

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

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Online Appendix

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Supplementary Section 1: Impact of 2019 Lancet Psychiatry Commission in the Field of Lifestyle Psychiatry.

Supplementary 1.1: Identification of Relevant Documents Citing the 2019 Commission.

Aim. To understand the influence of the 2019 Commission in the field of lifestyle psychiatry.

Strategy. In March 2024, we extracted titles of journal articles and policy documents that cited the 2019 Commission from *Scopus* and *PlumX Metrics*, respectively. For white paper policy documents, we extracted document details and context in which the 2019 Commission was cited. Consensus/position statements and guidelines published as journal articles were added to the list of policy documents to generate a list of policy documents, consensus/position statements and guidelines. OAY and ST sampled journal articles that were relevant to the field of lifestyle interventions in psychiatry. We then coded them for publication language, type of study/publication, country and country income level of lead author primary affiliation, geographic location of lead author primary affiliation, country of empirical data collection, and country of intervention data studies.

This strategy resulted in 16 unique policy documents, consensus/position statements, guidelines, and 319 journal articles. Aggregated extracted details of the 319 journal articles are presented in **Table S1**.

Table S1. Analysis of 319 journal articles with a lifestyle focus that cited the 2019 Commission.

Domain	Number	%	Domain	Number	%
<i>Lifestyle Component</i>			<i>Country Income Level of First Author Primary Affiliation[^]</i>		
Multiple (most often physical activity & nutrition)	144	45.1%	High	280	87.8%
Physical activity	123	38.6%	Upper-Middle	38	11.9%
Nutrition	38	11.9%	Lower-Middle	1	0.3%
Smoking	6	1.9%	Low	0	0.0%
Oral health	5	1.6%			
Sleep	3	0.9%	<i>Country of First Author Primary Affiliation</i>		
			Australia	102	32.0%
<i>Publication Language</i>			UK	48	15.0%
English	313	98.1%	Brazil	28	8.8%
Dutch	4	1.3%	USA	25	7.8%
English & Spanish	1	0.3%	Netherlands	19	6.0%
English & French	1	0.3%	Spain	12	3.8%
			Germany	12	3.8%
<i>Type of Publication</i>			Belgium	12	3.8%
Primary data article	213	67.8%	Italy	9	2.8%
Review	72	22.6%	China	8	2.5%
Editorial/Letter/Perspective/Note	25	7.8%	Denmark	6	1.9%
Book/Book Chapter	5	1.6%	Canada	6	1.9%
Consensus/Position Statement/Guideline	3	0.9%	Ireland	6	1.9%
Conference Paper	1	0.3%	Norway	5	1.6%
			Sweden	5	1.6%
<i>Type of Primary Data (n=213)</i>			Switzerland	3	0.9%
Observational	142	66.0%	Hong Kong, China	3	0.9%
Intervention	52	24.2%	France	2	0.6%
Intervention Protocol	19	8.8%	Taiwan, China	2	0.6%
			Türkiye	2	0.6%
<i>Geographic Region of First Author Primary Affiliation[^]</i>			Singapore	1	0.3%
Europe & Central Asia	141	44.2%	Bahrain	1	0.3%
East Asia & Pacific	116	36.4%	Qatar	1	0.3%
North America	31	9.7%	Bangladesh	1	0.3%
Latin America & Caribbean	28	8.7%			

Domain	Number	%	Domain	Number	%
Middle East & North Africa	2	0.6%			
South Asia	1	0.3%			
Sub-Saharan Africa	0	0.0%			
<i>Country Location Where Empirical Data Was Collected*</i>					
Australia	55	-	Paraguay	1	-
UK	22	-	Suriname	1	-
Brazil	22	-	Uruguay	1	-
USA	19	-	Thailand	1	-
Netherlands	10	-	Ghana	1	-
Germany	9	-	India	1	-
Spain	7	-	Mexico	1	-
China	7	-	Russia	1	-
Uganda	6	-	South Africa	1	-
Sweden	5	-	Peru	1	-
Denmark	4	-			
Norway	4	-	<i>Country Location of Intervention Studies</i>		
Ireland	3	-	Australia	25	48.1%
Italy	3	-	USA	6	11.5%
Hong Kong, China	3	-	Netherlands	6	11.5%
Austria	3	-	Germany	4	7.7%
Switzerland	2	-	UK	3	5.8%
Türkiye	2	-	Norway	2	3.8%
Belgium	1	-	Uganda	2	3.8%
Poland	1	-	Hong Kong, China	1	1.9%
France	1	-	Denmark	1	1.9%
Taiwan, China	1	-	China	1	1.9%
Singapore	1	-	Türkiye	1	1.9%
Bahrain	1	-			
Pakistan	1	-			
Bangladesh	1	-			

Domain	Number	%	Domain	Number	%
Qatar	1	-			
Argentina	1	-			
Bolivia	1	-			
Chile	1	-			
Colombia	1	-			
Guyana	1	-			

^according to World Bank classifications (2024).

*due to multinational studies, assigning percentages were not appropriate to this analysis.

Supplementary Section 2: Recent Lifestyle Interventions

Supplementary 2.1: Search Strategies for Intervention Studies

Aim. Identify and evaluate recent lifestyle intervention studies delivered in mental health settings.

Search Strategies. The search strategy was based on the PICOS criteria listed in **Table S2**. The search strategy included a comprehensive list of terms that are used in the literature to describe mental illness and lifestyle interventions, see **Table S3**. We searched the databases MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO and Scopus. We developed a unique search strategy for each database. Studies that had been published between November 1, 2018, and the search date were eligible for inclusion. This start date was chosen because it allowed us to identify studies that had not been included by Firth et al. (2019).¹ We aimed to include studies that involved participants from any mental healthcare setting or country. No language restrictions were applied. The screening was completed in two phases: i) title and abstract, and ii) full-text, using Covidence software by two reviewers independently (ME, WM and/or ST). Data were extracted into a predetermined template built into Covidence by two investigators, with discrepancies rectified by discussion.

Table S2. Inclusion Criteria.

PICOS domain	Inclusion criteria
Population	Mental disorders (exclude studies of eating disorders, neurological disorders and neurodevelopmental disorders).
Intervention	Modern foundational elements of lifestyle intervention, defined as nutrition, physical activity, smoking cessation, and sleep, either as a single component, e.g., physical activity, or as a multi-component intervention. Extensions that have recently come into the spotlight, such as social connectivity, were not included.
Comparator	Control group, pre-post analysis or not applicable depending on study design.
Outcomes	Physical health, mental health, quality of life, years lived with disability, mortality, employment, economic and healthcare use and implementation. Recommendations for use of lifestyle interventions in clinical practice.
Sources	Primary data studies published since 2018.

Tables S3. Search Strategy.

Categories	Keyword search words used ('OR' terms)
<i>Population</i>	((((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]))
<i>Intervention</i>	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
<i>Design</i>	(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]))

Supplementary 2.2: Study Identification for Intervention Studies

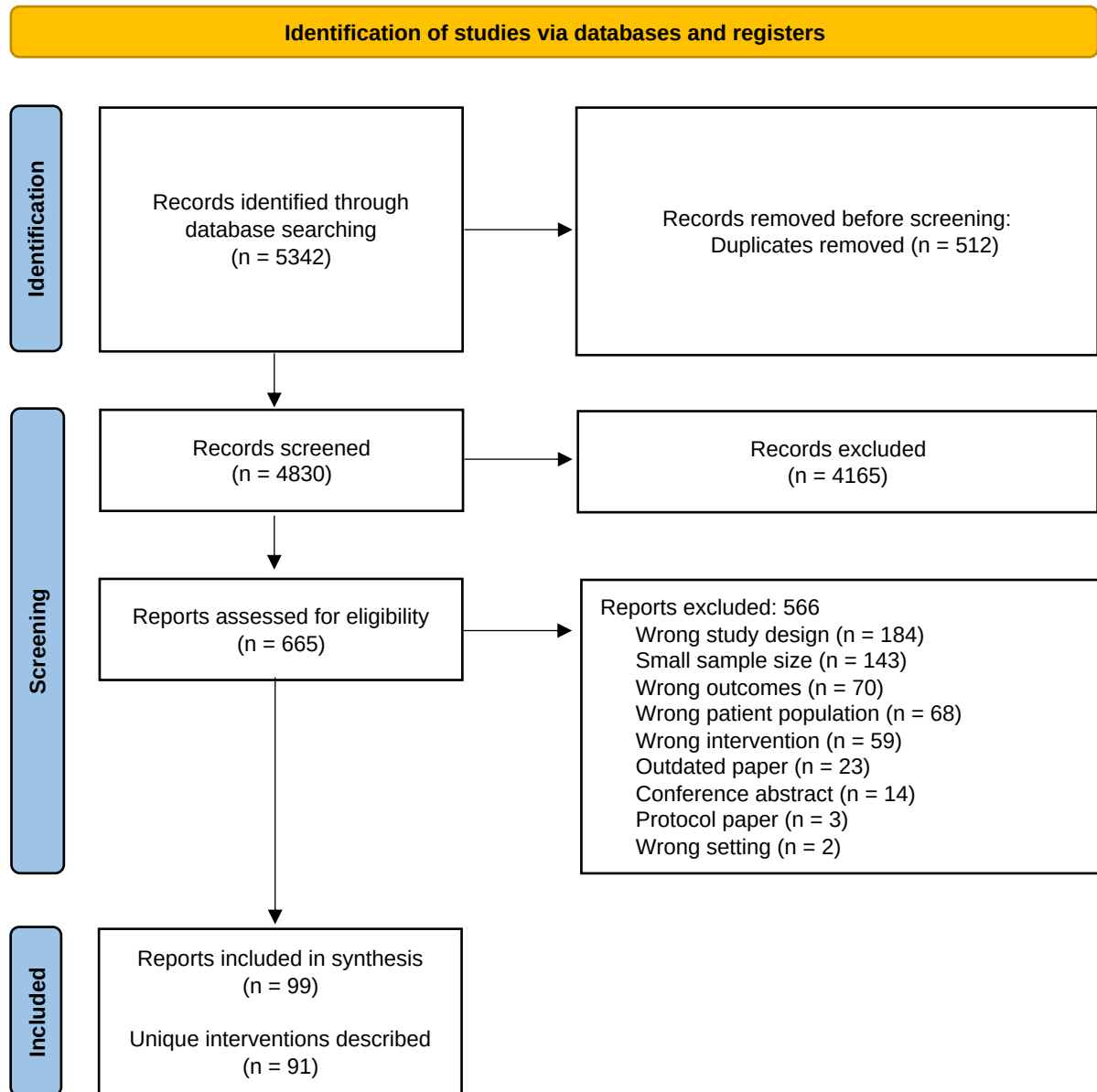


Figure S1. PRISMA flow diagram for intervention studies.

Supplementary 2.3: Recent lifestyle interventions.

Table S4. Strategies and Composition of Recent Lifestyle Interventions.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Abbott (2020) ² USA RCT	Community MDD N=71	Physical activity Nutrition Smoking Sleep	Guided education program. Online, individual delivery mode. 6-week intervention. Self-directed	Co-designed: No Peer-delivered: No Delivered by experts: N/A Flexible delivery: Yes Self-management: No Self-monitoring: No mHealth: No Staff supervision: N/A	Completion: 21% failed completion rate in the control group and a 30% failed completion rate in the intervention group.	The intervention group showed significant improvements in median scores of the SF-36 (Short Form Health Survey) subdomains of vitality and mental health, and clinically but not statistically significant improvements in the subdomain of emotional role functioning. Significant improvements in mean scores of the Medical Symptoms Questionnaire and the Patient Health Questionnaire-9 (PHQ-9).
Aguilar-Latorre (2022 & 2023) ^{3, 4} Spain RCT	Outpatient (primary care) Depression N=188	Physical activity Nutrition Sleep	1. Lifestyle program including education sessions (TAU + LMP) OR 2. Lifestyle program plus wearable wristwatch (TAU+ LMP + ICT). In-person, group 6 weeks Weekly 90-minute sessions.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: NR	Attrition: TAU+LMP – 30% TAU+LMP+ICTs – 21% TAU – 8%. Attendance (mean): TAU+LMP – M=5 TAU+LMP+ICTs – M=5 TAU – n/r.	Both interventions significantly reduced depressive symptoms when compared to Treatment As Usual (TAU), showing a moderate effect. LMP led to a significant improvement in sleep quality. The combination of LMP+ICTs resulted in increased walking and improved diet. Over a 12-month period, LMP + ICTs were effective in decreasing depressive symptoms ($p=0.001$). Furthermore, LMP + ICTs also helped reduce the number of minutes spent seated each day ($p=0.004$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Alessi (2022) ⁵ USA RCT	Outpatient SUD N=120	Physical activity	Contingency management (CM) for Exercise (CM-Exercise), including a behavioural contract and three physical activities each week. In-person, individual 4-months 3x/week	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attrition: 16% and 14% for CM-exercise and CM-general. Completion: CM-general had a greater number of activities completed. Attendance: Mean number of weeks in treatment = 9.	The CM-Exercise condition demonstrated during treatment and 12-month improvements in several physical activity and relevant psychosocial functioning indices, such as self-efficacy for exercise. The CM-Exercise condition did not show any advantages over the CM-General condition in reducing substance use.
Andersen (2020) ⁶ Norway EPHAPS RCT	Outpatient Schizophrenia spectrum N=82	Physical activity	High-intensity interval training and motivational work. In-person, group 3-months 2x/weekly 45mins	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: NR	Attrition: 79% attended post-program measurements and 49% had a valid VO2max test.	There were no significant differences between the groups on any cardiorespiratory variables at baseline or after the program. When the PA competence of the trainer (e.g. physical trainer, sports scientist) was included in the model, the intervention group increased VO2max significantly compared to the comparison group.
Aonso-Diego (2021) ⁷ Spain RCT	Community SUD N=54	Smoking	Cognitive Behavioural Therapy (CBT) + Emotional Freedom Techniques (EFT) + Contingency Management (CM). In-person, group 2-months 2x/weekly 30-120mins	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: No	Attrition (intervention): 16%. Completion: CBT+EFT+CM – 83% CBT + EFT – 70%. Attendance: CBT+EFT+CM – M=12 CBT + EFT – M=11	CBT+EFT+CM intervention significantly increased 24-hour tobacco abstinence (50% vs 20%, $p=0.02$) and the average days of continuous abstinence ($M=5.9$ vs 5.5 ; $p=0.89$) at the end-of-treatment, compared to the CBT+EFT intervention.
Aschbrenner (2022) ⁸ USA	Community Mental illness	Physical activity Nutrition	PeerFIT: a manualized group lifestyle intervention.	Co-designed: No Peer-delivered: No	Attrition: <i>PeerFIT</i> : 6m-15%, 12m-30%.	There was no significant between-group difference for weight loss, cardiorespiratory fitness (CRF), or

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Fit Forward RCT	N=150		In-person, group 12-months First 6-months 2x/week; second 6-months 1x/week.	Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Yes	<i>BEAT</i> : 6m–20%, 12m–31%. Attendance: <i>PeerFIT</i> – Intensive phase: M=6/24 Maintenance phase: M=2/24 <i>Control</i> - Telephone coaching sessions: M=4/6.	CVD outcomes at 6- and 12-months. Participants in both conditions achieved clinically significant reduction in CVD risk, weight loss, and CRF from baseline to 6 and 12 months. All these improvements were statistically significant ($p<0.01$).
Baker (2018) ⁹ Australia RCT	Community, SMI n=235	Physical activity Nutrition Smoking	Counselling. In-person, individual 9-months 16 1-hour appointments (furthered sessions offered following intervention phase).	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: No	Attrition: Ranged from 35% at 15-weeks (mid-intervention) to 46% at 36 months.	Significant reductions in cardiovascular disease risk and smoking were detected across the 36-month follow-up period in intervention and control, with no significant differences between conditions. There were no between-group differences in health behaviours, psychiatric symptomatology or quality of life measures at any time point.
Bartels (2018) ¹⁰ USA In Shape NRSI (controlled)	Community SMI N=122	Physical activity Nutrition	Health mentoring, a gym membership and instruction on healthy eating principles. In-person, individual 12-months Weekly for 60-mins	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Yes	Attendance: At 12-months, In SHAPE participants had attended a mean 34 sessions with the health mentor, median 36/50 sessions.	In SHAPE participants achieved significantly greater weight loss and BMI, improved fitness, and showed increased readiness to engage in exercise behaviour compared to control participants. There was no difference over time in the groups' readiness to engage in healthy dietary behaviours.
Blomqvist (2019) ¹¹ Sweden	Outpatient Psychotic disorders	Physical activity Nutrition	Individual counselling, goal setting and planning,	Co-designed: No Peer-delivered: No Delivered by experts: No	Attrition (intervention): 18%. Attendance:	There was a greater increase in physical activity in the intervention group (ES=0.5).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
NRSI (controlled)	N=81	Smoking	and group health education sessions. In-person, mixed Unclear duration (follow-up 12 and 24-months). 4x counselling and 6x education sessions.	Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	F2F counselling attendance: 4x 67%, 3x 20%, 1-2x 13%. Group education attendance: 5-6x 41%, 3-4x 20%, 1-2x 11%, 0x 28%. Engaged in individual: dietary advice 94%, physical activity prescription 35%, alcohol/smoking cessation 6-11%, individual plan 17%.	The control group had better effects on HbA1c (ES=0.96) and waist circumference (ES=moderate).
Bonfioli (2018) ¹² Italy PHYSICO-DSM-VR RCT	Community Psychotic disorders N=325	Physical activity Nutrition	Health promotion with education and walking. In-person, group 6-months 7x 1-hour education and weekly 1-hour walks.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: not reported Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition at follow-up: 7% Attendance: 18-45y – 43% 46-65y – 43% 18-45y – 39% 46-65y – 59%.	Improvement in one or more WHO criteria (e.g., recommendation on diet and exercise) over baseline was observed in 25% of the intervention group and in 12% of the control group ($p=0.01$).
Broberg (2022) ¹³ Denmark EWE RCT	Outpatient Depression, Anxiety (pregnant women) N=270	Physical activity Sleep	Aerobic, strength, stretching and relaxing supervised exercise program. In-person, group 3-months 2x/week for 70mins	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: not reported	Attendance: Intervention group - 42% attended >74% of the exercise sessions, 35% attended 50–74% of sessions, and 23% <50% of sessions.	There was no significant effect of group exercise on self-reported sleep quality at 29 to 34 weeks of gestation or postpartum. During this period, the intention-to-treat analysis showed no difference in the mean global Pittsburgh Sleep Quality Index (PSQI) score between the intervention group and the control group. The scores were 6.56 in the intervention group

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
						and 7.00 in the control group, ($p=0.2$).
Brown (2023) ¹⁴ USA NEW-R RCT	Community Mental illness N=113	Physical activity Nutrition	Weight-loss intervention with exercise. In-person, group 2-months 1x/week for 90mins	Co-designed: No Peer-delivered: Yes Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attrition: Intervention – 9% Control – 2%. Fidelity was 98%. Attendance: Mean 6.7/8 classes, and 84% completed $\geq 7/8$ classes.	Compared to the control group, the intervention group had statistically significant improvements, in perceived competence for exercise and healthy eating, and a total Health-Promoting Lifestyle Profile score (and nutrition and spiritual growth subscales). There was no between-group difference for weight loss.
Brown (2021) ¹⁵ USA Helping HAND RCT	Inpatient Mental illness N=353	Smoking	SusC smoking cessation intervention. In-home/telehealth, individual 1x 40-min counselling session. 5x telephone counselling sessions. 8x interactive voice response tele system.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attendance: SusC group were significantly more likely to report having used any smoking cessation treatment (75% vs 41%; $p<0.001$), including both counselling (37% vs 11%; $p<0.001$) and pharmacotherapy (71% vs 37%; $p<0.001$).	Significantly higher rates of 7-day point-prevalence abstinence were observed in the SusC group compared with the control group at 6-month follow-up (9% vs 4%; $p=0.01$). Long-term abstinence rates in the SusC group were about double that observed in the control group across more liberal definitions of abstinence.
Brunette (2018) ¹⁶ USA RCT	Community SMI N=661	Smoking	1. Prescriber visit (PV only) 2. PV and facilitated Quitline (PV+Q) 3. PV and telephone CBT (PV+CBT). In-person and telephone, individual PV only: 1 session. PV+Q: 1 session + 3	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: 35%	No significant effect of intervention (PV only, PV+Q, and PV+CBT). However, participants who received monetary incentives were more likely to abstain from smoking over time. Treatment participation and cessation outcomes did not differ significantly between diagnostic groups.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			telephone sessions. PV+CBT: 1 session + 12 CBT telephone sessions.			
Brupbacher (2021) ¹⁷ Switzerland RCT	Inpatient Depression N=92	Physical activity	Single bout of aerobic exercise. In-person, individual Single session	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: Not reported	Attrition: 2/46 (4%) intervention, 2/46 (4%) control. Fidelity: Implemented as planned.	Aerobic exercise had no effect on sleep efficiency but significantly improved mood ($p=0.003$) without increasing adverse outcomes.
Cabassa (2021) ¹⁸ USA PGLB RCT	Community (living in supportive housing) Mental illness N=314	Physical activity Nutrition	'Peer-led Group Lifestyle Balance' manualized, healthy lifestyle intervention. In-person, mixed delivery. 12-month intervention: 0-3 months weekly 3-6 months fortnightly 6-12 months monthly	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: PGLB - 6 month: 8%, 12-months: 18% 18-months: 22% No difference in attrition to usual care. Attendance: Median sessions: 18 of 22, 59% attended $\geq 50\%$, 36% attended all 22 sessions.	PGLB was not more effective than usual care in achieving clinically significant changes in weight loss, cardiorespiratory fitness, and CVD risk reductions at 12- and 18-months. A larger proportion of participants in PGLB than in usual care achieved clinically significant changes in study outcomes at 12- and 18-months, but none were statistically significant.
Celik Ince (2021) ¹⁹ Turkey NRSI (controlled)	Community SMI N=51	Physical activity Nutrition	Weight management, physical activity and nutrition program. In-person, group sessions. 4-week intervention.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes	Attrition (post intervention) Intervention - 15% Control - 17% Attrition (12-months) Intervention - 30% Control - 42%.	Waist circumference decreased in the intervention group at post-test and at follow-up. This resulted in favourable between-group difference post-test and at follow-up timepoints for both physical activity and nutrition.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			Weekly for 60-90mins.	mHealth: No Staff supervision: not reported		
Chan (2023) ²⁰ Hong Kong proact-S RCT	Community MDD (with insomnia) N=322	Sleep	proACT-S: smartphone-based, non-assisted self-help CBT-I. Online, individual delivery. 6-week intervention. Weekly for 45-60mins.	Co-designed: No Peer-delivered: No Delivered by experts: Not applicable Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not applicable	Attrition: Intervention – 35% (6-weeks), 38% (12-weeks). Control – 6% (6-weeks), 27% (12-weeks).	Compared with the waitlist group, the treatment group had lower levels of depression, insomnia, and anxiety. They also had better sleep quality. No differences across any measures were found at week 12 after the waitlist control group received the treatment. A higher proportion of participants in the treatment group no longer met clinical cut-offs for depression, insomnia, and anxiety post-treatment compared to the control group. The effect was sustained at 6 weeks postintervention.
Chan (2020) ²¹ South Korea RCT	Inpatient SMI N=310	Smoking	Three forms of Nicotine Replacement Therapy (NRT). In-person, mixed delivery. 2-month intervention.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: Yes Self-monitoring: not reported mHealth: No Staff supervision: not reported	Inhaler group had the highest rate of study participation, the lowest rate of medication discontinuation, and the lowest rate of consent withdrawal.	Only the nicotine inhaler group showed a statistically significant reduction in carbon monoxide (CO) levels at weeks 4 and 8 compared to baseline. Additionally, both the nicotine inhaler and the patch groups showed a significant decrease in nicotine withdrawal symptoms from baseline at weeks 4 and 8. The inhaler and gum groups also showed a significant reduction in psychiatric symptoms at weeks 4 and 8. Post hoc comparisons indicated that the inhaler group

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
						experienced a greater decrease in the severity of psychiatric symptoms compared to the patch group.
Chang (2018) ²² South Korea RCT	Community MDD N=93	Physical activity Nutrition	Lifestyle intervention based on prize-based contingency management. In-home and telehealth, individual delivery. 3-month intervention. Weekly phone calls and monthly visits.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attrition: Intervention – 4%, Control – 7%.	There was a higher reduction in depressive symptoms in the intervention group compared to the control.
Chatterton (2018) ²³ Australia SMILES RCT	Community MDD N=62	Nutrition	Dietitian sessions. In-person, individual delivery. 3-month intervention. 7x 60-min sessions.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: not reported	Attendance: Intervention - Median 7/7 sessions attended (mean 5·9/7) Control - median 5·5/7 attended (mean 4·3/7).	In comparison to the social support condition, individuals receiving dietary support had average total health sector costs that were \$856 lower and average societal costs that were \$2591 lower. These differences were primarily driven by reduced costs from fewer visits to allied and other health professionals. and lower costs related to unpaid productivity.
Chau (2022) ²⁴ China RCT	Outpatient Mild-to-Severe Depression N=84	Physical activity	Physical rehabilitation program group with various physical activity forms, crisis and stress management and exercise coaching.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Not reported Self-monitoring: Yes	Attrition: 19%	Statistically, the effect on VO2max, the Depression Anxiety Stress Scale, and the Brief Pain Inventory favouring the intervention group. The intervention group showed significant improvements in cardiopulmonary function, depressive symptoms, pain, body

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			In-person, individual delivery. 3-month intervention. 3x week for 60 mins.	mHealth: No Staff supervision: not reported		composition, muscle strength, and flexibility. However, a slight decline was observed from T2 to T3. Subjects without an exercise habit experienced a significant decline in cardiopulmonary function, depressive symptoms, and pain ($p<0.05$). All outcomes demonstrated a significant decrease between T2 and T3 for participants without an exercise habit ($p>0.05$).
Cody (2023) ^{25, 26} Switzerland PACINPAT RCT	Inpatient MDD N=244	Physical activity	Physical activity counselling intervention. In-person and telehealth, individual delivery. 12-month intervention. Two in-person sessions and one remote session after discharge. Longer-term: Bi-weekly (26 in 12 months) 0.5-hour telephone calls + weekly (52 in 12 months) text messages.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Yes	Attrition: Early drop out: 19%. Attendance: Low dose (<75% of the remote intervention): n=37/95, High dose (>75% of the intended remote intervention): n=40/95. Fidelity: Fidelity of the in-person counselling content was partly achieved and adapted, whereas that of the remote counselling content was well achieved.	Initial phase: Step count and moderate-to-vigorous physical activity decreased more in the intervention group compared to control. Did affect motivational and volitional determinants of and implicit attitudes toward physical activity. 12-months: The intervention dose varied between early dropouts (counselling sessions, M=2) and study completers with some participants receiving a low dose (counselling sessions, M=10) and high dose (counselling sessions, M=25). Differences in the attendance groups were recognizable in the

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
						first two counselling sessions (duration of counselling session was ~45-min for early drop outs vs 60-min for completers).
Daumit (2023) ²⁷ USA TRIUMPH RCT	Community SMI N=192	Physical activity Nutrition Smoking	Pharmacotherapy + behavioural smoking cessation, weight management and physical activity. In-person, mixed delivery. 18-month intervention. (motivational, smoking cessation, and relapse prevention phases). Individual sessions bi-weekly for 3-months, then monthly review. Group exercise (50-mins) 2-3x week.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attrition at 18-months: Intervention – 3% Control – 2% Attendance: Intervention - median 31 sessions over a median 73 weeks. All intervention participants received exercise plans, participants engaged in a median of 22% of exercise groups offered.	The intervention increased 7-day tobacco abstinence (26% vs 6%) without significant weight gain. Change in cardiovascular risk was reduced more in the intervention group (-13% vs +4%).
Deenik (2018) ²⁸ Netherlands MULTI RCT	Inpatient Schizophrenia and other psychotic disorders N=144	Physical activity Nutrition	Multidisciplinary lifestyle enhancing treatment (MULTI): day program with joint meals, physical activity, work-related activities, psycho-education and skills training. In-person, mixed delivery modes.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attrition: 1%	Compared with control, the defined daily dose for psychotropic medication significantly decreased with MULTI ($p=0.02$). Changes in total activity did not mediate this association, suggesting that multiple components of MULTI contributed.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			Duration varied.			
Denlinger-Apte (2020) ²⁹ USA RCT	Community Schizophrenia spectrum and/or bipolar disorder. N=58	Smoking	Very low nicotine content (VLNC) cigarettes. In-person, individual delivery mode. 6-week intervention. Weekly visits.	Co-designed: No Peer-delivered: No Delivered by experts: no Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: not reported	Not reported.	Participants in the very low nicotine condition smoked fewer puffs per cigarette and had shorter inter-puff intervals relative to the standard nicotine control condition at the week 6 visit. No significant differences between research cigarette conditions were observed for cigarette volume, puff duration, puff volume, peak flow rate, or CO boost.
Evins (2023) ³⁰ USA RCT	Community SMI N=1010	Smoking	Provider education (PE) and Community health worker (CHW) support for smoking cessation. In-person, mixed delivery. 2-year intervention. Ongoing support	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: 23% lost to follow-up before 1 year assessment. Retention rates did not significantly differ by intervention assignment.	In year 2, abstinence rates were significantly higher among participants assigned to PE+CHW compared to those receiving usual care (12% vs 5%) or to those receiving PE alone (12% vs 7%). No effect of PE alone on abstinence was detected. Additionally, participants assigned to PE+CHW had greater odds of varenicline use compared to those in the usual care group, and this was associated with higher abstinence rates in year 2.
Fenton (2021) ³¹ USA NRSI (single group)	Outpatient and inpatient. SMI N=29	Physical activity Nutrition Smoking	Diabetes prevention education with exercise. In-person, group delivery mode. 3-month intervention. Weekly for 1 hour	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No	Attendance: Mean attended: 9/12 sessions (range 3 to 12). The average attendance rate was 75%.	Weight, waist circumference, HbA1C, and blood pressure were reduced. Participants also showed improvements in self-knowledge and self-care.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
				Staff supervision: not reported		
Fernandez Guijarro (2019) ³² Spain RCT	Community SMI N=61	Physical activity Nutrition Smoking Sleep	Theoretical content and physical activity. In-person, group Weekly 20-mins content and 60-mins physical activity.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Yes	Attrition: 5% Attendance: 79% sessions	The intervention reduced cardiovascular and metabolic risks (BMI, triglycerides, and diastolic blood pressure) and improved physical activity levels and quality of life.
Foulds (2022) ³³ USA RCT	Outpatient Anxiety or mood disorder N=188	Smoking	Progressively reduced nicotine content (RNC) cigarettes. 12-week Treatment Choice Phase: 1) return to smoking usual brand; 2) continue with research cigarettes; 3) Quit with brief counselling and NRT. Individual delivery. 33 weeks, daily	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: not reported	Completion: Intervention – 73% Control – 79% Attended Week 33 session. Intervention – 65% Control – 64%	At 12-weeks, the RNC group was significantly more likely to have quit smoking compared to the UNC group, with 18% of the RNC participants quitting versus only 4% of the UNC participants ($p=0.004$). Furthermore, the RNC group had significantly lower plasma cotinine (a nicotine metabolite), urine NNAL (a metabolite of NNK, which is a lung carcinogen), exhaled carbon monoxide, cigarette consumption, and cigarette dependence. No significant effects were observed on psychiatric symptoms.
Gao (2022) ³⁴ USA RCT	Community Generalised Anxiety Disorder	Sleep	Mindfulness Training (MT) delivered through an app-based platform.	Co-designed: No Peer-delivered: No Delivered by experts: Not applicable	Completed 30 modules: Intervention – 53% completed at 2-months, 73% at 4-months.	At 2-months, the intervention group had a median 27% reduction in sleep disturbance compared to 6% in controls ($p=0.001$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
	N=80		Online (app), individual delivery. 10-mins daily for 2-months.	Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: not applicable	Control – mean 19 modules at 2-months, 34% completed at 4-months.	At 4 months, waitlist had a 29% reduction after beginning app-based MT at 2-months. The original intervention group maintained improvements.
Garcia (2023) ³⁵ Spain RCT	Community MDD N=94	Physical activity Nutrition	Online lifestyle modification program. Online, individual delivery. Weekly for 2-months.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Not reported Self-monitoring: Not reported mHealth: No Staff supervision: No	Attrition at 8-weeks: Lifestyle intervention 15%, mindfulness-based cognitive therapy 24%, placebo-control 26%. Attrition at 12-months: Lifestyle intervention 29%, mindfulness-based cognitive therapy 34%, placebo-control 48%. Mean session attendance: Lifestyle intervention 79%, mindfulness-based cognitive therapy 67%.	Depressive symptoms were reduced in all three groups with no between-group difference. Improvements in Diet Score (lifestyle modification) and Quality of Life (both lifestyle modification and mindfulness-based cognitive therapy) were found in per-protocol analyses (but not significant in ITT analyses). There was no between-group difference in physical activity levels.
Garcia-Garces (2021) ³⁶ Spain RCT	Inpatient Schizophrenia N=86	Physical activity	Aerobic training OR strength training OR mixed. In-person, group delivery. 4-months. 3/week for one hour	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: No Self-monitoring: No mHealth: No Staff supervision: No	Attrition (post treatment): Aerobic 18%, Strength 14%, Mixed: 35%. Attendance: Aerobic: 88%, Strength: 88%, Mixed: 79%.	At 16-weeks there were significant improvements in all three groups for negative, general, and total symptoms (moderate-to-large effect sizes). There was no change in BMI, 6MWT or IPAQ-SF, but there was a significant improvement in the handgrip strength test in the strength and mixed groups. All the improvements had disappeared at 10-months.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Gilbody (2019) ³⁷ , Li (2020) ³⁸ UK SCIMITAR+ RCT	Outpatient Schizophrenia spectrum and bipolar disorder. N=526	Smoking	Smoking cessation intervention. Mixed, individual 12-months 12x 30mins.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attendance: Intervention – 88% attended ≥1 treatment session (mean sessions 6.4).	At 12-months, 15% in the intervention group, and 10% in the usual care group had quit smoking. Improvement in physical health was observed in the intervention group at 6-months, but not at 12-months. No difference between the groups for mental health at 6- or 12-months. The mean total cost for the intervention group was £270 lower than usual care. The intervention group's mean QALY was (76% probability of cost-effective at £20 000 per QALY).
Gili (2020) ³⁹ Spain RCT	Outpatient Depression N=221	Physical activity Nutrition Sleep	1. 'HLP' healthy lifestyle psychoeducational program OR 2. 'PAPP' focused program on positive affect promotion OR 3. 'MP' brief intervention based on mindfulness. In-person and online, mixed delivery. 4-8 weeks 1x face-to-face session for 90 mins. 4x 40–60-minute online modules.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: not reported	Attrition: 45% Attendance: 81% attended the initial face-to-face session. Completion: HLP – 44% MP – 52% PAPP – 32% No between intervention group difference for session completion.	Short-term differences favour internet-based psychological interventions, specifically HLP and MP. No differences in depression severity were observed between the PAPP group and the control group.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Guydish (2023) ⁴⁰ USA RCT	Community SUD N=174	Smoking	Addressing Tobacco Trough Organizational Change (ATTOC) model. In-person and webinar, group delivery. 6-months 5x 1 hour sessions.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Yes Self-management: Not applicable Self-monitoring: Not applicable mHealth: No Staff supervision: No	Attrition: Nil programs lost to follow up.	Staff in the intervention and control conditions did not differ at post-intervention on smoking prevalence, self-efficacy to help clients quit, or practices used to help clients quit smoking. Intervention clients did not differ from controls in smoking prevalence or receipt of tobacco services.
Hallgreen (2019) ⁴¹ Sweden FitForLife NRSI (single group)	Outpatient FEP N=94	Physical activity	Resistance, aerobic and stretching exercise program. In-person, individual 3-months 3x/week for 60mins	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: No Self-monitoring: Not reported mHealth: No Staff supervision: Yes	Attrition: Pre commencement – 3%; 22% did not attend any exercise sessions. Attendance: Mean attendance was 14 sessions, 48% completed ≥ 12 sessions.	The positive effects included improvements in processing speed, visual learning, and visual attention.
Hallgreen (2021) ⁴² Sweden NRSI (single group)	Outpatient SUD N=140	Physical activity	A sub-maximal fitness test performed on a Monarch cycle ergometer. In-person, individual delivery. Single session for 12mins.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: Not applicable Self-monitoring: Not applicable mHealth: No	Not applicable.	Alcohol craving significantly decreased from pre-exercise to post-exercise ($p<0.001$) and 30-minutes ($p<0.001$), with small to moderate effect sizes. Additionally, mood disturbance also showed a significant reduction from pre-exercise to post-exercise ($p<0.001$), and at the 30-minutes mark ($p<0.001$), again with small to moderate effect sizes.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
				Staff supervision: not reported		State anxiety only decreased from pre-exercise to the 30-minutes mark ($p=0.052$).
Hammett (2020) ⁴³ USA OPTIN NRSI (controlled)	Community SMI N=939	Smoking	Smoking cessation intervention with counselling and NRT. Telehealth, individual delivery. 2-months Frequency not reported.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attendance: Intervention group had higher treatment utilization than usual care (52% vs 40%).	Participants in the intervention group had a higher rate of prolonged smoking abstinence after 6 months compared to those receiving usual care, with rates of 15% and 9%, respectively ($p=0.01$).
Harvey (2021) ⁴⁴ USA TranS-C RCT	Community Mental illness N=121	Sleep	TranS-C modular based education and behaviour change intervention incorporating CBT-I. In-person, individual delivery. Varied, up to 12 sessions. Weekly for 50mins.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: yes	Attendance: Mean session = 8. Attrition: Intervention – 17% Control – 3% ($p=0.001$).	TranS-C was associated with improvement from pre-treatment to post-treatment for all primary outcomes (reduction in functional impairment, general psychiatric symptoms, sleep disturbance and sleep-related impairment) compared to control. These effects were maintained to 6-month follow-up.
Healey (2019) ⁴⁵ England NRSI (controlled)	Community SUD N=1762	Smoking Sleep	Stop smoking services including pharmacological management, NRT and group or individualised support. Intervention information not reported.	Co-designed: No Peer-delivered: Not reported Delivered by experts: Not reported Flexible delivery: Not reported Self-management: Not reported	Not reported.	The incremental cost per QALY gained from quit attempts supported through more frequently provided interventions ranged from around £4,700 to £12,200. Group-based behavioural support interventions were estimated to be at least half as effective as individual support, owing to lower

