**Implementing lifestyle interventions in mental healthcare: the third report from The Lancet Psychiatry Physical Health Commission.**

**Authors:** Scott B.Teasdale, PhD,a,b\*Katarzyna K. Machaczek, PhD,c Wolfgang Marx, PhD,d Melissa Eaton, MNutrDiet,e Justin Chapman, PhD,f,g Alyssa Milton, PhD,h,i Adawele L. Oyeyemi, PhD,j,k Dicky C. Pelupessy, PhD,l Felipe B. Schuch, PhD,m,n,o Grace Gatera,p Prof Helal Uddin Ahmed, MD,q Hervita Diatri, MD,r,s Ibrahim M. Jidda, BSc Nursing,t Prof Miguel Gutiérrez-Peláez, PhD,u Mohamed Elshazly, MD,v Muhammad Abba Fugu, MD,w Natalia Grinko, MDx Prof Pillaveetil Sathyadas Indu, MD,y San San Oo, MD,z Suhavana Balasubramanian, Cl.Psy.,aa Jeroen Deenik, PhD,ab,ac Prof Davy Vancampfort, PhD,ad,ae Prof Brendon Stubbs, PhD,af,ag Evan Matthews, PhD,ah,ai Prof Philip B. Ward, PhD,aj,ak Lamiece Hassan, PhD, al Prof Samuele Cortese, MD,am,an,ao,ap,aq Prof Simon Gilbody, DSc,ar Joseph Firth, PhD,al,as^ and Prof Simon Rosenbaum, PhD,a^ on behalf of the Lancet Psychiatry Physical Health Commission Consortium.

a Nutrition, Exercise and Social Equity (NExuS) Research Group, Discipline of Psychiatry and Mental Health, School of Clinical Medicine, University of New South Wales, Sydney, NSW, Australia.

b Mindgardens Neuroscience Network, Sydney, NSW, Australia.

c Centre for Applied Health and Social Care Research (CARe) and Advanced Wellbeing Research Centre (AWRC), Sheffield Hallam University, Sheffield, United Kingdom.

d Institute for Mental and Physical Health and Clinical Translation (IMPACT), Food & Mood Centre, School of Clinical Medicine, Deakin University, Barwon Health, Geelong, Victoria, Australia.

e School of Medical, Indigenous and Health Sciences, University of Wollongong, Wollongong, NSW, Australia.

f School of Pharmacy and Medical Science, Centre for Mental Health, Griffith University, Brisbane, Queensland, Australia.

g Addictions and Mental Health Service, Metro South Health, Brisbane, Queensland, Australia.

h Central Clinical School, Faculty of Medicine and Health, The University of Sydney, Sydney, NSW, Australia.

i Australian Research Council (ARC) Centre of Excellence for Children and Families over the Life Course, University of Queensland, Brisbane, Queensland, Australia.

j College of Health Solutions, Arizona State University, Phoenix, Arizona, USA.

k Department of Physiotherapy, College of Medical Sciences, University of Maiduguri, Maiduguri, Nigeria.

l Faculty of Psychology, Universitas Indonesia, Depok, Indonesia.

m Department of Sports Methods and Techniques, Federal University of Santa Maria, Santa Maria, Rio Grande do Sul, Brazil.

n Institute of Psychiatry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.

o Faculty of Health Sciences, Universidad Autónoma de Chile, Providencia, Chile.

p Partners in Health Rwanda/Inshuti Mu Buzima, Kigali, Rwanda.

q Child Adolescent and Family Psychiatry, National Institute of Mental Health (NIMH), Dhaka, Bangladesh.

r Department of Psychiatry, Faculty Medicine, Universitas Indonesia, Jakarta, Indonesia.

s Cipto Mangunkusumo National General Hospital, Jakarta, Indonesia

t Africa Mental Health Awareness and Care Initiative (AMHACI), Maiduguri, Nigeria.

u Center for Psychosocial Studies (CEPSS), Universidad del Rosario, Bogotá, Colombia.

v Mental Health and Psychosocial Support Consultant, Cairo, Egypt.

w Department of Mental Health, Federal Neuropsychiatric Hospital, Maiduguri, Borno State, Nigeria

x Department of Clinical Psychology, Ukrainian Catholic University, Lviv, Ukraine.

y Department of Community Medicine, Government Medical College, Kollam, Kerala, India.

z Aung Clinical Mental Health Initiative, Yangon, Myanmar.

aa AMAHA Healthcare, Mumbai, India.

ab GGz Centraal, Amersfoort, the Netherlands.

ac Mental Health and Neuroscience Research Institute, Maastricht University, Maastricht, the Netherlands.

ad Department of Rehabilitation Sciences, KU Leuven, Leuven, Belgium.

ae University Pscyhiatric Centre, KU Leuven, Kortenberg, Leuven, Belgium.

af Centre for Sports Science, University of Vienna, Austria.

ag Department of Psychological Medicine, Institute of Psychiatry, Psychology and Neuroscience, Kings College London, London, UK.

ah Faculty of Health Sciences, South East Technological University, Waterford, Ireland.

ai Centre for Health Behavior Research, South East Technological University, Waterford, Ireland.

aj Discipline of Psychiatry and Mental Health, School of Clinical Medicine, University of New South Wales, Sydney, NSW, Australia.

ak Schizophrenia Research Unit, South Western Sydney Local Health District and Ingham Institute of Applied Medical Research, Liverpool Hospital, Liverpool, NSW, Australia.

al Division of Psychology and Mental Health, The University of Manchester, Manchester Academic Health Science Centre, Manchester, UK.

am Centre for Innovation in Mental Health, School of Psychology, Faculty of Environmental and Life Scienes, University of Southhampton, Southhampton, UK.

an Clinical and Experimental Sciences (CNS and Psychiatry), Faculty of Medicine, University of Southampton, Southampton, UK.

ao Solent NHS Trust, Southampton, UK.

ap Hassenfeld Children’s Hospital at NYU Lagone, New York University Child Study Centre, New York City, New York, USA.

aq SiMePRe-J-Department of Precision and Rigenerative Medicine-Jonic Area, University of Bari “Aldo Moro”, Bari, Italy.

ar Mental Health and Addiction Research Group, Department of Health Sciences, University of York, York, UK.

as Greater Manchester Mental Health NHS Foundation Trust, Manchester Academic Health Science Centre, Manchester, UK.

^ equal senior authorship.

[**And The Lancet Psychiatry Physical Health Commission Consortium**](#LISTCONSORTIUM)  **(to be inserted as authorship consortium, as listed at end of this document)**

\* Corresponding author

Scott B. Teasdale

Level 3, AGSM Building, UNSW Sydney, Botany Rd, Kensington, NSW 2033, Australia.

[s.teasdale@unsw.edu.au](mailto:s.teasdale@unsw.edu.au)

**Running title:** Lifestyle interventions in mental healthcare.

**Key words:** Mental Disorders; Mental Health Services; Lifestyle; Exercise; Nutrition; Smoking.

**Executive Summary**

The physical health disparities experienced by people who live with mental illness are well documented. This population group experiences cardiometabolic risks and diseases at rates 1·4–2·0 times higher than people without mental illness, and physical health conditions are responsible for 70% of the deaths of those with severe mental illness. These physical health conditions are the major drivers of the 13–15-year reduction in life expectancy that is found in individuals with mental illness, compared with those without mental illness. The 2019 Lancet Psychiatry Commission on protecting the physical health of people with mental illness (henceforth referred to as the 2019 Commission) was a landmark document that brought these disparities into focus and provided guidance for health promotion, multiprofessional clinical care and future research. Lifestyle risk factors, such as high smoking rates, low physical activity, high levels of sedentary behaviour, low cardiorespiratory fitness, lower diet quality, detrimental eating behaviour, and poor sleep hygiene, are prevalent in this population.These lifestyle risk factors contribute to physical health comorbidities, preventable premature deaths and the development of mental health conditions. There is increasing evidence that lifestyle interventions that target these risk factors are effective adjunctive therapies in people living with mental illness, alleviating mental health symptoms while protecting physical health and promoting wellbeing. Given the established benefits of lifestyle interventions in mental health settings, there is a need to shift the focus from efficacy towards implementation research and address how best to implement and deliver lifestyle interventions as core clinical practice. The ‘how’ to implement them should include a recognition of the social and economic context in which behavioural risk factors emerge to ensure equity of outcomes.

Involving lived experience groups in developing recommendations is essential for ensuring that these recommendations are acceptable and effective. We, therefore, collaborated with two groups, one in the UK and one in Australia, consisting of eight and seven people, respectively. These groups included individuals living with mental illness and carers recruited through active Lived Experience Advisory Groups and Organisations. The process unfolded in two phases: the first gathered members’ views about the relevance, importance and consideration of the initial recommendations from the 2019 Commission, while the second focused on their perspectives regarding the relevance, importance and considerations for recommendations generated within this report. Further, a lived experience expert was included in the Global South Advisory Group (GSAG). The inclusion of those with lived experience shaped the recommendations for how to best implement lifestyle interventions in mental healthcare to address the needs of people with mental illness. The groups’ input is described below.

Additionally, this report was created in collaboration with colleagues from countries in the Global South. Despite efforts to increase the representation of authors from these countries, an unacceptable disparity in authorship remains within global health research. We established the GSAG to address this gap. The GSAG comprised 14 colleagues representing 10 conflict-affected and low-, middle-, and upper-middle-income regions, specifically Bangladesh, Colombia, Egypt, India, Indonesia, Myanmar, Nigeria, Rwanda, Ukraine and Brazil. The GSAG comprised seven psychiatrists, three psychologists, one psychiatric nurse educator, two physical activity epidemiologists/practitioners, and one lived experience expert (eight men, five women and one non-binary member). Synchronous and asynchronous meetings (due to time zones) were carried out as a prioritisation exercise to ensure applicability of the final recommendations to colleagues working in Global South contexts.

This extension to the 2019 Commission provides an in-depth examination of lifestyle interventions that can prevent and manage mental health conditions and multimorbidity. This report focuses on four key modifiable lifestyle pillars that are considered fundamental to lifestyle medicine: physical activity, nutrition, smoking cessation, and sleep, and that have been a focus of lifestyle interventions in mental healthcare.

Across five parts, this report explores what makes lifestyle interventions effective, and how to implement and deliver them in the context of mental healthcare. It aims to provide evidence-based recommendations that address the existing evidence-implementation gap.

Part 1. What has been the impact of the 2019 Commission on the field of lifestyle interventions in mental healthcare?

In Part 1, we examined the impact of the 2019 Commission through citation mapping. We analysed policy documents and journal articles related to lifestyle that cited the 2019 Commission. As of March 2024, the 2019 Commission had been cited in 17 policy documents, consensus/position statements and guidelines, and 319 journal articles that discussed lifestyle interventions. These articles predominantly focused on physical activity or a combination of lifestyle elements. Most (88%) citations had a lead author with a primary affiliation from a high-income country, and 92% of intervention papers were from high-income countries.

Part 2. What do lifestyle interventions currently look like?

In Part 2, we summarised 99 reports relevant to 89 unique interventions published since 2018 to investigate how recent lifestyle interventions are currently being conducted. In addition, we present six case studies of grassroots interventions covering physical activity, nutrition and smoking cessation across both inpatient and community/outpatient settings in the Global North and Global South.

Part 3. What are the effective components of lifestyle interventions in mental health care?

In Part 3, we present the findings of a review of meta-analyses of intervention studies. We examined meta-analyses of lifestyle interventions to understand which aspects or elements were more likely to generate beneficial effects on mental and physical health outcomes for people with mental illness. Through an examination of 18 meta-analyses, we generated eight recommendations. These recommendations were reviewed by the lived experience group, GSAG and broader authorship team and modified where appropriate.

Part 4. What are the barriers and enablers to the implementation of lifestyle interventions in mental health settings, and how should interventions be delivered to meet the needs of people who are living with mental illness?

In Part 4, we present a qualitative evidence synthesis summarising the key barriers to implementing and delivering lifestyle interventions within mental health care. We identify opportunities and 18 priorities for action at the system’s micro, meso, and macro levels to guide implementation and delivery efforts. Additionally, we present ways in which lifestyle interventions can be implemented and delivered to address the needs of people with mental illness. Each component was reviewed by the lived experience group, GSAG and broader authorship team and modified where appropriate.

Part 5. Recommendations for the implementation of lifestyle interventions in mental health settings

Part 5 offers practical recommendations, in the form of principles and actions, based on the evidence from Parts 3 and 4 of the report, and on the perspectives of individuals with lived experience and colleagues from Global South and conflict-affected contexts. These recommendations describe the evidence that supports the implementation and delivery of lifestyle interventions in mental health services.

