierlin AS (2020). Nutritional psychiatry in the treatment of psychotic disorders: current hypotheses and research challenges. *Brain, Behavior, & Immunity - Health* **5**, 100070. doi:10.1016/j.bbih.2020.100070. PMID: 34589852; PMCID: PMC8474162.