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
				Self-monitoring: Not reported mHealth: No Staff supervision: Yes		costs and higher reported quit rates. Medication combined with group-based behavioural support may offer better value for money in this population than interventions using individual support.
Hearon (2018) ⁴⁶ USA NRSI (controlled)	Inpatient and Outpatient. Mental illness. N=152	Physical activity	Education based exercise group sessions integrated into a Behavioral Health Partial (BHP) program: 'Exercise for Mood' OR 'Exercise for Fitness'. In-person, group delivery. Single session for 50-mins.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Not applicable.	The advantage for an exercise-for-mood intervention relative to both a traditional exercise-for-fitness intervention and a control intervention that did not target exercise was only evident in participants who usually exercised. The degree of exercise was significantly associated with lower depression severity at discharge for all groups.
Hidalgo (2021) ⁴⁷ Spain RCT	Outpatient Depression N=313	Physical activity	Supervised aerobic, muscle strength, flexibility and balance exercise. In-person, group delivery. 6-months Weekly for 1-hour.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: not reported	Attendance: Intervention: poor attendance, mean sessions = 19. Attrition at 3- and 6-months: Intervention – 39%, 58% Control – 23%, 40%.	Both groups had a favourable effect on participants' self-perceived health status, with statistically significant ($p<0.01$) increases in both groups' health status scores over follow-up with respect to baseline. A significant difference in depressive symptomology improvement at the end of 3- and 6-months (not 1-month).
Higgins (2020) ⁴⁸ USA RCT	Community Affective disorders, SUD	Smoking	Very low-nicotine cigarettes (VLNC) or Low-nicotine cigarettes (LNC).	Co-designed: No Peer-delivered: No Delivered by experts: Not reported	Attrition: 83% completed the study (including 'women with socioeconomic	VLNC cigarettes had decreased mean (SEM) total cigarettes per day (CPD) during week 12 across populations ($p<0.001$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
	N=775		In-person and at home, individual delivery. Daily for 3-months	Flexible delivery: not reported Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: not reported	disadvantage' participant group).	At week 12, mean (SEM) CPD significantly decreased in intervention groups but not in the control group.
Hitsman (2023) ⁴⁹ USA RCT	Community MDD N=300	Smoking	Behavioural activation for smoking cessation (BASC) and Varenicline medication. In-person and telehealth, individual delivery. 3-month intervention. 0-4 weeks weekly; 4-12 weeks biweekly for 45 mins.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Retention: 59% (14-weeks) and 57% (27 weeks). Adherence: 63% Attendance: Mean behavioural sessions: 6.1 for control + placebo, 5.3 for BASC + placebo, 6.3 for ST + varenicline and 5.9 for BASC + varenicline.	No significant interaction was detected between behavioural treatment and pharmacotherapy at 27 weeks ($p=0.51$). Significant differences in abstinence rates ($p=0.03$) emerged among pharmacotherapy arms (16% for varenicline, 8% for placebo), with results favouring varenicline over placebo.
Hjorth (2018) ⁵⁰ Denmark NRSI (controlled)	Outpatient Schizophrenia N=183	Physical activity Nutrition Smoking	Individual motivational interviewing on diet, physical fitness and smoking, OR group sessions on physical health psychoeducation, diet and meal planning, exercise and training. In-person, mixed delivery. 2-month intervention.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Not reported mHealth: Not reported Staff supervision: Not reported	Attrition: 15.3% not measured at follow-up.	Patients newly diagnosed with schizophrenia: worsened physical profile, with increased weight, waist circumferences, visceral adiposity index ($p=0.03$), and glycosylated haemoglobin (HbA1c; $p=0.01$). Long-term patients: improved with regard to their consumption of soft drinks ($p=0.001$) and fast food ($p=0.009$), reduced their weight and waist circumferences and became more physically active.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			Weekly 1.5-hour group or 1-hour individual.			However, no changes in HbA1c values were observed in the long-term patients during the intervention period.
Holt (2019) ⁵¹ UK STEPWISE RCT	Outpatient Schizophrenia spectrum disorder. N=414	Physical activity Nutrition	Structure education intervention. In-person and telehealth, mixed delivery. 12-month intervention. 2.5hours, weekly and then triweekly. 10min phone calls biweekly for the remainder of the intervention period.	Co-designed: Yes Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attendance: Mean 2.7 foundation and 1.4 booster sessions. 54% attended ≥ 3 foundation sessions and ≥ 1 booster session, with 23% attended all foundation and booster sessions. 17% participants attended no sessions. Completion: Intervention – 81% Control – 84%	The weight change at 12-months was almost identical between groups (0.47kg and 0.51kg, $p=0.96$). There was no difference in weight loss percentage or in the percentage of participants who maintained or lost weight.
Japuntich (2020) ⁵² USA RCT	Community SMI N=982	Smoking	Outreach call, mental health tailored telephone counselling and NRT. Telehealth, individual delivery. 6-month intervention. 12 calls for 15-30mins.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: Yes Staff supervision: Yes	Attendance: Participants in the Intervention group were more likely to use telephone counselling than control group (22% vs 3%), NRT (51% vs 41%), and both counselling and NRT (18% vs 2%).	The intervention group was more likely to report 7-day point prevalence abstinence (18% vs 11%) and 6-month prolonged abstinence at 12-months (15% vs 9%) than those in the control group. A substantial proportion of participants in both groups made quit attempts (Intervention: 67%, Control: 63%).
Karg (2020) ⁵³ Germany RCT	Outpatient Depression N=133	Physical activity	Bouldering psychotherapy (BPT): combination of bouldering and psychotherapy OR Exercise programme	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes	Attendance: BPT – 8 sessions, EP – 2.2 sessions per week.	Significant improvements in both groups for depressive symptoms (BPT scores decreased 8.4 points vs EP decreased by 3.0 points on the MADRS (between group $p=0.002$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			(EP): home-based Exercise Programme. In-person and at home, mixed delivery.	Self-monitoring: Yes mHealth: No Staff supervision: Yes		On average, the BPT group improved by more than one severity grade (moderate to mild depression), and the EP group remained within the same severity grade (moderate depression).
Keizer (2019) ⁵⁴ Switzerland NRSI (controlled)	Inpatient and outpatient Mental illness N=174	Smoking	26-hour tobacco abstinence period with a structured day program. Optional NRT. In-person, group delivery. Single session for 26 hours.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: not reported	Attrition: 8% of participants were not reassessed.	52% of participants succeeded in 26-hour smoking abstinence. Significant improvements in most withdrawal symptoms pre- and post-intervention. There were significant improvements in cravings and well-being, along with significant decreases in anxiety and depression.
Kraepelien (2018) ⁵⁵ Sweden RCT	Outpatient (Primary care) Depression N=945	Physical activity	Supervised group exercise: 1) 'light exercise'; 2) 'moderate exercise'; 3) 'vigorous exercise' In-person, mixed delivery. 3-month intervention. 3x week exercise sessions. Weekly meetings with physiotherapist.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Yes	Attendance: Intervention – 15/36 1-hour group classes, 5/12 physiotherapist sessions and were reminded by phone an average of 7 times.	Improvements in depression after 3 months were significantly larger in both the physical exercise group (MD=3·0, $p<0\cdot001$) and the Internet-based CBT control group (MD=2·8, $p<0\cdot001$), respectively. The treatment effect of exercise and internet-based CBT control was approximately equal.
Kuo (2021) ⁵⁶ USA ACTIVE II RCT	Community MDD (with Type-2 diabetes).	Physical activity	Free membership to exercise centres and sessions with trained instructors (EXER) +	Co-designed: No Peer-delivered: No Delivered by experts: No	Retention: 76% completed both baseline and	Full remission from MDD: CBT – 66% EXER – 72% CBT+EXER – 71%

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
	N=140		CBT + Dining with Diabetes nutrition classes OR EXER alone. In-person, mixed delivery. 3-month intervention. CBT: 10 weekly sessions; Exercise: 6 classes.	Flexible delivery: Not reported Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Not reported	postintervention assessments.	Control – 32%. There was an interaction effect between CBT and EXER on the full remission rate ($p=0.05$). There was no interaction effect between EXER and CBT on the change in HbA1c, and the main effect of EXER and CBT on the change in HbA1c was not significant. There was no between-group difference for weight or BMI.
Lappin (2020) ⁵⁷ Australia NRSI (single group)	Inpatient SMI N=214	Smoking	System change intervention for smoking cessation. In-person, mixed delivery. 3-month intervention.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Not reported.	Modest gains in routine smoking screening (from 2% to 11%) and proportion of inpatients offered smoking cessation treatment (from 11% to 27%).
Li (2021) ⁵⁸ China RCT	Inpatient Schizophrenia N=101	Physical activity	Systematic psychological nursing (SPN) provided; 5) Entertainment and activities (playing chess, skipping rope, Tai Chi). In-person, individual Communication with doctor 1-2x/week for 60mins; Cognitive intervention 1x/ week for 60mins;	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Not reported	Not reported.	Sleep scores in the intervention group were lower (improved) than the scores in the control group (all $p<0.05$). Quality of life scores were increased in all groups (all $p<0.05$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			Entertainment and activities for 30mins (noting frequency not defined).			
Looijmans (2019, 2020) ^{59, 60} Netherlands LION RCT	Community Mental illness N=244	Physical activity Nutrition	Web tool 'Traffic Light Method for Somatic Screening' and Lifestyle'. In-person, individual delivery. 12-month intervention Biweekly sessions.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	The use of the web tool during routine care was lower than the estimated 23 follow-up reports. In the intervention group, 108 out of 140 patients (77%) completed at least one lifestyle behaviour screening and developed subsequent lifestyle plans with specific goals.	No significant between-group differences were identified for waist circumference, BMI or metabolic syndrome Z-score after 12 months. The intervention was not cost-effective at 12 months, and the budget impact over five years was substantial. After 12 months, both costs and the reduction in WC were higher in the intervention (N=114) than in the control (N=94) group after 12-months. Although not statistically significant, it resulted in a loss of €1,370 per cm waist circumference.
Luciano (2021, 2022) ^{61, 62} Italy LIFESTYLE RCT	Outpatient SMI N=401	Physical activity Nutrition Smoking Sleep	Psychoeducation, motivational interview, and cognitive-behavioural therapy + moderate physical activity. In-person, group delivery. 6-month intervention. Every 7-10 days. Meeting followed by 20 mins physical activity.	Co-designed: Yes Peer-delivered: No Delivered by experts: No Flexible delivery: Not reported Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: Intervention – 56% Control – 56%.	The intervention group significantly reduced BMI, body weight and waist circumference. The intervention group had almost 8x the likelihood to show an increase of the total MET ($p<0.001$) and of the walking MET ($p<0.001$) and was more likely to increase the weekly consumption of vegetables ($p<0.05$) and to reduce that of junk food ($p<0.05$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Lund (2023) ⁶³ Denmark MUSTAFI RCT	Outpatient Depression (with sleep disturbance). N=112	Sleep	Participants listened to music at bedtime with a MusicStar app combined with a sound pillow. At home, individual delivery. 4-week intervention. Daily for ≥30-mins.	Co-designed: No Peer-delivered: No Delivered by experts: Not applicable Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not applicable	Adherence: The average of strict adherence to protocol (27 nights, 30 min at indicated bedtime) was 39%. The adherence to protocol (27 nights, self-administered exposure) was 67%.	Comparison of PSQI sleep quality scores between groups showed a decrease in global scores from baseline to 4 weeks in the music intervention group. Statistically significant decrease of insomnia symptoms in the music intervention group compared to control ($p<0.001$).
Ma (2019) ⁶⁴ , Lewis (2021) ⁶⁵ USA RAINBOW RCT	Outpatient Depression N=409	Physical activity Nutrition	The Group Lifestyle Balance (GLB): goal-based approach to promote modest weight loss AND the Program to Encourage Active, Rewarding Lives for Seniors (PEARLS): behavioural activation strategies. Onsite, in-home and telephone. 12-month intervention. 0-6 months: 9 face-to-face sessions and 11 videos; 6-12 months: monthly phone calls.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Yes	Completion: Intervention – 74% completed ≥7/9 intensive treatment sessions and 65% completed ≥ 5/6 maintenance telephone sessions.	At 12 months, participants in the intervention group showed significantly greater improvements in BMI and scores for depression symptoms compared to those receiving usual care participants.
Mason (2023) ⁶⁶ Australia	Community Anxiety (with insomnia)	Sleep	Internet CBT Insomnia program (iCBT-I).	Co-designed: No Peer-delivered: No	Attendance: iCBT-I L1 (n=57), L2 (n=54), L3 (n=51), L4 (n=48);	Treatment for insomnia was more effective at alleviating insomnia symptoms compared to anxiety treatment, but both treatments

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
RCT	N=120		Online, individual delivery. 6–8-week intervention. 4 lessons to complete.	Delivered by experts: Not applicable Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not applicable	iCBT-Anxiety program (control), L1 (n=59), L2 (n=50), L3 (n=48), L4 (n=46). Attrition: iCBT-I post-treatment: 22%; iCBT-A post-treatment: 33%.	were equally effective in reducing anxiety symptoms. Participants in both groups experienced large reductions in symptoms of insomnia, anxiety, depression, and distress, along with enhancements in total sleep time and sleep efficiency. These treatment gains were sustained at 3-month follow-up, and no differences were observed between the two groups.
Mattock (2023) ⁶⁷ UK 1) SCIMITAR+ & 2) IC RCTs	1) Community SMI N=526 2) Outpatient PTSD N=943	Smoking	Two interventions: 1) Bespoke smoking cessation intervention (BSCI) consisting of behaviour change and pharmacotherapy. 12-month intervention. 12x 30-min individual, in-person sessions. In-home or onsite. 2) Tobacco cessation sessions and cessation medications prescribed. 18-48 months; 5x weekly core sessions, 3x follow-up visits then monthly boosters.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: 1. Yes, 2. Not reported Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Yes	1) 88% of intervention participants engaged; mean 6.4 quit smoking sessions. 2) Total smoking cessation sessions received (median): IC 8, SCC 1.	Cost effectiveness: both interventions were cost-effective from a UK healthcare perspective. Intervention effectiveness: 1) The intervention group had a higher proportion of participants who quit at 12 months than the usual care group, but this was not statistically significant. 2) IC was better than SCC on prolonged abstinence.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
McCuistian (2022) ⁶⁸ USA NRSI (controlled)	Residential services SUD N=249	Smoking	Tobacco-free policy development. In-person, group delivery. 15-month intervention.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: Not reported Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Yes	5/7 SUD programs had implemented tobacco-free grounds policies.	There was a significant decrease in smoking prevalence (decreased from 54% at pre- to 27% at post-intervention) and an increase in NRT/pharmacotherapy.
Meepring (2018) ⁶⁹ Thailand HIP-T NRSI (single group)	Outpatient Schizophrenia spectrum, delusional disorders N=105	Physical activity Nutrition Smoking Sleep	Screening and creation of an individualized care plan. In-person, individual 12-months	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision/training: Yes	Completion: All 105 service-users who volunteered to participate completed the study.	There were significant reductions in mean BMI (-0.78 kg/m^2 , $P < .001$) and bodyweight (-1.13 kg , $P < .001$) at post-test; 22% were found to have moved to a healthier BMI classification after 1 year. There was also a significant decrease in the total number of “red-flagged” HIP-T items, suggesting lowered potential health risks ($P < .001$).
Muralidharan (2018, 2020) ^{70, 71} USA RCT	Outpatient Schizophrenia spectrum & PTSD N=276	Physical activity Nutrition	Either: 1. WebMOVE is a weight management program and includes 1) internet browser-based provision of 30 interactive educational modules, tracking of activity and weight, and individualized	Co-designed: No Peer-delivered: Yes Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Yes	Attendance: Mean modules completed in WebMOVE was 15 (49% of 30 modules) and mean sessions completed in MOVE SMI was 10 (41% of 24 sessions) ($p=0.17$). Completion: In WebMOVE, 18 participants (31%)	WebMOVE group: 2.8kg weight loss ($p=0.001$). MOVE SMI group: no substantial change in BMI ($p=0.92$). Usual care: no substantial change, 0.30kg weight gain ($p=0.80$). Baseline to 6-months, there was a condition-by-visit effect in obese patients only ($p=0.02$).

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			homework, plus 2) weekly telephonic peer coaching. 2. MOVE SMI is an in-person weight management program. 24 sessions (8 individual and 16 group) for 60mins. 6-months		completed the intervention, while in MOVE SMI, no participants (0%) completed the intervention ($p<0.001$).	In-person MOVE was associated with a greater decrease in the Three Item Loneliness Scale total score at 6-months ($p=0.006$). WebMOVE had a greater increase in IWQOL-SE at six months ($p=0.026$). There were significant increases in both active interventions in VR-12 MCS compared to usual care: for WebMOVE at three months ($p=0.031$) and six months ($p=0.018$), and for in-person MOVE at six months ($p=0.048$).
Nordbrandt (2020) ⁷² Denmark RCT	Outpatient PTSD N=338	Physical activity	1) Basic body awareness therapy (BBAT) (group B) OR 2) Mixed physical activity (group M): Onsite and telehealth, individual delivery. 3-month intervention. Weekly sessions.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: Not reported Staff supervision: Not reported	Attrition: Group B – 22 people Group M – 32 people Control – 23 people Attendance: Mean physiotherapy attendance = 10 sessions for both Group B and Group M.	No post-treatment group differences were observed in PTSD severity scores. Significant decline in PTSD severity for all intervention groups between pre- and post-treatment ratings. There were no significant group differences in secondary outcome measures (i.e. depression, anxiety, quality of life, etc.).
O'Donoghue (2022) ⁷³ Australia PHAsTER RCT	Community FEP N=77	Physical activity Nutrition Smoking	Physical health nurse added to care team to provide lifestyle psychoeducation and link to already available services (expert clinicians).	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: No	Attrition: Intervention – 13% Control – 18%.	The intervention did not prevent clinically significant weight gain or metabolic complications or increase smoking cessation or physical activity levels.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			In-person and telehealth, Individual delivery. 3-month intervention Weekly sessions.	Staff supervision: Not reported		
Parletta (2019) ⁷⁴ , Segal (2020) ⁷⁵ Australia HELFIMED RCT	Outpatient Depression N=152	Nutrition	Nutrition education workshop + two fish oil capsules per day (MedDiet group). In-person, group delivery. 6-month intervention. 0-3 months: fortnightly sessions. 3-6 months: continue with fish oil capsules.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: Not reported Staff supervision: Yes	Attrition: 3-months = 53%; 6-months = 56%. Retention to 3-months: Intervention – 72% Control (social group) – 53%. Retention to 6-months: Intervention – 63% Control (social group) – 49%.	The MedDiet group reported significantly greater improvements in their depression score, and mental health QoL score over 3 months. All changes were sustained at 6 months. Mediterranean diet scores were significantly associated with lower anxiety, depression and negative affect. The diet was also associated with better coping and overall QoL. The economic evaluation found that the intervention represented a favourable societal investment.
Penna (2018) ⁷⁶ Brazil RCT	Inpatient Mental illness N=59	Physical activity	Aerobic exercise program. 2-month intervention In-person, group delivery. 2x/week for 50mins	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: not reported	Attrition: Intervention – 22% Control 16%. (between group $p=0.754$). Attendance: Mean sessions completed = 14 (no difference regarding treatment compliance between groups, $p=0.49$).	Participants showed clinical improvement in gambling severity, psychiatric comorbidity, and gambling craving. Those in the exercise program, however, did not report greater reductions in gambling severity and craving compared to the stretching group.
Petzold (2019) ⁷⁷ Germany	Outpatient Mental illness N=83	Physical activity Nutrition	Physical activity theory-based psychological intervention.	Co-designed: No Peer-delivered: No Delivered by experts: No	Attrition: 31%, with no differences between the groups ($p=0.80$).	There was a significantly higher level of objectively measured PA at follow-up in MoVo-LISA participants compared to control.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
MoVo-LISA RCT			In-person, mixed delivery. 2-week intervention. 2x group sessions for 90-mins. 1x individual session for 15-mins.	Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes		There was an improvement in dietary behaviour and fruit and vegetable intake in the control group, but not in MoVo-LISA participants. There was a significant increase in some, but not all social cognitive determinants of health behavior change in MoVo-LISA participants.
Pleaver (2023) ⁷⁸ Australia NRSI (single group)	Inpatient Mental illness N=91132 (discharge data).	Smoking	Brief smoking cessation and systems change intervention. In-person, individual delivery. Single implementation.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: Not reported Self-monitoring: Not reported mHealth: No Staff supervision: not reported	The completion rate for the smoking cessation 'Pathway' among inpatients who identified as smokers was 60%.	There was no change in smoking status over time for patients who reported smoking in the previous 30 days during the implementation and maintenance phases of the systems intervention. The documentation of smoking status remained high, and completions of 'the Pathway' stabilised in the inpatient units despite reducing support activities overtime for systems interventions.
Pratt (2023) ⁷⁹ USA RCT	Community SMI N=1348	Physical activity Nutrition	1) Gym: membership at local fitness facilities OR 2) InSHAPE: health mentorship and gym membership OR 3) Weight Watchers: strategies for weight loss, OR 4) InSHAPE + Weight Watchers. With cash incentives.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Attendance: Weight Watchers: mean 0·8 meetings each month. Gym membership mean 4·8 sessions per month. InSHAPE mean 1·7 Health Mentor meetings each month.	All participants experienced a significant decrease in weight over time ($p<0\cdot001$). The only between-groups difference in weight loss over time was greater weight loss by the InSHAPE + Weight Watchers group compared to the InSHAPE group ($p=0\cdot03$). Receiving cash incentives was not significant for any outcome. The

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			In-person with telephone support, individual and group components. 12-month intervention. InSHAPE: 1x week for 45-60mins. Weight Watchers: 1x week.			total amount of incentives was, however, significantly associated with cardiovascular endurance, mortality risk and weight loss.
Rajalu (2023) ⁸⁰ India Other	Outpatient Schizophrenia spectrum N=170	Smoking	Tobacco cessation intervention. Mixed setting, individual delivery. 3-week intervention. Week 1: 1x face-to-face (40-45mins). Weeks 2-3: 1x/week telephone (5-10mins).	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not reported	Attrition at 3-months: Intervention – 18% Control – 26% Attrition at 6-months: Intervention – 15% Control – 31%. (between group p=0.02).	At 6-months, significant (p<0.001) difference in 7-day point-prevalence abstinence (28% vs 11%), reduction of tobacco by at least 50% (62% vs 41%) with an attrition rate of 15% vs 31% in the intervention vs control group. Improvements in the intervention group included reduced nicotine dependence and tobacco craving, increased motivation, more quit attempts and clinical improvement.
Rasmussen (2018) ⁸¹ Denmark GSP NRSI (single group)	Community Mental illness N=36945	Smoking	Structured education smoking cessation intervention. In-person, mixed delivery modes. 6-week intervention. 5 meetings, group 2hours, individual 20-40mins.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: 69% participated in the follow-up after 6-months.	The success rate for quitting smoking was high overall, but it significantly lower for smokers living with SMI (29% vs 38%). Compliance, attending ≥75% of the planned meetings, was associated with successful quitting.
Ringen (2018) ⁸² Norway	Inpatient SMI N=83	Physical activity Nutrition	Motivational interventions (MI) + Physical activity.	Co-designed: Yes Peer-delivered: Yes Delivered by experts: Yes	Attendance: 88% received MI-sessions.	Physical activity level did not increase, but the level of activity was positively correlated with

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
NRSI (single group)		Smoking	In-person, mixed delivery modes. 6-7-month intervention. 15mins/week MI. minimum 3x 30mins/week physical activity.	Flexible delivery: N/A Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes	Mean MI sessions per week during the 6 months follow-up was 2.5.	motivation and negatively correlated with positive symptoms. Significant positive effects were observed on triglyceride levels, number of smokers and symptom levels.
Ronngren (2018) ⁸³ Sweden NRSI (single group)	Community SMI N=38	Physical activity Nutrition Smoking	Education and consultation for lifestyle change prescription. In-person and telehealth, mixed delivery modes. 26-week intervention. 19x 2-hour sessions and 1-4 hours/week of individual support.	Co-designed: Yes Peer-delivered: Yes Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Yes	Attrition: 5%; most users attended ≥75% of the group sessions.	The intervention had positive effects on quality of life, cognitive performance, exercise capacity and waist circumference, but it had no effect on BMI.
Saunders (2022) ⁸⁴ USA RCT	Community Bipolar disorder N=82	Nutrition	Intensive dietary intervention. In-person, at home and online, individual delivery mode. 3-month intervention. Fortnightly dietitian session, monthly physical exam, with smartphone and website support.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not reported	Attrition Intervention – 32% Control – 27%. Attendance: Intervention attendance in week 2 was n=34 and week 12 was n=30. Compliance Intervention – 86% Control – 84%.	Variability in mood, energy, irritability, and pain was reduced in the intervention group compared to the control group. There were no significant differences in mean ratings of mood symptoms or any other symptom measured. N-6 linoleic acid plasma levels reduced over time in the intervention group compared to control group. N-3 EPA and DHA plasma levels increased over time in the

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
						intervention group compared to the control group.
Secades-Villa (2022) ⁸⁵ Spain RCT	Inpatient (SUD treatment facilities). SUD N=80	Smoking	Contingency Management (CM) + cognitive-behavioural smoking cessation therapy (CBT). In-person, individual delivery mode. 2-month intervention. 2x sessions/week (1.5-hour therapy and 1x sample collecting session.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: No Self-management: Yes Self-monitoring: No mHealth: No Staff supervision: Not reported	Retention (end of treatment): Intervention – 68% Control – 46% Retention (12-month f/u): Intervention – 37% Control – 37%	Combining CM with CBT for smoking cessation increased tobacco abstinence at the end-of-treatment. No significant effects of treatment condition were observed across follow-up.
Singh (2023) ⁸⁶ India RCT	Outpatient SMI N=80	Physical activity Nutrition	A structured lifestyle modification package. In-person, individual 4-weeks 30-45mins twice a week.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: not reported	Attrition: Intervention – 23% Control – 18%. Attendance: Mean sessions attended = 7; 73% attended all eight sessions.	The intervention group had significantly reduced body weight, BMI, WC, and WHR compared to the control. Similarly, the intervention group also improved their QOL, whereas the control showed no improvement.
Smit (2022) ⁸⁷ Netherlands MULTI_sh RCT	Community SMI N=177	Physical activity Nutrition	Daily activity program In-person, group delivery mode. 12-month intervention.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Not reported Self-management: Yes Self-monitoring: Yes mHealth: No	Attrition: Intervention – N=36 Group – N=37 Retention: 42% could be included in the analysis.	Health outcomes did not substantially improve, and the intervention was not implemented as intended.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
				Staff supervision: Yes		
Subotnik (2023) ⁸⁸ USA RCT	Community Schizophrenia N=48	Physical activity	Internet-based cognitive training and aerobic exercise. In-person, at home and online, mixed delivery modes. 6-month intervention. 4-hours/week (2x group exercise and 2x at-home sessions).	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: not reported	Adherence: Mean 13 group exercise sessions (during month 4/6) and 13 individual exercise sessions at home.	Young adults with schizophrenia can engage in a regular exercise program. The number of exercise sessions attended was associated with better sleep quality.
Suen (2022) ⁸⁹ Hong Kong RCT	Community Schizophrenia spectrum N=57	Physical activity	Motivational coaching followed by a HIIT exercise session + weekly yoga. In-person, mixed delivery modes. 4-month intervention. 12 sessions for 30mins. 8 weekly, followed by 4 biweekly.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Not reported Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: not reported	Attrition: Intervention – 30% Control – 37%. Retention: 65% at immediate post-intervention and 83% at 6-months post-intervention follow-ups.	Motivational coaching had a significantly higher total physical activity level after intervention and at 6 months post-intervention.
Sugawara (2018) ⁹⁰ Japan RCT	Outpatient Schizophrenia N=265	Nutrition	Nutrition education sessions. In-person, individual delivery mode. 12-month intervention. 30-40mins monthly.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: No Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: No	Attrition: Standard care: 28% Doctor's weight loss advice: 28% Nutrition Intervention: 30%	Significantly lower prevalence of metabolic syndrome in the intervention group. Statistically significant decreases in mean weight and BMI were observed in patients in the intervention group but not in control groups.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
Uebelacker (2023) ⁹¹ USA Project MOVE RCT	Community Depression N=242	Physical activity	Brief Advice' (BA) + 'Supervised and home-based aerobic exercise' (SHE) + 'Cognitive-behavioural sessions' (CBEX). Onsite and in-home, mixed delivery modes. 6-month intervention. BA: one-off 45 minute prior to intervention. SHE: 1x week in clinic 1-hour exercise session + a home-based aerobic exercise program 2-4/week. CBEX: once weekly for 30mins.	Co-designed: No Peer-delivered: No Delivered by experts: Yes Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Not reported	Average fidelity rating: BA + SHE + CBEX – 99% BA + SHE + health education (HE) comparator – 97% Mean attendance at weekly exercise and class sessions: BA + SHE + CBEX = 6/11 BA + SHE + HE = 6/11 (between group p>0.05).	The BA + SHE + CBEX group had significantly higher moderate-vigorous physical activity at the 3-months. Relative to control, both BA + SHE + CBEX and BA + SHE + HE demonstrated higher levels of objectively determined moderate-to-vigorous physical activity over the entire 9-month study.
Wagner (2022, 2023) ^{92, 93} USA Eat, Walk, Sleep RCT	Community Depression N=188	Physical activity Nutrition Sleep	Diabetes prevention curriculum (EWS) and medication therapy management (MTM) In-person, mixed delivery modes. 12-month intervention. 3x individual and 24x 1-hour group sessions. Weekly initially then moving to biweekly,	Co-design: Yes Peer-delivered: Yes Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Not reported mHealth: No Staff supervision: Not reported	Attrition: EWS – 4% EWS+MTM – 3% SS – 8%. Retention: 96% at 15-months. Fidelity: 98% checklist adherence	Intervention groups did not differ from each other on any of the outcomes at any of the time points. Significantly greater improvements in self-reported diabetes knowledge and nutritional habits for intervention groups compared to control. There was a significant difference between EWS and control for health status at 12-months but not at 15-months. Waist circumference and blood pressure decreased at post-

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			triweekly and monthly.			treatment and follow-up for all groups. EWS+MTM intervention decreased HbA1c relative to control at post-treatment. Both treatment groups decreased depressive symptoms relative to control at 15 months. There were no significant differences in physical activity, symptoms of insomnia or levels of anxiety between the groups. Similarly, no significant changes in lipids or insulin resistance were observed.
Waite (2023) ⁹⁴ UK SleepWell RCT	Outpatient UHR N=40	Sleep	Psychological sleep therapy At-home, onsite or telehealth, individual delivery mode. 3-month intervention. 8x weekly sessions for 1-hour.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: Yes	Uptake: Intervention – 95%. Attendance: Mean sessions attended = 8. Mean sessions missed (not attended or cancelled) = 1.	Treatment provided large improvements in sleep, with smaller benefits for depression and psychotic experiences.
Walburg (2022, 2023) ^{95, 96} Netherlands SMILE RCT	Outpatient Mental illness N=224	Physical activity Nutrition	Focus on lifestyle change then weight-loss maintenance. In-person, mixed delivery modes. 12-month intervention. First 6 months: weekly 1-hour; 6-12	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: No	Attrition: Intervention – 35% Control – 12% Attendance: 53% of available sessions. Attendance at the sessions dropped each month (e.g. 71% attendance after 1 month, to 50% after 3 months)	98% of sessions were performed. Six sessions in one team were cancelled due to a lack of personnel. During the intervention, 39% of HCPs delivering the intervention dropped out. Positive effects in reducing weight.