**Considerations regarding the use of lifestyle interventions for people with eating disorders.**

Eating disorders are complex and can lead to significant detrimental (and potentially fatal) effects for those who experience them. Treatment typically requires collaborative input from a team of specialist clinicians across a continuum of care. Certain anthropometric and lifestyle messages within this report may be inappropriate or even harmful to those who live with eating disorders. The recommendations in this report are based on evidence from lifestyle interventions that were conducted among people with mental disorders such as schizophrenia spectrum, affective, anxiety, and stress-related disorders, and may not be appropriate for those with an eating disorder.

**Part 1. What was the Impact of the 2019 Lancet Commission in the Field of Lifestyle Interventions in Mental Health Care?**

*Introduction*

Since the publication of the report by the 2019 Lancet Psychiatry Commission on protecting the physical health of people with mental illness,1 significant steps were taken regarding the recognition, implementation and scaling-up of lifestyle interventions in mental healthcare. Key milestones have been the inclusion of the *Healthy Lifestyles Hub: Promotion of healthy lifestyles to improve mental health* in the World Psychiatric Association Action Plan 2023-2026,11 and the establishment of a lifestyle psychiatry special interest group within the American Psychiatric Association.12 These translational outcomes reflect the increasing evidence base that the 2019 Commission1 contributed to. As of March 2024, 17 unique policy documents, consensus/position statements and guidelines,and 319 journal articles, considering relevant lifestyle interventions, had cited the 2019 Commission report1 according to *PlumX Metrics* and *Scopus,* respectively. **Page 2** of the **online appendix,** presents details on sampling these documents.

*Policy documents, consensus/position statements and guidelines*

All 17 policy, consensus/position statements, and guidelines were published in English,13-29 with one document from the World Health Organization13 available in three additional languages.30-32 Four documents were from organisations with global/international foci.13-16 The remaining ten documents had a national or state focus: one each from England17 and Belgium,18 and eight from Australia.19-26 The three journal article position/consensus statements and guidelines had a broad geographic focus.27-29 The documents typically referenced the 2019 Commission1 to acknowledge disparities in life expectancy and physical health, and only a few cited it in the context of lifestyle interventions.

The Belgian Health Care Knowledge Centre extensively cited the 2019 Commission,1 emphasising the need for lifestyle assessment tools and guidelines, specialist clinicians to deliver lifestyle interventions (e.g., exercise professionals) and a collaborative care approach.18 Guidelines from the World Federation of Societies of Biological Psychiatry and Australasian Society of Lifestyle Medicine (2023) acknowledged the Commission’s potential dual benefit for improving depressive symptoms and physical health in patients with major depressive disorder.27 A report brokered by the Sax Institute for the NSW Ministry of Health (Australia) cited the Commission in the context of the inadequate support and care for the physical health of people living with mental illness.23 The report provided recommendations for implementing programs to improve the physical health of people who receive support from community-managed organisations (non-government, and not-for-profit organisations that offer mental health services within communities). These recommendations were: i) “Refer consumers to physical health care providers and services”; ii) “Support the integration of new models or initiatives with multi-strategy implementation components”; iii) “Undertake a comprehensive, systematic assessment of organisation-specific barriers and enablers and identify evidence-based solutions”; iv) “Involve mental health peer workers in the delivery and support of physical health interventions”; v) “Co-produce physical health care interventions with community managed organisation consumers and staff”; and vi) “Tailor existing evidence-based physical health care interventions for mental health community managed organisation consumers”.23 The list of policy documents, consensus/position statements and guidelines is presented in **Table 1**.

**Insert Table 1 here**

*Journal articles*

The majority of the 319 journal articles concentrated on multiple lifestyle elements (45%) or physical activity (38%). Smaller proportions were focused on nutrition (12%), smoking (2%), oral health (2%) and sleep (1%). Most articles were original data publications (67%), followed by review articles (23%), and editorials/perspectives (8%), with a small number of consensus/position statements/guidelines, books/book chapters and conference papers. Nearly all (98%) were published in English only. Twenty-four percent of articles had at least one affiliation from an upper-middle-income country, 2% had at least one affiliation from a lower-middle-income country, and 2% had at least one affiliation from a low-income country. Eighty-eight percent of the first authors’ primary affiliation was from a high-income country, 12% was from an upper-middle-income country, and one primary affiliation (<1%) was from a lower-middle-income country (**Figure 1**). Of the 52 articles describing an intervention, two were from upper-middle-income countries, and two were from a low-income country. No lead authors had a primary affiliation from a low-income country. More characteristics of the journal articles that cited the 2019 Commission and focused on lifestyle interventions are presented in the **online appendix pages 3-5**.

**Insert Figure 1a and 1b here**

**Part 2 What do Lifestyle Interventions in Mental Health Services currently look like?**

*Introduction*

We aimed to systematically scope articles describing lifestyle interventions published since the 2019 Commission,1 and to generate case studies for ongoing lifestyle initiatives in various contexts. Lifestyle interventions were included if they targeted people living with mental illness and focused on multiple modifiable lifestyle risk factors (e.g., physical activity, nutrition, smoking cessation and sleep), as well as those targeting a single modifiable lifestyle risk factor (e.g., solely physical activity). The search strategy is presented in **Panel 1**. Full details on the populations, interventions, comparisons and outcomes (PICOS), search strategies, study identification and synthesis approaches, PRISMA flowchart of study inclusion, and the study details for the 89 interventions (99 publications) are presented in the **online appendix pages 6-44.** The studies’ characteristics, implementation and delivery methods, attrition and adherence rates, and effectiveness details are also provided in a searchable table (<http://unsw.to/LifestylePsychiatry>).

|  |
| --- |
| **Panel 1. Search strategy to identify lifestyle interventions delivered in mental healthcare.**  **Databases:** MEDLINE, SCOPUS, PsychINFO and CINAHL.  **Search string:**(((schizo\*[Title] OR "mental illness"[Title] OR "mental disorder\*"[Title] OR psychiatr\*[Title/Abstract] OR depress\*[Title] OR bipolar[Title] OR anxiety[Title] OR substance abus\*[Title] OR ‘substance use’[Title] OR eating disorder\*[Title] OR psychosis[Title] OR psychotic[Title]) AND ("physical activity"[Title] OR exercis\*[Title] OR "resistance training"[Title] OR aerobic[Title] OR fitness[Title] OR diet\*[Title] OR nutrition[Title] OR "weight"[Title] OR sleep[Title] OR insomn\*[Title] OR smoking[Title] OR tobacco[Title] OR nicotine[Title] OR lifestyle\*[Title/Abstract])) AND (guideline[Title/Abstract] OR "meta-analys\*"[Title/Abstract] OR "systematic review\*"[Title/Abstract] OR metaan\*[Title/Abstract] OR Randomised[Title/Abstract] OR Randomized[Title/Abstract] OR Controlled[Title/Abstract] OR Intervention[Title/Abstract] OR trial[Title/Abstract])).  **Timeframe:**November 2018 to March 2024. |

In addition, convenience sampling was used to identify potential case studies of lifestyle initiatives that had been offered in mental health services. Case studies were written by practitioners, peer workers and researchers who were associated with the initiative using the (TIDieR) framework (**online appendix pages 45-60**).33 These submissions were then developed into implementation diagrams (**Figures 2a-2f**).

*Recently published lifestyle interventions in mental healthcare.*

*Study characteristics*

All but one of the interventions were conducted in high-income countries. Thirty interventions were from the USA (34%), eight from Spain (9%), eight from Australia (9%), and the remaining from the UK, Denmark, Sweden, Netherlands, Germany, Switzerland, Italy, and China. The median sample size was 152 participants. The duration of these interventions varied widely, with the most common being three months (20 studies), 12 months (15 studies), and both six months and two months (nine studies each).

*Intervention type*

The types of interventions explored in these studies varied. Fifty-seven interventions (64%) included physical activity as a key intervention component, often implemented through structured aerobic exercise programs. Thirty-seven interventions (42%) incorporated dietary interventions or included nutrition as part of a multicomponent approach. Smoking cessation was addressed in 34 interventions (38%). Sleep interventions, which targeted sleep hygiene or incorporated sleep as part of broader health initiatives, were included in 15 interventions (17%).

*Delivery*

Involvement of individuals with lived experience of mental illness in the design or development of the interventions was reported in only five interventions (6%), and peer-delivery methods were employed in five interventions (6%), predominantly in community settings. Forty-one interventions (46%) exclusively used individual sessions, 25 interventions (28%) used mixed delivery – combined individual and group sessions – and 21 interventions (24%) exclusively used group delivery. Thirty-seven interventions (42%) incorporated elements of flexible delivery (e.g., in-person, telehealth, and/or home visits). Most (72 interventions, 81%) included elements of self-management, and 43 interventions (48%) featured elements of self-monitoring. Fourteen interventions (16%) used healthcare technology, such as mobile apps or online platforms, to enhance engagement and accessibility. Expert clinicians were involved in the delivery of 20 interventions (22%), and 43 interventions (48%) reported providing supervision or training for those who delivered the interventions.

*Adherence, attrition and intervention fidelity*

Attrition, adherence, and fidelity data were reported inconsistently across interventions. Attrition rates were documented in 64 interventions (72%), with the most common level being low attrition (<20%), observed in 28 interventions (31%). Moderate attrition (20-40%) was reported in 11 interventions (12%), while high attrition (>40%) was observed in seven interventions (8%). Several interventions indicated mixed patterns, such as increasing attrition over time or differences between intervention and control groups.

Adherence was reported in 32 interventions (36%), with high adherence (>80%) noted in 16 interventions (18%), while low or moderate adherence was observed in six interventions (7%). Long-term post-intervention follow-ups often revealed substantial drops in adherence, suggesting strong initial adherence during the active study phase but challenges in maintaining participant engagement over time. Fidelity was reported in only four interventions (4%). The inadequate reporting on adherence to interventions and intervention fidelity emphasises the necessity for improved documentation in future trials of lifestyle interventions for people living with mental illness in accordance with reporting guidelines, such as the updated CONSORT 2025 statement.34

*Effectiveness*

The studies involved the assessment of a wide range of outcomes, including psychiatric, health behaviours, cognition, cardiometabolic, and cost-effectiveness outcomes. Psychiatric and quality of life outcomes were reported in 34 studies, with 29 studies (85%) demonstrating positive effects. Of the 26 studies that considered cardiometabolic outcomes, 15 (58%) demonstrated improvements. Other commonly reported outcomes included improvements in smoking cessation and alcohol use (20/25 studies, 80%), physical fitness and activity (19/23 studies, 83%), sleep (9/13 studies, 69%), and dietary knowledge and behaviour (9/9 studies, 100%). All three studies with cognitive outcomes reported favourable between-group effects.

*Cost-Effectiveness*

Six studies included an economic analysis, with five (83%) reporting favourable outcomes.35-40 Three studies conducted an economic analysis on smoking cessation interventions, with all three finding favourable outcomes.35-37 Healy et al. (2019)35 found that community-based smoking cessation services, which include pharmacological treatments, nicotine replacement therapy, and either group or individualised support, had an incremental cost per quality-adjusted life year gained from quit attempts. The costs associated with these more frequently provided interventions ranged from approximately £4,700 to £12,200. Additionally, the combination of medication with group-based behavioural support was estimated to offer better value for money than individual support. Li et al. (2020)36 assessed a community-based individual, in-person, smoking cessation program delivered by a smoking cessation practitioner. The programme offered 12 sessions for 30 minutes over 12 months and found that the mean total cost for the intervention group was £270 lower than usual care. Mattock et al. (2023)37 assessed two community-based smoking cessation programs, with both interventions deemed cost-effective from a UK healthcare perspective.

Two studies conducted an economic analysis on Mediterranean diet interventions for depression, both with favourable outcomes.38, 39 Chatterton et al. (2018)38 found that the SMILES trial, which included seven 60-minute sessions with a dietitian over a 3-month period, focusing on a modified Mediterranean diet for people with depression, compared to a social support control group (befriending), had, on average $856AU lower heath sector costs, and $2591AU lower societal costs. These differences were predominantly due to fewer visits to other health professionals and lower costs related to unpaid productivity. Segal et al. (2020)39 assessed the impact of a community-based, in-person, group Mediterranean diet intervention delivered by dietitians compared to a social group program. The group intervention was highly cost-effective when measured using the cost per Quality Adjusted Life Year (QALY) gained and the cost per resolved case of major depression, compared to the social programme.