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
			months: 1-hour monthly.	Staff supervision: Yes		Within the intervention group, people with high attendance lost more weight than people with medium and low rates. Little-to-no between-group effect on cardiometabolic risk factors and no between-group effects on lifestyle behaviour components.
Welford (2022) ⁹⁷ Sweden FitForChange RCT	Community SUD N=140	Physical activity	Access to a gym, personal trainer, aerobic/yoga classes. In-person, mixed delivery modes. 3-month intervention. 3x weekly classes and 3x 30min personal trainer sessions	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: not reported	Retention: Intervention 86% to aerobic exercise and 93% to yoga, Control 93%. Attendance: Mean 1x week gym and 1x week structured exercise outside of the gym.	Aerobic, yoga and TAU groups improved Hospital Anxiety and Depression Scale scores – the largest effect with the yoga group.
Young (2021) ⁹⁸ Australia SHED-IT Recharge RCT	Community Depression N=125	Physical activity	e-health weight loss program for men Online, individual delivery mode. 3-month intervention. Self-guided weekly modules.	Co-designed: No Peer-delivered: No Delivered by experts: Not reported Flexible delivery: Yes Self-management: Yes Self-monitoring: Yes mHealth: Yes Staff supervision: not reported	Retention: 80% at 3-months. 78% at 6-months. 82% attended ≥ 1 assessment post-randomisation.	Medium-sized treatment effects for both weight and depressive symptoms were maintained at 6-months.
Zeibig (2021) ⁹⁹ Germany 'ImPuls' RCT	Outpatient Depression, anxiety,	Physical activity	Exercise intervention In-person, group-based delivery mode.	Co-designed: No Peer-delivered: No Delivered by experts: No Flexible delivery: No	Completion rate: Intervention – 82% Control – 61%.	The intervention significantly improved global symptom severity, depression, anxiety, sleep quality, and increased the amount

Study Details	Setting & Participants	Lifestyle elements	Intervention	Implementation & Delivery	Summary of fidelity, attendance and attrition	Summary of effectiveness
	insomnia, ADHD N=74		Weeks 0-4: supervised exercise, weeks 5-12: non-supervised. Weekly phone calls.	Self-management: Yes Self-monitoring: Yes mHealth: No Staff supervision: Yes		of exercise compared to the control group. The reduction of global symptom severity was significantly predicted by increased exercise.
Zhu (2021) ¹⁰⁰ China RCT	Community SUD N=83	Physical activity	Aerobic exercise program. In-person, group-based delivery mode. 3-month intervention. 5 days/week at 30mins (first month) then 35mins.	Co-designed: No Peer-delivered: No Delivered by experts: Unclear Flexible delivery: No Self-management: No Self-monitoring: No mHealth: No Staff supervision: not reported	3-month attrition: Intervention – 2% Control – 5%.	The exercise group showed significant improvements in SSRT (stop-signal reaction time), symptoms of depression and anxiety, physical fitness scores, cravings, cognitive function and emotions.

ADHD: Attention deficit hyperactivity disorder, BMI: Body mass index, ES: Effect size, FEP: First-episode psychosis, HbA1c: glycated haemoglobin, HCP: Health care professional, M: Mean, MD: Mean difference, MDD: Major depressive disorder, mHealth: mobile health applications, mins: Minutes, N: Sample size, NRSI (controlled): Nonrandomised Study of an Intervention with a control group, NRSI (single group): Nonrandomised Study of an Intervention with a single-group, NRT: Nicotine replacement therapy, PTSD: Post-traumatic stress disorder, QoL: Quality of life, RCT: Randomised Controlled Trial, SMI: Serious mental illness, SUD: Substance use disorder, WC: Waist circumference, WHR: Waist-to-hip ratio.

Supplementary 2.4: Details submitted for case studies

Table S5. Physical Health & Wellbeing Team

Initiative	<i>Physical Health & Wellbeing Team</i>
Country	United Kingdom
Author	Contributed by Hannah Burton
Overview	Co-produced physical activity program for people with mental health issues, including SMI.
Location	Mainstream community facilities. Referrals from community mental health teams, GPs, social prescribers, asylum seeker and refugee services, and self-referrals.
Delivery	Delivered as face-to-face, one-to-one support for new participants. Group activities after initial one-to-one support. Delivered by peer support workers with lived experience of mental ill health, and staff and volunteers with various physical activity and sports qualifications.
Frequency	Seven-day program with varied session frequencies. Walking sessions in different locations to minimize travel.
Modifications made	Activities are personalized, e.g., adapted bikes for physical disabilities. Participants choose activities with no attendance limit, allowing time for positive long-term changes. Daily informal feedback from participants.
Sustainability of the program	Financial contributions for sessions are nominal to encourage participation. Community building through shared clothing, transport, and social support. Opportunities for local and national sporting competitions and links with the European Association for Sport and Social Interaction (EASI). Peer support workers, both paid and volunteer, provide empathetic support. Regular team supervision to meet changing needs and ensure service quality. Development of participants into volunteers or paid staff members. Strong community and international connections to enhance engagement and progression.
Impact	Physical activity has saved lives, improved confidence, self-esteem, and self-belief. Positive social connections, career opportunities, and a sense of belonging and purpose were fostered.

	Some individuals have been involved for over ten years, experiencing life-changing impacts.
Program barriers	Financial implications and management of community facilities. Many community venues do not see the benefits and cannot accommodate activities due to financial pressures.
Program enablers	Creating a culture of change by making individuals feel safe and supported through physical activity. Building positive social connections with people and places.
Lesson learned	Programs must address financial and facility management challenges. Emphasize the tangible benefits to community venues to gain support and accommodation for activities.

Table S6. Keep Quitting in Mind Initiative

Initiative	Keeping Quitting in Mind (KQIM)
Country	Australia
Author	Contributed by Dr Hamish Fibbins and Eliza Draper
Overview	Free clinical smoking cessation service offering nicotine replacement therapy (NRT) and behavioural counselling. The service is delivered by a Tobacco Treatment Specialist (TTS), who is a smoking cessation nurse, and co-delivered with a peer worker with lived experience of mental illness and smoking cessation, who provided health coaching to support consumers in working on their goals relating to smoking cessation, under the guidance of the tobacco treatment specialist.
Location	Integrated within public community mental health services across a health district.
Delivery	Onsite, face-to-face and via telehealth.
Frequency	The smoking cessation nurse is employed part-time. The frequency of sessions is flexible and dependent on the nurse. There are no limits placed on the number of sessions or time spent accessing the service. The peer worker provided health coaching
Modifications made	The original smoking cessation service began as a pilot project at the Bondi Junction Community Mental Health Centre for youth accessing the Early Psychosis Program.¹⁰¹ After the pilot's success, it was expanded and run as a pilot project for all adults accessing Eastern Suburbs Community Mental Health Services.¹⁰² The health district (South Eastern Sydney Local Health District) has since established a permanent position for the smoking cessation nurse, who now offers both smoking and vaping cessation support to mental health service users across the whole health district. The smoking cessation service is supported by Mindgardens Neuroscience Network, an organisation that facilitates translational research and service evaluation. Together, Mindgardens and the smoking cessation team have: • Provided health district-wide education in smoking cessation delivery to mental health clinicians, • Upskilled physical health-focused clinical nurse consultants to become 'smoking cessation champions' to provide smoking cessation support adjunctive to the limited formal smoking cessation service, • Created a Tobacco Treatment Framework algorithm¹⁰³. This framework provides step-by-step guidance for clinicians working with people living with serious mental illness.
Sustainability of the program	The smoking cessation nurse position is now a permanent position funded by the health district. Similarly, the physical health-focused clinical nurse consultants (and smoking cessation champions) are in permanently funded positions. The peer worker position, however, was based on temporary funding. The health district also funds NRT and varenicline prescriptions. Instigating culture change was an important element of the widespread implementation of KQIM across the district. Common beliefs were observed anecdotally among SESLHD clinicians e.g. patients are not interested in quitting, rely on smoking to manage their mental illness, or that cessation

	medications aren't effective. To promote acceptability of the service, and to upskill clinicians in smoking cessation support, the TTS and peer worker delivered grant-funded smoking and vaping cessation training to 106 inpatient and community mental health clinicians across the district. This training offered insight into nicotine addiction and its effects on mental health, how to use NRT correctly, how clinicians can better support patients in quitting, and promoted awareness of the KQIM service and the referral process. The training has not re-occurred due to lack of funding, but feedback from attendees indicated overwhelming support for ongoing training and upskilling and highlighted the value of the TTS' clinical expertise and the peer worker's lived experience perspective. As the service operates at a reduced capacity, ongoing smoking cessation training for mental health staff is necessary to promote sustainability of smoking cessation support across the district. The peer worker and TTS have also begun upskilling peer workers and Clinical Nurse Consultants operating out of the Keeping the Body in Mind physical health teams to become 'smoking cessation champions' to alleviate some of the workload of the KQIM service and to promote smoking cessation at the face of clinical delivery, outside of formalized training sessions. The Tobacco Treatment Framework is also being incorporated as a tool to aid clinicians in providing smoking cessation support throughout general clinical practice.
Impact	Engaging in these interventions has coincided with a reduction in smoking and levels of nicotine addiction.^{101, 102} The evaluations have formed the basis for permanent funding of the smoking cessation nurse position, funding for smoking cessation training and upskilling which was delivered to 106 staff members, and helped support the development of an international Tobacco Treatment Framework.¹⁰³
Program barriers	• Both positions were employed part time, limiting capacity to see patients. • Lack of ongoing funding for the peer worker position. • The service is only available to patients accessing community mental health services. • Widespread misinformed beliefs among staff around smoking and serious mental illness limit smoking cessation support outside of the service and reduce referrals to the service. • High turnover of district mental health staff means training should be regular and ongoing, but lack of funding prevents this. • Limited research on appropriate vaping cessation interventions for people living with serious mental illness. • Majority of clinicians attending training lacked knowledge around how to support patients with smoking cessation, including how to administer NRT correctly.
Program enablers	• Upskilling workforce through education and training. • Smoking cessation champions outside of the KQIM service. • Permanent funding for the TTS position and cessation medications.
Lesson learned	As KQIM is a small service operating on a part-time basis, and the service began in the eastern suburbs, it has been challenging to gain momentum implementing the service across the rest of the district. Training for mental health staff is necessary to ensure widespread smoking cessation support is available. Given the implementation challenges for a service not typically included or prioritised by mental health services, support from leadership is crucial to i) implement ongoing training and drive attendance, and ii) maintain the initiative to support ongoing smoking cessation in the clinical environment. Feedback from clinicians throughout the training highlighted the need for ongoing and regular training; majority of attendees lacked knowledge around how to support patients with smoking cessation, including how to administer NRT correctly. High turnover of staff also means training should be regular to capture any new staff coming through.

	Upskilling dedicated mental health smoking cessation champions is a cost-effective means of ensuring smoking cessation support is promoted outside of the core smoking cessation service.
Program references	KQIM: Fibbins, H., Ward, P. B., Morell, R., Lederman, O., Teasdale, S., Davies, K., McGuigan, B., & Curtis, J. (2024). Evaluation of a smoking cessation program for adults with severe mental illness in a public mental health service. <i>Journal of Psychiatric and Mental Health Nursing</i>, 00, 1–8. https://doi.org/10.1111/jpm.13052 Tobacco Resource: Watkins A; Gould P; Fibbins H; Morell R; Metse A; Manger S; Curtis J; Samaras K, 2024, Tobacco Treatment Resource: An intervention framework for people on psychotropic medication, http://dx.doi.org/10.26190/t259-mk60 Simplified Tobacco: Watkins A; Gould P; Fibbins H; Morell R; Metse A; Manger S; Curtis J, 2024, Simplified Tobacco Treatment Resource: An intervention framework for people on psychotropic medication., http://dx.doi.org/10.26190/unsworks/30171 Adult Cardiometabolic Resource: Watkins A; Gould P; Fibbins H; Morell R; Samaras K; Manger S; Curtis J; Newall H, 2023, Positive Cardiometabolic Health Resource: An early intervention framework for people on psychotropic medication (Adult version), http://dx.doi.org/10.26190/2h3h-kw57 Adolescent Cardiometabolic Resource: Watkins A; Gould P; Fibbins H; Morell R; Samaras K; Manger S; Curtis J, 2024, Positive Cardiometabolic Health Resource: An early intervention framework for people on psychotropic medication (Adolescent Version), http://dx.doi.org/10.26190/b4fb-z897

Table S7. Nile PICU Physical Activity Program

Initiative	Nile PICU Physical Activity Program
Country	United Kingdom
Author	Contributed by Matt Waugh
Background	Psychiatric Intensive Care Units (PICUs) are specialised facilities for individuals experiencing acute phases of severe mental disorders. Due to increased risk to themselves or others, a secure environment beyond the capacities of regular mental health wards is necessary. Violence and aggression are common reasons for admission to psychiatric wards, and commonly occur within them.¹⁰⁴ A UK National Audit of Violence found that 46% of nursing staff working in an adult inpatient mental health setting said that they had been physically assaulted, 72% had been threatened or made to feel unsafe, and 58% had experienced violence that had distressed them.¹⁰⁵ Of patients, 45 % had experienced violence that had distressed them and 18% had been physically assaulted.¹⁰⁴ Violence and aggression have a harmful impact on treatment outcomes, patient and staff safety, ward morale and the therapeutic environment. The management of acute behavioural disturbance on Nile PICU is a multi-disciplinary approach that integrates psychopharmacological, psychological, environmental and social interventions.¹⁰⁴ This case study examines Nile PICU's physical activity program.
Program	Nile PICU is a 12 bedded male ward in CNWL NHS Trust, London. A team was formed within the ward's staff with the capacity to develop and deliver a physical activity program: a Physical Activity Nurse (PAN) and Activities Coordinator (AC). The nurse, a dual-qualified RMN and Level 4 fitness instructor, co-produced physical activity care plans. The AC, an experienced staff member with 13 years' experience on PICU, led the delivery of a timetabled program. The program included physical activity, gym, cooking, gardening, exteroceptive relaxation, sleep, community football, and health education. Leaders on the ward created a resilient and cohesive culture where all team members felt valued and were encouraged to contribute towards quality improvement projects.
Environment	Access to physical activity was increased by improving the ward gym. The gym was redeveloped with equipment tailored to the PICU environment. Recumbent, upright and air bikes were added so a range of cardiovascular sessions could be safely provided. Power bags, soft dumbbells, barbells and benches allow resistance training to be offered. The dumbbells and barbells are manufactured from softer material and stored in a box. Gym mats enable the provision of stretching, bodyweight core and relaxation groups. Equipment was funded by CNWL NHS Charity and LiveMore CIC.
Physical activity	The physical activity nurse leads a combination of individual and small group sessions in the gym and outdoor garden. All patients have personalised programs. Regular activities promote the physical and social health of patients. Ongoing achievements are displayed on a whiteboard in the gym. Each activity is tailored to the patient's clinical needs and the effects of their medications. Physical activity sessions are held flexibly from Monday to Friday, 1000 to 1800, with seven additional staff trained to supervise gym access, including at weekends. The physical activity nurse had capacity to deliver individual sessions throughout the week, depending on the participant's preference. Medical staff aim to undertake physical assessments, ECGs and digital gym clearance forms within the first few days of admission.

Post discharge support	Nile patients can be connected directly from the ward into community exercise referral schemes. This process can be made directly from the clinical computer system, without patients having to visit their GP. To maintain physical activity after discharge, patients are connected into a peer-led community football club, Minds United. Club members are supported to undertake FA coaching and refereeing qualifications. Eighteen people have completed accreditations and gained part time employment. Minds United travelled to Italy with three Nile staff, winning a European futsal competition in consecutive years. Nile's AC is the club welfare officer.
Sleep	Alongside physical activity, the program includes sessions to improve sleep. Disturbed sleep is prevalent in psychosis. A weekly exteroceptive relaxation group was developed to improve sleep, utilising gym mats and music. The assistant psychologist supports health education on improving sleep and all areas of the program.
Co-production	Throughout program delivery, the physical activity team had capacity to continuously collect and respond to patient feedback. This information was gathered through informal conversations, feedback forms, community meetings, friends and family surveys, with twenty surveys conducted monthly. Ongoing feedback allows for incremental improvements and flexible delivery of the program that met proximal needs.
Outdoor space	Nile PICU is a locked ward. Greater access to outdoor space was a consistent theme in feedback. Increased access to the ward garden was timetabled, allowing for morning sunlight and ongoing gardening sessions where patients help maintain the garden. The physical activity team had capacity to open the garden flexibly throughout the day. Patients fed back that the calm garden, was a pleasant contrast to the ward. Particularly in the summer, the garden is often open for most of the day where patients and staff can interact and socialise communally, play ping pong, football, basketball and ping pong.
Cooking	Patients also requested to improve the range of food options. A cooking project was supported by a Royal College Grant. This included two weekly cooking sessions: one where patients made whole grain sandwiches with freshly prepared ingredients individually in the ward kitchen. The second is where individuals are supported to cook for the entire ward, sharing food communally in the garden. This cooking is highly popular, with meals prepared from a wide range of cultures. Patients are given the opportunity to choose the exact dish they want to cook, and supported to prepare it by the physical activity team. All ward staff, including the ward consultant, share the food in the garden. Patient's frequently feedback that the communal meals were very positive experiences.
Haircuts, Trims and Shaves	The AC leads a weekly refresh group, where patients can access haircuts, beard trims and shaves. Patients commonly fed back that this improved their experience on the ward, how they felt in themselves, and reframed their perception of being on a PICU.
Outcomes	Intended outcomes of the program were to improve patient experience, reduce levels of violence and improve weight management.
Patient and family experience	Patient feedback was captured in the friends and family feedback surveys, where over 90% of anonymous participants ranked their experience as being 'very positive.' One participant stated that the program "gave me a positive focus in a difficult period." Families expressed their satisfaction that their family members were being supported to improve their physical health. This also helped to improve family perceptions of PICU, mental health services and power imbalances. Greater trust of the families, and working with families in the triangle of care, helped to improve outcomes by working together.

Violence reduction	Prior to the quality improvement work, levels of violence and aggression on Nile PICU were high. The program contributed to a 51% reduction in violence over two years, as captured using routinely collected data on levels of assaults, seclusions and rapid tranquillisations. This was published in the British Journal of Psychiatry,¹⁰⁶ winning Safety Awards in 2020 and 2021.¹⁰⁷ Nile's consultant's psychiatrist has co-authored a textbook on 'The Management of Inpatient Violence.'¹⁰⁴ Reducing violence and aggression had a beneficial impact on treatment outcomes, patient and staff safety, ward morale and the therapeutic environment.
Weight management	PICUs can utilise high-dose psychotropic medication to treat psychosis and manage disturbed behaviour. Inpatient studies have shown sharp rises in the weights of males prescribed second generation antipsychotics for treatment resistant schizophrenia. On Nile PICU, healthcare assistants and nurses routinely monitor physical health measurements at weekends. One of the outcomes of the physical activity program was improved weight management and a reduction in significant weight gain. It is likely that this was in part due to an environment that was less sedentary. Following a six-month audit prior to the implementation of the program, it was shown that the number of patients experiencing significant weight gain (5+kg) reduced by 30% (n=102).¹⁰⁸ Nile PICU was awarded a 2022 Quality Improvement Award for this work.
Funding	Positive outcomes led to CNWL Charity funding the replication of gym equipment used on Nile PICU, across all six ward gyms at St Charles Hospital. Twenty-four staff across the unit have been trained as exercise support staff. Sport England have funded the ongoing development of a community gym for community mental health services, in collaboration with CNWL psychological therapies and LiveMore CIC. LiveMore CIC was founded by the physical activity nurse to develop physical activity programs for mental health services.
Research and evaluation	A Loughborough University PhD student is currently undertaking a realist enquiry of the Nile PICU program. The primary researcher spent 85 hours spanning six months (March 2023 – October 2023) on Nile PICU, undertaking 18 interviews and 2 focus groups.¹⁰⁹ The review will assist in disseminating the learnings of the program for wider implementation and recommendations for other services, policy and practice.
Implementation learnings	Physical activity is recognised as beneficial in the treatment of mental disorders. NICE recommends that 'People with psychosis or schizophrenia, especially those taking antipsychotics, should be offered a combined healthy eating and physical activity programme by their mental healthcare provider.'¹¹⁰ p6 Despite this guidance, physical activity is often underutilised in inpatient settings due to barriers such as staff capacity, access to appropriate resources, training and supervision. Several implementation learnings on Nile PICU helped overcome barriers and sustain the program over multiple years.
Foundational stability	Creating foundational stability on the ward; effectively addressing immediate challenges, such as disruptive behaviours; and optimal patient care through medication optimisation and clinical teamwork was crucial prior to the implementation of the physical activity program. Rapid tranquilisation and seclusions are last resort, when all other options have been exhausted. The physical activity program reduced RT and seclusion use over time by improving non-pharmacological options.

Staffing	The formation of a physical activity team made the delivery of a personalised program possible. This team was part of a cohesive staff unit, which worked together to achieve foundational stability on the ward, and strong clinical leadership. All members of the team were valued and encouraged to contribute towards quality improvement. Seven additional ward staff were trained to facilitate greater access to the gym. These staff were supervised by the physical activity nurse. All trained members of the MDT are familiar with ward systems, patient clinical presentations and risk assessing.
Access	Improvements to the PICU gym facilitated access to a space in which the physical activity program could be delivered. The gym's location meant that patients could be supervised to access it during acute phases of mental illness, without requiring leave from the ward. As such, it played a preventative role in violence reduction and improving patient experience on the ward. Increased access to the ward garden also reduced sedentary time.
Training	The primary physical activity team held dual mental health nursing and fitness qualifications, combined with extensive experience working with mental health populations in inpatient settings. Moving forward, improved staff training can improve the capacity of inpatient physical activity teams to deliver programs competently. There is a high turnover of staff on inpatient units, and systems should be in place that training is provided regularly, with adequate supervision by qualified staff. Ongoing co-design with patients is important, to ensure programs are enjoyable, tailored to their needs, strengths and preferences. Evaluation of programs using quality improvement and translational research methodology allows impact and learnings to be captured and disseminated.
Initiative links and reports	Rahman M, Taylor C, Abdullahi R, Okwuokei A, Waugh M, Kaji M, Magadlela B. Nile Ward PICU violence reduction quality improvement project. BJPsych Open. 2021 Jun 18;7(Suppl 1):S213–4. https://doi.org/10.1192/bjo.2021.570. Rahman M, Taylor C, Abdullahi R, Okwuokei A, Kaji M, Waugh M, Magadlela B, Coplestone J, Fell R. Nile Ward PICU Violence Reduction Quality Improvement Project - One Year on. BJPsych Open. 2022 Jun 20;8(Suppl 1):S108–9. https://doi.org/10.1192/bjo.2022.330. Keel T, Machaczek K, Waugh M, King J, Breen K, Rahman M, Kaji M, Kinnafock F. A Realist Inquiry Exploring a Ward Based Physical Activity Service in a Psychiatric Intensive Care Unit. <i>In development</i>.

Table S8. Physical Activity Initiatives in Uganda

Initiative	<i>Implementing Physical Activity Interventions in a Low-Resource Context</i>
Country	Uganda
Author	James Mugisha (Kyambogo University, Kampala, Uganda), Philip B. Ward (UNSW Sydney Australia), and Davy Vancampfort (KU Leuven, Belgium).
Overview	Various initiatives aim to increase physical activity in low-resource areas.
Location	These physical activity interventions are being implemented in various village settings: • Fishing Communities Around Lake Victoria: These communities face an increased risk of mental health disorders due to socioeconomic vulnerabilities, substance abuse, and the high prevalence of HIV/AIDS. Limited access to mental health services further exacerbates these issues. • Post-Conflict Areas in Northern Uganda: After two decades of civil war, these regions have experienced widespread atrocities, including the abduction and forced conscription of tens of thousands of children, who were used as soldiers and sex slaves. • Poverty-Affected Areas of Central Uganda: Economic hardships, limited access to healthcare, and the stress associated with subsistence living contribute to a significant risk of mental health disorders in these communities.
Delivery	The implementation of the interventions takes place on-site and involves the following interventionists: • Clinical staff • Village Health Teams: These consist of community-based volunteers trained to provide basic healthcare, health education, and referrals. These teams serve as a vital link between communities and the formal health system, playing a crucial role in promoting preventive care, including mental health support, especially in underserved rural areas. • Physical Activity Champions • Caregivers: Individuals who care for people with mental illness. Additionally, the interventions involve training health professionals at regional hospitals. Local health professionals and international experts delivery the training.
Frequency	The diverse activities include weekly village sessions and two-day ad-hoc training sessions at regional referral hospitals.
Modifications made	Staged implementation approach: Stage 1: A clinical officer was initially hired to provide physical activity counselling to individuals with alcohol use disorders and co-occurring mental health issues in a fishing village in Lake Victoria. The counselling was based on the Self-Determination Theory and focused on fostering three psychological needs: autonomy, belonging, and competence. Techniques such as Motivational Interviewing and Mental Contrasting with Implementation Intentions (MCII) were utilised to help individuals transform their aspirations for a better future into achievable goals and take actionable steps to fulfil their commitments.

	Stage 2: Following the program's success, champions who benefited from the intervention were identified and trained to provide physical activity counselling. Ten-hour workshops were conducted for multidisciplinary health professionals. A rural community in central Uganda now receives a monthly outreach program, which includes training for primary care providers in lifestyle psychiatry. Stage 3: The family and community-based mental health support model that empowers patients, caregivers, and family members through group counselling, psychoeducation, and the strengthening of social networks among families. By integrating income-generating initiatives, this approach addresses both the psychological and socioeconomic stressors that contribute to mental health challenges. These initiatives are co-created with participants. Stage 4: To enhance support, referral pathways and connections were created between community activities, schools, and local health services. Additional initiatives that play a crucial role in supporting community mental health: Income-generating initiatives, such as raising and selling pigs, support community mental health in Mpigi, Uganda. These activities help alleviate financial stress, foster a sense of purpose, and enhance self-reliance among families. By addressing the socioeconomic determinants of mental health, these initiatives create opportunities for community bonding and collective resilience, which are essential for psychological well-being.
Sustainability of the program	Funding for specific interventions has stopped. The rural community program gathers data on service usage, which is compiled and shared with major donors, sponsors, and the Health Ministry to secure continued support. Sustainability is partly supported by capacity building. Capacity building refers to enhancing the skills and competencies of clinical staff and local lay health workers, such as Village Health Teams. This process involves providing them with mental health first aid training, practical tools like need-supportive coaching and ongoing mentorship. The goal is to deliver culturally sensitive, patient-centred, community-based interventions that bridge service gaps and improve access to care in underserved areas. It is essential to invest in adequate resources to ensure the sustainability of mental health support across all settings. This includes hiring trained personnel, establishing community-based facilities, and implementing culturally appropriate interventions. Additionally, clear and accessible referral pathways must be established to guarantee continuity of care. Equally important is good governance, which prioritizes mental health through inclusive policies and accountability structures. This approach fosters equitable access to services and helps build long-term resilience within communities.
Impact	Physical activity counselling is both feasible and acceptable in a low-income setting. Community-wide programs are well-received and could help pave the way for ongoing funding that has the potential to be scaled up.
Program barriers	A lack of resources.
Program enablers	Village health care teams were open to learning about the benefits of physical activity and healthy food choices. For instance, those in Kasambaya County in rural Uganda retained knowledge of the key elements of the intervention despite delays caused by the COVID-19 pandemic and an Ebola outbreak, which lasted over four years.

Lesson learned	Even the small expense of having a clinical officer deliver interventions is not sustainable in a low-resource setting, where most government health funding focuses on communicable diseases that remain a significant health burden. Additionally, trained local health village teams need more support for operational costs such as transportation, resources, and adequate infrastructure.
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Table S9. Sport Coach+ Initiative

Initiative Country Author	<i>Sport Coach+</i> Partnership between the Olympic Refuge Foundation and the International Federation of the Red Cross (IFRC) Psychosocial Reference Centre: Contributed by: Leslie Snider, Kathleen Latimer and Simon Rosenbaum.
Overview	Sport Coach+ aims to equip 2,500 sports coaches in Ukraine and surrounding countries with the skills to more effectively manage young players who have experienced the stressors of forced displacement, including family separation, integration stressors, and exposure to violence and trauma.
Location	Ukraine, Poland, Moldova, Bulgaria, Romania, Germany and the Czech Republic with the potential to expand to neighbouring countries.
Delivery	A 3-day training of trainers is conducted for mental health and psychosocial support specialists and sports professionals, who then provide a 1-day training for coaches. Both trained trainers and coaches participate in follow-up training and supervision.
Frequency	Dependent upon identification and availability of coaches. Trained trainers participate in monthly supervision sessions and six-month refresher training.
Modifications made	The content of Sports Coach+ draws on the principles of Psychological First Aid to provide foundational mental health skills for Sports Coaches, and from best practices in trauma-informed and healing-centred coaching.
Sustainability of the program	The program is implemented through a partnership between the Olympic Refuge Foundation and International Federation of the Red Cross/Red Crescent Societies, Reference Centre for Psychosocial Support. Sustainability is promoted through local hosting and ownership of the program within national RC/RC societies within each country, together with National Olympic Committees. Funding supports training and supervision initiatives in target countries, and collaborations across mental health and sports professionals strengthen local ownership and sustainability. Outreach to Inter-Agency Standing Committee Mental Health and Psychosocial Support Working Groups, UNHCR, WHO, national sports federations, and local academic partnerships across sport and mental health in target countries supports strengthening workforce collaborations between sport and mental health services and improving referral pathways for young people impacted by forced displacement in need of specialized mental health and psychosocial support and protection services.
Impact	Outreach to Inter-Agency Standing Committee Mental Health and Psychosocial Support Working Groups, UNHCR, WHO, national sports federations, and local academic partners across sport and mental health in target countries supports strengthening workforce collaborations between sport and mental health services. Further, workforce collaborations improve referral pathways for young people impacted by forced displacement who need specialized mental health and psychosocial support and protection services. The first phase of training-of-trainers and coaches is ongoing.

Program barriers	• Identification and availability of coaches, particularly during certain times of the year • Training and work with national Olympic committees suspended during the 2024 June Olympic Games. • Funding
Program enablers	• Translation of all Sport Coach+ training and guidance materials into relevant languages in target countries. • Well-funded pilot phase with broad input to develop a relevant and effective approach. • Strong collaboration among the main partners with similar national structures (national societies and committees) for fostering local ownership. • Support from the Olympic Refugee Foundation Think Tank and partners in program design, materials, evaluation and learning methods.

Table S10. Healthy Bodies Healthy Minds Initiative

Initiative	<i>Healthy Bodies Healthy Minds</i>
Country	Australia
Author	Contributed by Dr Justin Chapman
Overview	Program to improve lifestyle support for adults who live with mental ill health, integrated into routine mental healthcare.
Location	Community gym facilities of a not-for-profit sports and recreation organization. Sessions during off-peak times (1000-1600).
Delivery	Delivered as face-to-face, group-based sessions (up to 10 participants), with 1-2 sessions per week. Accredited exercise physiologists, dietitians, and peer support workers co-facilitate.
Frequency	Sessions are two hours long: 60 minutes of gym exercise, 60 minutes of social support, health and nutritional education, and group discussion.
Modifications made	The program was adapted based on funding sources, with the inclusion of cooking and nutritional education, structured gym programs, and individual and group sessions offered when funding allowed.
Sustainability of the program	Transitioned through various funding models: service innovation grant, federal disability funding, and Primary Health Network commissioning. Partnerships with NGOs and public mental health services. Collaborative Deeds and Memorandum of Understanding agreements formalized partnerships. In-kind staff contributions to co-facilitate and strengthen referral pathways. Short-term funding led to 8-week programs with once-weekly sessions. Block funding allowed 1-2 sessions per week on an ongoing basis with regular reassessments. Program materials and structure were updated to align with funding changes.
Impact	The program improved quality of life, recovery, motivation for exercise, and a sense of belonging. Participants also reported enhanced relationships, self-worth, and confidence in pursuing new opportunities (e.g., employment).
Program barriers	Funding availability and stability.
Program enablers	Dedication and commitment from both front-line and management staff in mental health and not-for-profit sectors. Supportive and welcoming environment provided by partnering community organizations. A group-based program that brings together participants from similar backgrounds and experiences. Personable, approachable, and compassionate program facilitators.

Lesson learned	Qualitative and quantitative evaluation demonstrated feasibility and impact, supporting funding applications. Strengthened referral pathways, creative solutions for accessing different funding schemes, and increased participant engagement through multidisciplinary involvement. Program champions are essential for forming cross-sectoral partnerships, implementing robust evaluation plans, and maintaining program momentum through different funding phases.
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Supplementary Section 3: Scoping Review of Meta-Analyses.

Supplementary 3.1: Search Strategy

Aim. Identify and synthesise effective components of lifestyle intervention implementation and delivery from meta-analyses.

Search Strategies. The search strategy was based on the PICOS criteria listed in **Table S11**. The search strategy included a comprehensive list of terms that are used in the literature to describe mental illness and lifestyle interventions. We searched the databases MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO and Scopus. We developed a unique search strategy for each database (see **Tables S12a-S12d**). Studies that had been published between November 1, 2018, and the date of the search were eligible for inclusion. This start date was chosen because it allowed us to identify studies that had not been included in the landmark work by Firth et al. (2019).¹ We aimed to include studies that involved participants from any mental healthcare setting or country. No language restrictions were applied. Full search strategies are presented below in **Tables S12a-S12d**. Identified titles were exported into Covidence and screened in two stages, title/abstract and full-text, by ST.

Table S11. Inclusion criteria.

PICOS domain	Inclusion criteria
Population	Mental disorders
Intervention	Modern foundational elements of lifestyle intervention, defined as nutrition, physical activity, smoking cessation, and sleep, either as a single component, e.g., physical activity, or as a multi-component intervention. Extensions that have recently come into the spotlight, such as social connectivity, were not included.
Comparator	All types (e.g., treatment-as-usual, waitlist control, active control).
Outcomes	Meta-analysis (including subgroup analysis and meta-regression) of effective components of intervention implementation/delivery on various physical and mental health outcomes.
Sources	Meta-analyses of controlled trials published in peer-reviewed journals.

Tables S12a-S12d. Search strategy.

MEDLINE Search strategy (May 17,2024)	
Condition or Health State (Problem)	(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	
Lifestyle (Intervention)	("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	(intervention OR service OR program* OR modification).ti,ab
AND	
Design	("meta-analysis" OR "meta-analyses" OR "metaanalysis" OR "meta regression" OR "pooled effect").ti,ab

SCOPUS search strategy (May 17,2024)	
Condition or Health State (Problem)	TITLE (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)
AND	
Lifestyle interventions (Intervention)	TITLE ("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*)
AND	
Design	TITLE-ABS-KEY (intervention OR service OR program* OR modification)
AND	
Design	TITLE-ABS-KEY ("meta-analysis" OR "meta-analyses" OR metaanalysis OR "meta regression" OR "pooled effect")

PsychINFO Search strategy (May 17,2024)	
Condition or Health State (Problem)	(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	
Lifestyle interventions (Intervention)	("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 Descriptor	(intervention OR service OR program* OR modification).ti,ab
AND	
Outcome	("meta-analysis" OR "meta-analyses" OR metaanalysis OR "meta regression" OR "pooled effect").ti,ab

CINAHL Search strategy (May 17,2024)	
Condition or Health State (Problem)	(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	
Lifestyle interventions (Intervention)	("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	
Outcome	("meta-analysis" OR "meta-analyses" OR metaanalysis OR "meta regression" OR "pooled effect").ti,ab

Supplementary 3.2: Study Identification for Scoping Review of Meta-Analyses

The database searches returned 1,125 unique titles. Screening of titles and abstracts resulted in the retention of 157 papers; full-texts were not retrieved for two of these. Full-text review identified 76 papers that met eligibility criteria: most of which focused on exercise. See **Figure S2** for the PRISMA flow diagram and **Table S13** for reasons for excluding titles during full-text screening.

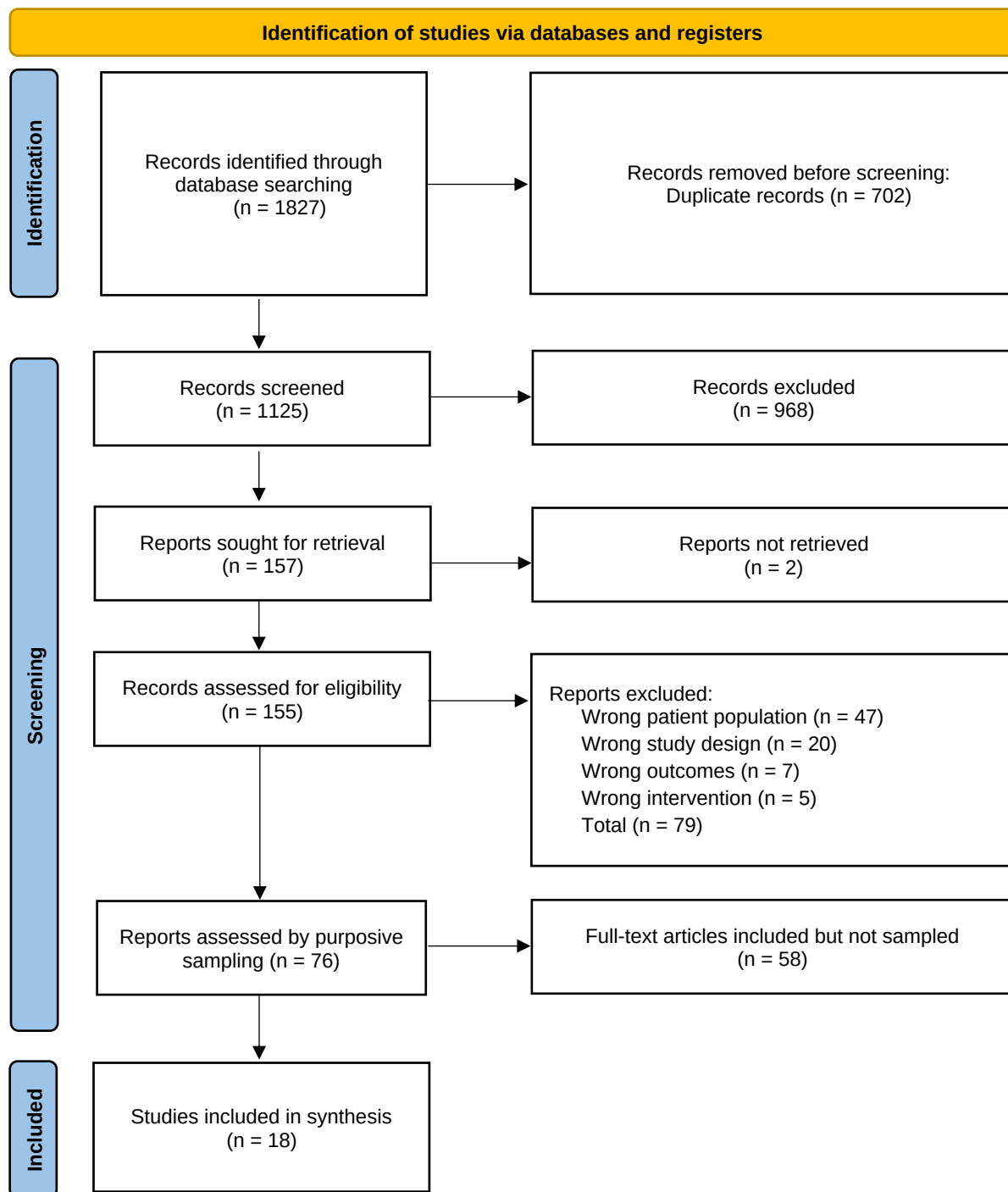


Figure S2. PRISMA flow diagram for scoping review of meta-analyses.

Table S13. Meta-analyses excluded during full-text review with reason.

Author, Year	Reason for Exclusion	Author, Year	Reason for Exclusion
Abd-Alrazaq et al., 2022 ¹¹¹	Wrong intervention	Lin et al., 2024 ¹¹²	Wrong patient population
Aldi et al., 2018 ¹¹³	Wrong intervention	Liu et al., 2021 ¹¹⁴	Wrong patient population
Ashdown-Franks et al., 2020 ¹¹⁵	Wrong study design	Martinez-Calderon et al., 2023 ¹¹⁶	Wrong study design
Augustin et al., 2023 ¹¹⁷	Wrong study design	Martinez-Calderon et al., 2024 ¹¹⁸	Wrong study design
Barahona-Fuentes et al., 2021 ¹¹⁹	Wrong patient population	Martinez-Calderon et al., 2024 ¹²⁰	Wrong study design
Bigarella et al., 2022 ¹²¹	Wrong patient population	Martinez-Dominguez et al., 2018 ¹²²	Wrong patient population
Bisdounis et al., 2022 ¹²³	Wrong intervention	Miller et al., 2020 ¹²⁴	Wrong patient population
Bourke et al., 2022 ¹²⁵	Wrong patient population	Mohanty et al., 2024 ¹²⁶	Wrong outcomes
Carter et al., 2021 ¹²⁷	Wrong patient population	Ofosu et al., 2023 ¹²⁸	Wrong patient population
Cella et al., 2023 ¹²⁹	Wrong study design	Olagunju et al., 2021 ¹³⁰	Wrong study design
Chen et al., 2022 ¹³¹	Wrong patient population	Pearsall et al., 2019 ¹³²	Wrong outcomes
Chen et al., 2024 ¹³³	Wrong patient population	Piva et al., 2023 ¹³⁴	Wrong patient population
Chong et al., 2022 ¹³⁵	Wrong study design	Rajalu et al., 2021 ¹³⁶	Wrong study design
Cunha et al., 2024 ¹³⁷	Wrong patient population	Recchia et al., 2022 ¹³⁸	Wrong patient population
Czosnek et al., 2019 ¹³⁹	Wrong study design	Recchia et al., 2023 ¹⁴⁰	Wrong patient population
Davis et al., 2021 ¹⁴¹	Unable to retrieve full-text	Rossi et al., 2024 ¹⁴²	Wrong patient population
Desai et al., 2022 ¹⁴³	Wrong patient population	Salihu et al., 2021 ¹⁴⁴	Wrong patient population
Dietch et al., 2023 ¹⁴⁵	Wrong study design	Sani et al., 2023 ¹⁴⁶	Wrong patient population
Dinoff et al., 2018 ¹⁴⁷	Wrong outcomes	Singh et al., 2023 ¹⁴⁸	Wrong study design
Dong et al., 2023 ¹⁴⁹	Wrong patient population	So et al., 2020 ¹⁵⁰	Wrong patient population
Dong et al., 2024 ¹⁵¹	Wrong patient population	Staines et al., 2022 ¹⁵²	Wrong patient population
Dongming et al., 2022 ¹⁵³	Unable to retrieve full-text	Stevens et al., 2023 ¹⁵⁴	Wrong outcomes
Fang et al., 2020 ¹⁵⁵	Wrong patient population	Sun et al., 2023 ¹⁵⁶	Wrong intervention
Feng et al., 2024 ¹⁵⁷	Wrong patient population	Szuhany et al., 2020 ¹⁵⁸	Wrong outcomes
Firth et al., 2021 ¹⁵⁹	Wrong document type	Tang et al., 2022 ¹⁶⁰	Wrong patient population
Firth et al., 2020 ¹⁶¹	Wrong study design	Tao et al., 2024 ¹⁶²	Wrong patient population
Fornaro et al., 2022 ¹⁶³	Wrong study design	Thal et al., 2023 ¹⁶⁴	Wrong study design
Frederiksen et al., 2021 ¹⁶⁵	Wrong study design	Tolkien et al., 2019 ¹⁶⁶	Wrong outcomes
Garcia-Estela et al., 2024 ¹⁶⁷	Wrong patient population	Tse et al., 2024 ¹⁶⁸	Wrong patient population
Gee et al., 2019 ¹⁶⁹	Wrong patient population	Varaee et al., 2023 ¹⁷⁰	Wrong patient population
Gianfredi et al., 2023 ¹⁷¹	Wrong study design	Vasodi et al., 2023 ¹⁷²	Wrong patient population
Gómez-Gómez et al., 2020 ¹⁷³	Wrong patient population	Viana et al., 2020 ¹⁷⁴	Wrong patient population
Gordon et al., 2018 ¹⁷⁵	Wrong patient population	Wegner et al., 2020 ¹⁷⁶	Wrong study design

Author, Year	Reason for Exclusion	Author, Year	Reason for Exclusion
Hawes et al., 2021 ¹⁷⁷	Wrong study design	Wong et al., 2021 ¹⁷⁸	Wrong patient population
Huang et al., 2022 ¹⁷⁹	Wrong patient population	Wong et al., 2022 ¹⁸⁰	Wrong patient population
Jin et al., 2023 ¹⁸¹	Wrong study design	Wu et al., 2022 ¹⁸²	Wrong patient population
Kazeminia et al., 2020 ¹⁸³	Wrong patient population	Yang et al., 2023 ¹⁸⁴	Wrong patient population
Klil-Drori et al., 2020 ¹⁸⁵	Wrong patient population	Yen et al., 2021 ¹⁸⁶	Wrong patient population
Kuang et al., 2023 ¹⁸⁷	Wrong patient population	Zavala et al., 2022 ¹⁸⁸	Wrong outcomes
Kurebayashi et al., 2018 ¹⁸⁹	Wrong outcomes	Zika et al., 2021 ¹⁹⁰	Wrong patient population
Lee et al., 2022 ¹⁹¹	Wrong patient population		

Supplementary 3.3: Bespoke Purposive Sampling

The quantity of meta-analyses ($k=58$) could pose a challenge to the quality of synthesis. This was particularly true for the physical activity-specific studies ($k=43$). Therefore the identified studies were subjected to purposive sampling, resulting in 18 studies being sampled.

In step one, we excluded meta-analyses that were superseded by a more recent and data-rich meta-analysis. We then followed a three-step process:

1. Sampling for analyses that include a broad range of exercise types instead of being limited to a particular type of exercise (physical activity-specific studies only). For example, studies that assessed, for example, yoga only, were excluded, whereas studies that broadly included physical activity interventions were included.
2. Sampling for richness and spread of outcomes. We prioritised studies that interrogated multiple aspects within the predefined intervention components or that provided unique analyses compared to the other studies. A higher priority was also given to those examining these across multiple health outcomes.
3. Sampling for maximum spread of diagnostic groups. We finally prioritised based on spread of mental health conditions included, aiming to cover a broad range of conditions given the transdiagnostic approach taken in this report.

Table S14. List of Meta-Analyses Not Sampled.

Author, Year	Sampling Step Meta-Analysis Was Excluded
Axelsdóttir et al., 2021 ¹⁹²	Sampling for richness and spread of outcomes
Aylett et al., 2018 ¹⁹³	Sampling for richness and spread of outcomes
Bailey et al., 2018 ¹⁹⁴	Sampling for richness and spread of outcomes
Björkman et al., 2022 ¹⁹⁵	Sampling for richness and spread of outcomes
Bourke et al., 2022 ¹⁹⁶	Sampling for richness and spread of outcomes
Bredin et al., 2021 ¹⁹⁷	Sampling for maximum spread of diagnoses
Brinsley et al., 2021 ¹⁹⁸	Sampling for a broad range of exercise types assessed
Brown et al., 2018 ¹⁹⁹	Superseded by Fernández-Abascal (2021)
Brupbacher et al. 2021 ²⁰⁰	Sampling for richness and spread of outcomes
Carneiro et al., 2020 ²⁰¹	Sampling for a broad range of exercise types assessed
Castro et al., 2021 ¹²⁷	Sampling for richness and spread of outcomes
Chen et al., 2021 ²⁰²	Sampling for maximum spread of diagnoses
Contreras-Osorio et al., 2022 ²⁰³	Sampling for maximum spread of diagnoses
Correia et al., 2024 ²⁰⁴	Sampling for maximum spread of diagnoses
Cui et al., 2024 ²⁰⁵	Sampling for richness and spread of outcomes
Fang et al., 2020 ²⁰⁶	Sampling for a broad range of exercise types assessed
Giménez-Meseguer et al., 2020 ²⁰⁷	Sampling for richness and spread of outcomes
Guo et al., 2019 ²⁰⁸	Sampling for a broad range of exercise types assessed
Jazayeri et al., 2022 ²⁰⁹	Sampling for richness and spread of outcomes
Ju et al., 2023 ²¹⁰	Sampling for a broad range of exercise types assessed
Koomen et al., 2022 ²¹¹	Sampling for richness and spread of outcomes
Korman et al., 2020 ²¹²	Sampling for a broad range of exercise types assessed
Lee et al., 2021 ²¹³	Sampling for richness and spread of outcomes
Li et al., 2023a ²¹⁴	Sampling for richness and spread of outcomes
Li et al., 2023b ²¹⁵	Sampling for maximum spread of diagnoses
Li et al., 2018 ²¹⁶	Sampling for a broad range of exercise types assessed
Marinelli et al., 2024 ²¹⁷	Sampling for richness and spread of outcomes
Martinez-Calderon et al., 2023 ²¹⁸	Sampling for a broad range of exercise types assessed
Martland et al., 2023 ²¹⁹	Sampling for richness and spread of outcomes
Martland et al., 2020 ²²⁰	Sampling for a broad range of exercise types assessed
McGranahan et al., 2021 ²²¹	Sampling for richness and spread of outcomes
Mitter et al., 2022 ²²²	Sampling for richness and spread of outcomes
Morres et al., 2019 ²²³	Sampling for maximum spread of diagnoses
Nebiker et al., 2018 ²²⁴	Sampling for a broad range of exercise types assessed
Oliva et al., 2023 ²²⁵	Sampling for richness and spread of outcomes
Pérez-Bedoya et al., 2023 ²²⁶	Sampling for maximum spread of diagnoses
Ren et al., 2023 ²²⁷	Sampling for maximum spread of diagnoses
Riðmayer et al., 2024 ²²⁸	Sampling for richness and spread of outcomes
Sabe et al., 2020 ²²⁹	Sampling for richness and spread of outcomes
Simjanoski et al., 2023 ²³⁰	Sampling for richness and spread of outcomes
Singh et al., 2018 ²³¹	Superseded by Fernández-Abascal (2021)
Su et al., 2024 ²³²	Sampling for a broad range of exercise types assessed
Sun et al., 2018 ²³³	Sampling for maximum spread of diagnoses
Swora et al., 2022 ²³⁴	Sampling for maximum spread of diagnoses
Taylor et al., 2020 ²³⁵	Sampling for a broad range of exercise types assessed
Vogel et al., 2019 ²³⁶	Sampling for a broad range of exercise types assessed
Wang et al., 2022 ²³⁷	Sampling for richness and spread of outcomes
Wei et al., 2020 ²³⁸	Sampling for a broad range of exercise types assessed
Yu et al., 2022 ²³⁹	Sampling for richness and spread of outcomes
Zeng et al. 2023 ²⁴⁰	Sampling for a broad range of exercise types assessed
Zhang et al., 2023a ²⁴¹	Sampling for maximum spread of diagnoses
Zhang et al., 2023b ²⁴²	Sampling for richness and spread of outcomes
Zhang et al. 2022a ²⁴³	Sampling for a broad range of exercise types assessed
Zhang et al., 2022b ²⁴⁴	Sampling for a broad range of exercise types assessed

Author, Year	Sampling Step Meta-Analysis Was Excluded
Zheng et al., 2024 ²⁴⁵	Sampling for richness and spread of outcomes
Zhiming et al., 2022 ²⁴⁶	Sampling for a broad range of exercise types assessed
Zhu et al., 2022 ²⁴⁷	Sampling for a broad range of exercise types assessed
Ziebart et al., 2022 ²⁴⁸	Sampling for maximum spread of diagnoses

Supplementary 3.4: Strategy for Data Extraction and Synthesis.

Data were extracted by one researcher (ST) and checked by another (LW). We extracted data—focusing on number of studies included in the analysis and effect size—for primary analyses, subgroup analyses, and meta-regressions on outcomes that indicated more effective means of intervention delivery. Extracted data were presented in line with each meta-analysis to describe the characteristics and outcomes of sampled meta-analyses. Extracted data on the effectiveness and on the relationship of effectiveness were mapped to seven predefined intervention components²⁴⁹ in the main file.

These predefined intervention components were:

1. Theoretical basis.
2. Behaviour change techniques.
3. Mode of delivery.
4. Intervention provider.
5. Intensity.
6. Characteristics of the target population.
7. Setting.

Supplementary 3.5: Characteristics of Sampled Studies.

Eighteen meta-analyses were included in the scoping review.²⁵⁰⁻²⁶⁷ Five meta-analyses focused on lifestyle intervention with multiple components,^{251, 252, 260, 261, 265} with the remainder focusing on one specific intervention component: exercise (ten meta-analyses),^{250, 253, 255, 257-259, 262, 264, 266, 267} nutrition (one meta-analysis),²⁶³ and sleep (two meta-analyses).^{254, 256} The meta-analyses included were spread across serious mental illnesses, typically including schizophrenia spectrum disorders, bipolar disorder and major depression (nine meta-analyses),^{251, 252, 259-261, 263-266} schizophrenia (two meta-analyses),^{253, 258} depression (three meta-analyses),^{250, 256, 257} anxiety and related disorders (two meta-analyses),^{262, 267} bipolar disorder (one meta-analysis),²⁵⁴ and alcohol use disorders (one meta-analysis).²⁵⁵ The meta-analyses assessed the effect on various outcomes related to physical health, mental health and quality of life. The strategies examined included factors such as setting, stage of illness, mode of delivery, intensity and frequency of intervention, who delivered the intervention, and whether the intervention included practical components or solely education/counselling.

Supplementary 3.6: Quality Assessment

One reviewer (ST) assessed the methodological limitations of the sampled studies using *A MeaSurement Tool to Assess systematic Reviews (AMSTAR 2)* tool,²⁶⁸ which involved applying the following questions:

1. Did the research questions and inclusion criteria for the review include the components of PICO?
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?
3. Did the review authors explain their selection of the study designs for inclusion in the review?
4. Did the review authors use a comprehensive literature search strategy?
5. Did the review authors perform study selection in duplicate?
6. Did the review authors perform data extraction in duplicate?
7. Did the review authors provide a list of excluded studies and justify the exclusions?
8. Did the review authors describe the included studies in adequate detail?
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?
10. Did the review authors report on the sources of funding for the studies included in the review?
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?

12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?
13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

Table S15. Quality scores of sampled studies.

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Score
Chen, 2024 ²⁵⁰	Yes	No	No	Partial	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	CLQ
Coles, 2022 ²⁵¹	No	Yes	No	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	CLQ
Fernández-Abascal, 2021 ²⁵²	Yes	Yes	Yes	Partial	Yes	Yes	No	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	No	LQ
Gallardo-Gómez, 2023 ²⁵³	Yes	Yes	No	Partial	Yes	Yes	No	Partial	Partial	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
Gottlieb, 2021 ²⁵⁴	No	No	Yes	Partial	No	No	No	Partial	No	No	Yes	No	No	No	Yes	Yes	CLQ
Gür, 2020 ²⁵⁵	Yes	No	Yes	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
He, 2023 ²⁵⁶	Yes	Yes	Yes	Partial	Yes	Yes	No	Partial	Yes	No	Yes	Yes	No	Yes	Yes	Yes	CLQ
Heissel, 2023 ²⁵⁷	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	MQ
Korman, 2023 ²⁵⁸	Yes	Yes	No	Partial	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	MQ
Lederman, 2019 ²⁵⁹	Yes	Yes	No	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	LQ
Mucheru, 2019 ²⁶⁰	Yes	Yes	Yes	Partial	Yes	No	Yes	Partial	Yes	No	Yes	No	Yes	Yes	Yes	Yes	MQ
Pape, 2022 ²⁶¹	Yes	Yes	No	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
Ramos-Sanchez, 2021 ²⁶²	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	MQ
Rocks, 2022 ²⁶³	Yes	Yes	No	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
Romain, 2020 ²⁶⁴	Yes	Yes	No	Partial	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
Speyer, 2019 ²⁶⁵	Yes	Yes	Yes	Partial	Yes	Yes	No	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	LQ
Taylor, 2020 ²⁶⁶	Yes	No	No	Partial	No	No	No	Yes	Partial	No	Yes	No	Yes	Yes	Yes	Yes	CLQ
Vancampfort, 2021 ²⁶⁷	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	MQ

CLQ: Critically low quality, LQ: Low quality, MQ: Moderate quality, HQ: High quality. Items 2, 4, 7, 9, 11, 13, 15 were considered critical domains. A 'partial' score for items 4, 8, and 9 was considered a non-critical weakness.

Supplementary 3.7: Sampled meta-analyses and results.

Table S16. Key findings from individual meta-analyses.

Author, Year	Population	Outcome	Findings
<i>Analyses based on multiple lifestyle elements</i>			
Coles, 2022 ²⁵¹	Schizophrenia spectrum	Physical activity and capacity	Peer-facilitated interventions had a small significant effect on physical activity and capacity ($k=6$, $SMD=0.19$) compared to control conditions.
		Physical health	Peer-facilitated interventions had a small, non-significant effect on physical health ($k=10$, $SMD=0.20$) compared to control conditions.
		Healthy eating	Peer-facilitated interventions did not have an effect on healthy eating ($k=4$, $SMD=-0.03$) compared to control conditions.
		BMI	Peer-facilitated interventions had a non-significant effect on BMI ($k=3$, $MD=-0.6\text{kg/m}^2$) compared to control conditions.
Fernández-Abascal, 2021 ²⁵²	Serious mental illness	BMI	Group-based approaches had a large effect ($k=18$, $g=-1.02$), while individual interventions had a small effect ($k=6$, $g=-0.43$).
			The largest effect was observed for combined exercise and psychotherapy ($k=3$, $g=-2.75$), followed by exercise-based therapy ($k=7$, $g=-0.91$), and then psychotherapy ($k=14$, $g=-0.45$).
			Moderate to vigorous aerobic exercise had a large effect ($k=4$, $g=-1.69$), whereas mixed aerobic and anaerobic exercise had no effect ($k=3$, $g<-0.01$).
			Mixed psychotherapies had a large effect ($k=4$, $g=-0.86$), while psychoeducation ($k=4$, $g=-0.44$) and cognitive behaviour therapy ($k=6$, $g=-0.32$) had small effects.
			Larger effects were observed in participants with first-episode psychosis ($k=2$, $g=-3.66$) compared to those with chronic conditions.
		Body weight	Exercise and psychotherapy had a large effect ($k=5$, $g=-0.85$) compared to the effects of each component alone ($k=14$, $g=-0.46$ and $k=6$, $g=-0.25$).
			Moderate-to-vigorous aerobic exercise had a medium effect size ($k=5$, $g=-0.57$). However, weight gain was reported for those participating in a mixed aerobic and anaerobic exercise ($k=1$, $g=2.70$).
			Similar effects were observed for psychoeducation ($k=5$, $g=-0.48$), cognitive behavioural therapy (CBT) ($k=6$, $g=-0.36$) and mixed psychotherapy ($k=3$, $g=-0.59$).

Author, Year	Population	Outcome	Findings
			Weight reduction was medium-sized and statistically significant in both group and individual approaches, with similar effects across different diagnoses.
		Waist circumference	Larger effect for inpatient setting ($k=3$, $g=-0.69$) compared to outpatient setting ($k=10$, $g=-0.09$).
			Medium-large effect for combined exercise and psychotherapy ($k=3$, $g=-0.77$). No effect for exercise or psychotherapy alone.
			Small effect for psychoeducation. No effect for CBT or psychotherapy.
			Group and individual interventions had similar effects.
		Blood glucose	Similar effects for setting.
			While the effects were comparable across various intervention types, the largest effect was for combined interventions.
			The largest effect was observed in cases of first-episode psychosis ($k=1$, $g=-1.63$).
		HDL	There was a medium, non-significant effect for exercise only ($k=2$, $g=0.52$), while psychotherapy had no effect ($k=5$, $g=0.06$).
			Mixed aerobic and anaerobic exercise had a large effect ($k=1$), while psychoeducation had a small effect size ($k=1$). Other psychotherapies had no effect.
			Similar effects by mode of intervention and stage of illness. All studies included outpatient participants.
		Triglycerides	Similar effects for mode of intervention and setting. Insufficient studies for stage of illness.
		Blood pressure	Similar effects for mode of intervention and setting. Insufficient studies to analyse the stage of illness.
		PANSS total	A medium effect was observed for both inpatients and outpatients.
			Significant effect for exercise only ($k=17$), small and non-significant effect for psychotherapy ($k=2$) and combined intervention ($k=2$).
			A large effect was observed for mixed exercise; a medium effect for moderate-vigorous aerobic exercise ($k=5$) and mind-body exercise ($k=6$). No effect was identified for light aerobic exercise ($k=1$).
			Mixed psychotherapies had a large effect ($k=1$), whereas CBT did not have an effect ($k=1$).
			Medium-large effect in schizophrenia ($k=13$, $g=-0.79$), medium effect in first-episode psychosis ($k=3$, $g=-0.55$) and small non-significant effect in SSD ($k=5$, $g=-0.27$).

Author, Year	Population	Outcome	Findings
		Positive symptoms	Similar effects for schizophrenia ($k=19$, $g=-0.50$) and first-episode psychosis ($k=3$, $g=-0.52$) and not significant for SSD ($k=3$, $g=-0.18$).
			Medium effect in outpatients ($k=17$, $g=-0.52$), small effect in inpatients ($k=8$, $g=-0.27$).
		Negative symptoms	Larger effect in first-episode psychosis ($k=3$, $g=-1.00$), than schizophrenia ($k=19$, $g=-0.54$) and SSD ($k=3$, $g=-0.17$).
			Small effect in both outpatients ($k=17$, $g=-0.23$) and inpatients ($k=8$, $g=-0.23$).
		PANSS general	Similar effect by setting. Light aerobic exercise, moderate-vigorous aerobic exercise, anaerobic exercise and mind-body exercise were effective, mixed exercise was not. All were group interventions.
		Depressive symptoms	Significant improvements in outpatients but not inpatients, exercise but not psychotherapy, and group approaches but not individual.
Mucheru, 2019 ²⁶⁰	Serious mental illness	Bodyweight	There was a large effect for approaches with both a structured [†] diet and structured physical activity approach ($k=4$, $ES=-5.36$, $p<0.001$), whereas the effect of non-structured approaches was not statistically significant ($k=8$, $ES=0.39$, $p=0.78$).
		BMI	Large effect for approaches with both a structured diet and structured physical activity approach ($k=5$, $ES=-1.07$, $p=0.003$) whereas the effect of non-structured approaches was not statistically significant ($k=7$, $ES=0.16$, $p=0.83$).
		Waist circumference	There was a large effect for approaches with non-structured approaches to diet and physical activity ($k=3$, $ES=-3.68$, $p=0.025$). However, there were insufficient studies to assess a structured approach for both intervention elements.
Pape, 2022 ²⁶¹	Serious mental illness	Quality of life	High attendance had a larger effect ($k=8$, $g=0.46$) than low attendance ($k=8$, $g=-0.02$), (between groups $p=0.01$).
			Shorter intervention duration of 1-3 months ($k=6$, $g=0.2$) and 4-8 months ($k=6$, $g=0.37$) had a larger effect than longer intervention duration of 9-12 months ($k=7$, $g=-0.05$), (p -value not reported).
			Group-based ($k=10$, $g=0.30$) and individual-based ($k=3$, $g=0.18$) had small effects, whereas a combination of the two had no effect ($k=6$, $g=-0.07$), (between groups $p=0.08$).
			Interventions including mainly structured high-intensity physical activity had a large effect ($k=5$, $g=0.92$).
			Including skill training for a healthy diet had a null-small effect ($k=4$, $g=-0.11$).
			Having mainly behavioural therapy components did not have an effect ($k=6$, $p=0.01$).

Author, Year	Population	Outcome	Findings
Speyer, 2019 ²⁶⁵	Serious mental illness	BMI	Individual sessions ($k=10$, $PE=-1.28\text{kg/m}^2$) had the largest point estimate, then combination ($k=15$, $PE=-0.43\text{kg/m}^2$), then group sessions ($k=15$, $PE=-0.25\text{kg/m}^2$), (between groups $p=0.03$). Individual sessions were more effective than group sessions (explained 31% of heterogeneity, $p=0.005$).
			Diet interventions ($k=3$, $PE=-1.3\text{kg/m}^2$) had the largest effect, then exercise ($k=5$, $PE=-1.13\text{kg/m}^2$) then mixed ($k=32$, $-PE=0.51\text{kg/m}^2$). Interventions where exercise was performed had a larger (non-significant between group) effect ($PE=-0.75\text{kg/m}^2$) than counselling or coaching ($PE=-0.46\text{kg/m}^2$), ($p=0.51$).
			Inpatient setting had the largest point estimate ($k=2$, $PE=-1.17\text{kg/m}^2$), then mixed ($k=5$, $PE=-0.98\text{kg/m}^2$) then outpatients ($k=33$, $PE=-0.49\text{kg/m}^2$), (between groups $p=0.57$).
			Intervention studies had similar effects ($k=32$, $PE=-0.64\text{kg/m}^2$) to prevention studies ($k=8$, $PE=-0.56\text{kg/m}^2$), (between groups $p=0.86$).
			The duration of intervention ($p=0.60$), the number of sessions offered ($p=0.87$), program fidelity ($p=0.90$), and the duration of illness ($p=0.53$) did not influence the effect.
<i>Analyses based on exercise interventions</i>			
Chen, 2024 ²⁵⁰	Depression (adolescents)	Depressive symptoms	Exercising 3x week ($k=7$, $SMD=-0.84$, $p<0.001$) or 4-5x week ($k=4$, $SMD=-0.63$, $p=0.01$) was more effective than 2x week ($k=1$, $SMD=-0.14$, $p=0.62$), (between group $p=0.04$).
			Exercise session duration effect peaked at 45-50mins ($k=4$, $SMD=-0.93$, $p<0.001$), and was also significant at 60-75mins ($k=3$, $SMD=-0.65$, $p=0.01$) and 30-40mins ($k=4$, $SMD=-0.47$, $p<0.001$), (between groups $p=0.39$).
			Low-intensity exercise ($k=2$, $SMD=-0.68$, $p=0.005$), medium-intensity exercise ($k=5$, $SMD=-0.75$, $p=0.006$) and high-intensity exercise ($k=2$, $SMD=-0.63$) had medium to large effect sizes, with no difference between groups ($p=0.94$)
			Both team sports ($k=10$, $SMD=-0.75$, $p<0.001$) and individual exercise ($k=4$, $SMD=-0.60$, $p=0.01$) had medium to large effects with no difference between groups ($p=0.58$).
			Exercise interventions lasting 8-10 weeks ($k=3$, $SMD=-0.95$) were more effective than those lasting 4-6 weeks ($k=5$, $SMD=-0.80$) and 11-14 weeks ($k=4$, $SMD=-0.37$), (between group $p=0.02$).
Gallardo-Gómez, 2023 ²⁵³	Schizophrenia	Psychopathology	Larger effects in outpatient settings ($k=10$, $g=0.43$) compared to inpatient settings ($k=4$, $g=-0.05$), (with a significant difference between groups $p=0.004$).
		Quality of life	Larger effects in inpatient settings ($k=3$, $g=0.89$) compared to outpatient settings ($k=6$, $g=-0.07$), (with a significant difference between groups $p=0.004$).