The final study by Looijmans et al. (2020)40 assessed a community-based physical activity and nutrition program that included a web tool called ‘Traffic Light Method for Somatic Screening and Lifestyle’. Supported by nurses, participants in the intervention group utilised the tool to assess their lifestyle behaviours and develop a plan with specific lifestyle change goals. During biweekly care visits over 6 months, patients and nurses evaluated the patients’ progress towards achieving their goals. After this period, patients and nurses reassessed the lifestyle behaviours, updated the lifestyle plan, and continued to evaluate this revised plan for the next 6 months until the trial concluded. Patients in the control group received usual care. There was no between-group difference for anthropometric or metabolic syndrome Z-scores; therefore, the intervention was not cost-effective, considering the substantial budget over five years.40

Most of the interventions were conducted in high-income countries, which restricts the applicability of the findings, especially the cost-effectiveness data to low-income countries. Limited representation from the Global South in the evidence base creates a risk of geographical bias, potentially overlooking the unique challenges and resource constraints in those regions.

|  |
| --- |
| **Panel 2. A call to action on interventions to reduce sedentary behaviour.**  Sedentary behaviour, which involves any waking behaviour characterised by an energy expenditure ≤ 1·5 METs\* while in a sitting, reclining or lying posture, is an independent risk factor for poor physical health41 and mental health42 outcomes and should be considered a lifestyle element distinct from physical activity.43 A recent shift to 24-hour movement guidelines, such as those in Canada44 and Australia45, highlights the importance of interventions to specifically target sedentary behaviour, such as prompts to break up long periods of sitting, in addition to interventions that aim to increase physical activity levels.  Despite the increase in need for interventions to address sedentary behaviour, as reported in Ashdown-Franks review (2018),46 we were not able to identify any studies whose primary aim was to address sedentary behaviour in mental disorders. This is in-line with the systematic review of interventions to increase physical activity and reduce sedentary behaviour in people with severe mental illness by Peckham et al. (2023)47 which identified three studies having sedentary behaviour as an outcome, but not as a primary aim. |

\*One metabolic equivalent (MET) is defined as the quantity of oxygen utilised while sitting at rest, equating to 3.5 ml O2 per kg of body weight per minute.48

*Case studies.*

We included six real-world case studies in the report. These covered: i) different types of lifestyle interventions including physical activity, nutrition and smoking; ii) various environments including inpatient and community settings; and iii) interventions delivered in countries from both the Global North and Global South. Information from these case studies was used to inform the implementation and delivery example diagrams presented in **Figure 2a-2f**.

**Insert Figures 2a-2f here**

**Part 3. What are the Effective Components of Lifestyle Interventions?**

*Introduction*

The effectiveness of lifestyle interventions delivered to people who are engaged with mental health services has been demonstrated for aspects of both physical and mental health outcomes.5, 49-51 However, the variations in intervention methods and reported outcomes highlight the need to identify the most effective components of these interventions.

We conducted a scoping review across four databases (MEDLINE, SCOPUS, PsychINFO and CINAHL) to identify meta-analyses of both standalone (e.g., solely physical activity) and multi-component (e.g., physical activity, nutrition and smoking cessation) lifestyle interventions that have identified effective strategies to improve health outcomes through primary or subgroup analysis or meta-regression. The search strategy is presented in **Panel 3**. Full details on the search strategy, study identification and purposive sampling, PRISMA flowchart of study inclusion, details on the 18 included meta-analyses,52-69 and study quality scores are presented in **online appendix pages 61-86.** We extracted data on the effectiveness of interventions and examined effectiveness data within seven predefined intervention components.70 These were: Theoretical basis, Behaviour change techniques, Mode of delivery, Intervention provider, Intensity, Characteristics of the target population, and Setting. We extracted data as number of studies (*k*) and measures of effect, such as hedges-g (*g*), point estimate (*PE*) and weighted mean difference (*WMD*).

|  |
| --- |
| **Panel 3. Search strategy to identify meta-analyses of lifestyle interventions in mental healthcare.**  **Databases:** MEDLINE, SCOPUS, PsychINFO and CINAHL.  **MEDLINE Search string:**(schizo\* OR "mental illness" OR "mental disorder\*" OR psychiatr\* OR depress\* OR bipolar OR anxiety OR "substance abus\*" OR "‘substance use’" OR "eating disorder\*" OR psychosis OR psychotic).ti,ab AND ("physical activity" OR exercis\* OR "resistance training" OR aerobic OR fitness OR diet\* OR nutrition OR "weight" OR sleep OR insomn\* OR smoking OR tobacco OR nicotine OR lifestyle\*).ti,ab AND (intervention OR service OR program\* OR modification).ti.ab AND (“meta-analysis” OR “meta-analyses” OR “metaanalysis” OR “meta regression” OR “pooled effect”).ti.ab  **Timeframe:**November 2018 to May 2024. |

Sixteen meta-analyses explored nutrition and physical activity interventions (physical activity-specific, *k*=10; multiple lifestyle elements, *k*=5; nutrition specific, *k*=1)52-67. In the two remaining meta-analyses, the effectiveness of sleep deprivation on depression was assessed.68, 69 No meta-analyses were identified in which effective components of smoking cessation interventions were assessed. A set of evidence-based statements for the delivery of interventions was generated. The lived experience group reviewed these recommendations and modified them where appropriate. These are presented in **Panel 4**.

*Effective Components of Lifestyle Interventions*

Theoretical basis – theory of behaviour change.

Regarding exercise interventions, Romain et al. (2020) found that interventions grounded in motivational theory (e.g., self-determination theory, social cognitive theory, self-efficacy theory, transtheoretical model) were effective in increasing physical activity (*k*=8, *g*=0·27), reducing weight (*k*=10, WMD=-1·87kg), body mass index (*k*=11, *WMD*=-0·82kg/m2), waist circumference (*k*=9, *WMD*=-1·91cm), and fasting glucose (*k*=7, *g*=-0·17).64 Interventions grounded in only one theoretical model of motivation had larger effect sizes for physical activity (*k*=6, *g*=0·34, vs *k*=2, *g*=0·10) and weight (*k*=5, *WMD*=-2·51kg, vs *k*=5, *WMD*=1·72kg), compared to interventions based on multiple motivational theories.64

Behaviour change techniques

Romain et al. (2020) found that exercise interventions that included goal and planning components of behaviour change techniques had a small “borderline effect” (*k*=6, *g*=0·29), whereas those that involved other domains of behaviour change techniques did not have an effect. In fact, the interventions had a greater effect on physical activity in studies that did not include the social-support (k=6, g=0·26) and shaping-knowledge (*k*=4, *g*=0·45) domains of behaviour change techniques compared with those that did.64 Vancampfort et al. (2021) found that fewer participants dropped out of exercise interventions that used autonomous motivation strategies (self-determined, consistent with participants’ intrinsic goals) compared to not using autonomous motivation strategies (*k*=7, 7·2% vs *k*=9, 30·4%), and with those that did not employ controlled motivational strategies (non-self-determined, external reasons e.g., perceived approval) compared to studies that did use controlled motivation strategies (*k*=12, 12·2% vs *k*=4, 26·5%).67

Mode of delivery

Analyses comparing individual and group delivery found a mixed and sometimes conflicting effects on physical and possibly mental health, though there may be unique benefits when including both. Fernández-Abascal et al. (2021) found that lifestyle interventions that included individual or group components had similar effects on standard anthropometric and metabolic biochemical levels; however, the group-based approaches showed large effects on BMI (*k*=18, *g*=-1·02) while individual interventions had a small effect (*k*=6, *g*=-0·43).54 Mucheru et al. (2019) found that lifestyle interventions that offered personalization and consistent progress reviews (i.e., structured approach) had larger effects on body weight (*k*=4, *ES*=-5·36). In contrast, the effect of non-structured approaches did not have a significant effect (*k*=8, *ES*=0·39).60 Speyer et al. (2019) found that lifestyle interventions delivered as individual sessions had the largest effect on BMI (*k*=10, *PE*=-1·28kg/m2), followed by combined group and individual approaches (*k*=15, *PE*=-0·43kg/m2).65 For exercise-specific interventions, findings were mixed; both individual and group sessions conferred benefit.52, 58, 59 For nutrition-specific interventions, individual sessions effectively reduced BMI (*k*=3, *SMD*=-0·30). In contrast, there was no overall effect when including individual, group and mixed dietary interventions (*k*=10, *SMD*=-0·11).63 Mental health services should offer interventions that are both individual (e.g., education, behaviour change/health coaching, and personalised exercise/nutrition programs) and group-based (sports/exercise and cooking/nutrition education groups), which can cater for heterogeneous presentations in terms of age, gender, illness severity and readiness/motivation to change.

Fernández-Abascal et al. (2021) found that combined exercise and psychotherapy interventions were most effective in terms of anthropometric measures (e.g., BMI *k*=3, *g*=-2·75) followed by exercise-based therapy (e.g., BMI *k*=7, *g*=-0·91), whereas effects on metabolic biochemistry and psychiatric measures were less clear.54 Speyer et al. (2019) found that both diet interventions (*k*=10, *PE*=-1·3kg/m2) and exercise interventions (*k*=5, *PE*=-1·13kg/m2) had large effects on BMI, though, combined interventions had a small-moderate effect (*k*=32, *PE*=-0·51kg/m2).65 The outcomes varied depending on the type of exercise. 54-58, 62 These findings suggested that different types of exercise conferred different benefits and that programs should be guided by participant preference.

Vancampfort et al. (2021) identified that dropout rates for people with anxiety and related disorders were lowest in interventions that offered mixed exercise modalities (*k*=3, 4%), compared with those which employed strength training (*k*=2, 16%) and aerobic exercise (*k*=8, 20%); the highest dropout rates were from mind-body exercise interventions (*k*=3, 26%).67 Speyer et al. (2019) found that interventions where participants engaged in exercise (e.g., group walking program) had a larger, although non-significant, between-group effect on BMI (*PE*=-0·75kg/m2) compared with counselling or coaching (*PE*=-0·46kg/m2).65 Interestingly, Pape et al. (2022) found that skills training to improve diet (e.g., cooking skills and buying groceries) did not affect quality of life (*k*=4, *g*=-0·11).61

Intervention provider

Integrating specialist practitioners, such as exercise physiologist/physiotherapists and dietitians/clinical nutritionists, with nationally and/or internationally recognised qualifications into the delivery of lifestyle interventions increased intervention effectiveness for multiple outcomes. For example, Rocks et al. (2022) found that nutrition interventions delivered by dietitians had significant effects on body weight (*k*=5, *SMD*=-0·28). In contrast, there was no overall effect when including both dietitian and non-dietitian delivered studies (*k*=10, *SMD*=-0·11).63 Lederman et al. (2019) reported that exercise interventions that were supervised by qualified exercise professionals had considerably larger effects on sleep quality (*k*=6, *g*=1·00) compared to those delivered by less qualified supervisors (*k*=2, *g*=0·16).59 Further, dropout rates from exercise interventions were lower when they were delivered by qualified exercise experts (*k*=7, 7% vs *k*=9, 26%).67 There was also notable consistency in terms of larger effects (*k*=40, *SMD*=-1·03 vs *k*=6, *SMD*=-0·45),57 and fewer dropouts (*k*=9, 13% vs *k*=7, 18%),67 from supervised exercise sessions compared to unsupervised ones. In the absence of specialist practitioners, it was found that delivery–such as exercise supervision–by mental health clinicians and peer workers with additional support, supervision and training, might be effective (*k*=14, *SMD*=-1·28 for depressive symptoms).57 For example, Coles et al. (2022) found that peer-facilitated interventions improved physical activity levels (*k*=6, *SMD*=0·19).53 This is critical for lower resource settings, such as the Global South and conflict affected areas where ‘task shifting’– transferring specific tasks from highly qualified health workers to health workers with less training and fewer qualifications71–can help address workforce shortfalls making interventions more feasible and sustainable.

Intensity

Most of the analyses on intensity and frequency analyses pertained to exercise interventions. Pape et al. (2022) found that interventions that included mainly structured, high-intensity physical activity had a large effect on quality of life (*k*=5, *g*=0·92), and noted that higher rates of attendance in lifestyle interventions had a larger effect on quality of life (*k*=8, *g*=0·46) than lower attendance rates (*k*=8, *g*=-0·02).61 Chen et al. (2024) explored the elements of ‘precision exercise’ in adolescents with depression.52 There were three key findings: (i) exercising three times (*k*=7, *SMD*=-0·84) or four or five times (*k*=4, *SMD*=-0·63) per week rather than once or twice (*k*=1, *SMD*=-0·14); (ii) having sessions of 45-50mins (peak) (*k*=4, *SMD*=-0·93) or 60-75mins (*k*=3, *SMD*=-0·65) rather than 30-40mins (*k*=4, *SMD*=-0·47); were more effective; and (iii) the varying exercise intensities had similar effects.52 In other studies that explored intervention intensities, moderate-vigorous aerobic exercise and high-intensity interval training, and having at least three sessions per week, had larger effects on various outcomes than lower intensity and fewer sessions.54-58, 61, 62, 66 However, Vancampfort et al. (2021) found that dropout rates were similar across intensity levels, but lower for interventions that comprised sessions of shorter duration (16-mins *k*=2, 5%; 30-mins *k*=4, 16%; 60-mins *k*=2, 20%; 90-mins *k*=3, 14%).67 Physical activity interventions should balance the established benefits of higher intensity and frequency with the need for individualised approaches, starting at manageable levels and gradually increasing over time.

Exercise interventions of short duration (≤10 weeks) seemed to have greater impacts on mental health outcomes. Meta-analyses of exercise interventions offered to people with depression,52, 57 alcohol use disorder,56 and severe mental illness,66 found that programs of shorter duration (≤10 weeks) were more effective for various mental health outcomes, quality of life and self-efficacy. The impact of the length of lifestyle interventions on physical health was unclear. Speyer et al. (2019) found that the length of lifestyle interventions did not influence the effect on BMI.65 Lifestyle interventions likely require time to facilitate long-term changes in behaviours and, subsequently, on physical health outcomes. Although intensive interventions tend to have set timelines, ongoing support is necessary to sustain these changes.

Characteristics of the target population

Lifestyle interventions are beneficial in the early stages of illness and for established and persistent illness. Interventions that target the early stages of illness present a critical opportunity to prevent the deterioration of physical health. Speyer et al. (2019) found similar effect sizes for lifestyle interventions on BMI by stage of illness (*k*=8, *PE*=-0·56kg/m2 for prevention studies; *k*=32, *PE*=-0·64kg/m2 for intervention studies).65 Fernandez-Abascal et al. (2021) found large effects for lifestyle intervention on body mass index (BMI) and blood glucose during early psychosis (*k*=2, *g*=-3·66 for BMI and *k*=1, *g*=-1·63 for glucose).54 For other outcomes, there were large effects of lifestyle intervention on the Positive and Negative Syndrome Scale (PANSS) for schizophrenia (*k*=13, *g*=-0·79), medium effect in first-episode psychosis (*k*=3, *g*=-0·55), and small non-significant effect in SSD (*k*=5, *g*=-0·27).54 There was a large effect on negative symptoms in first-episode psychosis (*k*=3, *g*=-1·00), a moderate effect in schizophrenia (*k*=19, *g*=-0·52), and a small non-significant effect in SSD (k=3, g=-0·17).54 Korman et al. (2020) found a large effect of exercise intervention on global functioning in participants with early psychosis (*k*=2, *g*=0·80) and a small-to-moderate effect in persistent schizophrenia (*k*=15, *g*=0·36).58 Lifestyle interventions should be offered to all people who are engaged with mental health services, and not solely for the treatment of chronic physical health conditions.

Setting

There are benefits to providing lifestyle interventions in both inpatient and outpatient/community settings. A comparison of all meta-analyses that examined effects by setting showed mixed findings, but overall they were found to have beneficial outcomes across each treatment setting.54, 55, 59, 62, 65-67 For example, Fernández-Abascal et al. (2021) explored the impact of multiple lifestyle intervention elements for people with serious mental illness according to setting. The authors found no clear differences in effect for standard anthropometric or metabolic biochemistry measures apart from waist circumference which was larger in an inpatient setting (*k*=3, *g*=-0·69) compared to an outpatient setting (*k*=10, *g*=-0·09).54 In reality, people who receive support from mental health services should be offered interventions across all treatment settings, in order to support their overall health including physical health. Access to a gym or clinic-based exercise facility is important for both outpatient/community and inpatient services, given the potential for larger effects,62 with home-based regimens potentially able to complement onsite facilities.

|  |
| --- |
| **Panel 4. Evidence-based recommendations from meta-research.**   1. **Ground exercise interventions in one motivational theory.** Include each component of the theoretical model, **aim to foster autonomous intrinsic motivation**, and avoid using controlled motivational strategies. 2. Offer both **individual and group-based interventions** that can cater to heterogeneous presentations in terms of age, gender, illness severity, readiness, and motivation to change. 3. Ideally, **a range of intervention approaches should be offered** that consider individual needs and preferences to improve adherence and reduce dropout rates. 4. **Integrate** **health coaching, behaviour change techniques, and the foundational principles of motivational interviewing**. This can be delivered by upskilled exercise and nutrition practitioners, peer workers or other healthcare workers. 5. **Integrate exercise and nutrition specialists (with nationally and/or internationally recognised qualifications) into mental health services** to increase effectiveness of lifestyle interventions, and reduce dropout rates. These professionals should receive additional training in mental health. In the absence of specialists, delivery by mental health clinicians and peer workers with additional support, supervision, and training, may be effective. 6. **Start exercise interventions at a manageable level. Focus on addressing barriers, consider open goals,**⧺ **and progress intensity and frequency over time**, ideally aiming for three or more times per week, and supervised where possible. 7. Lifestyle interventions **should be prevention-focused and offered to everyone engaged with mental health services.** Given the systemic health benefits, implementing these interventions early in the illness presents a crucial opportunity to prevent the deterioration of physical and mental health. Those with an eating disorder should be offered specialist eating disorder treatment. 8. Offer lifestyle interventions in both **inpatient and outpatient/community settings**. |

Additional recommendation content added by the authorship team is marked with a double plus sign (⧺) and based on work by Swann et al. (2023).72 ‘Open goals’ refer to non-specific, exploratory goals that are often phrased ‘See how well I can do…’.

**Part 4. What are the Barriers and Enablers to the Implementation and Delivery of Lifestyle Interventions in Mental Health Services?**

*Introduction*

Lifestyle interventions that are delivered in mental healthcare settings for people who live with mental illness are shaped by their intricate interactions with the rapidly changing contexts in which they are implemented and delivered, as well as the complexity of their multi-component structures.73 This suggests that they should be seen as isolated events but as dynamic components within the system that embraces the people involved, relevant policies and practices, and the underlying interactions (e.g. patterns, processes) among these various components .73, 74 This section presents the findings of a qualitative synthesis of evidence of the factors that affect the implementation and delivery of lifestyle interventions in healthcare settings for people with mental illness. The search strategy is presented in **Panel 5**. Full details of the methodology and results are presented in **online appendix pages 87-136**.

|  |
| --- |
| **Panel 5. Search strategy to identify factors that affect the implementation and delivery of lifestyle interventions in mental healthcare.**  **Databases:** MEDLINE, SCOPUS, PsychINFO and CINAHL.  **MEDLINE Search string:**(schizo\* OR "mental illness" OR "mental disorder\*" OR psychiatr\* OR depress\* OR bipolar OR anxiety OR "substance abus\*" OR "‘substance use’" OR "eating disorder\*" OR psychosis OR psychotic).ti,ab AND ("physical activity" OR exercis\* OR "resistance training" OR aerobic OR fitness OR diet\* OR nutrition OR "weight" OR sleep OR insomn\* OR smoking OR tobacco OR nicotine OR lifestyle\*).ti,ab AND (((“semi-structured” OR semistructured or unstructured OR informal OR “in-depth” OR indepth OR “face-to-face” OR structured or guide) adj3 (interview\* OR discussion\* OR questionnaire\*))).ti,ab. OR (focus group\* OR qualitative OR ethnograph\* OR fieldwork OR “field work” OR “keyinformant”).ti,ab.  **Timeframe:**November 2018 to April 2024. |

We created two initial conceptual frameworks of the *a-priori* themes corresponding to various system levels (*macro*, *meso* and *micro*). One framework was for data that reflected providers’ perspectives, and the other was for data that described the experiences and needs of people living with mental illness. We mapped the study data to various levels of the system to generate relevant themes. We used distinct definitions for the levels of the system concerning providers and participants. **Table 2** provides definitions and examples of the levels of the system from the perspective of both providers and participants. More detailed descriptions of these different levels of the system are presented in the **online appendix pages 89-90**. We extracted and synthesised data on *how* lifestyle interventions should be delivered from the perspective of intervention participants. We also developed a tailored, best-fit framework from established theories/implementation and evaluation frameworks (**online appendix pages 113-114**). We used this tailored, best fit framework to synthesise data from studies focused on implementing lifestyle interventions in mental healthcare settings.

**Insert Table 2 here.**

*Barriers to Implementation and Delivery*

Macro-level barriers

Provider-related barriers at the health systemlevel included inadequate reimbursement mechanisms,77, 78 impractical clinical guidelines,79 and the challenges associated with delivering interventions in rural and low resource settings.80 Additionally, no studies specifically addressed macro-level barriers from the perspective of participants.

Meso-level barriers

The most reported provider-related obstacles were a lack of resources,77-94 including time,78, 80, 81, 83-85, 89-91 money,79-81, 84, 88, 91 infrastructure, equipment,79-81, 86, 88 and training;79, 85, 87, 88, 91, 95 unclear roles and responsibilities;79, 96 and relative or competing priorities.77, 78, 83, 84, 89, 90, 94, 95 The latter included priority being afforded to conventional therapies such as pharmacotherapy.77, 80, 81, 84, 89, 90, 95, 97

There were several participant-related barriers. One was insufficient support for participants to engage in activities (long-term in particular).85, 94, 98 This issue stemmed, for example, from the discontinuation of interventions or changes in staff that reduced group cohesiveness, mental health stigma and ‘competing’ social norms (e.g., using smoking as a means to socialise).79, 80, 82, 88, 99, 100

Micro-level barriers

A lack of engagement of practitioners to deliver the interventions emerged as an important (and most frequently reported) barrier at the *frontline team* level.83, 84, 88, 90, 100 This lack of engagement was attributed to some practitioners’ scepticism regarding patients’ abilities (e.g., to understand interventions or to engage meaningfully with them)81, 83, 85, 89, 90, 92, 95, 96 and/or scepticism regarding participants’ motivation or interest to participate88, 89, 96 due to, for example, staff perceptions that those who live with mental illness are difficult to support.95 It was also attributed to some practitioners’ lack of awareness and knowledge of the value of lifestyle interventions.77, 80, 84, 97

The most commonly reported participant-related barriers at the micro-level that affected participants’ ability to engage in lifestyle interventions were the nature of mental health conditions (low mood, social anxiety, side effects of medication, cognitive difficulties),79, 82, 83, 85, 86, 88, 90, 96-99, 101-105 psychosocial factors (such as low confidence, poor body image and lack of drive),82, 83, 96, 98, 99, 102, 103 and financial constraints.79, 80, 82, 85, 86, 88, 103-106 Other frequently reported barriers at this level included, for example, not achieving sought intervention outcomes, which triggered feelings of failure;83, 85, 106 lack of transport (e.g., to get to the exercise venues);88, 102-104 or being unable to acquire appropriate clothing.80, 103 For the complete list of barriers that were identified in the studies, please see **online appendix pages 115-118**.

*Implementation Process*

Studies that explore implementation do not reflect the proliferation of lifestyle interventions for people with mental illness that are delivered via mental healthcare services. The examination of implementation processes intended to facilitate the scaling-up of lifestyle interventions within mental healthcare settings is lacklustre. Few studies have been conducted in this area, and few were high-quality studies. More efforts to examine implementation, including thorough examinations of the implementation processes, are urgently required.

Of the studies sampled, 23 (58.9%) specifically focused on the implementation of lifestyle interventions.77, 78, 80-85, 87-90, 92, 93, 96-98, 102, 103, 107-110 In five of these 23 studies, the implementation process was defined and described, differentiating it from the intervention itself.77, 82, 93, 96, 102 Additionally, 11 of the 23 studies described the theoretical frameworks that underpinned the implementation processes.77, 82-84, 88, 93, 96, 102, 108-110 However, few researchers reported the stages of their chosen implementation process or mapped the flows of resources, chains of responsibility (either individual or institutional), or transmission points for intervention recipients, such as the transition from one level of a multi-component intervention to another.77, 82, 96

The studies reported various implementation outcomes (see **online appendix** **page 120** for the most frequently reported outcomes). In seven studies, evaluators considered which outcomes mattered to which stakeholders and why.77, 80, 81, 84, 89, 90, 96 Details were provided on the implementation strategies that had been used in ten studies,77, 78, 81-84, 88, 93, 96, 103 and descriptions of which strategies were thought to be effective were described in eight of these ten studies.77, 81, 82, 84, 88, 93, 96, 103 This information was synthesised for this report and informed the development of actionable recommendations, as described in Section 4.4 below.

*Priorities for Action by Providers at each Level of the System.*

This section offers actionable recommendations for providers to facilitate the implementation, adoption, and scaling-up of lifestyle interventions. The comprehensive list of recommendations is presented in the **online appendix pages** **121-123**; a summary is provided in **Panel 6**. These recommendations are considered ‘adaptive’, whereby mental healthcare organisations draw inspiration from successful efforts in other settings but tailor approaches to their specific contexts (e.g. available resources). Adaptations might involve, for example, choosing a limited number of feasible recommendations to implement in a given setting rather than implementing them all.