Author, Year	Population	Outcome	Findings
			For different types of exercise, large effects were identified for aerobic exercise ($k=3$, $g=0.80$) and high-intensity interval training ($k=1$, $g=0.77$). A small effect was noted for yoga ($k=2$, $g=0.23$), while light-to-moderate aerobic exercise showed no effect ($k=3$, $g=-0.24$), (between groups $p=0.012$).
		Anthropometry	There was no difference between settings (between groups $p=0.24$) or intervention types (between groups $p=0.32$).
		Cardiorespiratory fitness	There was a larger effect in outpatient settings ($g=0.31$) compared to inpatient settings ($g=0.21$), (between groups $p=0.01$), which was statistically significant only in outpatient settings.
			No difference between intervention types (between groups $p=0.051$).
		ADL	No difference between settings (between groups $p=0.14$) or intervention types ($p=0.42$).
		Cognitive function	No difference between intervention types (between groups $p=0.88$), no analyses by setting reported.
		Muscular strength	No difference between settings (between groups $p=0.43$) or intervention types (between groups $p=0.64$)
		Physical function	No difference between settings (between groups $p=0.96$) or intervention types (between groups $p=0.88$).
		Physical health biomarkers	No difference between settings (between groups $p=0.51$) or intervention types (between groups $p=0.13$)
		Psychological biomarkers	No difference between settings (between groups $p=0.30$) or intervention types (between groups $p=0.20$)
		Stress & anxiety	No difference between intervention types (between groups $p=0.98$), no analyses by setting reported.
Gür, 2020 ²⁵⁵	Alcohol use disorder	Depressive symptoms	Yoga ($k=2$, $SMD=-1.12$) and mixed exercise types ($k=1$, $SMD=-0.78$) were more effective than aerobic exercise ($k=1$, $SMD=0.30$), (between groups $p=0.015$).
			Interventions <10 weeks in duration ($k=2$, $SMD=-1.25$) were more effective than those ≥ 10 weeks ($k=2$, $SMD=-0.08$), (between group $p=0.019$).
			Exercising 1-2x week ($k=3$, $SMD=-0.60$) and 3-4x week ($k=1$, $SMD=-0.78$) both had moderate-large effect sizes, (between groups $p=0.81$)
		Anxiety symptoms	Mixed exercise types had the largest effect ($k=1$, $SMD=-0.94$), with mixed exercise and yoga ($k=1$, $SMD=-0.40$) both more effective than aerobic exercise ($k=1$, $SMD=0.46$), (between group $p=0.005$).
			Interventions lasting less than 10 weeks ($k=2$, $SMD=-0.94$) were more effective than interventions lasting 10 or more weeks ($k=2$, $SMD=-0.13$), (between groups $p=0.043$).

Author, Year	Population	Outcome	Findings
			Exercising 3-4x week ($k=1$, $SMD=-0.94$) had a larger effect than exercising 1-2x week ($k=3$, $SMD=0.13$), (between groups $p=0.043$).
		Quality of life	Mixed exercise types had a medium effect size ($k=2$, $SMD=0.54$) while yoga showed no effect ($k=1$, $SMD=-0.07$), (between groups $p=0.28$).
			High exercise intensity had a large effect size ($k=1$, $SMD=0.79$) while moderate intensity had a small effect ($k=1$, $SMD=-0.33$), (between groups $p=0.34$).
			Both exercise duration of less than 10 weeks ($k=1$, $SMD=0.33$) and 10 weeks or more ($k=2$, $SMD=0.43$) had small effect sizes, with no significant difference between groups ($p=0.84$).
			Both exercising 1-2x week ($k=2$, $SMD=0.43$) and 3-4x week ($k=1$, $SMD=0.33$) had small effect sizes, with no significant difference between groups ($p=0.84$).
		Self-efficacy	Mixed exercise had a moderate-to-large effect size ($k=1$, $SMD=0.76$), while aerobic exercise showed a null-to-small effect size ($k=1$, $SMD=0.09$), (between groups $p=0.11$).
			Exercising for less than 10 weeks had a moderate-to-large effect ($k=1$, $SMD=0.76$), while exercising for 10 weeks or more had a null-to-small effect ($k=1$, $SMD=0.09$), (between groups $p=0.11$).
			Exercising 1-2x week had a moderate-to-large effect ($k=1$, $SMD=0.76$), while exercising 3-4x week had a null-to-small effect ($k=1$, $SMD=0.09$), (between groups $p=0.11$).
		Alcohol intake	Both aerobic exercise ($k=4$, $SMD=-0.17$) and yoga ($k=1$, $SMD=-0.12$) had null-small effects (between groups $p=0.92$).
			Low-intensity exercise had a medium effect ($k=1$, $SMD=-0.53$), and both moderate ($k=1$, $SMD=-0.19$) and high-intensity exercise ($k=1$, $SMD=-0.16$) had null-to-small effects, (between groups $p=0.71$).
			Interventions lasting less than 10 weeks had a medium effect ($k=1$, $SMD=-0.53$), while interventions lasting 10 or more weeks had a null-to-small effect ($k=4$, $SMD=-0.11$), (between groups $p=0.29$).
			Exercising 1-2x week showed a moderate-to-large effect ($k=4$, $SMD=0.76$), while exercising 3-4x week had a null-to-small effect ($k=1$, $SMD=0.09$), (between groups $p=0.11$).
Heissel, 2023 ²⁵⁷	Depression	Depressive symptoms	Aerobic ($k=30$, $SMD=-1.16$, $p<0.001$) and resistance ($k=7$, $SMD=-1.04$, $p=0.013$) exercise had larger effects than mixed exercise interventions ($k=10$, $SMD=-0.46$, $p=0.009$).
			Supervised interventions ($k=40$, $SMD=-1.03$, $p<0.001$) had larger effects than unsupervised interventions ($k=6$, $SMD=-0.45$, $p=0.05$).

Author, Year	Population	Outcome	Findings
			Both sessions supervised by exercise professionals ($k=18$, $SMD=-0.98$, $p<0.001$) and by other professionals/students ($k=14$, $SMD=-1.28$, $p<0.001$) had large effects.
			Both interventions, those involving group exercise ($k=27$, $SMD=-0.85$, $p<0.001$) and those without it ($k=13$, $SMD=-0.80$, $p<0.001$), had large effects.
			Duration of the intervention moderated the effect in all people with depressive symptoms ($\beta=0.047$, $p=0.032$) but not in those with Major Depressive Disorder (MDD) ($\beta=0.04$, $p=0.22$).
			Weekly frequency ($p=0.96$ and $p=0.84$) and minutes per session ($p=0.27$ and $p=0.75$) did not moderate the effect.
Korman, 2023 ²⁵⁸	Schizophrenia	Global functioning	There was a larger effect with individual format ($k=4$, $g=0.68$, $p<0.001$) vs group formats ($k=11$, $g=0.29$, $p=0.13$), though the difference between formats was not statistically significant ($p=0.12$).
			The lower weekly frequency had a larger effect ($k=6$, $g=0.52$, $p=0.005$) compared to the high weekly frequency (≥ 3 x week) ($k=11$, $g=0.34$, $p=0.09$), though the difference between frequencies was not statistically significant ($p=0.51$).
			The larger effect was observed in early psychosis ($k=2$, $g=0.8$, $p=0.002$) compared to persistent schizophrenia ($k=15$, $g=0.36$, $p=0.023$), although the difference between subgroups was not significant ($p=0.15$).
			Aerobic exercise had a larger effect ($k=10$, $g=0.63$, $p<0.001$) compared to mixed aerobic/resistance ($k=3$, $g=-0.15$, $p=0.78$) and other types ($k=3$, $g=0.25$, $p=0.12$), though the difference was not statistically significant ($p=0.09$).
Lederman, 2019 ²⁵⁹	Serious mental illness	Sleep quality	Greater improvements were observed in community settings ($k=6$, $g=0.83$, $p=0.02$) compared to inpatient settings ($k=2$, $g=0.49$, $p=0.22$).
			Supervision by a qualified exercise professional, instructor, or trainer demonstrated significant improvement in sleep ($k=6$, $g=1.00$, $p=0.02$) compared to less qualified supervisors ($k=2$, $g=0.16$, $p=0.56$).
			Studies that were not individualised displayed greater improvements in sleep ($k=6$, $g=0.88$, $p=0.012$) compared to those that allowed individualisation ($k=2$, $g=0.31$, $p=0.56$).
		Anxiety symptoms	Exercise interventions conducted in gyms or clinics ($k=9$, $SMD=-0.56$, $p=0.008$) had larger effects than home-based interventions ($k=2$, $SMD=-0.25$, $p=0.24$).

Author, Year	Population	Outcome	Findings
Ramos-Sanchez, 2021 ²⁶²	Anxiety and related disorders (PTSD, OCD)		Supervision by a physiotherapist, exercise professional, or physiologist had a significant effect ($k=10$, $SMD=-0.35$, $p=0.005$). The effect of interventions delivered by other professional was large but not significant ($k=3$, $SMD=-1.01$, $p=0.06$).
			Aerobic exercise had larger effects ($k=8$, $SMD=-0.66$, $p=0.001$) compared to resistance exercise ($k=4$, $SMD=-0.37$, $p=0.09$). The effect of mixed approaches was not significant ($k=3$, $SMD=-0.12$, $p=0.27$).
			Moderate-to-vigorous intensity ($k=7$, $SMD=-0.51$, $p=0.02$) and high intensity ($k=5$, $SMD=-0.44$, $p=0.01$) had moderate effects. The effect of light activity was not significant ($k=1$, $SMD=-0.26$, $p=0.22$).
			Community and outpatient interventions showed significant effects ($k=12$, $SMD=-0.45$, $p=0.001$), while inpatient interventions did not ($k=1$, $SMD=-0.32$, $p=0.16$).
Romain, 2020 ²⁶⁴	Serious mental illness	Physical activity levels	A higher implementation score was associated with a favourable impact (estimate=0.16, $p=0.01$).
			Studies grounded in motivational theory were effective ($k=8$, $g=0.27$).
			Interventions based on one motivational theory had a larger effect size ($k=6$, $g=0.34$, $p=0.05$) compared to interventions based on multiple motivational theories ($k=2$, $g=0.10$, $p=0.21$).
			The behaviour change technique (BCT) domains, goal and planning, had a small "borderline effect" ($k=6$, $g=0.29$, $p=0.06$). Other BCT domains showed no association with an effect.
			Studies that did not include BCTs from the social support domain ($k=6$, $g=0.26$, $p=0.05$) and shaping knowledge domain ($k=4$, $g=0.45$, $p=0.01$) had higher effects.
		Weight	Studies grounded in motivational theory were effective ($k=10$, $WMD=-1.87\text{kg}$).
			Interventions based on one motivational theory ($k=5$, $WMD=-2.51\text{kg}$, $p=0.008$) had larger effects compared to interventions based on multiple motivational theories ($k=5$, $WMD=-1.72\text{kg}$, $p=0.01$).
		BMI	Studies grounded in motivational theory were effective ($k=11$, $WMD=-0.82\text{kg/m}^2$).
			Interventions based on one motivational theory ($k=7$, $WMD=-0.75\text{kg/m}^2$, $p=0.008$) and those based on multiple motivational theories ($k=3$, $WMD=-0.99\text{kg/m}^2$, $p=0.009$) had similar effects.
		Waist circumference	Studies grounded in motivational theory were effective ($k=9$, $WMD=-1.91\text{cm}$).
			Interventions based on one motivational theory ($k=6$, $WMD=-2.82\text{cm}$, $p=0.06$) had larger effects compared to those based on multiple motivational theories ($k=3$, $WMD=-1.12\text{cm}$, $p=0.29$).
		Fasting glucose	Studies grounded in motivational theory were effective ($k=7$, $g=-0.17$).

Author, Year	Population	Outcome	Findings
			Interventions based on one motivational theory had larger effects ($k=4$, $g=-0.36$, $p=0.01$) compared to those based on multiple motivational theories ($k=3$, $g=-0.09$, $p=0.34$).
		Blood pressure	Studies grounded in motivational theory did not have a significant effect on systolic ($k=7$, $WMD=0.87\text{mmHg}$) or diastolic ($k=6$, $WMD=0.42\text{mmHg}$) blood pressure.
		Blood lipids	Studies grounded in motivational theory did not have a significant effect on total cholesterol ($k=6$, $g=-0.06$), HDL ($k=8$, $g=0.04$), LDL ($k=6$, $g=-0.007$), triglycerides ($k=7$, $g=-0.06$).
		HbA1c	Studies grounded in motivational theory did not have a significant effect on HbA1c ($k=4$, $g=-0.06$).
Taylor, 2020 ²⁶⁶	Serious mental illness	Symptom severity	A larger (non-significant between-group) effect was observed for adherence to ACSM guideline ($k=7$, $SMD=-0.62$, $p=0.005$) compared to non-adherent individuals ($k=3$, $SMD=-0.46$, $p=0.03$), (between groups $p=0.59$).
			A larger (non-significant between-group) effect was observed for inpatient setting ($k=3$, $SMD=-0.72$, $p=0.07$) compared to outpatient setting ($k=7$, $SMD=-0.45$, $p=0.003$), (between groups $p=0.53$).
			A larger (non-significant between group) effect was observed for programs that lasted 10 or more weeks ($k=4$, $SMD=-0.72$, $p=0.009$) compared to programs that lasted less than 10 weeks ($k=6$, $SMD=-0.45$, $p=0.01$), (between groups $p=0.41$).
			A larger (non-significant between group) effect was observed for sessions ≥ 3 x times per week ($k=6$, $SMD=-0.63$, $p=0.02$) compared to <3 x times per week ($k=4$, $SMD=-0.49$, $p=0.008$), (between groups $p=0.71$).
			A larger (non-significant between-group) effect was observed for low to moderate exercise intensity ($k=7$, $SMD=-0.60$, $p=0.002$) compared to moderate to vigorous intensity ($k=3$, $SMD=-0.46$, $p=0.10$), (between groups $p=0.68$).
			A larger (non-significant between group) effect was observed for sessions lasting 40-minutes or less ($k=4$, $SMD=-0.93$, $p=0.02$) compared to those lasting over 40-minutes ($k=6$, $SMD=-0.37$, $p=0.01$), (between groups $p=0.18$).
			A larger (non-significant between group) effect was observed for intervention adherence $>80\%$ ($k=7$, $SMD=-0.59$, $p=0.002$) compared to $<80\%$ ($k=3$, $SMD=-0.45$, $p=0.15$), (between groups $p=0.69$).
Vancampfort, 2021 ²⁶⁷		Intervention drop-out rates	Higher dropouts were observed in outpatient setting ($k=14$, 17.9%) vs inpatient ($k=1$, 1.2%), (between groups $p=0.01$).

Author, Year	Population	Outcome	Findings
	Anxiety and stress-related disorders		A lower frequency of exercise per week was associated with lower dropout rates (between groups $p<0.001$). 1x week ($k=2$, 6.8%), 2x week ($k=3$, 19.8%), 3x week ($k=8$, 12.1%), 4x week ($k=1$, 31.1%), 5x week ($k=1$, 39.5%).
			Lower dropouts in exercise sessions of short duration (between groups $p<0.001$): 16min ($k=2$, 4.5%), 30min ($k=4$, 16.1%, 60min ($k=2$, 19.8%), 90min ($k=3$, 14.0%).
			Lower dropouts in supervised ($k=9$, 13.3%) vs partially unsupervised sessions ($k=7$, 18.2%), (between groups $p<0.001$).
			Lower dropouts with supervision from exercise expert ($k=7$, 7.0%) vs non-exercise expert ($k=9$, 25.6%), (between groups $p<0.001$).
			Lower dropouts with using autonomous motivation strategies ($k=7$, 7.2%) compared to not ($k=9$, 30.4%), (between groups $p<0.001$).
			Lower dropouts when not using controlled motivation strategies ($k=12$, 12.2%) than when using it ($k=4$, 26.5%), (between groups $p<0.001$).
			The lowest dropout in mixed exercise modalities ($k=3$, 3.6%), then strength training ($k=2$, 15.6%), then aerobic exercise ($k=8$, 19.7%), and highest dropout in the mind-body intervention ($k=3$, 26.0%), (between groups $p<0.001$).
			There were similar dropout rates in exercise of moderate-high intensity ($k=13$, 14.6%) and low-intensity ($k=3$, 18.5%), (between groups $p=0.10$).
Analyses based on nutrition interventions			
Rocks, 2022 ²⁶³	Serious mental illness	Body weight	Dietitian-delivered interventions were effective ($k=5$, $SMD=-0.28$, $p=0.02$), but there was no overall effect ($k=10$, $SMD=-0.11$, $p=0.21$).
			Individual interventions were effective ($k=3$, $SMD=-0.30$, $p=0.01$), but there was no overall effect ($k=10$, $SMD=-0.11$, $p=0.21$).
Analyses based on sleep interventions			
Gottlieb, 2020 ²⁵⁴	Bipolar disorder	Depressive symptoms	Sleep deprivation had a mean response rate (defined as the level of impact on symptoms) of 48%.
He, 2023 ²⁵⁶	Depression	Depression remission	Sleep deprivation combined with sleep phase advance or sleep phase delay had a larger effect than sleep phase advance or delay alone ($k=2$, $OR=3.90$, $p=0.002$).

[^]Mucheru et al. (2019)²⁶⁰ defined interventions that “offered personalization of both dietary and physical activity education, as well as consistent review of progress” as *structured* and interventions that “delivered education on dietary and physical activity information without personalization of any of the components” as *unstructured*. ACSM: American College of Sports Medicine, ADL: Activities of daily living, CBT: Cognitive behaviour therapy, CTs: Behaviour change techniques, BMI: Body mass index, ES: Effect size, *g*: Hedge’s *g* effect size, HbA1c: glycated haemoglobin, *k*: Number of studies, MD: Mean difference, MDD: Major depressive disorder, OR: Odds Ratio, PANSS: Positive and negative symptom scale, PE: Point estimate, SMD: Standardised mean difference, WMD: Weighted mean difference.

Supplementary 3.8: Meta-Research Recommendations.

Two authors, ST and SR, reviewed data extracted from meta-analyses. They examined the number of studies included in each meta-analysis, the outcomes measured, the effect sizes, and the consistency of effects across multiple meta-analyses to generate a list of recommendations from meta-research. The GSAG, lived experience group, and broader authorship team including the Lancet Psychiatry Physical Health Consortium then reviewed and updated these recommendations.

Table S17. Studies Underpinning Meta-Research Recommendations.

Recommendation	Studies
1. Ground exercise interventions in motivational theory. Include each component of the theoretical model, aim to foster autonomous motivation, and avoid using controlled motivational strategies.	264, 267
2. Offer both individual and group-based interventions that can cater to heterogenous presentations in terms of age, gender, illness severity, readiness, and motivation to change.	250, 252, 258, 260, 261, 263, 265
3. Ideally, a range of intervention approaches should be offered that consider individual needs and preferences to improve adherence and reduce dropout rates.	252, 253, 255, 257, 258, 261, 262
4. Integrate health coaching, behavior change techniques, and the foundational principles of motivational interviewing. This can be delivered by upskilled exercise, nutrition practitioners, peer workers, or other healthcare workers.	252, 264
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.	251, 257, 259, 262, 263, 267
6. Start exercise sessions at a manageable level, focusing on barriers and open goals, and increase over time, ideally to three or more times per week, and offer supervised sessions.	250, 255, 257-259, 262, 265-267
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.	252, 258, 265
8. Offer lifestyle interventions in both inpatient and outpatient/community settings.	252, 253, 259, 262, 265-267

Supplementary Section 4.

Supplementary 4.1: Definitions of Key Terms

Table S18. Definition of Key Terms

Term	Definition/Description	Source
Context	“Context reflects a set of characteristics and circumstances that consist of active and unique factors, within which the implementation is embedded. As such, context is not [just] a backdrop for implementation, but interacts, influences, modifies and facilitates or constrains the intervention and its implementation. Context is usually considered in relation to an intervention, with which it actively interacts. It is an overarching concept, comprising not only a physical location but also roles, interactions and relationships at multiple levels*.” p.6 Macro – the system level, external to the organisation; meso – the organisational level; and micro – the frontline service/provider/clinical team level.	269
Culture	“Culture refers to deep-seated assumptions and values far below surface manifestations (who gets to park in front of the hospital?), officially espoused ideologies or, even patterns of behaviour.” p.29	270
Developmental evaluation	Developmental evaluation seeks to guide ‘adaptation to emergent and dynamic realities in complex environments’ p.1	271
Implementation	“Implementation is an actively planned and deliberately initiated effort with the intention to bring a given intervention into practice within a particular setting. These actions are undertaken by agents who either actively promote the use of the intervention or adopt the newly appraised practices. Usually, a structured implementation process consisting of specific implementation strategies is used and underpinned by an implementation theory.” p.6	269
Lifestyle interventions*	For this review, ‘lifestyle interventions’ are defined as interventions which are provided via mental healthcare settings for individuals with mental illness, aiming to change any of the following health-related behaviours: • Diet • Physical activity and/or sedentary behaviour • Sleep quality • Smoking • Substance (e.g., alcohol) abuse	**
Participant/stakeholder group	Clients/patients/intervention recipients/participants Individuals living with mental illness who have either been recipients of lifestyle interventions in mental healthcare settings or declined to participate in such interventions but agreed to share their reasons for refusal (if available, this information will most likely be found in process evaluations that were run alongside clinical trials).	**
Participant/stakeholder group	Healthcare professionals/providers/intervention managers Those involved in commissioning, designing, setting up, delivering, as well as managing and overseeing lifestyle interventions for people with mental illness.	**

Participant/stakeholder group	Peer practitioners Individuals living with mental illness who contribute to the design, set-up, and delivery of lifestyle interventions in mental healthcare settings for others living with mental illness.	**
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*Interventions can be delivered as an individual or combined lifestyle intervention.

**Developed for this synthesis by the study team.

Table S19. Description of macro-, meso-, and micro-levels from the providers' perspectives

System Level	Definition and Examples.
Macro 'system' level	This level refers to the broad, overarching structures that shape healthcare delivery at national or global levels. This level encompasses contextual factors external to organisations, such as healthcare policy and budgetary allocation, regulatory mechanisms, professional regulation and location/demographics.
Meso 'organisational' level	This level comprises contextual factors such as leadership, culture, financial and clinical performance, equipment and resources, data and information systems, knowledge and training, and the fostering of organisational support.
Micro 'clinical team' level	This level involves individuals and their immediate environment. It includes factors such as clinical team knowledge of lifestyle interventions, familiarity with the evidence base, value placed on lifestyle interventions, clinician motivation and interest, and opportunities for interventions.

*Definitions adapted from Fulop & Robert, 2015.²⁷²

Table S20. Description of macro-, meso-, and micro-levels from the participants' perspectives*

System Level	Definition and Examples.
Macro, 'system' level	This relates to external factors, both proximal and distal. It pertains to policy-level influences and regulations that control the welfare system, the wider economic environment (e.g. recession), wider societal values, beliefs, cultural forces, and changes in ways of living.
Meso, 'organisational and community' level	This pertains to the social contexts of patients, practices, and organisations of providers. For instance, obesogenic factors in mental health hospitals, such as limited physical activity facilities, lack of stair access, a 'culture of sitting', or restrictions on leaving hospital units. It also encompasses community-level factors, in addition to cultural and social factors. Examples include stigma, social isolation, lack of social support, limited access to local recreation centres, and perceptions of lack of neighbourhood safety in terms of crime and traffic, among others.
Micro, 'an individual's immediate environment' level	This level covers individual-level factors (e.g. biological/physiological, psychological, socioeconomic). Biological and physiological factors include, for example, the severity of symptoms, lack of energy, and comorbid physical health problems. Psychological factors can encompass motivational deficiencies, lack of self-confidence, self-consciousness, fear of or perceptions of embarrassment, lack of interest, fear of exacerbating

	the current condition, fear of going outdoors, and uncertainty about what actions to take. It also includes social factors at the individual level (e.g. those linked to interactions between a patient and provider or a patient and peer). Examples of economic factors at the individual level are educational status and disposable income (financial constraints).
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*Developed for this report, with selected examples drawn from Leyland and Groenewegen, 2020.²⁷³

Supplementary 4.2: Identification of Relevant Qualitative Studies and Conceptual Frameworks.

Aim. Identify what factors affect the implementation and delivery of lifestyle intervention in mental health settings [PROSPERO Registration: CRD42024542611].

Search Strategies.

The search strategy included a comprehensive list of terms that are used in the literature to describe mental illness and lifestyle interventions, especially those that have been implemented in mental healthcare settings. To identify qualitative studies, we aligned the search strategy with recommended methods for sourcing qualitative evidence.²⁷⁴⁻²⁷⁷

We searched the databases MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO and Scopus. We developed a unique search strategy for each database.^{278, 279} We also searched the bibliographies of studies that had been included in the review of outcome analyses for recent intervention studies (Section 2).

Studies that had been published between November 1, 2018, and the date of the search were eligible for inclusion. This start date was chosen because it allowed us to identify studies that had not been included in the landmark work by Firth et al. (2019).¹ We aimed to include studies that involved participants from any mental healthcare setting or country. No language restrictions were applied. Full search strategies are presented below.

Table S21. Inclusion Criteria.

PICOS domain	Inclusion criteria
Population	Mental disorders (exclude studies of eating disorders, neurological disorders and neurodevelopmental disorders).
Intervention	Lifestyle intervention, either as a single component, e.g., exercise, or as a multi-component intervention (e.g., nutrition, exercise and smoking cessation).
Comparator	Nil restriction.
Outcomes	Barriers, enablers and implementation frameworks.
Sources	Primary data studies that include recognised qualitative designs.

Tables S22a-S22d. Search Strategy.

MEDLINE search strategy	
Condition or Health State (Problem)	(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	
Lifestyle (Intervention)	("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	
Design	((("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.
* Search filter applied: Rogers et al., 2018.	

SCOPUS search strategy	
Condition or Health State (Problem)	TITLE (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)
AND	
Lifestyle interventions (Intervention)	TITLE ("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 TITLE-ABS-Key lifestyle*)
AND	
Design	TITLE-ABS-KEY (qualitative* OR ethno* OR ethnog* OR ethnonurs OR emic OR etic OR leininger OR OR noblit OR "field note*" OR "field record*" OR fieldnote* OR "field stud*" OR "participant observ*" OR "participant observation*" OR hermeneutic* OR phenomenolog* OR "lived experience*" OR heidegger* OR husserl* OR "merleau-pont*" OR colaizzi OR giorgi OR ricoeur OR spiegelberg OR "van kaam" OR "van manen" OR "grounded theory" OR "constant compar*" OR "theoretical sampl*" OR (glaser AND strauss) OR "content analy*" OR "thematic analy*" OR narrative* OR "unstructured categor*" OR "structured categor*" OR "unstructured interview*" OR "semi-structured interview*" OR "maximum variation*" OR snowball OR audio* OR tape* OR video* OR "purposive sampl*" OR "action research" OR "focus group*" OR photovoice OR "photo voice" OR "mixed method*"**
** A modified search filter to retrieve qualitative studies has been applied: Slater, 2021.	

PsycINFO search strategy	
Condition or Health State (Problem)	(schizo* OR "mental illness" OR "mental disorder*" OR 94exercise94y* OR depress* OR bipolar OR anxiety OR "substance abus*" OR "substance use*" OR "eating disorder*" OR psychosis OR psychotic).ti,ab
AND	
Lifestyle interventions (Intervention)	("physical activity" OR exercise* 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 Descriptor	(intervention OR service OR program* OR modification).ti,ab
AND	
Outcome	((("semi-structured" OR semistructured OR unstructured OR informal OR "indepth" OR indepth OR "face-to-face" OR structured OR guide) NEAR3 (interview* OR discussion* OR questionnaire*)) OR (focus group* OR qualitative OR ethnograph* OR fieldwork OR "field work" OR "key informant"))).ti,ab.
Search filter applied: Rogers et al., 2018.	

CINAHL search strategy	
Condition or Health State (Problem)	(schizo* OR “mental illness” OR “mental disorder*” OR 95xercise95y* OR depress* OR bipolar OR anxiety OR “substance abus*” OR “substance use*” OR “eating disorder*” OR psychosis OR psychotic).ti,ab
AND	
Lifestyle interventions (Intervention)	(“physical activity” OR 95xercise* 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	
Outcome	(“Qualitative Research” OR exp Questionnaires OR “Interviewing” OR “Attitudes” OR “Ethnology” OR “Phenomenology” OR “Observation Methods” OR “Discourse Analysis” OR “Content Analysis” OR “process evaluation” OR “process* evaluation*” OR “program* evaluation*”)***

Supplementary 4.2: Study Identification for Qualitative Evidence Synthesis

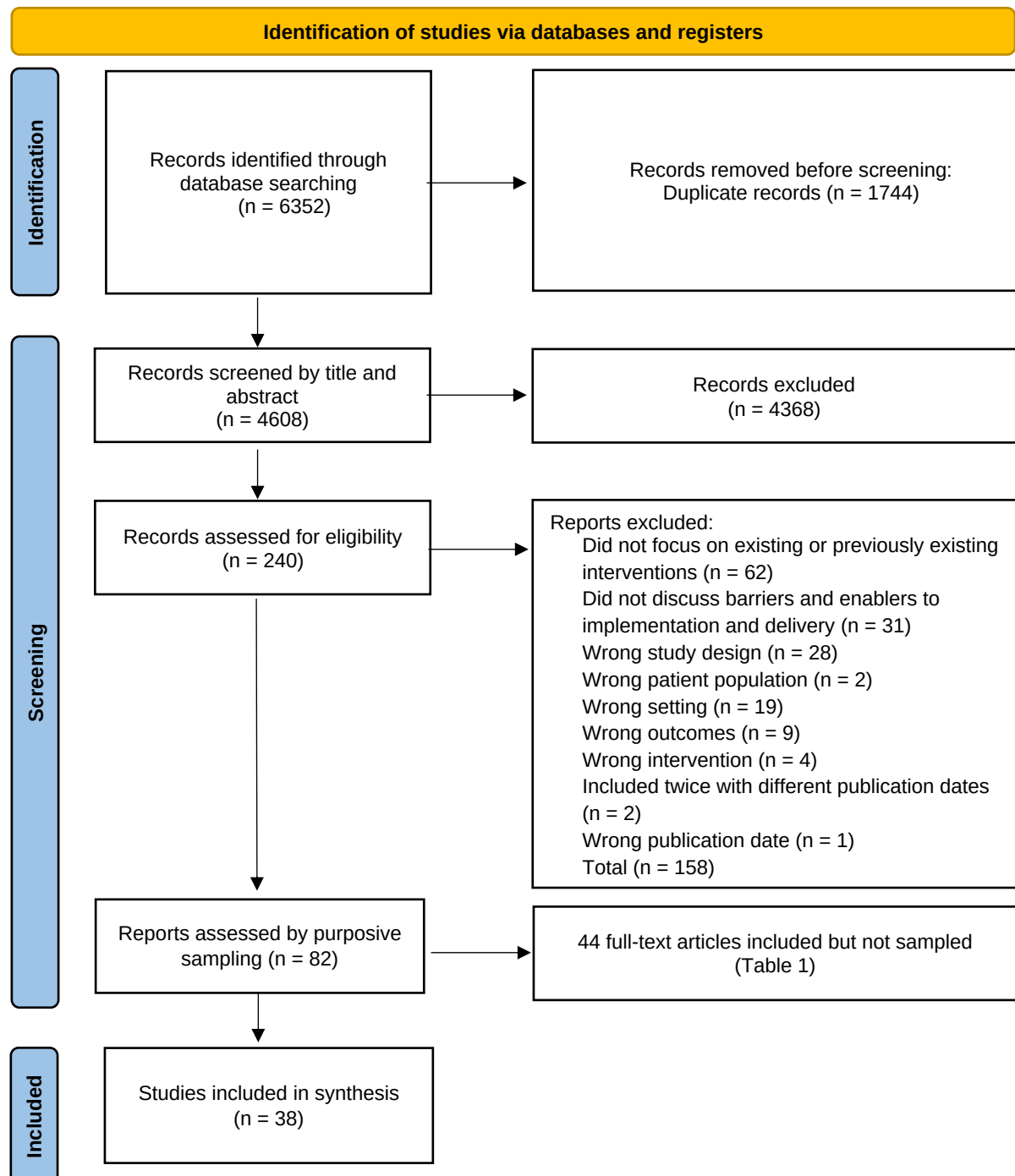


Figure S3. PRISMA flow diagram for qualitative evidence synthesis.

Supplementary 4.3: Purposive Sampling

Process

The database searches returned 4,608 papers (after the removal of duplicates). A review of their titles and abstracts resulted in the retention of 240 papers. Full-text screening of the remaining papers identified 38 papers that met the eligibility criteria for the review. As the quantity of data could pose a challenge to the quality of analysis,²⁸⁰ the eligible studies were subjected to purposive sampling.²⁸¹

We applied the sampling process seen in Ames et al. (2019),²⁸¹ which involves three steps:

1. Sampling for maximum geographical spread.
2. Sampling for data richness.
3. Sampling for match of scope.

Step 1: Sampling for maximum geographical spread

Most of the studies originated from high-income countries. We included all studies from low- and middle-income countries to describe global patterns and identify similarities and differences across various settings (from high-, middle- and low-income countries),

Step 2: Sampling for data richness ('conceptual clarity')

Studies with rich data are often more methodologically rigorous.²⁸² To adequately describe context-specific factors that affect the implementation and delivery of lifestyle interventions in healthcare settings for people with mental illness, we evaluated data richness using the data richness scale (see **Table S23**). Studies that scored 3 or higher were included in the synthesis.

Step 3: Sampling for match of scope

In Step 3, we sampled studies whose findings and objectives closely match the synthesis's objectives. Studies were eligible for inclusion if they included at least one theme relating to stakeholders' perceptions of barriers and enablers to implementing and delivering lifestyle interventions in mental healthcare settings.

Table S23. Data richness scale.

Score	Measure	Example
1	Very few qualitative data were presented. The findings that are presented are fairly descriptive.	For example, a mixed methods study using open-ended survey questions or a more detailed qualitative study where only part of the data relates to the synthesis objective.
2	Some qualitative data was presented.	For example, a limited number of qualitative findings from a mixed methods or qualitative study.
3	A reasonable amount of qualitative data.	For example, a typical qualitative research article in a journal has a smaller word limit and often uses simple thematic analysis.
4	A good amount and depth of qualitative data.	For example, a qualitative research article in a journal with a larger word count that includes more context and setting descriptions and a more in-depth presentation of the findings.
5	A large amount and depth of qualitative data.	For example, from a detailed ethnography or a published qualitative article.

[Adapted from Ames et al., 2019²⁸¹].

Results

Table S24 presents included but not sampled studies, with reasons for exclusion. **Table S25** lists the 38 papers that were sampled.

Table S24. Included but not sampled studies.

Study	Title	Reason for exclusion
Aschbrenner, 2019 ²⁸³	Qualitative analysis of social network influences on quitting smoking among individuals with serious mental illness.	The relevant data was not as close to the review question as the sampled studies
Ashdown-Franks, 2023 ²⁸⁴	“Triggered by the sound of other runners”: An exploration of parkrun mentions in mental health hospital records in the UK.	The relevant data was not as close to the review question as the sampled studies
Bringmann, 2021 ²⁸⁵	Meditation Based Lifestyle Modification (MBLM) in outpatients with mild to moderate depression: A mixed-methods feasibility study.	The relevant data was not as close to the review question as the sampled studies
Browne, 2024 ²⁸⁶	Factors influencing engagement in in-person and remotely delivered lifestyle interventions for young adults with serious mental illness: A qualitative study.	Did not meet the sampling criteria for data richness
Cimo, 2019 ²⁸⁷	Tailoring Diabetes Education to Meet the Needs of Adults With Type 2 Diabetes and Mental Illness: Client and Health-Care Provider Perspectives From an Exploratory Pilot Study.	The relevant data was not as close to the review question as the sampled studies
Deenik, 2019 ²⁸⁸	Implementation barriers and facilitators of an integrated multidisciplinary lifestyle enhancing treatment for inpatients with severe mental illness: the MULTI study IV.	Did not meet the sampling criteria for data richness
Dyrberg, 2021 ²⁸⁹	Experience of Treatment and Adherence to Cognitive Behavioral Therapy for Insomnia for Patients with Depression: An Interview Study.	The relevant data was not as close to the review question as the sampled studies
Estel, 2023 ²⁹⁰	Wirkfaktoren von Tanz- und Bewegungstherapie im klinischen Kontext: Eine partizipatorische multizentrische Studie.	Did not meet the sampling criteria for data richness
Freiburghaus, 2021 ²⁹¹	The right to smoke and the right to smoke-free surroundings: international comparison of smoke-free psychiatric clinic implementation experiences.	Did not meet the sampling criteria for data richness
Garvey, 2023 ²⁹²	The perceptions of mental health clinicians integrating exercise as an adjunct to routine treatment of depression and anxiety.	The relevant data was not as close to the review question as the sampled studies
Gorvine, 2021 ²⁹³	An Exploratory Study of the Acceptability and Feasibility of Yoga Among Women in Substance Use Disorder Recovery.	The relevant data was not as close to the review question as the sampled studies
Graydon, 2018 ²⁹⁴	A statewide initiative to train behavioral health providers in smoking cessation.	Did not meet the sampling criteria for data richness
Griffiths, 2022 ²⁹⁵	Treatment resistant depression (TRD) service outpatient’s experience of sleep, activity, and using a Fitbit wearable activity and sleep tracker.	The relevant data was not as close to the review question as the sampled studies
Griffiths, 2023 ²⁹⁶	An exploration of patient experience of sleep, physical activity, and exercise in early psychosis.	The relevant data was not as close to the review question as the sampled studies
Guerin, 2019 ²⁹⁷	Physical activity programs and severe mental illness: A case study of an Assertive Community Treatment (ACT) team.	Did not meet the sampling criteria for data richness
Gurusamy, 2024 ²⁹⁸	Effect of lifestyle modification intervention (LMI) on metabolic syndrome in schizophrenia in a residential mental health care setting—A mixed method study.	The relevant data was not as close to the review question as the sampled studies

Study	Title	Reason for exclusion
Hui, 2023 ²⁹⁹	Perspectives of mental health clinicians on physical health of young people with early psychosis.	The relevant data was not as close to the review question as the sampled studies
Japuntich, 2022 ³⁰⁰	Implementing Chronic Care Model Treatments for Cigarette Dependence in Community Mental Health Clinics.	Did not meet the sampling criteria for data richness
Jenkin, 2021 ³⁰¹	There's no smoke without fire: Smoking in smoke-free acute mental health wards.	The relevant data was not as close to the review question as the sampled studies
Kathuria, 2019 ³⁰²	Patient and Physician Perspectives on Treating Tobacco Dependence in Hospitalized Smokers With Substance Use Disorders: A Mixed Methods Study.	Did not meet the sampling criteria for data richness
Klein, 2019 ³⁰³	Tailoring of a Smartphone Smoking Cessation App (Kick.it) for Serious Mental Illness Populations: Qualitative Study.	The relevant data was not as close to the review question as the sampled studies
Martinez Leal, 2021 ³⁰⁴	Addressing Smoking Cessation among Women in Substance Use Treatment: A Qualitative Approach to Guiding Tailored Interventions.	The relevant data was not as close to the review question as the sampled studies
Martland, 2023 ³⁰⁵	Service user experiences of a physical health group for people experiencing psychosis, designed following service user consultation.	Did not meet the sampling criteria for data richness
Matthews, 2024 ³⁰⁶	A qualitative evaluation of an exercise practitioner in an outpatient child and adolescent mental health service.	Did not meet the sampling criteria for data richness
Murphy, 2019 ³⁰⁷	Pilot-testing of "healthy body healthy mind": An integrative lifestyle program for patients with a mental illness and co-morbid metabolic syndrome.	Did not meet the sampling criteria for data richness
Nadal, 2022 ³⁰⁸	Eliciting the mechanisms of action of care navigators in the management of type 2 diabetes in people with severe mental illness: A qualitative study.	The relevant data was not as close to the review question as the sampled studies
O'Keeffe, 2023 ³⁰⁹	A qualitative evaluation of a telehealth healthy lifestyle intervention for people with serious mental illness.	The relevant data was not as close to the review question as the sampled studies
Okoli, 2019 ³¹⁰	Which Types of Tobacco Treatment Interventions Work for People with Schizophrenia? Provider and Mental Health Consumer Perspectives.	Did not meet the sampling criteria for data richness
Patten, 2019 ³¹¹	Feasibility trial of an unsupervised, facility-based exercise programme for depressed outpatients.	Did not meet the sampling criteria for data richness
Pritchett, 2020 ³¹²	Women's experiences of exercise as a treatment for their postnatal depression: A nested qualitative study.	The relevant data was not as close to the review question as the sampled studies
Roberts, 2023 ³¹³	Exergaming (physically active video gaming) for mental health service users in a community mental health care setting: an ethnographic observational feasibility study.	Did not meet the sampling criteria for data richness
Rosa, 2023 ³¹⁴	Quitline nurses' experiences in providing telephone-based smoking cessation help to mental health patients: A mixed methods study.	Did not meet the sampling criteria for data richness
Schnitzer, 2021 ³¹⁵	Multidisciplinary barriers to addressing tobacco cessation during an inpatient psychiatric hospitalization.	Did not meet the sampling criteria for data richness

Study	Title	Reason for exclusion
Schnitzer, 2021 ³¹⁶	Patient Experience and Predictors of Improvement in a Group Behavioral and Educational Intervention for Individuals With Diabetes and Serious Mental Illness: Mixed Methods Case Study.	Did not meet the sampling criteria for data richness
Sharma-Kumar, 2018 ³¹⁷	Are Australian smokers with mental illness receiving adequate smoking cessation and harm reduction information?	The relevant data was not as close to the review question as the sampled studies
Sharma-Kumar, 2022 ³¹⁸	The Acceptability and Effectiveness of Videos Promoting Smoking Cessation Among Australians Experiencing Mental Illness.	The relevant data was not as close to the review question as the sampled studies
Shrestha, 2021 ³¹⁹	Physical activity and sedentary behaviour counselling: Attitudes and practices of mental health professionals.	Did not meet the sampling criteria for data richness
Taylor, 2022 ³²⁰	A novel smartphone-based intervention targeting sleep difficulties in individuals experiencing psychosis: A feasibility and acceptability evaluation.	The relevant data was not as close to the review question as the sampled studies
Teychenne, 2021 ³²¹	Key stakeholder perspectives on the development and real-world implementation of a home-based physical activity program for mothers at risk of postnatal depression: a qualitative study.	The relevant data was not as close to the review question as the sampled studies
Thompson, 2021 ³²²	Qualitative analysis of the Meals, Mindfulness, & Moving Forward (M3) lifestyle programme: Cultivating a 'safe space' to start on a 'new path' for youth with early episode psychosis.	The relevant data was not as close to the review question as the sampled studies
Tous-Espelosin, 2023 ³²³	It Helped Me to Disconnect My Mind from the Problems': The Subjective Experiences of People with Schizophrenia Taking Part in a Concurrent Exercise Program.	The relevant data was not as close to the review question as the sampled studies
Tous-Espelosin, 2023 ³²⁴	"Out-of-Hospital and with Qualified Exercise Professionals": Keys to the CORTEX-SP Physical Exercise Program According to the Experience of the Participants.	Did not meet the sampling criteria for data richness
Tuda, 2023 ³²⁵	Using the matrixed multiple case study methodology to understand site differences in the outcomes of a Hybrid Type 1 trial of a peer-led healthy lifestyle intervention for people with serious mental illness.	Did not meet the sampling criteria for data richness
Yap, 2020 ³²⁶	An exercise intervention for people with serious mental illness: Findings from a qualitative data analysis using participatory theme elicitation.	The relevant data was not as close to the review question as the sampled studies

Supplementary 4.4: Characteristics of Sampled Studies

Thirty-five studies were from high-income countries: Australia ($k=10$), Belgium ($k=1$), Canada ($k=2$), Denmark ($k=3$), Germany ($k=1$), the Netherlands ($k=2$), Norway ($k=1$), Sweden ($k=2$), the UK ($k=6$), and the USA ($k=7$). Three studies were from middle-income or low-income countries: China ($k=1$), Kenya ($k=1$), and Uganda ($k=1$). Interventions were implemented and delivered in a range of mental healthcare settings.

Table S25. Characteristics of Sampled Studies.

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
Bohicchio (2020) ³²⁷ USA	Peer-led Group Lifestyle Balance (PGLB)	Physical activity Nutrition	SMI	Supported housing agencies	Qualitative component of an effectiveness/implementation trial	Grounded theory	Delivery	<i>Total N=37</i> Intervention participants N=28 Peer specialists N=4 Supervisors N=5	Interviews Card sort exercise	Grounded theory analysis
Brooke (2022) ³²⁸ Australia	Sport-based life skills training	Physical activity Life skills	FEP	Early psychosis functional recovery service	A feasibility study and process evaluation	Unclear or not reported	Implementation and delivery	<i>Total N=16</i> Intervention participants N=7 Community workers N=4 Peer support worker N=3 Administration manager N=1 Social work student N=1	Interviews Focus groups Observations	Thematic analysis
Czosnek (2023) ³²⁹ Australia	Exercise physiologist-led physical activity service	Physical activity	Mental illness	Community-based youth mental health service	Mixed methods study	Case study	Implementation	<i>Total N=10</i> Exercise physiologist N=2 Key referral staff N=2 Other health professional N=4 Executive N=1	Interviews Document study Other	Framework analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
								Programme manager N=1 Documents reviewed N=24		
Dobbins (2020) ³³⁰ USA	Kinect for Xbox 360	Physical activity	SMI	Transitional residential and day treatment centre	Qualitative study	Grounded theory	Delivery	Intervention participants N=16	Group & individual interviews Observations	Grounded theory analysis
Fagan (2021) ³³¹ Canada	Exercise programming	Physical activity	Substance use (most with co-occurring mental illness)	Residential treatment facility	Qualitative study	Unclear or not reported	Delivery	Intervention participants N=15	Interviews	Thematic analysis
Fibbins (2019) ³³² Australia	Embedding exercise professional in mental health service	Physical activity	SMI	Psychiatric hospital	Qualitative study	Unclear or not reported	Implementation	<i>Total N=14</i> Psychologists N=3 Nurses N=2 Registrars N=2 Occupational therapists N=2 Social Workers N=2 Peer worker N=1 Exercise physiologist N=1 Executive N=1	Interviews Focus groups	Systematic text condensation
Fredman Stein (2023) ³³³ UK	Integrated CBT-based intervention for smoking cessation and depression/anxiety	Smoking	Depression and anxiety	NHS talking therapies	Qualitative study/evaluation nested in an RCT	Unclear or not reported	Implementation (participants experiences of mechanisms underlying change in	Intervention participants N=15	Interviews	Thematic analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
							smoking behaviour)			
Gossage-Worrall (2019) ³³⁴ UK	Structured lifestyle education for people with schizophrenia (STEPWISE)	Physical activity Nutrition	Schizophrenia	Community mental health teams in rural and urban locations	Mixed-methods process evaluation	Case study	Implementation	<i>Total N=51</i> Service users N=24 Facilitators N=20 Interventionists N=7	Interviews Other	Analysis underpinned by multiple theoretical & conceptual frameworks
Gudzune (2023) ³³⁵ USA	Multi-purpose group weight management and exercise intervention	Physical activity Nutrition	SMI	Community-based psychiatric program	Mixed-methods process evaluation	Unclear or not reported	Implementation	<i>Total N=15</i> Intervention participants N=12 Staff N=3	Focus groups	Thematic analysis
Gumport (2020) ³³⁶ USA	Transdiagnostic sleep and circadian modular intervention	Sleep	SMI	Community mental health clinics	Mixed methods study	Unclear or not reported	Implementation	Providers (staff) N=22	Interviews Other	Thematic analysis
Hogan (2022) ³³⁷ USA	Pharmacological treatment for smoking cessation & metacognitive remediation to quit	Smoking	Psychotic disorders	Community mental health centre	Qualitative study	Case study	Implementation	Multidisciplinary staff N=22	Interviews	Thematic analysis
Khoubaeva (2023) ³³⁸ Canada	Tailored behaviour change counselling to increase cardiorespiratory fitness	Physical activity	Bipolar disorder	Youth mental health service	Qualitative study	Unclear or not reported	Implementation	<i>Total N=16</i> Youth N=11 Parents N=5	Focus groups/post intervention consultation forums	Content and thematic analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
Kirschner (2022) ³³⁹ Germany	Health-conscious lifestyle intervention	Physical activity Nutrition Smoking Substance use	Mental illness	Community-based sheltered housing and day care	Mixed-methods process evaluation	Unclear or not reported	Implementation	Mental health care workers N=12	Interviews	Content analysis
Kohn (2022) ³⁴⁰ Belgium	Somatic health care	Other	SMI	Psychiatric hospital Hospital psychiatric ward Psychiatric nursing home Sheltered housing	Qualitative study (study was part of a larger project aimed to examine status of somatic health care of people with SMI)	Unclear or not reported	Delivery	<i>Total N=60</i> Patients N=10 Intervention providers N=50	Interviews Focus groups	Thematic analysis
Larsen (2019) ³⁴¹ Denmark	Supervised, group-based, functional exercise training programme	Physical activity	FEP	Delivered by a specialised outpatient multidisciplinary team in a commercial fitness centre	Qualitative sub-study from a randomised feasibility trial	Unclear or not reported	Delivery	<i>Total Interviews N=32</i> Participants N=16 (pre-intervention) Participants N=12 (post-intervention) Instructors N=4 Observations N=8	Interviews Focus groups Participant observations	Thematic analysis
Lee (2019) ³⁴² China	Yoga and mindfulness programme	Physical activity	Depression	Outpatient clinic of a psychiatric hospital	Qualitative study	Unclear or not reported	Delivery	Intervention participants N=9	Interviews	Manual inductive content analysis
Lund (2020) ³⁴³ Sweden	Group-based, occupational therapy course which	Physical activity Nutrition Sleep	Mental illness	Outpatient psychiatric clinics of community-	Qualitative study	Field research	Delivery	<i>Total N=31</i> OT facilitators N=10	Interviews Focus group discussions	Grounded theory analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
	focuses on aspects of life and lifestyle	Other		based activity centres				Other health professional facilitators N=2 Intervention participants N=19		
Lundström (2020) ³⁴⁴ Sweden	Health promotion	Healthy lifestyle	SMI	Psychiatric outpatient clinics	Qualitative study	Unclear or not reported	Delivery	Mental health nurses N=15	Interviews	Content analysis
McCarter (2022) ³⁴⁵ Australia	“Quitlink” smoking cessation	Smoking	SMI	Mental health services	Qualitative study/evaluation nested in an RCT	Unclear or not reported	Delivery (focuses on participants experiences of smoking cessation)	<i>Total N=29</i> Intervention participants N=15; Control group participants N=14	Interviews	Thematic analysis using a general inductive approach
McKeon (2023) ³⁴⁶ Australia	Exercise physiologists using telehealth with people with mental illness	Physical activity	Mental illness	Telehealth delivered by clinicians in a range of clinical settings (e.g., private practice, hospitals)	Qualitative study	Unclear or not reported	Implementation (exercise physiologists’ attitudes towards using telehealth for people with mental illness)	Exercise physiologists N=9	Interviews	Reflexive thematic analysis
Møller (2020) ³⁴⁷ Denmark	Health promotion activities	Other	Psychotic disorders	Mental health care – clinical departments, forensic, outpatient and community	Qualitative study	Unclear or not reported	Delivery	Mental health nurses N=12 Case descriptions N=59	Focus groups Other	Content analysis
Mucheru (2020) ³⁴⁸ Australia	Health and wellbeing programs	Physical activity Nutrition	SMI	Community-managed organisations that	Qualitative study	Unclear or not reported	Implementation	<i>Total N=12</i> Consumers N=6 Staff involved in delivery N=6	Interviews	Thematic analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
				provide services for people with mental illness						
Mugisha (2019) ³⁴⁹ Uganda	Physical activity in Ugandan mental health care system	Physical activity	Mental illness	National referral and mental health hospital	Qualitative study	Unclear or not reported	Implementation	Multidisciplinary clinicians N=13	Interviews	Content thematic analysis
Olando (2020) ³⁵⁰ Kenya	Group behavioural tobacco cessation intervention	Smoking	SMI, SUD	National referral and mental health hospital	Qualitative study nested in an RCT	Unclear or not reported	Delivery	Intervention participants N=49	Focus groups	Thematic analysis
O'Neill (2023) ³⁵¹ USA	Virtual peer-driven healthy lifestyle intervention	Physical activity Nutrition	SMI	Community-based rehabilitation programs	Qualitative study	Community-based participatory action research framework	Delivery	Intervention participants N=35	Focus groups	Thematic analysis
Rogova (2024) ³⁵² USA	Tobacco-free workplace program	Smoking	Mental illness	Substance use centre	Qualitative study	Ethnography	Implementation	Total N=22 Consumers N=16 Staff N=6	Interviews	Thematic analysis
Sawyer (2023) ³⁵³ UK	Smoking cessation intervention integrated with talking therapies	Smoking	Depression and anxiety	Primary care psychological therapy service	Qualitative study embedded within a feasibility RCT	Unclear or not reported	Implementation	Intervention participants N=36	In-depth, qualitative, semi-structured interviews	Framework approach to thematic analysis with deductive approach (COM-B).

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
Sawyer (2024) ³⁵⁴ UK	Digital technologies for physical health promotion	Physical activity Nutrition Sleep	Mental illness	Mental health clinicians from various services	Mixed-methods study, part 2: qualitative study	A pragmatist approach	Implementation and delivery	<i>Total N=127</i> Intervention providers N=13 Intervention participants N=114	In-depth semi-structured interviews, responses to open-ended survey items	Inductive thematic analysis
Smith (2020) ³⁵⁵ UK	Supporting Health and Promoting Exercise program	Physical activity	FEP, schizophrenia	Delivered via a university community fitness centre	Qualitative study nested in an RCT	Unclear or not reported	Implementation and delivery	Intervention participants N=26	Focus groups	Deductive analysis
Sørensen (2020) ³⁵⁶ Norway	Motivational physical activity intervention	Physical activity	Mental illness	Psychiatric institution	Qualitative study	Unclear or not reported	Implementation	<i>Total N=18</i> Consumers N=6 Intervention providers N=6 Leaders N=4	Interviews, focus groups	Thematic analysis
Tambyah (2022) ³⁵⁷ Australia	Nature-based intervention	Physical activity Sleep	Mental illness	Community mental health services	Qualitative study	Unclear or not reported	Implementation and delivery	Staff N=15	Interviews	Inductive thematic analysis
Twyman (2019) ³⁵⁸ Australia	Smoking cessation	Smoking	SMI	Community mental health services	Qualitative study	Unclear or not reported	Delivery	<i>Total N=48</i> Staff N=31 Consumers N=17	Focus groups	Thematic analysis
Wagner (2022) ³⁵⁹ Denmark	Health promotion activities	Healthy lifestyle	Mental illness	Mixed settings	Qualitative study	Unclear or not reported	Delivery	Multidisciplinary clinicians N=18	Interviews	‘Descriptive qualitative data analysis’
Walburg (2022) ³⁶⁰ Netherlands	Severe Mental Illness Lifestyle	Physical activity Nutrition	Mental illness	Flexible assertive community treatment	Qualitative component of a mixed-methods	Unclear or not reported	Implementation	<i>Total N=28</i> Consumers N=15	Interviews informed by	Thematic analysis

Study Details	Intervention	Lifestyle elements	Diagnosis	Setting	Study type	Methodology	Research focus	Participants	Data collection	Analysis
	Evaluation (SMILE)			outpatient teams	process evaluation			Providers and peer worker providers N=13	the RE-AIM framework	
Walburg (2022) ³⁶¹ Netherlands	Severe Mental Illness Lifestyle Evaluation (SMILE)	Physical activity Nutrition Sleep Stress	Mental illness	Flexible assertive community treatment outpatient teams	Process evaluation	Unclear or not reported	Implementation	<i>Total N=28</i> Consumers N=15 Providers and peer worker providers N=13	Interviews informed by the RE-AIM framework MIDI Observations	Thematic analysis (of interviews)
Walker (2024) ³⁶² UK	Well-track physical activity and sleep intervention	Physical activity Sleep	Psychotic disorders	Early intervention services	Qualitative study	Assumptions underlying evaluation were relativist and interpretivist	Implementation and delivery	<i>Total N=18</i> Consumer participants N=13 Intervention providers N=5	Interviews	Reflexive thematic analysis
Watkins (2020) ³⁶³ Australia	Keeping the Body In Mind lifestyle program	Physical activity Nutrition Sleep Smoking	FEP	Community-based early intervention service	Qualitative component of a mixed-methods service evaluation	Naturalistic enquiry	Delivery	Intervention participants N=16	Interviews	Thematic analysis
Woodhead (2021) ³⁶⁴ Australia	New exercise professional clinic	Physical activity	Youth with SMI	Youth mental health service	Qualitative study	Phenomenological approach	Implementation	<i>Total N=9</i> Staff N=4 Exercise physiology students N=5	Interviews	Content analysis

FEP: First episode psychosis, MIDI: Measurement Instrument for Determinants of Innovations, N: Sample size, SMI: Serious mental illness, SUD: Substance use disorder.

Supplementary 4.5: Quality Assessment

Two reviewers (LW and KM or ME and KM) independently assessed the methodological limitations of the sampled studies using an adapted version of the Critical Appraisal Skills Programme tool, which involved applying the questions listed here.^{365, 366}

1. Were the settings and context described adequately?
2. Was the sampling strategy described, and was this appropriate?
3. Was the data collection strategy described and justified?
4. Was the data analysis described, and was this appropriate?
5. Were the claims/findings supported by sufficient evidence?
6. Was there evidence of reflexivity?
7. Did the study demonstrate sensitivity to ethical concerns?
8. Are there any other concerns?

Any discrepancies in judgements were resolved through discussion. Each study was assigned a methodological limitation score (minor, minor to moderate, moderate, moderate to severe, or severe). **Table S26** presents the assessment outcomes, and why the studies were assigned their specific scores.

Table S26. Quality Assessment of Sampled Studies.

Study	Were the settings & context described adequately?	Was the sampling strategy described & appropriate?	Was the data collection strategy described & justified	Was the data analysis described & was this appropriate?	Were the claims made/findings supported by sufficient evidence?	Was there evidence of reflexivity?	Did the study demonstrate sensitivity to ethical concerns?	Are there any other concerns?	Methodological limitation core
Bohicchio, 2019 ³²⁷	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Brooke, 2022 ³²⁸	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Czosnek, 2023 ³²⁹	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Dobbins, 2020 ³³⁰	(?)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor to moderate
Fagan, 2021 ³³¹	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Fibbins, 2019 ³³²	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Fredman Stein, 2023 ³³³	(?)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Gossage-Worrall, 2019 ³³⁴	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Gudzune, 2023 ³³⁵	(+)	(?)	(+)	(+)	(+)	(-)	(+)	Yes	Moderate
Gumport, 2020 ³³⁶	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Hogan, 2022 ³³⁷	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Khoubaeva, 2023 ³³⁸	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Minor
Kirschner, 2022 ³³⁹	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Minor to moderate
Kohn, 2022 ³⁴⁰	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Moderate
Larsen, 2019 ³⁴¹	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Minor
Lee (2019) ³⁴²	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Lund (2020) ³⁴³	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Minor to moderate
Lundström (2020) ³⁴⁴	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor to moderate
McCarter (2022) ³⁴⁵	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Minor

Study	Were the settings & context described adequately?	Was the sampling strategy described & appropriate?	Was the data collection strategy described & justified	Was the data analysis described & was this appropriate?	Were the claims made/findings supported by sufficient evidence?	Was there evidence of reflexivity?	Did the study demonstrate sensitivity to ethical concerns?	Are there any other concerns?	Methodological limitation core
McKeon (2023) ³⁴⁶	(+)	(+)	(?)	(+)	(+)	(-)	(+)	Yes	Moderate
Møller (2020) ³⁴⁷	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor to moderate
Mucheru (2020) ³⁴⁸	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Moderate
Mugisha (2019) ³⁴⁹	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Moderate
Olando (2020) ³⁵⁰	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Moderate
O'Neill (2023) ¹⁹⁰	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Rogova (2024) ³⁵²	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Sawyer (2023) ³⁵³	(+)	(+)	(+)	(?)	(+)	(+)	(+)	Yes	Minor
Sawyer (2024) ³⁵⁴	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Smith (2020) ³⁵⁵	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Sørensen (2020) ³⁵⁶	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Tambyah (2022) ³⁵⁷	(+)	(+)	(+)	(+)	(+)	(?)	(+)	No	Minor to moderate
Twyman (2019) ³⁵⁸	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Wagner (2022) ³⁵⁹	(+)	(+)	(+)	(+)	(+)	(+)	(+)	No	Minor
Walburg (2022) ³⁶⁰	(+)	(+)	(+)	(+)	(+)	(-)	(+)	Yes	Moderate
Walburg (2022) ³⁶¹	(+)	(+)	(+)	(+)	(+)	(?)	(+)	Yes	Moderate
Walker (2024) ³⁶²	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Watkins (2020) ³⁶³	(+)	(+)	(+)	(+)	(+)	(-)	(+)	No	Minor
Woodhead (2021) ³⁶⁴	(+)	(+)	(+)	(+)	(+)	(?)	(+)	Yes	Minor to moderate

Supplementary 4.6: Strategy for Data Extraction and Synthesis.

Two researchers (LW and KM or ME and ST) coded the data independently. We used a ‘best-fit framework’ to synthesise the evidence (**Table S27**).³⁶⁷⁻³⁶⁹ This approach was chosen because it supported the synthesis of qualitative evidence within a limited timeframe,³⁶⁸ as was necessary in the case of this review, in which the qualitative review commenced after the quantitative review had been completed.

We extracted and synthesised evidence on barriers to the implementation and delivery of lifestyle interventions in mental healthcare settings to identify the key challenges that must be addressed by providers. The primary analysis focused, however, on identifying opportunities, strategies, and/or approaches at the various levels of the system to guide implementation and delivery efforts. We created an initial conceptual framework of the *a-priori* themes corresponding to barriers and enablers at various system levels (macro - the system, external to the organisation; meso - the organisational level; and micro - frontline service, the individual level).

The analysis started with mapping the data onto the various levels of the framework. Next, within each level, we identified data-elicited themes and categories regarding the key enablers of the implementation and delivery of lifestyle interventions in mental healthcare settings for people with mental illness. These were refined further through iteration as coding progressed.

To further scrutinise studies that were focused on implementation, we developed a set of additional a-priori themes that were derived from several established theories/implementation and evaluation frameworks. These were drawn from a) the Context and Implementation of Complex Interventions framework,²⁶⁹ b) the Medical Research Council’s (MRC’s)

framework for developing and evaluating of complex interventions,³⁷⁰ c) a few questions that were inspired by the scientific realist approach,³⁷¹ d) an established taxonomy of implementation outcomes,³⁷² e) the Theoretical Framework of Acceptability,³⁷³ and f) the work undertaken by the Health Foundation that was focused on the role of context in quality improvement interventions.³⁷⁴ These frameworks were selected as their scope best fitted the review's remit. The framework was created through non-systematic literature searches, team discussions, as well as consultation with the GSAG and the lived experience group.

Table S27. Best-fit, bespoke data extraction framework

Domain	Question	Source or 'inspired by'
Context*		
Context	Was the role of contextual factors explored in the study? If yes, at what stage(s) (e.g., pre-implementation, post-implementation)?	371
	Which aspects of the context interact with the implementation of the intervention? Barriers at the macro level. Enablers at the macro level. Barriers at the meso level. Enablers at the meso level. Barriers at the micro level. Enablers at the micro level.	269
Implementation		
Implementation	Has the implementation process been defined and described? (Has it been explained how the process of implementation differs from the intervention itself?)	370
Implementation theory	Which theoretical framework(s) guided the implementation? Have the different theories underlying each implementation stage been described?	269, 371
Implementation process	Have implementation chains** been acknowledged or mapped? For example, regarding the flow of resources, chains of responsibilities (individuals and institutional), and transmission points for patients and intervention recipients.	269, 371
Implementation strategy	Which implementation strategies were used during the process? Which of these strategies were described as effective or ineffective, and why?	269, 370
Implementation agents	Who were the agents involved in the implementation effort? Were the stakeholders' profiles and their characteristics documented?	269, 371

Domain	Question	Source or 'inspired by'
	Were interpersonal exchanges through which the intervention(s) were delivered mapped?	
Additional questions for consideration	Did the evaluators or researchers consider which populations (e.g., sub-clinical populations, practitioners with specific training) the intervention might be effective for (or not)?	371
	Have interpersonal factors, such as non-verbal rapport and empathy, been studied? Have they been considered as mechanisms of change?	371
Time		
Time	Was the history of the family of programmes the intervention is a member considered (e.g., previous experiences of stakeholders delivering similar interventions)?	371
Outcomes		
Implementation outcomes	Which implementation outcomes were reported? E.g.: Acceptability (satisfaction with various aspects of the intervention such as perceived effectiveness, ethicality, intervention coherence, opportunity costs): individual provider, individual consumer. Appropriateness (perceived fit, relevance, compatibility, suitability and usefulness, practicality): individual provider, individual consumer, organisation/setting.	372, 373
Additional points	Has the evaluator considered which outcomes could be contested, how stakeholders might differ in their interpretation and whether behavior might change due to being monitored rather than as an intended action of the programme?	371
	Have causal, i.e., generative (as opposed to correlational), relationships between the elements of the intervention, the context, and the outputs been considered?	371
	Are procedures in place to monitor and continue implementation support?	371, 372
	Were the intervention's wider location and prerequisites of intervention considered (e.g., how and where it fits in with the medical model in mental health)?	371

*Context interacts with and affects the implementation and delivery of interventions and programmes.

**Interventions evolve over many months and years.

Table S28. Summary of barriers to implementation and delivery of lifestyle interventions – Provider-perspective.