Many countries are grappling with the effects of a lack of funding, or reduced funding for healthcare services, specifically in mental healthcare. This calls for collective action with the government and local providers and for adopting approaches that consider and address factors at all levels of the system, including interactions and dynamics over time between various levels of the system. Such moves should pave the way towards the implementation of lifestyle interventions and their integration as part of routine healthcare; in turn, as the other parts of this report indicate, this should lead to better physical health of people with mental illness.

|  |
| --- |
| **Panel 6. Priorities for action by providers at each level of the system**  **Macro-level**   * **engage external stakeholders (local, national and international) from various sectors** to facilitate support for best-in-class efforts that drive the implementation and delivery of lifestyle interventions (‘Who to involve’). * **include** **collaborative governance**, whereby the capacity for lifestyle interventions for people who are living with mental illness is built through joint decision-making and collaborative working (‘How to involve them and work together for a common goal’). * where possible, **ensure adequate funding, reimbursement mechanisms, and payment models**. Attract investment beyond the healthcare system by applying for funding from charitable foundations and sponsors.   **Meso-Level**   * **ensure that there is strategic alignment** between the integration of lifestyle interventions and organisational strategy, mission, priorities and target population. * **ensure that organisational-level policies support implementation and delivery efforts.** * **build capacity** for the implementation and delivery of lifestyle interventions, including the need to appointinternal implementation leaders; members of staff whose sole role would be to address participants’ physical health; or those who would be able to dedicate a proportion of their time to the delivery of the interventions. * **champion and lead culture change** through, for example, mobilising leaders with mandate to advocate for the integration of lifestyle interventions or advancing the steps that leaders should take to ratify the implementation of lifestyle interventions. * **inspire action through education** by dedicating resources and time to the education, training and supervision of staff. * **install clear and flexible intervention processes** that allow staff sufficient flexibility during implementation and intervention delivery to respond to local and individual needs. * **introduce coordination activities to support implementation efforts** and ensure there is adequate capacity within the team to deliver them. * **utilise data/information systems** to facilitate monitoring of the completion of intervention-related tasks (e.g., physical health screening). * **utilise digital systems** to integrate lifestyle interventions into day-to-day care delivery, for example through digital-physical health screening forms that prompt referral to physical health professionals. * carry out **ongoing monitoring and evaluation** to help build confidence in intervention outcomes. The complex nature of the implementation and delivery of interventions in mental healthcare settings necessitates a shift from a static, one-off evaluation, to continuous, developmental evaluation that facilitates adaptations of interventions as they are being implemented. * **formally integrate qualified dietitians and exercise professionals** into the interventions and implement job shadowing to facilitate learning, in high-resourced settings. * **utilise task-shifting**, the training of non-specialist workers to deliver lifestyle intervention, in low-resourced settings. * **where applicable and desirable, engage patients’ primary social ties** (i.e., family members, friends).   **Micro-level**   * **foster a willingness and capability among staff** to prioritise lifestyle interventions. * **promote positive attitudes** toward various methods of delivery of lifestyle interventions (e.g., telehealth). * **ensure that there is management support** at the frontline team level. * **build collaborative learning communities** (e.g., interest groups). |

\* Provided these systems are accessible to healthcare services.

*How lifestyle interventions can be implemented in ways that address the needs of people with mental illness.*

This section offers recommendations from the perspectives of people with mental illness to assist in the implementation and delivery of lifestyle intervention in a way that meets their needs. The synthesis generated nine themes, presented in **Table 3**.

**Insert Table 3 here.**

**Part 5. Recommendations for Implementing Lifestyle Interventions in Mental Health Services.**

*Introduction*

This section offers actionable recommendations for implementing and delivering lifestyle interventions in mental health services. We generated recommendations in an iterative process. We first generated a list of recommendations from the 2019 Lancet Psychiatry Commission report.1 We then independently virtually surveyed the GSAG (*n*=10) and Lived Experience Advisory Groups (*n*=8) to: i) generate relevance scores on each recommendation, ii) ask for suggestions on improving each recommendation, and iii) report any recommendations that are missing. Additionally, we conducted a series of online focus groups with individuals who live with mental illness (*n*=8) and a virtual roundtable with the GSAG (*n*=13) to discuss the findings from Sections 1 to 4 of the report and generate a narrative on their perspectives. Full details on the methods and results of this section of the report, including supporting quotes, are presented in the **online appendix pages 116-133**. The recommendations have been summarised in **Table 4,** with narrative generated from the perspectives of people with lived experience and the GSAG included in **Sections 5.2 and 5.3 below**.

**Insert Table 4 here.**

*Perspectives on the recommendations in this report from people with lived experience.*

While participants acknowledged the value of lifestyle interventions, they also acknowledged that the framing of ‘lifestyle’ in this Commissioned report was narrow. The targeted nature of the report was seen as overlooking many fundamental challenges to people’s health and wellbeing. The impact of disadvantage, inequality, exclusion and trauma throughout one’s life, and intergenerationally, was frequently referred to as the most fundamental issues for people, and the root cause of unhealthy behaviours conceptualised in this report. Some participants believed these fundamental issues needed to be solved before other lifestyle options were considered, whereas others recognised the broad value of these approaches at all stages of an individual’s journey.

Contributions from participants through the consumer and carer consultation process indicated that contextual and relational elements are critical to the acceptability and accessibility of any program, and incorporating these elements in program design should be done purposefully. Those involved with supporting people with mental illnesses should foster empathic engagement and ensure appropriate interactions that respect self-determination, and services should work with communities and organisations to develop lifestyle programs that facilitate community connection, a sense of belonging, and purpose. Co-producing programs with the consumer group that the program is intended to benefit is an essential first step in ensuring the appropriateness of such programs, and governments have a responsibility to provide adequate resourcing for authentic co-production and sustainable implementation of such programs.

The importance of relational aspects of engagement to support autonomy and address the root causes of ‘unhealthy lifestyle behaviours’ was discussed, with participants reflecting on positive experiences of when this engagement was done well. Empathy was seen as a key ingredient, which can come naturally to some health workers. However, the experience of prejudice and discrimination in everyday interactions with health service staff was not uncommon and was described as particularly damaging.

Participants preferred health and wellbeing to be framed beyond a biomedical perspective, emphasising the importance of tailoring interventions to the diverse needs of target populations (e.g., ethnic groups). Considerations for tailoring interventions included structural (e.g., type of activity) and contextual (e.g., social support) elements. Examples included women-only activities, co-delivering interventions with community members, using convenient locations within the participants’ communities, and adapting the content of intervention materials to their faith. Other priorities included holistic and emotional wellbeing concepts and trauma-informed framing. Group characteristics were seen as important for influencing group dynamics, but assumptions about individual preferences for group context should be avoided.

Funding challenges to program longevity were discussed, and technology was suggested as a supportive program feature that could enhance longer-term engagement. However, it was also acknowledged as problematic if used as a replacement for in-person engagement. Discussions about meso- and macro-level considerations as to how services and government should support lifestyle programs related to two main categories: (1) enabling program development and long-term implementation with communities, supported by appropriate policies and funding support for implementation; and (2) integration and collaboration with communities to collectively address these issues in the most appropriate and beneficial ways.

*Considerations for Global South contexts.*

Even without consideration of lifestyle interventions, access to standard mental health treatment is unequal across countries based on income status.114 In high-income countries, only 1 in 5 people receive minimally adequate treatment for depression. In contrast, this statistic is even worse in low- and middle-income countries, with only 1 in 27 people receiving adequate treatment. In many Global South contexts, high costs and inequitable access to services may result in people seeking alternative care from, for example, religious leaders or traditional healers.115 Further, there is a prevailing gap in mental healthcare capacity in rural areas compared to urban areas.116 Several factors must be considered for effective lifestyle interventions to be sustainably implemented and scaled in mental health services across countries considered part of the Global South. These include resource availability, the potential for ‘task shifting’ or delivery by lay members of the community (i.e., not only by specialists or clinicians), and the possibility of utilising other community resources, such as existing mental health programmes. Addressing macro (system), meso (organizational), and micro (frontline service, individual) level barriers will require engaging policymakers, organisational leaders, clinical staff, people with lived experience, and community leaders (e.g., religious leaders and traditional healers) in the co-creation and co-development process of lifestyle interventions. Engaging stakeholders beyond the healthcare system will allow for culturally responsive and acceptable lifestyle interventions while fostering sustainable implementation across mental health services. Further, the asymmetry in evidence for the Global South compared to the Global North means there is an urgent need for Global South research to ensure that the allocation of funds matches population needs.117

**Summary**

Mental health services need to prioritise evidence-based lifestyle interventions to generate systemic health benefits for people living with mental illness. The growing recognition of the need for lifestyle interventions in mental healthcare in national and international guidelines and from leading organisations such as the World Psychiatric Association creates an opportune time for change. Our Commission provides recommendations for the implementation and delivery of lifestyle interventions in mental healthcare, where delivery elements are known to be more effective complement implementation and delivery strategies to manage feasibility, acceptability, and sustained engagement. This work accompanies partner Lancet Psychiatry Commission documents on physical health related to optimal pharmacological prescribing and public health strategies.

Though the available evidence this Commission focuses on physical activity, nutrition, tobacco smoking and sleep, lifestyle interventions in mental healthcare should not be limited to these. Interventions are needed to target other elements, such as sedentary behaviour and stress management. Further, a key critique is that lifestyle interventions emphasise individual behaviour change (e.g., diet, exercise, and stress management) while underestimating structural barriers like poverty, education, housing and systemic inequalities that significantly impact health. Lifestyle interventions should be considered alongside upstream factors such as income inequality, unsafe neighbourhoods, food deserts/food insecurity, or a lack of access to healthcare, which significantly influence health behaviours.

Lastly, the disparity in published articles from the Global South likely represents a combination of a lack of lifestyle interventions delivered in these regions and a lack of opportunity to publish findings. This is concerning given that much of the global burden lies in these regions and speaks to the broader inequalities experienced in the Global South. Creating opportunities to implement and report on lifestyle interventions in the Global South will generate a greater understanding of the implementation and delivery needs in this context.

**Declaration of Interests**

SBT is funded by a National Health and Medical Research Council (NHMRC) EL1 Investigator Fellowship (APP2017302). KKM is supported partially by NIHR grants: NIHR201618, NIHR206943. AM is supported partially by the Australian Government through the Australian Research Council’s Centre of Excellence for Children and Families over the Life Course (Project ID CE200100025), the Medical Research Future Fund Clinician Researchers Applied Research in Health (Project ID: MRF2032279), and an NHMRC Targeted Call for Research for Improving physical health of people with a mental illness 2022 (ID 2025098). ALO is funded by the National Institute of Health (NIH), National Heart, Lung, and Blood Institute Award (1R21HL175536-01). FBS is part funded by Conselho Nacional de Ciência e Tecnologia (CNPq) grant 314105/2023-9 and by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) grant 0001. SG was Director of the UKRI Closing the Gap Network [2019-24] that addresses health inequalities for people with severe mental illness [UKRI Grant ES/S004459/1]. BS is supported by an NIHR Advanced Fellowship (NIHR301206). SR is funded by an NHMRC EL2 Investigator Fellowship (APP2017506).

**Funding**

The authors of this commissioned report did not receive any funding. Payments for the consumer and carer consultation process were funded through SBT’s NHMRC EL1 Investigator Fellowship (APP2017302). Payments to participants of the consumer and carer consultation process were made using Mindgardens Neuroscience Network’s Paid Participation Policy and Payment Procedure.

**Acknowledgements**

The authors acknowledge the support of research assistants Oliver Ardill-Young (Section 1) and Lauren Wheatley (Sections 2 and 4). The authors also acknowledge the contribution of Carmel Denholm, David Sims, Marvin Williams, Stephen Lake, Timothy To and additional participants of the consumer and carer consultation process.

**Authorship**

**Conception:** SBT, SR, JF. **Formal Analysis:** SBT, KKM, WM, ME, JC. **Investigation:** SBT, KKM, WM,ME,JC,AM, ALO, DCP, FBS, GG, HUA, HD, IJ, MGP, ME, MAF, NG, PSI, SSO, SB, JD, DV, BS, EM, PW, SC, SG. **Methodology:** SBT, KKM, WM, JC, SR, JF. **Project Administration:** SBT. **Resources:** SBT, JC. **Software:** SBT, KKM, WM. **Supervision:** SBT, KKM, WM, SR, JF. **Validation:** SBT, KKM, WM, ME, AM, ALO, DCP, FBS, GG, HUA, HD, IJ, MGP, ME, MAF, NG, PSI, SSO, SB, JD, DV, BS, EM, PW, SC, SG, SR, JF. **Visualization:** SBT, KKM, WM, SR, JF. **Writing – original draft:** SBT, KKM, WM, JC. **Writing – review & editing:** ME, AM, ALO, DCP, FBS, GG, HUA, HD, IJ, MGP, ME, MAF, NG, PSI, SSO, SB, JD, DV, BS, EM, PW, LM, SC, SG, SR, JF.

**References**

1. Firth J, Siddiqi N, Koyanagi A, et al. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *Lancet Psychiatry* 2019; **6**: 675-712. DOI: 10.1016/S2215-0366(19)30132-4.

2. Nielsen RE, Banner J and Jensen SE. Cardiovascular disease in patients with severe mental illness. *Nat Rev Cardiol* 2021; **18**: 136-145. DOI: 10.1038/s41569-020-00463-7.

3. Hjorthøj C, Stürup AE, McGrath JJ, et al. Years of potential life lost and life expectancy in schizophrenia: a systematic review and meta-analysis. *Lancet Psychiatry* 2017; **4**: 295-301.