System Level	Provider-related barriers	Associated Studies
Macro level	Inadequate reimbursement mechanisms	332, 336, 337
	Impractical clinical guidelines	340
	Avenues for physical activity are limited in rural areas	349
Meso level	<u>Policies and procedures:</u> Lack of clear direction results in the organisation's mission being unclear (e.g., it may not include lifestyle interventions or place equal importance on clients' physical health as well as mental health). Inadequate organisational policies and procedures make the delivery of lifestyle interventions impossible. For instance, in one case on-site access to gym equipment had to be supervised by specialised staff, who were otherwise unavailable at the organisation. Rules and regulations require the completion of other mandated tasks and priorities. Priority is afforded to conventional therapies such as pharmacology.	314, 329, 332, 336, 337, 349, 354, 356, 357
	Lack of resources (to implement the programme and to deliver it adequately), including time, money, human capital (e.g., limited availability of exercise professionals to provide treatment), infrastructure and equipment. Inadequate coordination of resources.	28, 329, 332, 334-337, 339, 340, 343, 346-348, 354, 356, 359, 361, 364
	Insufficient intervention information, training and supervision. This includes a lack of clarity regarding roles and responsibilities, and communication breakdowns between providers.	314, 329, 332, 336, 339, 340, 346, 348, 352, 359
	Lack of support and commitment from senior management and other providers (e.g., allied health professionals).	92, 334, 336
	Culture that involves decision-making process that does not include frontline staff: "I think that frequently makes people resent the new practice before we even have the opportunity to try it out simply because nobody ever asked us in the first place." ³³⁶ This results in inconsistency or a lack of buy-in, motivation or commitment by providers to deliver the interventions.	335, 336, 348, 356
	High attrition of facilitators.	334, 336
	Inadequate monitoring of a programme results in no collective assessment of its worth and no data collection regarding its independent effects.	349
	Data concerns: technological difficulties, consent and privacy.	354
	Disadvantages of interventions using technology (e.g., an inability to provide physical cues and hands-on adjustments during exercise sessions).	346
Micro level	Participants' engagement is perceived as challenging and demanding. This is due to providers' scepticism regarding patients' knowledge and beliefs about the importance of lifestyle interventions, motivation, or interest in taking part. The providers doubted the service users' ability to comprehend the content of the course, or that the service users had sufficient skills to perform the necessary activities. "I'm just guessing that the main problem you guys are going to have is really communicating it to the clients, not all clients but some of them, where they're able to really understand it and then to follow up on what to do." ³³⁶	314, 332, 335, 336, 339, 352, 354, 356, 364

System Level	Provider-related barriers	Associated Studies
	In other examples, clients were perceived as uncommunicative, and providers viewed this situation as a complication in identifying needs and goals for lifestyle change.	
	Lack of knowledge and beliefs about the importance of lifestyle intervention. The belief that a lifestyle intervention during treatment for mental illness is not a priority. Especially in inpatient settings, providers considered that behavioural changes might not be well received.	347, 352, 354, 358, 364
	Negative attitudes towards lifestyle intervention caused by providers' personal beliefs.	347, 356, 358
	The view is that intervention conflicts with respecting patient autonomy and threatens therapeutic relationships. This includes viewing health-related behaviour choices as the individual responsibility of the patient.	347, 352, 358, 375
	Some providers normalise the relationship between smoking and mental illness.	314, 352
	Providers' preferences for certain types of medications and unwillingness to change patient's medication in case it might be required to enhance the delivery of lifestyle intervention (e.g., smoking cessation intervention for clients who are given cessation pharmacotherapy).	337
	Challenges in sustaining client engagement in the programme.	335, 339, 348

Table S29. Summary of participant/client-related barriers to implementation and delivery of lifestyle interventions

System Level	Client/consumer-related barriers	Associated Studies
Macro level	None reported	—
Meso level	Insufficient support for patients to engage in activities (long-term in particular). This issue stems, for example, from the discontinuation of interventions.	327, 333, 343, 353, 361
	Mental health stigma, meaning people in the community may not be willing to be associated with those who live with mental illness.	334, 348, 349, 351
	Competing social norms: for example, sharing cigarettes to socialise and the normalisation of tobacco use within the consumers' environments.	345, 352, 358
Micro level	Related to the nature of mental health conditions. • Difficulty managing symptoms: low mood, anxiety, stress, low energy/fatigue/lethargy. • Cognitive difficulties, including forgetfulness and poor concentration. • Social anxiety (fear of having to socialise and/or not fitting into the group). • Elevated anxiety sensitivity* (e.g., regarding the physical sensations of exercise, such as sweating or being concerned about the possibility of having a panic attack in front of others). Side effects of medication. Poor physical health. Psychological factors. • Low confidence, including poor body image concerns. • Lack of motivation and drive. • Self-consciousness. • Self-stigma (not wanting to be seen by the community undertaking activities with peers/activities organised for those with mental illness).	327, 328, 334, 335, 337-340, 343, 345, 348-352, 355-357, 364
	Lack of resources. Examples of such resources include money, technology, access to reliable internet (especially for members of certain groups such as older adults and people living in rural and remote locations), space to exercise, transport to get to exercise venues, and appropriate attire.	328, 331, 334, 339, 340, 342, 343, 345, 346, 348, 350, 355, 357
	Lack of social support, isolation, loneliness	358
	Place in recovery journey not conducive to attendance (e.g., being too unwell to participate).	328, 337
	Due to patients' immediate needs (e.g., lack of housing), lifestyle behaviours may be challenging to address during appointments.	
	Difficulties with intervention structure, delivery, and location; examples: • Interventions that target dietary changes/weight: too much emphasis given to discussing unhealthy foods/drinks without discussing healthier options. • Finding advice given as part of the programme inappropriate: "At one point he suggested dips and crackers as a substitute for crisps and things. I noticed, if you bought a tub of dip or whatever, it would go off within two days, and you have to have quite a lot of	327, 328, 335, 339, 340, 346, 349, 351, 355, 357, 363

System Level	Client/consumer-related barriers	Associated Studies
	crackers over the two days, rather than having it once a week or twice a week, you are having to have it quite a lot to use it all and not waste it.”³⁵⁵ • Finding the ways providers communicate outcomes to be inappropriate: “Not everyone wants to just lose weight, so like if I said I want to get stronger then maybe you could take arm measurements ... instead of just saying you have gained or lost weight.”³⁵⁵ • Perceptions of interventions as too complex or intense: e.g., with regard to exercise sessions, being worried about using gym equipment; finding specific exercises too difficult to do (weight-lifting) or to follow (tai chi). • Wanting more variation (e.g., feeling that more exercise options should be offered). • Having difficulties with physical resources, time and program length. • Lack of clarity regarding or lack of understanding of intervention. • Being more familiar with a didactic, rather than facilitative, approach. • Wanting more structure and concrete expectations. • Feeling rushed, a sense that the practitioner pays more attention to a manual pro forma than to the participant. • Feeling awkward or confronted. • Considering support for individual needs during group sessions to be inadequate. • Finding environmental conditions unappealing (e.g., large group, sport type). • Online delivered interventions: ○ Challenges with technology: finding the tracker and weight graph confusing. ○ Mistrust of technology.	
	Experiencing disappointment; examples: • Experiencing feelings of failure linked to difficulties formulating attainable goals and sticking to them and not achieving intervention outcomes. • Feeling frustrated with weight fluctuations.	335, 339, 342, 360
	Clients not being informed about/being unaware of available lifestyle interventions (e.g., physical activity opportunities).	349

* A fear of anxiety-based sensations due to a brief that the consequences will be catastrophic.³⁷⁶

Supplementary 4.8: Implementation frameworks and outcomes.

Table S30. Theoretical frameworks that underpinned the implementation processes.

Study	Theoretical underpinning that guided implementation
Brooke, 2022 ³²⁸	The MRC's framework for process evaluation of complex interventions, ³⁷⁷ combined with a framework for the design of feasibility studies. ³⁷⁸
Czosnek, 2023 ³²⁹	The Consolidated Framework for Implementation Research ³⁷⁹ combined with the Expert Recommendations for Implementation Change ³⁸⁰ and the Implementation Outcomes Framework. ³⁷²
Gossage-Worrall, 2019 ³³⁴	Normalisation process theory, a modified version of Linnan and Sekhon's acceptability of healthcare interventions framework, ³⁷³ the Theoretical Domains Framework, ³⁸¹ the World Health Organization International Classification of Functioning ³⁸² for schizophrenia was used as a conceptual framework for describing 'context', National Institute for Health Behaviour Change Consortium Framework, ³⁸³ The Programme logic model, the Behaviour Change Consortium recommendations for enhancing treatment fidelity (BCCr). ³⁸⁴
Gudzunde, 2022 ³³⁵	The enhanced Replicating Effective Programs (REP) framework, ³⁸⁵ The Systems Engineering Initiative for Patient Safety (SEIPS) Model. ³⁸⁶
Gumport, 2020 ³³⁶	The Framework for Building Evidence on Dissemination and Implementation in Health Services Research. ³⁸⁷
Mucheru, 2020 ³⁴⁸	The Integrated Promoting Action on Research Implementation in Health Systems knowledge translation framework. ³⁸⁸
Rogova, 2024 ³⁵²	Extended Normalisation Process Theory ^{389, 390}
Sawyer, 2023 ³⁵³	The Capability, Opportunity and Motivation Model of Behaviour (COM-B) ³⁹¹
Walburg, 2022a ³⁶⁰	The Reach, Effectiveness Adoption, Implementation and Maintenance framework (RE-AIM). ³⁹²
Walburg, 2022b ³⁶¹	RE-AIM; ³⁹² The Measurement Instrument for Determinants of Innovation (MIDI). ³⁹³
Walker, 2024 ³⁶²	Structure-process-outcome framework ³⁹⁴ was implemented using a framework for Health Care Quality. ³⁹⁵

* The two papers by Walburg et al. describe the same process evaluation. We present them as two studies because in one study (Walburg, 2022b³⁶¹) the authors used additional data collection methods and a theoretical framework.

Table S31. Implementation outcomes that were most frequently reported in the sampled studies.

Reported outcome* and definition^	Number of studies	Study
Acceptability Satisfaction with various aspects of the intervention, such as content, comfort, delivery. affective attitude, burden, perceived effectiveness, ethicality. <u>Refers to:</u> provider and individual consumer.	21	328, 329, 333-339, 346, 348, 349, 352-357, 362-364
Adoption Uptake, utilisation, initial implementation, intention to try. <u>Refers to:</u> provider.	12	328, 329, 334, 336, 339, 348, 349, 352, 354, 355, 361, 364
Appropriateness Perceived fit, relevance, compatibility, suitability, usefulness, and practicality. <u>Refers to:</u> provider, individual consumer, organisation, and setting.	22	328, 329, 332, 334-339, 346, 348, 349, 351-357, 362-364
Feasibility Actual fit or utility, suitability for everyday use and practicality. <u>Refers to:</u> provider, organisation, and setting.	20	328, 329, 332, 334-339, 346, 348, 349, 351, 352, 354-356, 361, 363, 364
Fidelity The degree to which a specific intervention is implemented as intended, i.e., providers' fidelity to the various elements of the intervention's protocol, including consistency and quality of delivery.	6	329, 334-336, 338, 361
Sustainability Maintenance and continuation, i.e. the extent to which a program or policy becomes institutionalised or part of the routine organisational practices and policies.	10	329, 334, 339, 348, 352, 354, 355, 360, 361, 364

* Information extracted from qualitative and quantitative components of the sampled studies.

^ Adapted Proctor et al.'s (2011) definitions of implementation outcomes.³⁷²

Supplementary 4.9: Recommendations for Implementing and Delivering Lifestyle Interventions in Mental Health Services.

Table S32. Recommendations for implementing and Delivery Lifestyle Interventions in Mental Health Services.

Macro-level	
Make the implementation of lifestyle interventions everybody's business by involving various stakeholders from outside healthcare services and conveying purpose-driven collaborations ^{329, 336, 352}	Fund and reimburse the cost of implementation and delivery of lifestyle interventions. ^{329, 332, 337, 347, 349}
- Engage local and national leaders (individuals who exert a significant influence within their network and who can affect the opinions of connected individuals) to promote support for best-in-class efforts driving the implementation of lifestyle interventions. - Establish collaborative governance that facilitates collaboration and joint decision-making among diverse sector stakeholders. - Establish formal partnerships with community providers. - Establish transparent mechanisms and regulations for resource sharing.	- Introduce adequate funding, reimbursement and payment models, including financial incentives. - Attract more investment beyond healthcare services: e.g. from charity funds and sponsors, if applicable/available.
Meso-level	
Strategic alignment ^{329, 336, 349, 352, 356}	Ensure that organisational-level policies support implementation and delivery efforts ^{314, 334, 340, 348, 350, 352, 357}
Align priorities for integrating lifestyle interventions with organisational strategy: mission and priorities, population, and structure.	- Incorporate the provision of lifestyle interventions into organisational policy. Develop organisation-level policies to: examples - promote the use of psychiatry-trained healthcare professionals, such as psychiatric nurses, on somatic wards, or vice versa. - overcome l resourcing and leadership challenges (perceived and actual); and - prohibit the use of any form of tobacco inside buildings. Ensure that these policies: - take into account the patient and setting contexts to ensure that they address the needs of the targeted populations; - check how other organisation-level policies support implementation and delivery efforts, such as policies around safety risk, in order to avoid issues such as explained in this example: "One manager noted that policies and

	procedures stipulated that onsite access to gym equipment had to be supervised by specialised staff, who were otherwise unavailable at the CMO”,^{348 p8} and align lifestyle intervention efforts with supportive policies such as those that aim to de-normalise smoking.
Create an enabling environment/organisational culture ^{329, 332, 335, 343, 344}	Inspire action through education ^{332, 334-336, 339, 343, 349, 361}
- Encourage a culture of inclusion and respect. Empower staff involved in implementing lifestyle intervention. Help them to feel valued and seen. - Avoid working in silos (e.g. by promoting the integration of staff involved in the delivery of lifestyle interventions into core mental health teams). - Better define roles and responsibilities. For example, introduce shared responsibility for delivering interventions to keep the onus of delivery from falling on an individual (i.e., ‘Having a co-leader’). - Share responsibility for the delivery of interventions with staff at all levels. - Ensure that team members understand their colleagues’ roles to build trust and amplify clinical norms.	Increase the capability and confidence of staff to deliver intervention through education, training and other means: - Dedicate resources and time for staff education, training and supervision. - Organise regular workshops and seminars for all staff members on lifestyle interventions and their implementation. - Create a safe learning environment. - Formally integrate dietitians’ and exercise professionals’ roles and implement job shadowing to facilitate learning.
Build capacity in your organisation ^{329, 332, 335, 337, 354, 356, 361, 364}	Champion and lead change ^{329, 332, 334, 336, 352, 356}
- Appoint internal implementation leaders. - Appoint multiple staff members whose sole role would be to address clients’ physical health or who would be able to dedicate a proportion of their time to the delivery of the interventions. - Weigh the pros and cons of having current members of staff delivering lifestyle interventions versus employing new team members (e.g. exercise professionals, dieticians). - If practicable, offer staff an option to volunteer for the role rather than assigning them to deliver interventions, as this may facilitate ownership and commitment. - Allocate funding for new staff members who will deliver lifestyle interventions (e.g. exercise professionals). - If required, subcontract the delivery of interventions, or their elements (e.g. physical activity sessions) to external providers. - Promote collaboration between mental health staff and other medical specialities, such as cardiology.**	Lead change through harnessing leadership positions: - Mobilise leaders to advocate for the integration of lifestyle interventions by encouraging their buy-in and ensuring their commitment: Create conversation, explaining the ‘why’ of the change. - Advance the steps leaders should take to ratify the implementation of lifestyle interventions. - Champion integration of lifestyle intervention through a pluralistic leadership culture, one which draws on collective and distributed efforts and incorporates diverse voices. Engage champions who can facilitate change efforts - Mobilise champions to support the cause: staff members who are well-regarded by other staff but do not necessarily hold leadership positions.

Carry out ongoing monitoring and evaluation: this will help to build confidence in intervention outcomes ^{329, 334, 364}	Install clear and flexible intervention processes ^{334, 336, 347, 359}
Establish infrastructure • Establish processes, mechanisms and regulations to facilitate ongoing monitoring and evaluation. • Undertake ongoing monitoring and evaluation. • Incorporate feedback loops to overcome implementation barriers and raise staff morale and motivation. Establish evaluation teams • Establish dedicated research teams to evaluate the interventions. • Establish partnerships with universities.	• Develop guidelines, operational protocols and clear evidence-based instructions for staff on how to deliver lifestyle interventions. • Allow sufficient flexibility during implementation and intervention delivery to respond to local and individual needs (appropriate for the population/clients and the clinic structure).
Transform provision through digital systems ^{329, 334, 336, 347, 359}	
Data/information systems • Use digital systems to integrate lifestyle interventions into day-to-day care delivery. For example, establish systems to monitor the completion of intervention-related tasks, such as physical health screening. • Ensure that electronic patient records are shareable. Digital nudging: • Screening forms prompting referral to physical health professionals.	
Micro-level	
Inspire action through education ^{332, 334-336, 339, 343, 349, 360}	Positive attitudes towards interventions ^{335, 336, 346, 352, 354, 357, 364}
At the frontline team level: • Encourage staff to participate in relevant learning opportunities. • Organise regular workshops for staff delivering lifestyle interventions. • Build collaborative learning communities (e.g. interest groups). • Develop user-friendly resources (intervention manuals for staff that support them in conducting their interventions).	• Help providers appreciate the value of lifestyle interventions. Associated action: • Encourage staff's willingness to place a level of priority on lifestyle interventions and build capacity and capability among staff to 'change' current practice.
Positive attitudes towards the adoption of telehealth ^{346, 355}	
• Encourage positive attitudes towards the adoption of telehealth.	

* Primary ties include non-paid, family and friend support. **An additional recommendation that reflects the opinion of the experts.

Supplementary 4.10: Appraisal of Confidence in the Review Findings/Recommendations

The identified methodological limitations were examined to moderate the confidence that we could place in specific findings as part of the GRADE-CERQual (www.cerqual.org) assessment.³⁹⁶ The confidence assessment refers to how accurately a review finding represent the phenomena of interest.³⁹⁶ The assessment of confidence in individual review findings is based on four components: methodological limitations, coherence, adequacy of data and relevance.³⁹⁶ Methodological limitations refer to the extent to which concerns exist related to the design and execution of the primary studies that provide evidence for an individual review finding.³⁹⁶ Coherence involves assessing the clarity and strength of the connection between the data and the synthesised findings derived from that data (i.e., how well the data supports the findings).³⁹⁶ Data adequacy refers to an overall assessment of the richness and quantity of the data that support a review finding.³⁹⁶ Relevance pertains to how applicable the body of evidence from the primary studies is to the context specified in the review question.³⁹⁶ Based on this assessment, we had high confidence in 16 findings and moderate confidence in five findings, meaning that the included studies provided a good representation of the phenomenon of interest. Common methodological limitations included a lack of researcher reflexivity and poor reporting of sampling. There were concerns about the relevance, as most studies that informed the recommendations were conducted in high-income countries. Coherence was strong across the studies, and many provided rich data. See **Tables S33 and S34** for GRADE-CERQual evidence profile tables that supported the assessment of confidence in each key finding.

Table S33. GRADE-CERQual evidence profile for actionable recommendations for providers that should facilitate the implementation, adoption, and scaling-up of lifestyle interventions.

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
Make the implementation of lifestyle interventions everybody's business by involving various stakeholders from outside healthcare services and conveying purpose-driven collaborations	<i>N</i> =3 329, 336, 352	Three studies have minor methodological limitations.	No concerns about coherence, as the findings are well supported by details in the underlying studies.	Moderate to severe concerns regarding relevance, as although the studies focus on the issue, all are from high-income settings.	Minor concerns as although the data is mostly rich, it is only from three studies.	Moderate confidence	There are only minor concerns regarding methodological limitations in the studies. There are no concerns about coherence. There are concerns regarding relevance, as all studies are from high-income countries. There are minor concerns about adequacy.
Fund and reimburse the cost of implementation and delivery of lifestyle interventions	<i>N</i> =5 329, 332, 337, 347, 349	Three studies have minor methodological limitations, one has minor to moderate limitations, and one has moderate limitations.	Minor concerns about coherence.	Moderate concerns about relevance. One study is from a low-income country, and four are from high-income countries.	Minor to moderate concerns. Some studies have limitations regarding breadth or depth.	Moderate confidence	Four studies contain rich data, and one has some limitations regarding the breadth and depth of the data. There are concerns about adequacy and coherence. Also, there are concerns about relevance, as only one study is from a low-income country.
Align priorities for the integration of lifestyle interventions with organisational strategy: mission and priorities, population, and structure.	<i>N</i> =5 329, 336, 349, 352, 356	Four studies have minor methodological limitations, and	Minor concerns about coherence.	Moderate concerns about relevance. One study is from a low-income	Minor concerns regarding adequacy. A good	High confidence	All studies contain relatively rich data and minor methodological limitations. Four studies were

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
		one has moderate limitations.		country, and four are from high-income countries.	number of studies are included, four have mostly rich data.		conducted in high-income countries and one in a low-income country.
Ensure that organisational-level policies support implementation and delivery efforts	<i>N</i> =6 334, 340, 348, 350, 352, 357	Two studies have minor methodological limitations, one has minor to moderate limitations, and three have moderate limitations.	Moderate concerns about coherence.	Moderate concerns about relevance: all studies focused on the issue, but only one is from a low-income country.	Limitations in the breadth and depth of data in some studies. Three studies have fair breadth and depth of data.	Moderate confidence	Some methodological limitations. Four studies have some limitations regarding the breadth and depth of data. One study is from a low-income country.
Create an enabling environment/organisational culture	<i>N</i> =5 329, 332, 335, 343, 344	Two studies have minor methodological limitations, two have minor to moderate limitations, and one has moderate limitations.	Minor concerns about coherence.	Moderate to severe concerns about relevance, as although all studies focus on the phenomena, all are from high-income settings.	Minor concerns. Four studies have fair depth and breadth of data; one study has limited depth or breadth of data.	Moderate confidence	Four out of five studies contain mostly rich data. Concerns about relevance are noted as all studies are from high-income countries.
Inspire action through education (meso level)	<i>N</i> =8 332, 334-336, 339, 343, 349, 361	Three studies have minor methodological limitations, two have minor to moderate	Minor concerns about coherence.	Moderate concerns about relevance because although all studies focus on the	Minor concerns. Six studies have fair breadth and depth of	High confidence	Six out of eight studies contain relatively rich data, and the remaining two have limited depth and breadth of data. There

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
		limitations, and two have moderate limitations.		phenomena, only one is from a low-income country.	data, and two studies have limited depth and breadth of data.		are minor concerns about adequacy and coherence. However, concerns remain about relevance, as only one study is from a low-income country.
Build capacity in your organisation	<i>N</i> =8 329, 332, 335, 337, 354, 356, 361, 364	Four studies have minor methodological limitations, three have minor to moderate limitations, and two have moderate limitations.	Minor concerns about coherence.	Moderate to severe concerns about relevance: although all studies focus on the phenomena, they are from high-income countries.	Minor concerns. Good number of studies included. Six studies have fair depth and breadth of data. Two studies have some depth and breadth issues.	High confidence	Six out of eight studies contain mostly rich data. There are minor concerns about adequacy and coherence. Also, there are concerns about relevance, as all studies are from high-income countries.
Champion and lead change	<i>N</i> =6 329, 332, 334, 336, 352, 356	Six studies have minor methodological limitations.	Good coherence.	Moderate to severe concerns about adequacy. All studies focus on the issue, but all are from high-income countries.	Minor concerns. Good number of studies included and have fair breadth and depths of data.	High confidence	A good number of studies inform this recommendation. Six studies contain mostly rich data. Concerns about relevance are noted as all studies are from high-income countries.
Carry out ongoing monitoring and evaluation: this will help to	<i>N</i> =3	Two studies have minor	No concerns about coherence	Moderate to severe concerns	All studies contain	Moderate confidence	All studies contain mostly rich data. There

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
build confidence in intervention outcomes	329, 334, 364	methodological limitations, and one has minor to moderate limitations.	because the findings are well supported by details in the underlying studies.	about relevance, as although all studies focus on the issue, all are from high-income countries.	mostly rich data, but there are only three of them.		are no concerns about adequacy but concerns about relevance remain, as all studies are from high-income countries.
Install clear and flexible intervention processes	<i>N</i> =4 334, 336, 347, 359	Three studies have minor methodological limitations, and one has minor to moderate limitations.	No concerns about coherence because the findings are well supported by details in the underlying studies.	Moderate to severe concerns about relevance, as although all studies focus on the phenomena, all are from high-income countries.	Minor concerns as although all studies contain mostly rich data, there are only four of them.	High confidence	Four studies have minor or minor to moderate methodological concerns. No concerns exist about coherency. There are minor concerns about adequacy. Concerns about relevance are noted, as all studies are from high-income countries.
Transform provision through digital systems	<i>N</i> =5 329, 334, 336, 347, 359	Four studies have minor methodological limitations, and one has minor to moderate limitations.	No concerns about coherence because the findings are well supported by details in the underlying studies (i.e. there is a clear link between the data and the recommendation).	Moderate to severe concerns about relevance, as although the studies focus on the phenomena, all are from high-income countries.	Minor concerns as all studies have fair depth and breadth of data.	High confidence	All studies have good depth and breadth of data. There are no concerns about coherence. Concerns remain about relevance, as all studies are from high-income countries.
Inspire action through education (micro level)	<i>N</i> =8 332, 334-336, 339, 343, 349, 360	Three studies have minor methodological limitations, two	Minor to moderate concerns about coherence.	Moderate concerns about relevance, as all studies focus on	Five out of eight studies contain mostly rich	Moderate confidence	There is a good number of studies. Five out of eight studies contain mostly

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
		have minor to moderate limitations, and three have moderate limitations.		the phenomena, but only one is from a low-income country.	data. Three studies have limited depth and breadth of data.		rich data. Three studies have limited depth and breadth of data. Some concerns about relevance exist, as only one study is from a low-income country.
Positive attitudes towards intervention	<i>N</i> =7 335, 336, 346, 352, 354, 357, 364	Four studies have minor methodological limitations, two have minor to moderate limitations, and two have moderate limitations.	There are minor concerns about coherence from six studies (with mostly descriptive results).	Moderate to severe concerns about relevance because although the studies focus on the phenomena of interest, all are from high-income settings.	Minor concerns about adequacy with mostly rich data from six studies.	Moderate confidence	There is a good number of studies. Six studies contain mostly rich data. Concerns about relevance are noted, as all studies are from high-income countries.
Positive attitudes towards the adoption of telehealth	<i>N</i> =2 346, 354	One study has minor methodological limitations, and one has moderate limitations.	Minor concerns about coherence. Results are mostly descriptive.	Moderate to severe concerns. Limited number of studies. Only high-income settings represented: Australia and the UK.	Moderate concern. One study contains rich data. Only two studies inform this recommendation.	Moderate confidence	One study has only minor methodological concerns, with good breadth and depth of data, and one has moderate concerns. There are no concerns about coherence. Only two studies are included.

Priorities for providers are based on 15 recommendations.

Table S34. GRADE-CERQual evidence profile table that supported the assessment of confidence in each key recommendation on how lifestyle interventions can be implemented in ways that address the needs of people with mental illness.

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
Value the importance of peer-led and peer-delivered lifestyle interventions	<i>N</i> =3 327, 335, 341	Two studies have minor methodological limitations, and one has moderate limitations.	Minor concerns about coherence.	Moderate to severe concerns regarding relevance, as although the studies focus on the issue, all are from high-income countries.	Moderate concerns about adequacy, as there are only three studies. Two studies have fair depth and breadth of data. One study has some depth and breadth issues.	Moderate confidence	Two out of three studies contain mostly rich data. There are concerns about relevance, as all studies are from high-income countries.
Foster positive characteristics and attitudes among the personnel who deliver interventions	<i>N</i> =5 327, 333, 341, 343, 363	Four studies have minor methodological limitations, and one has minor to moderate limitations.	Good coherence.	Moderate to severe concerns regarding relevance, as although the studies focus on the issue, all are from high-income countries.	Minor concerns about adequacy, as all studies contain mostly rich data.	High confidence	There are minor or minor to moderate concerns regarding methodological limitations in the studies. No concerns exist about coherence. Concerns about relevance are noted, as all studies are from high-income countries.
Create a safe environment/build psychological safety	<i>N</i> =10 328, 330, 333, 339, 341, 348, 351, 359, 360, 364	Five studies have minor methodological limitations, three have minor to moderate limitations and two have	Minor concerns about coherence.	Moderate to severe concerns about relevance, as although the studies focus on the issue, all are from high-income settings.	Minor concerns. Eight studies have fair depth and breadth of data, while two studies have limited depth	High confidence	A good number of studies are included. Eight out of ten studies contain mostly rich data. There are minor concerns about adequacy. Also, there are concerns about

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
		moderate limitations.			or breadth of data. A good number of studies are included.		relevance, as all studies are from high-income countries.
Provide personalised and flexible intervention options	<i>N=14</i> 327-329, 332, 333, 338, 340-342, 348, 353, 360, 362, 364	Ten studies have minor methodological limitations, two have minor to moderate limitations and two have moderate limitations.	Minor concerns about coherence, as there is a clear link between the data and the recommendation.	Moderate concerns about relevance: all studies focus on the issue, but only one is from an upper-middle-income country.	Minor concerns. Twelve studies have fair breadth and depth of data, while two studies have limited breadth and depth of data. A good number of studies support this recommendation.	High confidence	A good number of studies are included. Twelve studies contain mostly rich data, though two studies have some methodological limitations and limitations regarding the breadth and depth of data. Some concerns about relevance exist, as only one study is from an upper-middle-income country.
Implement group-based interventions	<i>N=10</i> 328, 330, 335, 336, 341, 343, 348, 351, 359, 360	Five studies have minor methodological limitations, two have minor to moderate limitations and three have moderate limitations.	Good coherence.	Moderate to severe concerns about relevance, as all studies focus on the issue but are from high-income settings.	Moderate concerns. Seven studies have fair depth and breadth of data, while three studies have limited depth or breadth of data. A good number of studies inform this	Moderate confidence	A good number of studies are included. Seven studies have good breadth and depth of data, while the remaining three have limited depth or breadth. No concerns about coherence, but there are concerns about relevance, as all studies are from high-income countries.

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
					recommendation.		
Utilise opportunities presented by telehealth and technology	<i>N</i> =2 260, 354	One study has minor methodological limitations, and one has moderate limitations.	Minor concerns about coherence.	Moderate to severe concerns about relevance, as although the studies focus on the issue, both are from high-income countries.	Moderate concerns. One study has fair breadth and depth of data, while the other has limited breadth and depth.	Moderate confidence	One of the two studies contain mostly rich data. One study has some depth and breadth issue. Concerns about relevance are noted, as the studies are from high-income countries. Only two studies are included.
Offer resources to support transitions to healthier lifestyles	<i>N</i> =3 343, 348, 355	One study has minor methodological limitations, one has minor to moderate limitations and one has moderate limitations.	Minor concerns about coherence, although there is a clear link between the data and the recommendation.	Moderate to severe concerns about adequacy. While all studies focus on the issue, all are from high-income countries.	Moderate concerns. Two studies have good breadth and depth of data, while one study has limited breadth and depth. Only three studies are included.	Moderate confidence	Two studies contain mostly rich data. There are minor concerns about coherence. Only two studies support this recommendation. All studies are from high-income countries.
Provide the necessary support for participants to initiate and maintain lifestyle changes	<i>N</i> =4 327, 334, 348, 362, 363	Four studies have minor methodological limitations, and one has moderate limitations.	Minor concerns about coherence, although there is a clear link between the data and the recommendation.	Moderate to severe concerns about relevance, as although all studies focus on the issue, all are from high-income settings.	Four out of four included studies have fair breadth and depth of data, while one study has limited breadth and depth.	Moderate confidence	Four out of five studies contain mostly rich data. Concerns about relevance remain, as all studies are from high-income countries.

Recommendation	Studies	Methodological limitations	Coherence	Relevance	Adequacy	GRADE-CERQual assessment	Explanation of GRADE-CERQual assessment
Where applicable and desirable, engage participants' families and friends (primary social ties*)	<i>N</i> =7 92, 333, 338, 345, 349, 350, 355	Five studies have minor methodological limitations, one has minor to moderate limitations, and one has moderate limitations.	Minor concerns about coherence because the findings are well supported by details in the underlying studies.	Moderate concerns about relevance, as all studies focus on the phenomena but only one is from a low-income country.	Minor concerns about adequacy with rich data from six studies. There were contrasting findings within and across the studies.	High confidence	A good number of studies inform this recommendation. Six studies contain mostly rich data. Some concerns about relevance exist, as only one study is from a low-income country. There are minor concerns about coherence and adequacy.

This table does not include recommendations that were added after the PPI consultations.

Supplementary 4.11: Reflexivity.

Reflexivity Statement

In keeping with quality standards for rigour in qualitative research, the authors considered how their backgrounds, expertise, views and opinions could plausibly affect the way in which the review was designed and conducted, and, in turn, how the emerging results have affected those views and opinions.

For all team members, research projects that are focused on the utility of lifestyle interventions to improve the physical and mental health of those who live with mental illness, and the work on this Commission, are a labour of love. From the outset, the review authors believed that there was an urgent need for more efforts to implement lifestyle interventions into healthcare settings and to integrate them into the management of people who live with mental illness. Therefore, the authors used several measures to counter the potential individual biases of each team member and by the team as a whole. Also, they made every effort to harness the potential of the multidisciplinary team.

Team composition: ensuring team diversity in terms of background, expertise and demographics

The team members were carefully selected to ensure that they represented different backgrounds, in terms of experience, research expertise and demographic characteristics.

Cultivating a culture of questioning

The authors held regular meetings throughout the review period to counteract any potential individual biases. At each stage, the team members referred to each other to resolve conflicts. At the data analysis stage, the team members questioned others' interpretations of the data, including how the data fitted within the a-priori framework and how it could inform the development of recommendations for the implementation and delivery of lifestyle interventions in healthcare settings. The same principles of questioning each other's assumptions and opinions were applied to the appraisal of the quality of sampled studies and confidence in the review findings/recommendations.

Team dynamics & building an inclusive culture

Special attention was paid to reducing potential power imbalances and empowering junior team members to contribute to team discussions and decisions.

Additional measures

The authors incorporated a consultation exercise with stakeholders (Global South Group members, see Supplementary Section 5 for more information), to counter any potential biases of the review team.³⁹⁷

Disconfirming cases

During the data analysis and interpretation stages, special attention was paid to identifying and discussing any dissonances (i.e. negative or disconfirming cases) that team members might have identified.

Disconfirming or negative cases were those in which the data did not “...unanimously support the conclusions of the researcher...” (p. 59).³⁹⁸ The authors identified disconfirming data in relation to the engagement of families as social support for individuals with mental illness. The review team believed that the involvement of family members held potential in terms of supporting the efforts of people who live with mental illness to change and maintain changes to their lifestyle behaviours. Some of the findings, however, illustrated that such an involvement and support should be optional and were sometimes not wanted by the participants. The team decided to present the two sides of the argument in the recommendations and highlight that while family involvement was in many cases experienced and perceived as valuable and important, this might not be the case for all participants.

Supplementary Section 5: Recommendations for the Implementation and Delivery of Lifestyle Interventions in Mental Health Settings.

Supplementary 5.1: Preliminary Recommendation List based on 2019 Commission.

The generation of a preliminary recommendation list based on the 2019 Commission entailed several steps to develop quality fidelity and engagement measures for complex health interventions³⁹⁹, which are listed below:

- One author (OAY) reviewed the 2019 Lancet Commission and coded phrases and sentences to generate an initial implementation and delivery framework.
- One author (ST) reviewed the coding and content of the initial implementation and delivery framework.
- Two authors (ST and SR) discussed the framework to generate consensus on an initial list of recommendations (see **Panel S1**).
- Co-senior author (JF), the Global South Advisory Group members, and Lived Experience groups provided additional feedback on recommendations, which were revised accordingly.

Panel S1. Recommendations for Implementing and Delivering Lifestyle Intervention in Mental Health Services: Preliminary List

Organisation level

1. Training and tools to allow for metabolic monitoring and lifestyle assessment.
2. Access to an appropriate space to conduct metabolic monitoring and lifestyle assessments.
3. Appropriate facilities to provide lifestyle interventions.
4. Metabolic monitoring and follow-up referral to relevant clinical services are routinely available, per health service or peak national body guidelines.