4. Correll CU, Solmi M, Veronese N, et al. Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large‐scale meta‐analysis of 3,211,768 patients and 113,383,368 controls. *World Psychiatry* 2017; **16**: 163-180.

5. Firth J, Solmi M, Wootton RE, et al. A meta-review of "lifestyle psychiatry": the role of exercise, smoking, diet and sleep in the prevention and treatment of mental disorders. *World Psychiatry* 2020; **19**: 360-380. DOI: 10.1002/wps.20773.

6. Sunkel C and Sartor C. Perspectives: involving persons with lived experience of mental health conditions in service delivery, development and leadership. *BJPsych Bull* 2022; **46**: 160-164. DOI: 10.1192/bjb.2021.51.

7. Molloy N, Kilcoyne I, Belcher H, et al. Exploring the involvement of people with lived experience of mental disorders in co-developing outcome measures: a systematic review. *Lancet Psychiatry* 2025; **12**: 140-152. DOI: 10.1016/S2215-0366(24)00376-6.

8. Dimitris MC, Gittings M and King NB. How global is global health research? A large-scale analysis of trends in authorship. *BMJ Glob Health* 2021; **6**: e003758. DOI: 10.1136/bmjgh-2020-003758.

9. Rippe JM. Lifestyle Medicine: The Health Promoting Power of Daily Habits and Practices. *Am J Lifestyle Med* 2018; **12**: 499-512. 20180720. DOI: 10.1177/1559827618785554.

10. Dedhia P, Wahbeh F and Sherzai D. *Sleep and Lifestyle Medicine.* Lifestyle Medicine, Fourth Edition. CRC Press, pp.925-934.

11. World Psychiatric Association. *WPA Action Plan 2023-2026*. <https://www.wpanet.org/action-plan-2023-2026>

12. World Psychiatric Association. *APA Specialty Interest Caucuses, Listservs & Communities.* <https://www.psychiatry.org/membership/get-involved/join-a-caucus> (2024).

13. World Health Organization. (‎2019)‎. *Field test version: mhGAP community toolkit: Mental Health Gap Action Programme (‎mhGAP)*‎. World Health Organization. <https://iris.who.int/handle/10665/328742>. License: CC BY-NC-SA 3.0 IGO.

14. Lee Y, Brietzke E, Cao B, et al. Mental Health Guidelines Working Group. Development and implementation of guidelines for the management of depression: a systematic review. *Bull World Health Organ* 2020; **98**: 683-697. doi: 10.2471/BLT.20.251405.

15. World Economic Forum (2022). *Governance Frameworks in Digital Mental Health.* World Economic Forum: Geneva.

16. OECD (2021). *A New Benchmark for Mental Health Systems: Tackling the Social and Economic Costs of Mental Ill-Health*. OECD Health Policy Studies. OECD Publishing: Paris. DOI: 10.1787/4ed890f6-en.

17. NHS (2021). Managing a healthy weight in adult secure services – practice guidance. Public Health England: London.

18. Jespers V, Christiaens W, Kohn L, Savoye I, Mistiaen P. *Somatic health care in a psychiatric setting.* Health Services Research (HSR) Brussels: Belgian Health Care Knowledge Centre (KCE). 2021. KCE Reports 338. D/2021/10.273/4.

19. Department of Health, Australian Government (2021). *National Preventative Health Strategy 2021-2030.* *Valuing health before illness: Living well for longer.* Australian Government: Canberra.

20. Department of Health, State of WA (2024). *Western Australian Health Promotion Strategic Framework 2022–2026: A 5-year plan to reduce preventable chronic disease and injury due to common risk factors in our communities.* Government of Western Australia: Perth.

21. NSW Health (2021). *Evidence check: Acute Mental Health Inpatient Unit Risk Mitigation and Models.* NSW Government: Sydney.

22. Broerse J, Klepac Pogrmilovic B, Brisbane R, et al. (2021). *Getting Australia’s Health on Track 2021.* Australian Health Policy Collaboration, the Mitchell Institute for Health and Education, Victoria University: Melbourne.

23. Bartlem K, Fehily C, Wynne O, et al. (2020). *Implementing initiatives to improve physical health for people in community-based mental health programs: an Evidence Check rapid review brokered by the Sax Institute (*[*www.saxinstitute.org.au*](http://www.saxinstitute.org.au)*) for the NSW Ministry of Health*. Sax Institute: Sydney.

24. Productivity Commission (2020). *Mental Health, Report no. 95*. Productivity Commission: Canberra.

25. Group of Eight, Australia (2020). *COVID-19 Roadmap to Recovery – A Report For The Nation*. Group of Eight: ACT.

26. Queensland Health (2018). *The State of Queensland (Metro South Hospital and Health Service) Metro South Addiction and Mental Health Services Research and Learning Year in Review*. Queensland Health: Brisbane.

27. Marx W, Manger SH, Blencowe M, et al. Clinical guidelines for the use of lifestyle-based mental health care in major depressive disorder: World Federation of Societies for Biological Psychiatry (WFSBP) and Australasian Society of Lifestyle Medicine (ASLM) taskforce. *World J Biol Psychiatry* 2023; **24**: 333-386. DOI: 10.1080/15622975.2022.2112074.

28. Machaczek KK, Quirk H, Firth J, et al. A whole systems approach to integrating physical activity to aid mental health recovery – Translating theory into practice. *Ment Health Phys Act* 2022; **23**: 100480. DOI: 10.1016/j.mhpa.2022.100480.

29. Guu TW, Mischoulon D, Sarris J, et al. A multi-national, multi-disciplinary Delphi consensus study on using omega-3 polyunsaturated fatty acids (n-3 PUFAs) for the treatment of major depressive disorder. *J Affect Disord* 2020; **265**: 233-238. DOI: 10.1016/j.jad.2020.01.050.

30. Всесвітня організація охорони здоров’я. Європейське регіональне бюро. (‎2023)‎. *Всесвітнья організація охорони здоров’я. Інструменти mhGAP для громади: програма дій із подолання прогалин у сфері психічного здоров’я ВООЗ.* Тестова версiя. Всесвітня організація охорони здоров’я. Європейське регіональне бюро. <https://iris.who.int/handle/10665/372458>. License: CC BY-NC-SA 3.0 IGO.

31. Maailma Terviseorganisatsioon. (‎2022)‎. *Vaimse tervise parandamise kogukonna juhend: praktikas järele proovitud. WHO vaimse tervise parandamise tegevuskava (‎mhGAP)‎.* Maailma Terviseorganisatsioon. Euroopa Regionaalbüroo. <https://iris.who.int/handle/10665/360476>. License: CC BY-NC-SA 3.0 IGO.

32. *Herramientas del mhGAP para usar en la comunidad: versión de prueba sobre el terreno.* Washington, D.C.: Organización Panamericana de la Salud; 2021. Licencia: CC BY-NC-SA 3.0 IGO. DOI: [10.37774/9789275324639](https://doi.org/10.37774/9789275324639).

33. Hoffmann TC, Glasziou PP, Boutron I, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014; **348**: g1687. DOI: 10.1136/bmj.g1687.

34. Hopewell S, Chan AW, Collins GS, et al. CONSORT 2025 statement: updated guideline for reporting randomized trials. *Nat Med* [epub ahead of print 15 April 2025]. doi. 10.1038/s41591-025-03635-5.

35. Healey A, Roberts S, Sevdalis N, et al. A cost-effectiveness analysis of stop smoking interventions in substance-use disorder populations. *Nicotine Tob Res* 2019; **21**: 623-630. DOI: 10.1093/ntr/nty087.

36. Li J, Fairhurst C, Peckham E, et al. Cost-effectiveness of a specialist smoking cessation package compared with standard smoking cessation services for people with severe mental illness in England: a trial-based economic evaluation from the SCIMITAR+ study. *Addiction* 2020; **115**: 2113-2122. DOI: [10.1111/add.15086](https://dx.doi.org/10.1111/add.15086).

37. Mattock R, Owen L and Taylor M. The cost-effectiveness of tailored smoking cessation interventions for people with severe mental illness: a model-based economic evaluation. *EClinicalMedicine* 2023; **57**: 101828. DOI: [10.1016/j.eclinm.2023.101828](https://dx.doi.org/10.1016/j.eclinm.2023.101828).

38. Chatterton ML, Mihalopoulos C, O'Neil A, et al. Economic evaluation of a dietary intervention for adults with major depression (the "SMILES" trial). *BMC Public Health* 2018; **18**: 599. DOI: [10.1186/s12889-018-5504-8](https://dx.doi.org/10.1186/s12889-018-5504-8).

39. Segal L, Twizeyemariya A, Zarnowiecki D, et al. Cost effectiveness and cost-utility analysis of a group-based diet intervention for treating major depression-the HELFIMED trial. *Nutr Neurosci* 2020; **23**: 770-778. DOI: [10.1080/1028415X.2018.1556896](https://dx.doi.org/10.1080/1028415X.2018.1556896).

40. Looijmans A, Jorg F, Bruggeman R, et al. Cost-effectiveness and budget impact of a lifestyle intervention to improve cardiometabolic health in patients with severe mental illness. *Glob Reg Health Technol Assess* 2020; **7**: 131-138. DOI: [10.33393/grhta.2020.2027](https://dx.doi.org/10.33393/grhta.2020.2027).

41. Wu J, Zhang H, Yang L, et al. Sedentary time and the risk of metabolic syndrome: A systematic review and dose-response meta-analysis. *Obes Rev* 2022; **23**: e13510. DOI: 10.1111/obr.13510.

42. Tebar WR, Aguilar BAS, Delfino LD, et al. Association of meeting 24-hour movement guidelines with anxiety and depressive symptoms in adults. *BMC Public Health* 2024; **24**: 3509. DOI: 10.1186/s12889-024-21038-y.

43. World Health Organization (2020). *WHO guidelines on physical activity and sedentary behaviour.* Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.

44. Canadian Society for Exercise Physiology (2021). *Canadian 24-hour movement guidelines for adults aged 18-64 years: an integration of physical activity, sedentary behaviour, and sleep.* CESP: Ottawa.

45. Department of Health (2021). *Guidelines for healthy growth and development for your child. Australian 24-hour movement guidelines for the early years (birth to 5 years: an integration of physical activity, sedentary behaviour, and sleep).* Australian Government: Canberra.

46. Ashdown-Franks G, Williams J, Vancampfort D, et al. Is it possible for people with severe mental illness to sit less and move more? A systematic review of interventions to increase physical activity or reduce sedentary behaviour. *Schizophr Res* 2018; **202**: 3-16. DOI: 10.1016/j.schres.2018.06.058.

47. Peckham E, Tew G, Lorimer B, et al. Interventions to increase physical activity and reduce sedentary behaviour in severe mental ill health: How effective are they?’- A systematic review. *Ment Health Phys Act* 2023; 25: 100547. DOI: [10.1016/j.mhpa.2023.100547](https://doi.org/10.1016/j.mhpa.2023.100547).

48. Jetté M, Sidney K, Blümchen G. Metabolic equivalents (METS) in exercise testing, exercise prescription, and evaluation of functional capacity. *Clin Cardiol*. 1990; **13**: 555-565. DOI: 10.1002/clc.4960130809.

49. Cella M, Roberts S, Pillny M, et al. Psychosocial and behavioural interventions for the negative symptoms of schizophrenia: a systematic review of efficacy meta-analyses. *Br J Psychiatry* 2023; **223**: 321-331. DOI: 10.1192/bjp.2023.21.

50. Martinez-Calderon J, Villar-Alises O, García-Muñoz C, et al. Evidence level of physical exercise in the treatment of substance abuse/dependence: An overview of systematic reviews including 53 meta-analyses that comprised 103 distinct clinical trials. *Ment Health Phys Act* 2023; **24**: 100519. DOI: [10.1016/j.mhpa.2023.100519](https://doi.org/10.1016/j.mhpa.2023.100519).

51. Czosnek L, Lederman O, Cormie P, et al. Health benefits, safety and cost of physical activity interventions for mental health conditions: A meta-review to inform translation efforts. *Ment Health Phys Act* 2019; **16**: 140-151.

52. Chen X, Zeng X, Liu C, et al. Formulation of precise exercise intervention strategy for adolescent depression. *Psych J* 2024; **13**: 176-189. DOI: 10.1002/pchj.726.

53. Coles A, Maksyutynska K, Knezevic D, et al. Peer-facilitated interventions for improving the physical health of people with schizophrenia spectrum disorders: systematic review and meta-analysis. *Med J Aust* 2022; **217**: S22-S28. DOI: 10.5694/mja2.51693.

54. Fernández-Abascal B, Suárez-Pinilla P, Cobo-Corrales C, et al. In- and outpatient lifestyle interventions on diet and exercise and their effect on physical and psychological health: a systematic review and meta-analysis of randomised controlled trials in patients with schizophrenia spectrum disorders and first episode of psychosis. *Neurosci Biobehav Rev* 2021; **125**: 535-568. DOI: 10.1016/j.neubiorev.2021.01.005.