Staffing level

5. Employment of practitioners or staff dedicated to lifestyle interventions.
6. Employment of peer workers to support the delivery of lifestyle interventions.
7. Mental health practitioners receive training in the delivery of lifestyle interventions.
8. Practitioners or staff providing lifestyle interventions receive foundational mental health skills training.

Intervention level

9. Intervention targets physical activity, nutrition and smoking cessation.
10. Physical activity interventions are supervised and supported.
11. Nutrition interventions are supervised and supported.
12. mHealth strategies are utilised to implement and deliver lifestyle interventions.
13. Interventions utilise behavior change techniques.
14. Proactive engagement and outreach.

Supplementary 5.2: Global South Perspectives on the Preliminary List of Recommendations.

To understand the applicability and considerations for the Global South* context, a survey was generated in REDCap⁴⁰⁰ and sent to the Global South Advisory Group (GSAG). The survey asked participants to rate the relevance of each recommendation on a scale of 0 for ‘not relevant at all’ to 10 for ‘highly relevant’. Recommendations with a mean score of $\geq 7/10$ were considered relevant to the GSAG based on methodological criteria for generating consensus.⁴⁰¹ In addition, for each recommendation, participants could provide open-ended text responses to improve the recommendation and how it could be implemented in their context. Finally, participants could provide open-ended responses for recommendations that were missing from the list and any additional feedback they would like to give.

Ten respondents took the survey. The mean, median, and minimum and maximum were calculated. All recommendations met the mean $\geq 7/10$ scoring for relevance. Open-ended responses were listed verbatim. **Table S35** presents the survey scores and open-ended responses.

*The term “Global South” encapsulates diverse countries representing various economic, political and cultural differences, as well as each nation’s unique circumstances and preferences, and its use has become increasingly controversial. We have decided to use it in this report to foster a sense of solidarity during GSAG meetings and promote a vision for more equitable access to lifestyle interventions across the globe.

Table S35: The Scores and Responses from the Global South Advisory Group.

Recommendation	N	Mean	Median	Min	Max
1. Training & Tools to allow for metabolic monitoring and lifestyle assessment.	10	8.4	9	5	10
<i>Feedback on improving the recommendation:</i> • “It’s okay” • “Tools that help self evaluation without the use of too much technology as a watch or band is inaccessible to a large number of people in LMIC's” • “Lifestyle assessment is important. But I am not sure of metabolic monitoring especially if this involves an invasive monitoring procedure.” • “Metabolic monitoring & lifestyle assessment will be compulsory in Care of persons with mental illness” • “Policy options” • “Really important!”					
<i>How this could be achieved in your context:</i> • “Helping them monitor their weight, heart rate, exercise levels on a monthly basis in their own homes or as a group while using basic equipment. Teaching them how to create a fitness routine that is culturally and gender appropriate to improve sustainability and isn't focusing on just one muscle group.” • “Engaging top level organizational managers to obtain their buy in and support at institutional level” • “Training and tools can be carried out through public policies and eventually be self-monitored more efficiently.” • “Establishing a country level committee that looks into opportunities for integration in usual and routine practice” • “Integrated health and mental health services @ Safe Space by Collaborated works of the persons with lived experience" the team practitioners " Peers and Interns” • “Mental health is priority now in health system,” • “Leveraging existing resources like community health workers”					
Summary: This recommendation was considered relevant and important. Key considerations include organizational buy-in, establishing within country committee’s to support local integration, leveraging existing resources like community workers and peers, and supporting self-monitoring.					
2. Access to an appropriate space to conduct metabolic monitoring and lifestyle assessments.	10	7.6	8	5	10
<i>Feedback on improving the recommendation:</i> • “It’s okay” • “Space that has privacy but also easy access to both genders.” • “Lifestyle assessment is important. But I am not sure of metabolic monitoring especially if this involves an invasive monitoring procedure.” • “An appropriate space is Safe space to access” • “Mental health centers”					
<i>How this could be achieved in your context:</i> • “Using/involving Primary health centres or smaller clinics .” • “it is very relevant, but implies high investments.”					

Recommendation	N	Mean	Median	Min	Max
“Safe Space”s philosophy and practices about metabolic monitoring and life style interventions by Work together of practitioners” “Rwanda already employs a version of this in their car free days, but uptake has stagnated” Summary: This recommendation was considered relevant but implies substantial investment and considerations are needed in practice due to the invasive nature of certain aspects. Local integration could explore various existing resources such as primary health care, mental health services and non-clinical supports such as ‘Safe Space’. Local practice should also consider the					
3. Appropriate facilities to provide lifestyle interventions.	10	8.2	8	5	10
<i>Feedback on improving the recommendation:</i> “It’s okay” “appropriate facilities can help, maybe also access to interventions from one’s home as climatic conditions can affect travel to accessing facilities in India.” “To be embedded in nutrition and/or physiotherapy services” “Appropriate facilities may be context specific life style interventions” “Mental health centres.” <i>How this could be achieved in your context:</i> “Teaching ashwa workers and non medical staff basic exercise they can recommend to patients without the supervision of a professional. Even if the intervention is body based strength training/ yoga, it could be helpful to train local health care workers on what appropriate suggestions for various age groups considering their physical setbacks.” “Adding more resources (budgeting and staffing) into aforementioned services.” “Public policies for the use of public space for lifestyle interventions is highly relevant. It grants access to a wide percentage of the population and moves forward to a democratic use of space.” “Eg remote ethnic health workforces use resources of nature: bamboo thatched roof trees for prevention of extreme heat and sheltering as renewable” the ethnic community let the person with mental illness for gardening (active life style) and their empathy don’t allow their loved one with mental illness to be confined in hospital or institutions.” “Among other provided services” “Resources vary per country, and it might not be an immediate recommendation taken up by a poor country when it has rivaling priorities.” Summary: This recommendation was considered important. Strategies for local roll out include dedicating resources (budget and staff) into existing services such as nutrition/physiotherapy services, using strategies such as task shifting, for example with ASHA workers and other non-clinical staff, and working with community for cultural sensitivities and learnings.					
4. Metabolic monitoring and follow-up referral to relevant clinical services routinely available, as per health service or peak national body guidelines.	10	8.1	8	5	10
<i>Feedback on improving the recommendation:</i>					

Recommendation	N	Mean	Median	Min	Max
• “It’s okay” • “encouraging cross referrals and increasing agency to assess metabolic measures.” • “Psycho-education and public campaign are needed.” • “being Relevant is Need” • “Policy options”					
<i>How this could be achieved in your context:</i> • “increasing knowledge and confidence of health care professionals other than doctors to assess basic metabolic parameters” • “This is relevant but uncertain regarding current public health policies. it would probably be available for a smaller percentage of the population.” • “Developing local guidelines” • “Eg ethnic health workforces (Federal Health) are trained for Access of relevant clinical services in their communities to reduce disparity and to launch SDG (Sustainable Development Goal) and UHC (Universal Health Coverage) launch SDG” • “Could be done when using community health workers. Plus really important”					
Summary: This recommendation was considered important but consideration is needed to ensure it occurs for all rather than a small percentage. This could be achieved by developing local guidelines and increasing non-doctor health workers’ knowledge, confidence and agency to assess, interpret and refer for metabolic health, encouraging cross-referrals.					
5. Employment of practitioners or staff dedicated to lifestyle interventions.	10	8	8	5	10
<i>Feedback on improving the recommendation:</i> • “very okay” • “Affirmative policy on this matter is needed.” • “it could also include training staff to replicate lifestyle interventions in their ecosystems” • “Staff employment is resource for implementation” • “New policy options on mental health”					
<i>How this could be achieved in your context:</i> • “awareness should be created first regarding the importance of life style interventions for the populace before employing the dedicated staff” • “this would be great but often financially difficult, so empowering health care workers to assess basic metabolic measures could be useful” • “staffing issue is usually based on availability of limited budget. Rather than employing new staff, organizational leaders may be predisposed to reassigning existing staffs to new role to save cost. a strategy is to identify existing staff with needed skills or with some retraining to be able to handle the lifestyle intervention unit of the hospital” • “this would be a great tendency.” • “Co-workers including peers believe and practice life style interventions for better health & life” • “Very necessary. My country has a big lack”					

Recommendation	N	Mean	Median	Min	Max
Summary: This recommendation was considered aspirational but acknowledged there is a lack of staff currently dedicated to lifestyle interventions and limited budget. Policy changes and awareness campaigns for the importance of lifestyle interventions are required. Further, a more realistic initial step is to 'task shift' or retrain existing staff and utilise co-workers/peers for its delivery.					
6. Employment of peer workers to support delivery of lifestyle interventions.	10	8.1	8	5	10
<i>Feedback on improving the recommendation:</i> • "employment of peer workers outside in patient settings." • "Affirmative policy on this matter is needed." • "Peer is effective communication in group" • "New policy options on mental health" • "Including people with lived experience in the title!"					
<i>How this could be achieved in your context:</i> • "Encourage community health centres and social media reach of persons with lived experience discussing their healthy practices. Educating and empowering them to help others assess basic metabolic measures" • "this would be even more relevant and more plausible I believe" • "the peer group was established for over 5 years and they can go forward and worktogether" solidarity and advocacy as leads and extend their works to new comers" • "Community health workers!"					
Summary: This recommendation was considered more immediately achievable compared to the employment of other staff dedicated to lifestyle interventions. The group highlighted a number of strengths that peer workers bring: communication, education, empowerment, solidarity and advocacy.					
7. Mental health practitioners receive training in delivery of lifestyle interventions.	10	8.9	9.5	5	10
<i>Feedback on improving the recommendation:</i> • "very important" • "mental health practitioners to receive training in assessing metabolic health and delivery of lifestyle interventions" • "Capacity building/enhancement trainings are needed." • "MHPs will be trained in life style interventions is Need" • "Provide education for mental health practitioners in lifestyle interventions"					
<i>How this could be achieved in your context:</i> • "organizing short training courses lifestyle interventions for practitioners" • "mental health practitioners should be trained, but they should not necessarily be the main deliverers, as they have other relevant action regarding mental health interventions."					

Recommendation	N	Mean	Median	Min	Max
“All the team members are inspired with context specific / Contemporary life style moves and they are inventive and can work in collaboration with peers and service users” “Online/ offline training, summer schools, short-termed programs, certification orograms” “An existing challenge would actually be on the retention of these mh workers.”					
Summary: This recommendation was considered important and achievable through context specific short courses, online/offline training, summer schools, short-termed programs, or certification programs. Consideration around staff retention was raised, as was a concern on mental health practitioners being the main delivers of lifestyle intervention due to their role in other mental health interventions and would require collaboration with others such as peers.					
8. Practitioners or staff providing lifestyle interventions receive training in foundational mental health skills.	10	8·5	8·5	5	10
<i>Feedback on improving the recommendation:</i> “awesome” “Policy/regulation and budget are needed.” “awareness and practice of Inclusion is Need (Life Style interventions for All)”					
<i>How this could be achieved in your context:</i> “if this could be at 2 levels, one basic foundational work and another that is more indepth regarding MH conditions and physcial interventions/nutrition etc to help bridge the gap in india as we dont have physical therapists who are experts in mental health conditions.” “it is relevant for all staff to have an integrsted view of lyfedtyle interventions and mentsl health” “Social Inclusion" Equality" Rights base Recovery program and Trauma Informed Care and Collaboration and the strength as potentials of every human being”					
Summary: This recommendation was considered appropriate though policy change and budget are required. Training on inclusive practice was highlighted. Further a suggested approach could include two levels: i) mental health foundations, and ii) in-depth training on mental health conditions with integrated physical health interventions.					
9. Intervention targets physical activity, nutrition and smoking cessation.	10	8·1	8·5	3	10
<i>Feedback on improving the recommendation:</i> “very good” “Intervention targets physical activity, nutrition, smoking cessation and sleep.” “Psycho-education and public campaign about the linkage of physical activity, nutrition and smoking cessation are needed. Capacity building is needed for those who will primarily involve in interventions.” “The evidence-based intervention should be culturally appropriate and contextually relevant” “target actions’ “Nutrition in Rwanda relevant, but the other two not quite so.”					
<i>How this could be achieved in your context:</i>					

Recommendation	N	Mean	Median	Min	Max
• “More accessible data on the effects of sleep on physical and mental recovery.” • “engaged community and religious leaders in the implementation” • “definitely relevant” • “Effective body regulation and nutrition always reduce the smoking” • “Targeting malnutrition separately, which is a bigger challenge”					
Summary: This recommendation was generally well received. Physical activity, nutrition, smoking cessation and sleep were all highlighted as important. There was a desire for psycho-education and public campaigns to raise awareness. These need to be culturally appropriate and contextually relevant. Further, depending on context, some aspects may require a greater focus than others, for example, nutrition (malnutrition) was noted as a critical focus in Rwanda.					
10. Provide supervised and supported physical activity intervention.	10	8.8	10	5	10
<i>Feedback on improving the recommendation:</i> • “Good” • “Provide supervised and supported physical activity intervention at primary health centres or in community centres to increase access.” • “Capacity building/training needed for those who will involve in the provision.” • “Supervision is Need for right choices and Support is needed for Sustainability” • “Now present only in veterans hub and private area” • “Would have to address this with nutrition.”					
<i>How this could be achieved in your context:</i> • “in certain stages an later replicated by people and peers” • “Co - workers (medical doctors/ art therapist/ social worker) carried out the education of life style intervention and supervision and support works” • “A lot of poor people in Rwanda, do physical activity to t survive, for this intervention to work, one would have to impress upon them why exercise is important and different”					
Summary: This recommendation was considered important and highlighted that training is necessary for those involved in the supervision, with the support being necessary for sustaining physical activity. In some countries/contexts, physical activity is already high due to circumstances, so interventions need to account for this, ensuring content is relevant and appropriate.					
11. Provide supervised and supported nutrition intervention.	10	8.6	8	7	10
<i>Feedback on improving the recommendation:</i> • “Capacity building/training needed for those who will involve in the provision.” • “Supervision is for Right choices and Support is for Sustainability”					
<i>How this could be achieved in your context:</i>					

Recommendation	N	Mean	Median	Min	Max
• “Include this in primary health centres and more access to this intervention for community level workers such as asha workers and school teachers as well.” • “in certain stages an later replicated by people and peers” • “The whole team including peers and service users love their community kitchen very much” • “Very relevant in Rwandan context, can be achieved through working with govt, NGOs, peer workers and people with lived experience.”					
Summary: This recommendation was considered appropriate but capacity building and training is required. Supervision and support is required for appropriate intervention and sustainability of actions. To make this achievable, it was suggested to collaborate with other sectors including government agencies, NGOs, primary health care and community kitchens and integrate peer workers and people with lived experience.					
12. Utilisation of mHealth strategies.	10	7.7	7.5	5	10
<i>Feedback on improving the recommendation:</i> • “Link with the existing mobile-based service providers.” • “this is relevant but not many disadvantaged people are able to afford internet services for effective mobile health” • “strategic approach works” • “Not many people know mHealth strategies.”					
<i>How this could be achieved in your context:</i> • “yes, as it aims to integrating views and interventions, and not viewing mental health and lifestyle as independent realms” • “the team got inspired with seeing the person as the wholeness" social change" collaborative works and potentials of every human" dignity" empowerment for persons with psychosocial disability and diversities” • “Educating relevant parties about mHealth”					
Summary: This recommendation received mixed opinions, noting that is relevant but may not be consistently accessible for disadvantaged people in these contexts, for example, due to costs. Further, education may be required for both the provider and service user on mHealth strategies in certain contexts. Despite this, there were favourable perspectives given the potential for holistic, adjunctive support.					
13. Utilisation of behavior change techniques.	10	8.3	9	4	10
<i>Feedback on improving the recommendation:</i> • “Capacity building/training needed for those who will involve in the utilization of behavior change techniques.” • “behavior change may be targeted work”					
<i>How this could be achieved in your context:</i> • “Brief training for Mh specialists on the delivery of these techniques, It need not be 1-1 therapy but can be done as group work or brief online work that has more consistent check-in or feedback for those inclined to the intervention” • “in certsin cases, but not as a "one size fits all" policy”					

Recommendation	N	Mean	Median	Min	Max
“It takes time for behavior change but the new comers joined the peers and the behavior change came faster in some cases” “Useful in Kigali, not so useful outside.”					
Summary: This recommendation was considered relevant but should be integrated as appropriate to the context. For example, it should not be seen as a ‘one size fits all’ policy and could be integrated into group work or online support, with more targeted support to those accepting of the intervention. In any case, capacity building and training of those delivering the behaviour change techniques will likely be required.					
14. Proactive engagement and outreach.	10	8.1	8	6	10
<i>Feedback on improving the recommendation:</i> “Enhance the existing healthcare management and services.” “Initiative and Innovative are curiosity and exploratory” “Dissemination knowledge about holistic medicine and approach, implement”					
<i>How this could be achieved in your context:</i> “yes, interventions require proactiveness and outreach” “the team is interested in freedom of connectedness and communication and finding out more and extending & collaboration in different expertise and interested in worktogether” “Psychoeducation of patients and clients, Implementation as important component of educational process of mental health specialists” “Useful for engaging with stakeholders, not so useful otherwise.”					
Summary: This recommendation had mixed perspectives but overall was considered important, suggesting interventions require providers to be proactive and outreach to community.					
Are there key recommendations that are missing?					
“It would be useful to understand how we can further use technology to help geriatric population assess and monitor their lifestyle. It would be helpful to understand how sport can be used for adolescents in communities to improve lifestyle practices and serve as mediator to build rapport to disperse educational information about lifestyle interventions.”					
Any additional feedback?					
“The importance of lifestyle intervention in mental health services will vary between urban and non-urban/rural settings.” “I would stress the need to integrate views, understanding lifestyle interventions and mental health holistically”					

Countries/contexts represented: Brazil, Colombia, Egypt, India, Indonesia, Myanmar, Nigeria, Rwanda, Ukraine.

*ASHA workers are health workers in India, serving as a link between the community and the healthcare system.

Supplementary 5.3: Global South Review of Key Evidence and Recommendations for the Report.

The summary scores and open-ended feedback were sent back to the GSAG, together with the synthesis of Sections 1-4, to assist in generating a description of Global South considerations via a virtual meeting conducted in Microsoft Teams.

Eleven stakeholders attended the meeting. Two participants also wrote feedback directly into the documents. SR reviewed and interpreted the feedback and integrated this into the report.

Section 5 of the main text presents the Global South considerations.

Supplementary 5.4: Lived Experience Perspectives on the Preliminary Recommendations.

A survey was generated in REDCap⁴⁰⁰ to understand the relevance of the preliminary recommendations from the perspective of people with mental illness. To provide the recommendations in a more accessible language, TP and a person with lived experience reviewed them and modified them accordingly. The modified language is presented in **Table S36**.

The modified survey was sent via TP to the DIAMONDS Patient and Public Engagement panel and a Lived Experience Advisory Group in South London. The survey asked participants to rate the relevance of each recommendation on a scale of 0 ‘not relevant at all’ to 10 ‘highly relevant’. In addition, for each recommendation, participants had the opportunity to provide open-ended text responses for suggestions on improving the recommendation. Finally, participants could provide open-ended responses for: i) recommendations missing from the list, and ii) any additional feedback they would like to give.

Eight people completed the survey: six client/patients, one carer, and one person that was both a carer and patient/client. All participants were from the United Kingdom. The mean, median, and minimum and maximum scores were calculated. Recommendations with a mean score of $\geq 7/10$ were considered relevant to the LEAG based on methodological criteria for generating consensus.⁴⁰¹ Text responses were listed verbatim and interpreted to inform Section 5 of the main file. Scores and open-ended feedback on each survey component are presented in **Table S36**.

Table S36. Lived Experience Advisory Group Responses.

Recommendation	N	Mean	Median	Min	Max
1. People who work as mental health practitioners ('mental health workers') should be given training and appropriate tools (e.g., weight scales and measuring tape) to support metabolic monitoring (e.g., changes in weight, blood tests) and lifestyle assessments (e.g., diet and physical activity of clients/patients).	8	8.1	9	3	10
<i>Feedback on improving the recommendation:</i> • “BMI machines available at Boots stores.” • “don't use scales and tape eg (trauma like CSA)”					
2. In buildings that provide mental health care, there should be access to a space where metabolic monitoring (e.g., checking body weight) and lifestyle assessments can take place.	8	7.5	8.5	4	10
<i>Feedback on improving the recommendation:</i> • “Smokers and drinkers must be aware about consequences of their addiction.” • “sometimes be if needed”					
3. In buildings that provide mental health care, there should be access to facilities where lifestyle interventions can take place, e.g., a gym or a kitchen to provide cooking lessons.	8	8.1	8.5	5	10
<i>Feedback on improving the recommendation:</i> • “Instead of the the gym it can be simple 5-10 thousands steps with monitors or just 15-30 minutes litter pick around the house.” • “if needed”					
4. People cared for by mental health services should have access to regular metabolic monitoring (e.g., weight and blood tests). Where any problems are identified, these should be acted on promptly (either by a mental health practitioner with appropriate experience, or by onward referral to another medical professional).	8	8.0	8.5	4	10
<i>Feedback on improving the recommendation:</i> • “Side effects of the medication can drastically increase weight...”					
5. Mental health care facilities should employ staff dedicated to providing lifestyle interventions, e.g., dietitians and exercise specialists, and people who help others stop smoking.	8	8.4	8.5	5	10
<i>Feedback on improving the recommendation:</i> • “Stop smoking must be taking more seriously! Recovery Colleges in England have a short courses about Men's health and it seems working.”					

Recommendation	N	Mean	Median	Min	Max
6. Mental health care facilities should employ peer workers (these are people with lived experience of mental illness) to support lifestyle interventions.	8	8.5	8.5	6	10
<i>Feedback on improving the recommendation:</i> “Yes, very good idea. Recovery Colleges in England already put this in place.I” “where wanted, needs staged intro”					
7. Mental health workers should receive training on providing lifestyle interventions to clients/patients, e.g., helping people to stop smoking, or providing dietary advice.	8	8.4	8.5	6	10
<i>Feedback on improving the recommendation:</i> “I think every citizen/resident should have this kind of training for the healthy nation.” “ongoing training”					
8. Workers who provide lifestyle interventions (e.g., dietitians) should receive training in mental health.	8	8.1	8.5	6	10
<i>Feedback on improving the recommendation:</i> “Obviously everyone have a mental health and need to be aware of mental health illnesses.” “I find this very broad, they should probably receive training on serious mental health diseases than in mental health in general.” “and supervision”					
9. Lifestyle interventions provided to clients/patients should target physical activity levels, diet and smoking.	8	7.1	7.5	5	10
<i>Feedback on improving the recommendation:</i> “It should be prevention instead of Intervention.” “broader eg hsg income family”					
10. As part of the physical activity intervention, client’s/patient’s should be offered sessions supervised and supported by a trained professional.	8	6.6	6	3	10
<i>Feedback on improving the recommendation:</i> “Physical activity should be simple gardening, walking, dancing.” “sustainability of access”					
11. As part of the nutrition intervention, client’s/patient’s should be offered practical sessions (e.g., cooking skills) supervised and supported by a trained professional.	7	7	8	3	9
<i>Feedback on improving the recommendation:</i>					

Recommendation	N	Mean	Median	Min	Max
“Recovery Colleges provided cooking lessons for the group of 5 people.” “where poss in own space”					
12. Where possible, digital health strategies such as mobile phone applications should be used to support lifestyle interventions.	8	7.3	6.5	5	10
<i>Feedback on improving the recommendation:</i> “Not for everyone, direct human interaction most effective way.” “if wanted and feasible”					
13. Techniques that support behaviour change (e.g., approaches that motivate people to address their lifestyle) should be available to clients/patients.	8	8	8.5	3	10
<i>Feedback on improving the recommendation:</i> “Some of the patients have no willpower at all, I think self discipline, self motivation and self management are absolutely crucial for the patients, care providers, National Health Service and global Environment and Economy.”					
14. Lifestyle support should be provided proactively and flexibly via an approach that suits the client/patient, e.g., in-person, over the phone, or home visits.	8	8.5	9	5	10
<i>Feedback on improving the recommendation:</i> “Home visit is necessary to understand home environment and surroundings for the physical activity, shopping and community support.”					
Are there key recommendations that are missing?					
“Mindset, attitude and willpower must be taken seriously and then physical activities, healthy habits. Without changing behaviour there's no chance to achieve changes in life style of the patients.” “Please give details of the blood tests required. Apart from the glucose tolerance test, it should be an insulin tolerance test as well and the interventions should start from pre-diabetic status, not wait till diabetes is established.” “look at what has been tried before”					
Any additional feedback?					
“People respond to external motivation in the moment but retreat once they are on their own. it requires sensitivity from health practitioners to skillfully manage their interventions not to exacerbate this problem.” “Time scale is very important, appropriate dairy, compatible health professionals with the patient, volunteer or group of patients with the similar conditions.” “There is a significant budget implications from some of the healthcare interventions you are mentioning. You might need to propose as well some cost-effective studies for these recommendations.”					

Supplementary 5.5: Lived Experience Perspectives on the Evidence and Recommendations for the Commissioned Report.

Aim:

We conducted three focus groups with people who live with mental illness to gain their feedback on the evidence and recommendations generated by the reviews conducted during this commission, including further considerations that needed to be incorporated into the report.

Methods:

Design. Focus groups. All participants provided informed consent and were reimbursed in line with the Paid Participation Policy and a Payment Procedure from Mindgardens Neuroscience Network. We received approval for the conduct of the focus groups from the UNSW Human Research Ethics Committee (#7456).

Setting & Participants. Participants: i) were aged 18-65 years, ii) had lived experience of mental illness and/or were a parent/carer of a person with lived experience of mental illness, and iii) living in Australia. Participants were recruited through known consumer networks in Australia. Focus group were conducted online (Microsoft Teams). Seven participants consented to participate, five attended all three focus groups, one attended two focus groups, and one participant attended one focus group.

Procedure. Participants were provided with ≤ 1 hour of pre-reading for the three focus groups. Pre-readings and focus groups focused on draft recommendations and findings for *Evidence-Based Recommendations from Meta-Research, Priorities for Action by Providers at Each*

Level of the System, and How can Lifestyle Interventions be Implemented in Ways that Address the Needs of People with Mental Illness (Panel 4, Panel 6, and Table 2 of the main file). The focus groups were co-facilitated by a lifestyle researcher with experience working in a mental health service (ST), and a lifestyle researcher and consumer consultant (JC). Participants were encouraged to share their perspectives and experiences/personal stories as they desired verbally or in writing (i.e., Microsoft Teams chat function). ST introduced concepts/questions and then opened the floor to participants. JC sought to clarify participants' comments and interpretation, and prompted participants whenever appropriate.

Integration into the report. JC reviewed transcripts and written comments and worked in collaboration with ST and KM to modify recommendations within the report. JC then generated narrative to more holistically reflect on the perspectives and experiences gained through the focus groups, which is included in **Section 5** of the main file. Supporting quotes for each segment of the narrative are presented in **Table S38**.

Table S38. Perspectives Provided by Consumers with Supporting Quotes

While participants acknowledged the value of lifestyle interventions, they also acknowledged that the framing of ‘lifestyle’ in this Commissioned report was narrow.	When asked about what else should be added, oral and dental health was suggested as one important lifestyle factor that was missing. Other participants provided broader interpretations of ‘lifestyle’ as having structure and regularity in daily activities and positive thoughts and feelings.
• <i>“I find this whole definition of lifestyle incredibly restricting... it has to include anything that anybody would consider gives them a sense of meaning and purpose in their lives...”</i> • <i>“There’s something more than these lifestyle factors, it’s a cross between spiritual and emotional, something that gives you meaning and purpose in life.”</i> • <i>“These interventions can be useful, but they don’t go anywhere near meeting the needs of people with complex, lifelong mental health issues.”</i>	• <i>“Routine is one of the most important things. When you’re struggling, you lose that contact with the world around you... if you start losing that routine you start going further away from what you want your lifestyle to be.”</i> • <i>“As Aboriginal people we are soul and spirit people. [lifestyle is] Being able to find love for oneself, to wake up every morning and have that inside you, that you’re worthy and the hopes are outweighing the pains...”</i>
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 broad value of these approaches at all stages of one’s journey.
• <i>“If you start off early in life with adverse experiences, you don’t develop positive habits or enjoy favourable opportunities. Counterproductive behaviours become normalised, and then in adulthood is challenging to embrace an alternative.”</i>	• <i>“...until you improve my life conditions, I’m indifferent, and until I have a purpose to live I don’t see the benefit in something like this.”</i> • <i>“Lifestyle factors are very much about prevention, managing stress, not letting unhealthy habits creep in. Having a good routine and sense of purpose and activity to do, this structure really helps and is a part of the prevention effort.”</i>

Regardless of <i>when</i> participants believed lifestyle programs should be introduced, all agreed that <i>how</i> it's offered is critical. Participants emphasised that lifestyle programs must be offered in a way that supports autonomy and self-determination, empowering individuals to make their make their choices, whatever that may be.	Rather than using approaches that focus on adherence to lifestyle recommendations, health literacy or “<i>motivational rhetoric</i>”, participants believed that the root causes of ‘unhealthy lifestyle behaviours’ as articulated in the report should be addressed.
• “If you give people options, they can make a choice that’s relevant to them. Motivation is very fleeting, that’s why I like to say, ‘determination over motivation.’” • “There is a big issue in mental health generally - it’s judgement of clinicians that ‘you have a problem, you need to change, and I’m here to make you to change’. That approach will kill it for people with serious mental illnesses.” • “If you’re told to do a particular treatment, it takes our empowerment away from our health. If we are empowered to talk about what our balance is and what we need, it’s much more empowering to get motivated than being told to adhere to certain lifestyle recommendations”	• “If you want to stop people doing things like smoking, you have to replace it with another emotionally satisfying and life defining benefit, not just incentivise them with health information because that’s meaningless.” • “There’s one line I keep saying, ‘the opposite of addictions is not sobriety, it’s connections’. If I’ve got a purpose and a connection every day, that is beating the trauma. If our systems can focus on that, it may open up to be more effective.”
The importance of relational aspects of engagement to support autonomy and address these core issues 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.
• “A lot of the services couldn’t give me what I need, but some parts of the service gave me the feeling that they understood. Communication and understanding can go a long way to helping with the process.” • “There’s a feeling when I talk to some people in the service – if I can feel the soul and spirit of the person, that they’re trying to help, that’s where the empathy and trust is.”	• “You’d expect that people who are trained and educated would be the most understanding and empathetic but they’re often not. Even the best-intentioned professionals can continue to stigmatise and discriminate. Unexamined biases and prejudices can persist in how they engage, which can make an unsafe environment.” • “Sometimes there’s no feeling of being heard, that’s what we’re trying to overcome, all this pain in the soul and spirit. Our system lasted 65,000 years – it was conversation and observation – they were the two tools to deal with the core of the issues.”

Tailoring programs to suit diverse needs was a prominent theme throughout the focus groups. Considerations for tailoring programs included structural and contextual elements, such as the activity type, diversity of programs, and sensory needs. Participants expressed a desire for different framings of health and wellbeing, rather than always being understood and communicated through a biomedical lens. Priorities were more holistic social and emotional wellbeing concepts, trauma-informed framings, and cultural understandings.	Other contextual elements such as group characteristics were seen as important, because of the potential to hinder or enhance the group dynamic. However, an important caveat provided by one participant, was that assumptions and generalisations can't be made about the preferred group context for any individual. This was illustrated through a personal example in which people of similar age weren't conducive to therapeutic experiences.
• <i>“diversity of programs is needed... there are groups focusing on yoga or dance, and there's interest in these programs.”</i> • <i>“noise sensitivity and types of music should be considered.”</i> • <i>“I have huge problems in getting people to understand where I'm coming from and what experiences I've had and how they affect my life.”</i> • <i>“Traditional healers can help deal with mental health. Diagnoses are very often wrong from the start, and they are getting mixed up with trauma responses.”</i>	• <i>“People can feel uncomfortable in groups unless the others have had similar mental health challenges. Sometimes it works well to have people with lived experience as carers and consumers together, but sometimes they work better separated.”</i> • <i>“It's really important to tailor group-based initiatives according to gender and age. ... At the moment everybody's just grouped together, but their needs are so different... it makes it difficult to identify with each other.”</i> • <i>“They were always trying to pair him with peer workers his own age, but he found that very threatening because he kept comparing himself with others.”</i>
Once a program is appropriately designed for a given population group and individually tailored, the importance of long-term duration was seen as essential for making any real impact on people's lives.	Funding challenges to program longevity were discussed, and the use of technology was suggested as a supportive program feature that could enhance longer term engagement, but also acknowledged as problematic if used as a replacement for in-person engagement.
• <i>There's a lot of stagnation in these community groups - you have one then there's a break. [We need] them overlapping so you can move from one to another for some continuity to prevent disconnection.</i> • <i>...motivation is lacking when you have a mental health condition... Long-term programs are needed to help people change behaviours.</i>	• <i>In person classes first followed by online options can help because a personal connection is established first which can help longer-term engagement.</i> • <i>There are limitations to telehealth and it shouldn't be overused... non-verbal communication is problematic.</i>

Discussions about meso- and macro-level considerations about how services and government should support lifestyle programs related to two main categories: (1) enabling program development and long-term implementation with communities through policy and funding support for implementation; and (2) integration and collaboration with communities to collectively address these issues in the most appropriate and beneficial ways. Supporting these themes, participants reflected on the challenges that piecemeal funding and short-term commitments create for people and communities.	The fragmentation of services and the need for collective action across different settings was acknowledged as the most beneficial approach.
• <i>The funding issue is a problem; government seems unwilling to commit long-term or permanent funding to anything which leads to programs stopping.</i> • <i>Cost is such a huge factor... that takes options away from people experiencing disadvantage.</i> • <i>Policy always articulates the best ideas and principles, but they all fail because they're not implemented. It shouldn't matter where I live or what my situation is, I should be able to access any service I need but most of the country can't do that.</i>	• <i>Building collaborative learning communities should involve staff operating across sectors... the whole community involved, partnerships with external groups and services.</i> • <i>Libraries can help with overcoming accessibility issues – this would also help people get into the community.</i> • <i>Where we are we have a bunch of different services, but none of them ever sit together; they're all individualistic. I'm carrying my own pain but I'm also carrying our culture's.</i> • <i>There are often no community-based services that are coordinated to provide follow up... The failure to permanently fund community services... is partly why we have so many of these problems.</i>

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