55. Gallardo-Gómez D, Noetel M, Álvarez-Barbosa F, et al. Exercise to treat psychopathology and other clinical outcomes in schizophrenia: A systematic review and meta-analysis. *Eur Psychiatry* 2023; **66**: e40. DOI: 10.1192/j.eurpsy.2023.24.

56. Gür F and Can Gür G. Is Exercise a Useful Intervention in the Treatment of Alcohol Use Disorder? Systematic Review and Meta-Analysis. *Am J Health Promot* 2020; **34**: 520-537. DOI: 10.1177/0890117120913169.

57. Heissel A, Heinen D, Brokmeier LL, et al. Exercise as medicine for depressive symptoms? A systematic review and meta-analysis with meta-regression. *Br J Sports Med* 2023; **57**: 1049-1057. DOI: 10.1136/bjsports-2022-106282.

58. Korman N, Stanton R, Vecchio A, et al. The effect of exercise on global, social, daily living and occupational functioning in people living with schizophrenia: A systematic review and meta-analysis. *Schizophr Res* 2023; **256**: 98-111. DOI: 10.1016/j.schres.2023.04.012.

59. Lederman O, Ward PB, Firth J, et al. Does exercise improve sleep quality in individuals with mental illness? A systematic review and meta-analysis. *J Psychiatr Res* 2019; **109**: 96-106. DOI: 10.1016/j.jpsychires.2018.11.004.

60. Mucheru D, Hanlon M-C, McEvoy M, et al. Comparative efficacy of lifestyle intervention strategies targeting weight outcomes in people with psychosis: a systematic review and network meta-analysis. *JBI Database System Rev Implement Rep* 2019; **17**: 1770-1825. DOI: 10.11124/JBISRIR-2017-003943.

61. Pape LM, Adriaanse MC, Kol J, et al. Patient-reported outcomes of lifestyle interventions in patients with severe mental illness: a systematic review and meta-analysis. *BMC Psychiatry* 2022; **22**: 261. DOI: 10.1186/s12888-022-03854-x.

62. Ramos-Sanchez CP, Schuch FB, Seedat S, et al. The anxiolytic effects of exercise for people with anxiety and related disorders: An update of the available meta-analytic evidence. *Psychiatry Res* 2021; **302**: 114046. DOI: 10.1016/j.psychres.2021.114046.

63. Rocks T, Teasdale SB, Fehily C, et al. Effectiveness of nutrition and dietary interventions for people with serious mental illness: systematic review and meta-analysis. *Med J Aust* 2022; **217**: S7-S21. DOI: 10.5694/mja2.51680.

64. Romain AJ, Bernard P, Akrass Z, et al. Motivational theory-based interventions on health of people with several mental illness: A systematic review and meta-analysis. *Schizophr Res* 2020; **222**: 31-41. DOI: 10.1016/j.schres.2020.05.049.

65. Speyer H, Jakobsen AS, Westergaard C, et al. Lifestyle Interventions for Weight Management in People with Serious Mental Illness: A Systematic Review with Meta-Analysis, Trial Sequential Analysis, and Meta-Regression Analysis Exploring the Mediators and Moderators of Treatment Effects. *Psychother Psychosom* 2019; **88**: 350-362. DOI: 10.1159/000502293.

66. Taylor CI, Tompsett C, Sanders R, et al. The effectiveness of structured exercise programmes on psychological and physiological outcomes for patients with psychotic disorders: A systematic review and meta-analysis. *Int J Sport Exerc Psychol* 2020; **18**: 336-361. DOI: 10.1080/1612197X.2018.1519838.

67. Vancampfort D, Sánchez CPR, Hallgren M, et al. Dropout from exercise randomized controlled trials among people with anxiety and stress-related disorders: A meta-analysis and meta-regression. *J Affect Disord* 2021; **282**: 996-1004. DOI: 10.1016/j.jad.2021.01.003.

68. Gottlieb JF, Goel N, Chen S, et al. Meta-analysis of sleep deprivation in the acute treatment of bipolar depression. *Acta Psychiatr Scand* 2021; **143**: 319-327. DOI: 10.1111/acps.13255.

69. He C, Xiao L, Xu J, et al. Effect of sleep deprivation plus existing therapies on depression: A systematic review and meta-analysis of randomized controlled trials. *Int J Psychophysiol* 2023; **184**: 1-11. DOI: 10.1016/j.ijpsycho.2022.11.016.

70. Greaves CJ, Sheppard KE, Abraham C, et al. Systematic review of reviews of intervention components associated with increased effectiveness in dietary and physical activity interventions. *BMC Public Health* 2011; **11**: 119. DOI: 10.1186/1471-2458-11-119.

71. World Health Organization (2008). *Task shifting: Global recommendations and guidelines.* Geneva: World Health Organization.

72. Swann C, Jackman PC, Lawrence A, et al. The (over)use of SMART goals for physical activity promotion: A narrative review and critique. *Health Psychol Rev* 2023; **17**: 211-226. DOI: 10.1080/17437199.2021.2023608.

73. Skivington K, Matthews L, Simpson SA, et al. A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance. *BMJ* 2021; **374**: n2061. DOI: 10.1136/bmj.n2061.

74. Hawe P, Shiell A and Riley T. Theorising interventions as events in systems. *Am J Community Psychol* 2009; **43**: 267-276. DOI: 10.1007/s10464-009-9229-9.

75. Fulop N and Robert G (2015). *Context for successful quality improvement*. Health Foundation: London.

76. Leyland AH, Groenewegen PP (2020). *Multilevel Modelling for Public Health and Health Services Research: Health in Context*. Cham (CH): Springer

77. Czosnek L, Rosenbaum S, Rankin NM, et al. Implementation of physical activity interventions in a community-based youth mental healthcare service: A case study of context, strategies, and outcomes. *Early Interv Psychiatry* 2023; **17**: 212-222. DOI: 10.1111/eip.13324.

78. Hogan TH, Quisenberry A, Breitborde N, et al. An evaluation of the feasibility of implementing a novel tobacco dependence treatment program for high-risk individuals into clinical practice within a community mental health center. *Int J Ment Health Syst* 2022; **16**: 15. DOI: [10.1186/s13033-022-00517-y](https://doi.org/10.1186/s13033-022-00517-y).

79. Kohn L, Christiaens W, Detraux J, et al. Barriers to Somatic Health Care for Persons With Severe Mental Illness in Belgium: A Qualitative Study of Patients' and Healthcare Professionals' Perspectives. *Front Psychiatry* 2022; **12**: 798530. DOI: 10.3389/fpsyt.2021.798530.

80. Mugisha J, De Hert M, Knizek BL, et al. Health care professionals’ perspectives on physical activity within the Ugandan mental health care system. *Ment Health Phys Act* 2019; **16**: 1-7. DOI: 10.1016/j.mhpa.2019.02.001.

81. Fibbins H, Ward PB, Stanton R, et al. Embedding an exercise professional within an inpatient mental health service: A qualitative study. *Ment Health Phys Act* 2019; **17**: 100300. DOI: [10.1016/j.mhpa.2019.100300](https://doi.org/10.1016/j.mhpa.2019.100300).

82. Gossage-Worrall R, Hind D, Barnard-Kelly KD, et al. STructured lifestyle education for people with SchizophrEnia (STEPWISE): Mixed methods process evaluation of a group-based lifestyle education programme to support weight loss in people with schizophrenia. *BMC Psychiatry* 2019; **19**: 358. DOI: 10.1186/s12888-019-2282-5.

83. Gudzune KA, Jerome GJ, Dalcin AT, et al. Scaling a behavioral weight-loss intervention for individuals with serious mental illness using the enhanced replicating effective programs framework: A preconditions phase proof-of-concept study. *Obes Sci Pract* 2023; **9**: 618-630. DOI: 10.1002/osp4.690.

84. Gumport NB, Yu SH and Harvey AG. Implementing a transdiagnostic sleep and circadian intervention in a community mental health setting: A qualitative process evaluation with community stakeholders. *Psychiatry Res* 2020; **293**: 113443. DOI: 10.1016/j.psychres.2020.113443.

85. Kirschner V, Lamp N, Dinc Ü, et al. The evaluation of a physical health promotion intervention for people with severe mental illness receiving community based accommodational support: a mixed-method pilot study. *BMC Psychiatry* 2022; **22**: 6. DOI: 10.1186/s12888-021-03640-1.

86. Lund K, Hultqvist J, Bejerholm U, et al. Group leader and participant perceptions of Balancing Everyday Life, a group-based lifestyle intervention for mental health service users. *Scand J Occup Ther* 2020; **27**: 462-473. DOI: 10.1080/11038128.2018.1551419.

87. McKeon G, Fitzgerald C, Furzer B, et al. A qualitative exploration of the experience and attitudes of exercise professionals using telehealth for people with mental illness. *J Ment Health Train Educ Pract* 2023; **18**: 14-29. DOI: 10.1108/JMHTEP-07-2021-0084.

88. Mucheru D, Ashby S, Hanlon MC, et al. Factors to consider during the implementation of nutrition and physical activity trials for people with psychotic illness into an Australian community setting. *BMC Health Serv Res* 2020; **20**: 743. DOI: 10.1186/s12913-020-05629-0.

89. Sawyer C, Hassan L, Sainsbury J, et al. Using digital technology to promote physical health in mental healthcare: A sequential mixed-methods study of clinicians' views. *Early Interv Psychiatry* 2024; **18**: 140-152. DOI: 10.1111/eip.13441.

90. Sørensen M, Bentzen M and Farholm A. Lessons Learned From a Physical Activity Intervention in Psychiatric Treatment: Patient, Staff, and Leader Perspectives. *Front Psychiatry* 2020; **11**: 87. DOI: 10.3389/fpsyt.2020.00087.

91. Wagner S, Addington KS, Varming A, et al. Caught between good intentions and rigid structures: A qualitative description of professionals' experiences with health promotion in mental health services. *Scand J Caring Sci* 2022; **36**: 663-672. DOI: 10.1111/scs.13023.

92. Woodhead G, Hitch D, Watson J, et al. Setting up an exercise physiology clinic in youth mental health: Staff and student perspectives. *Adv Ment Health* 2021; **19**: 4-16. DOI: 10.1080/18387357.2019.1622429.

93. Walburg FS, de Joode JW, Brandt HE, et al. Implementation of a lifestyle intervention for people with a severe mental illness (SMILE): a process evaluation. *BMC Health Serv Res* 2022; **22**: 27. DOI: 10.1186/s12913-021-07391-3.

94. Møller JE, Møller A and Ledderer L. Dilemmas in delivering health promotion activities: findings from a qualitative study of mental health nurses in Denmark. *BMJ Open* 2020; **10**: e036403. DOI: 10.1136/bmjopen-2019-036403.

95. Rosa N, Feliu A, Ballbè M, et al. Quitline nurses' experiences in providing telephone-based smoking cessation help to mental health patients: A mixed methods study. *J Psychiatr Ment Health Nurs* 2024; **31**: 755-766. DOI: 10.1111/jpm.13012.

96. Rogova A, Leal IM, Britton M, et al. Implementing a tobacco-free workplace program at a substance use treatment center: a case study. *BMC Health Serv Res* 2024; **24**: 201. DOI: 10.1186/s12913-024-10629-5.

97. Tambyah R, Olcoń K, Allan J, et al. Mental health clinicians' perceptions of nature-based interventions within community mental health services: evidence from Australia. *BMC Health Serv Res* 2022; **22**: 841. DOI: 10.1186/s12913-022-08223-8.

98. Khoubaeva D, Popel N, Omrin D, et al. “You can't take a pill to exercise”—Qualitative findings from the Toward Exercise as Medicine for Adolescents with bipolar disorder (TEAM-BD) study. *Ment Health Phys Act* 2023; **24**: 1-12. DOI: 10.1016/j.mhpa.2022.100485.

99. O'Neill K, Hand R, Diop B, et al. Informing the development of the coaching online and community health (COACH) program: a qualitative study of clubhouse members living with serious mental illness. *Transl Behav Med* 2023; **13**: 343-353. DOI: 10.1093/tbm/ibad001.

100. Twyman L, Cowles C, Walsberger SC, et al. ‘They’re going to smoke anyway’: A qualitative study of community mental health staff and consumer perspectives on the role of social and living environments in tobacco use and cessation. *Front Psychiatry* 2019; **10**: 503. DOI: 10.3389/fpsyt.2019.00503.

101. Bochicchio L, Stefancic A, Gurdak K, et al. "We're All in this Together": Peer-specialist Contributions to a Healthy Lifestyle Intervention for People with Serious Mental Illness. *Adm Policy Ment Health* 2019; **46**: 298-310. DOI: 10.1007/s10488-018-0914-6.

102. Brooke LE, Gucciardi DF, Ntoumanis N, et al. Enhancing functional recovery for young people recovering from first episode psychosis via sport-based life skills training: Outcomes of a feasibility and pilot study. *Health Psychol Behav Med* 2022; **10**: 1136-1158. DOI: 10.1080/21642850.2022.2147073.

103. Smith J, Griffiths LA, Band M, et al. Early Intervention in Psychosis: Effectiveness and Implementation of a Combined Exercise and Health Behavior Intervention Within Routine Care. *Front Endocrinol* 2020; **11**: 577691. DOI: 10.3389/fendo.2020.577691.

104. McCarter K, McKinlay ML, Cocks N, et al. The value of compassionate support to address smoking: A qualitative study with people who experience severe mental illness. *Front Psychiatry* 2022; **13**: 868032. DOI: 10.3389/fpsyt.2022.868032.

105. Olando Y, Kuria MW, Mathai M, et al. Barriers and facilitators to cessation among tobacco users with concomitant mental illness attending group behavioral tobacco cessation: A qualitative study. *Tob Prev Cessat* 2020; **6**: 46. DOI: 10.18332/tpc/125354.

106. Lee KC, Tang WK and Bressington D. The experience of mindful yoga for older adults with depression. *J Psychiatr Ment Health Nurs* 2019; **26**: 87-100. DOI: 10.1111/jpm.12517.

107. Fredman Stein K, Sawyer K, Daryan S, et al. Service-user experiences of an integrated psychological intervention for depression or anxiety and tobacco smoking in improving access to psychological therapies services: A qualitative investigation into mechanisms of change in quitting smoking. *Health Expect* 2023; **26**: 498-509. DOI: 10.1111/hex.13684.

108. Sawyer K, Fredman Stein K, Jacobsen P, et al. Acceptability of integrating smoking cessation treatment into routine care for people with mental illness: A qualitative study. *Health Expect* 2023; **26**: 108-118. DOI: 10.1111/hex.13580.

109. Walburg F, de Joode JW, Brandt H, et al. Experiences and perceptions of people with a severe mental illness and health care professionals of a one-year group-based lifestyle programme (SMILE). *PLoS One* 2022; **17**: e0271990. DOI: 10.1371/journal.pone.0271990.

110. Walker K, Griffiths C, Willis A. Patients’ and staff’s experiences of well-track physical activity and sleep quality intervention in an early intervention in psychosis (eip) service. *Adv Ment Health* 2024; **22**: 635-652. DOI: 10.1080/18387357.2024.2302118.

111. Larsen LQ, Schnor H, Tersbøl BP, et al. The impact of exercise training complementary to early intervention in patients with first-episode psychosis: a qualitative sub-study from a randomized controlled feasibility trial. *BMC Psychiatry* 2019; **19**: 192. DOI: 10.1186/s12888-019-2179-3.

112. Dobbins S, Hubbard E and Leutwyler H. "Looking Forward": a qualitative evaluation of a physical activity program for middle-aged and older adults with serious mental illness. *Int Psychogeriatr* 2020; **32**: 1449-1456. DOI: 10.1017/S1041610218002004.

113. Watkins A, Denney-Wilson E, Curtis J, et al. Keeping the body in mind: A qualitative analysis of the experiences of people experiencing first-episode psychosis participating in a lifestyle intervention programme. *Int J Ment Health Nurs* 2020; **29**: 278-289. DOI: 10.1111/inm.12683.

114. Thornicroft G, Chatterji S, Evans-Lacko S, et al. Undertreatment of people with major depressive disorder in 21 countries. *Br J Psychiatry* 2017; **210**: 119-124. DOI: 10.1192/bjp.bp.116.188078.

115. Gureje O, Appiah-Poku J, Bello T, et al. Effect of collaborative care between traditional and faith healers and primary health-care workers on psychosis outcomes in Nigeria and Ghana (COSIMPO): a cluster randomised controlled trial. *Lancet* 2020; **396**: 612-622. DOI: 10.1016/S0140-6736(20)30634-6.

116. Saraceno B, van Ommeren M, Batniji R, et al. Barriers to improvement of mental health services in low-income and middle-income countries. *Lancet* 2007; **370**: 1164-1174. DOI: 10.1016/S0140-6736(07)61263-X.

117. Zavala GA, Todowede O, Mazumdar P, et al. Effectiveness of interventions to address obesity and health risk behaviours among people with severe mental illness in low- and middle-income countries (LMICs): a systematic review and meta analysis. *Glob Ment Health (Camb)* 2022; **9**: 264-273. DOI: 10.1017/gmh.2022.21.

**Figure Legends**

Figure 1. Heat map of lifestyle-related citations of the 2019 Lancet Commission based on (a) first author primary affiliation, and (b) country of intervention studies.

\*Country classification by income developed by *The World Bank* (World Bank Group, 2024).

Figure 2a-2f. Case studies describing implementation and delivery.

**Lancet Psychiatry Physical Health Commission Consortium Authors**

Joseph Firth, PhDᵃ,ᵇ ∙ Najma Siddiqi, PhDᶜ,d ∙ Dan Siskind, PhDᵉ,f ∙ Simon Rosenbaum, PhDg ∙ Prof Cherrie Galletly, MDʰ,i ∙ Stephanie Allan, MAj ∙ Constanza Caneo, MDk ∙ Rebekah Carney, PhDˡ,m ∙ Prof Andre F Carvalho, MDn ∙ Mary Lou Chatterton, PharmDo ∙ Prof Christoph U Correll, MDp,q,r,s,t ∙ Prof Jackie Curtis, MBBSᵘ,v ∙ Fiona Gaughran, MDʷ,x ∙ Adrian Heald, DMʸ,z ∙ Erin Hoare, PhDᵃᵃ,ab ∙ Sarah Jackson, PhDac ∙ Prof Steve Kisely, DMedResad,ae ∙ Prof Karina Lovell, PhDaf ∙ Prof Patrick D McGorry, MDag,ah ∙ Prof Cathrine Mihalopoulos, PhDai ∙ Brian O'Donoghue, PhDaj,ak ∙ Toby Pillinger, MRCPal,am ∙ Prof Jerome Sarris, PhDan,ao,ap ∙ Prof Felipe B Schuch, PhDaq,ar,as ∙ David Shiers, MBChBat,au ∙ Lee Smith, PhDav ∙ Marco Solmi, MD, PhDaw,ax,ay,az ∙ Shuichi Suetani, MDba ∙ Johanna Taylor, PhDbb ∙ Scott B Teasdale, PhDbc,bd ∙ Prof Graham Thornicroft, PhDbe ∙ John Torous, MDbf ∙ Prof Tim Usherwood, MDbg,bh ∙ Prof Davy Vancampfort, PhDbi ∙ Nicola Veronese, MDbj ∙ Prof Philip B Ward, PhDbk,bl ∙ Prof Alison R Yung, MBbm,bn ∙ Prof Eóin Killackey, DPsychbo,bp ∙ Brendon Stubbs, PhDbq,br

ᵃ Division of Psychology and Mental Health, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK  
ᵇ Greater Manchester Mental Health NHS Foundation Trust, Manchester Academic Health Science Centre, Manchester, UK  
ᶜ Hull York Medical School, University of York, York, UK

d Bradford District Care NHS Foundation Trust, Bradford, UK  
eMetro South Addiction and Mental Health Service, Queensland, Australia  
f Faculty of Medicine, University of Queensland, Australia  
g Nutrition, Exercise & Social Equity (NExuS) Research Group, Discipline of Psychiatry and Mental Health, School of Clinical Medicine, UNSW Sydney, NSW, Australia.  
h Consultant Psychiatrist, Modbury Hospital, Northern Adelaide Local Health Network, South Australia  
i Discipline of Psychiatry, Adelaide Medical School, The University of Adelaide  
j School of Health & Wellbeing, University of Glasgow, UK  
k Unidad de Psiquiatría Integrativa, UPSINT Clinic. Wellness & Wellbeing Director, FINDEN.  
l Youth Mental Health Research Unit, Greater Manchester Mental Health NHS Foundation Trust, Manchester, UK  
m Faculty of Biology, Medicine and Health, University of Manchester, Manchester, UK  
n Innovation in Mental and Physical Health and Clinical Treatment (IMPACT) Strategic Research Centre, School of Medicine, Barwon Health, Deakin University, Geelong, VIC, Australia  
o Health Economic Group, School of Public Health and Preventive Medicine, Monash University, Vic, Australia  
p Zucker Hillside Hospital, Department of Psychiatry, Northwell Health, Glen Oaks, NY, USA  
q Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Department of Psychiatry and Molecular Medicine, Hempstead, NY, USA  
r The Feinstein Institute for Medical Research, Center for Psychiatric Neuroscience, Northwell Health, New Hyde Park, NY, USA  
s Charité - Universitätsmedizin Berlin, Department of Child and Adolescent Psychiatry, Berlin, Germany  
t German Center for Mental Health (DZPG), partner site Berlin, Germany  
u Discipline of Psychiatry and Mental Health, School of Clinical Medicine, UNSW Sydney, NSW, Australia.  
v Mindgardens Neuroscience Network, Sydney, Australia  
w Dept of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King’s College London, UK  
x South London and Maudsley NHS Foundation Trust, London, UK  
y School of Medicine, University of Manchester, Manchester Academic Health Sciences Centre, Manchester, UK  
z Department of Endocrinology and Diabetes, Salford Royal Hospital, Salford, UK  
aa Deakin University, IMPACT – The Institute for Mental and Physical Health and Clinical Translation, School of Medicine, Geelong, Victoria, Australia  
ᵃb University of New England, Manna Institute, Australia  
ac Department of Behavioural Science and Health, University College London, London, UK  
ad The University of Queensland School of Medicine, Queensland, Australia  
ae Metro South Health Service, Woolloongabba, Queensland, Australia  
af Division of Psychology and Mental Health, University of Manchester, Manchester Academic Health Science Centre, Manchester, UK  
ag Centre for Youth Mental Health, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Parkville, VIC, Australia  
ah Orygen Youth Health, Parkville, VIC, Australia  
ai Health Economic Group, School of Public Health and Preventive Medicine, Monash University, Vic, Australia  
aj School of Medicine, University College Dublin, Ireland  
ak Department of Psychiatry, St Vincent's University Hospital, Elm Park, Dublin, Ireland  
al Dept of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King’s College London, UK  
am South London and Maudsley NHS Foundation Trust, London, UK  
an NICM Health Research Institute, Western Sydney University, Westmead, NSW, Australia  
ao Centre for Mental Health, Swinburne University, Melbourne, VIC, Australia  
ap The Florey Institute of Neuroscience and Mental Health, Melbourne University, Australia

aq Department of Sports Methods and Techniques, Federal University of Santa Maria, Santa Maria, Brazil  
ar Institute of Psychiatry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

as Faculty of Health Sciences, Universidad Autónoma de Chile, Providência, Chile  
at Division of Psychology and Mental Health, University of Manchester, Manchester, UK  
au Psychosis Research Unit, Greater Manchester Mental Health NHS Foundation Trust  
av Centre for Health Performance and Wellbeing, Anglia Ruskin University, Cambridge, UK  
aw SCIENCES lab, Department of Psychiatry, University of Ottawa, Ontario, Canada  
ax Regional Centre for the Treatment of Eating Disorders and On Track: The Champlain First Episode Psychosis Program, Department of Mental Health, The Ottawa Hospital, Ontario, Canada

ay Ottawa Hospital Research Institute (OHRI) Clinical Epidemiology Program, University of Ottawa, Ottawa, Ontario  
az Department of Child and Adolescent Psychiatry, Charité Universitätsmedizin, Berlin, Germany  
ba Queensland Centre for Mental Health Research, University of Queensland, Wacol, QLD, Australia  
bbDepartment of Health Sciences, University of York, York, UK  
bc Nutrition, Exercise & Social Equity (NExuS) Research Group, Discipline of Psychiatry and Mental Health, School of Clinical Medicine, UNSW Sydney, NSW, Australia.  
bd Mindgardens Neuroscience Network, NSW, Australia  
be Centre for Global Mental Health, IoPPN, King's College London  
bf Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, 02215, USA  
bg University of Sydney, Sydney, Australia  
bh George Institute for Global Health, Sydney, Australia  
bi KU Leuven Department of Rehabilitation Sciences  
bj Saint Camillus International University of Health Sciences, Rome, Italy  
bk Discipline of Psychiatry and Mental Health, Faculty of Medicine and Health, University of New South Wales, Sydney, NSW, Australia  
bl Ingham Institute of Applied Medical Research, University of South Wales, Liverpool, NSW, Australia  
bm Deakin University, IMPACT – The Institute for Mental and Physical Health and Clinical Translation, School of Medicine, Geelong, Victoria, Australia  
bn Division of Psychology and Mental Health, University of Manchester, UK  
bo Orygen Youth Health, Parkville, Australia  
bp Centre for Youth Mental Health, The University of Melbourne, Parkville, Australia  
bq Psychological Medicine, Institute of Psychiatry, Psychology, Neuroscience, King's College London, UK  
br Department of Sport Science and University Sports, University of Vienna, Austria